# Garages at Gravelly Crescent
# Lancing
# West Sussex

## Combined Geotechnical and Ground Contamination Risk Assessment

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# EXECUTIVE SUMMARY

The following presents a summary of the main findings of the report. It is emphasised that no reliance should be placed on any individual point until the whole of the report has been read as other sections of the report may put into context the information contained herein.

It is proposed to demolish the existing garages at Gravelly Crescent, Lancing, West Sussex and to construct 7 no. two-storey residential dwellings with new areas of private and communal soft landscaping and parking.

The site currently comprises several rows of flat roofed domestic garages with areas of asphalt and concrete surfaced hardstanding in between.

The site comprised open land at the time of the earliest map referenced in 1873. By 1943 the site and surrounding areas formed part of a large Nursery. By 1966 the existing garages and surrounding houses were shown to have been constructed.

Reference to geological datasets indicates that the site is expected to be underlain by the Head deposits overlying the White Chalk Subgroup. The ground investigation confirmed the underlying soils to comprise a shallow thickness of made ground, overlying Head and, in turn, White chalk Subgroup deposits.

The Head is classed as a Secondary Undifferentiated Stratum. The White Chalk Subgroup is classed as a Principal Aquifer. The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply. Groundwater was encountered at depths of between 2.05m and 2.85m during the intrusive works and subsequent monitoring period.

The preliminary contamination risk assessment identified potential pollutant linkages relating to the end users of the site.

The ground investigation recorded some marginally elevated concentrations of heavy metals within the made ground soils. At present, given the relatively limited set of data available, it should be assumed that the made ground may pose an unacceptable risk to end users of the development and that remedial measures will be required.

Precautions against shrinkage and heave for any new foundation system should assume a medium volume change potential for the fine-grained Head soils. The undisturbed chalk deposits of the White Chalk Subgroup may be considered to be non-plastic and hence non-shrinkable.

A net allowable bearing capacity of 100kN/m$^2$ may be assumed for spread (pad or strip) foundations up to 1.0m across bearing within the Head soils of at least firm consistency or medium dense relative density. In this regard whilst in general such soils were typically encountered at depths of below 1.00m below ground level, within borehole WS01 soft soils were encountered to depths of around 3.00m to 4.00m.

Consideration may need to be given to supporting the proposed structures on piled foundations as an alternative to deep spread foundations given the presence of localised deep soft soils.

A DS-1 Design Sulfate Class and an AC-1 ACEC classification should be assumed as a minimum for the design of concrete in contact with the ground.

In view of the variable thickness of made ground and the presence of soils of medium volume change potential underlying the site, it is recommended that ground floors should be suspended.

The results from the infiltration tests indicate that the made ground and Head soils possess moderate to good infiltration characteristics.

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# 1. INTRODUCTION

It is proposed to demolish the existing garages at Gravelly Crescent, Lancing, West Sussex and to construct 7 no. two-storey residential dwellings with new areas of private and communal soft landscaping and parking. A copy of the proposed development layout is presented in Appendix A.

Ashdown Site Investigation Ltd was requested to undertake a ground investigation, to provide advice to assist with the structural design and to support a planning application for the site.

The specific objectives of the works were to:

a) Establish the expected geology, hydrogeology and hydrology at the site;
b) Ascertain the development history and current site use;
c) Develop a preliminary conceptual model of the site identifying potential pollutant linkages relating to end users of the proposed development works, to controlled waters beneath and in the vicinity of the site, or to other off-site sensitive receptors, if identified;
d) Investigate the shallow ground and groundwater conditions in the area of the proposed development;
e) Provide advice to assist others in undertaking design of spread foundations, ground floors and soakaways;
f) Test for the presence of contaminants identified by the preliminary conceptual model; and
g) Develop a quantitative conceptual model of the site, refining the preliminary model to identify any remaining pollutant linkages that may be present.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letter Q10306Rev3, dated 21st January 2022. The works were undertaken under purchase order number PO1006968 provided by the client.

Copies of the historical maps and geo-environmental data referred to in this report are presented within Appendix H.

# 2. WALKOVER SURVEY

The site comprises an irregular shaped plot of land located at to the north of Gravelly Crescent, Lancing, West Sussex, and is centred on the approximate Ordnance Survey national grid reference 518710 105022. A site location plan and site plan are presented as Figure 1 and Figure 2, respectively. Photographs taken during the walkover survey are included in Appendix B.

The site comprises several rows of flat roofed domestic garages, with areas of asphalt and concrete surfaced hardstanding in between.

The site is generally level and is surrounded by housing on all sides.

# 3. ENVIRONMENTAL AND GEO-ENVIRONMENTAL DATA REVIEW

## 3.1 Geological Data Review

### *3.1.1 Expected Geology and Aquifer Designation*

The stratigraphic succession that may be expected to underlie the site is presented in the following table.

*Table 1. Expected Strata and Aquifer Designation*

| Type | Stratum | Aquifer Designation |
|---|---|---|
| **Superficial** | Head | Secondary Undifferentiated Aquifer |
| **Bedrock** | White Chalk Subgroup | Principal Aquifer |

The superficial Head is a polymict deposit generally comprising clay and sandy clay with variable amounts of gravel and cobbles. The lithology of the Head reflects the nature of the parent solid strata; the gravel and cobble fraction comprising chalk and flint. The material is likely to have been disturbed by intense frost action in a periglacial environment. It is usually poorly sorted but may be stratified where it has been subject to solifluction and/or hillwash and soil creep. It may form infill to solution features within the chalk.

The White Chalk Subgroup comprises a weak, white chalk locally with flint bands together with scattered nodular flints. It may be expected to have a deeply convoluted upper surface as a result of solution weathering.

Whilst not shown by the geological data sets to be present on site, an area of Alluvium is shown a short distance to the south of the site. Alluvium is a term for any material that has been transported and laid down by rivers. It can variably comprise sand and gravel, and, where deposited on flood plains may include compressible organic clay and silt. Peat and sand horizons may be present within the deposits, indicating localised changes within the depositional regime.

### 3.1.2 Natural Ground Subsidence

*Table 2. Natural Ground Subsidence from Groundsure Data*

| | Risk Assessment | |
|---|---|---|
| **Section** | **Head** | **Alluvium** |
| **Soil Volume Change Potential (Shrink-Swell)** | Very Low - Ground conditions predominantly low plasticity | Low - Ground conditions predominantly medium plasticity |
| **Running Sands** | Very Low - Running sand conditions are unlikely | Low - Running sand conditions may be present |
| **Compressible Deposits** | Negligible - Compressible strata are not thought to occur | High - Highly compressible strata present |
| **Collapsible Deposits** | Very low - Deposits with potential to collapse when loaded and saturated are unlikely to be present | Negligible - Deposits with potential to collapse when loaded and saturated are believed not to be present |
| **Landslides** | Very low - Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered | |
| **Ground Dissolution of Soluble Rocks** | Very low - Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered | |

It should be noted that the assessment provided within the data represents a generic assessment only. Reference should be made to the site-specific geotechnical assessment presented in Section 8.

### 3.1.3 Mining, Ground Workings and Natural Cavities

*Table 3. Mining, Extraction and Natural Cavities from Groundsure Data*

| Section | Risk Assessment |
|---|---|
| **Natural Cavities** | No natural cavity records are identified within 500m of the site. |
| **BritPits** | No BritPits records are identified within 500m of the site. |
| **Surface Ground Workings** | The nearest entry refers to a sewage works 199m south of the site. Given the distance this is not considered to represent a potential source of contamination that could impact the site. |
| **Underground Workings** | No underground workings are identified within 250m of the site. |
| **Historical Mineral Planning Areas** | No records are identified within 500m of the site. |
| **Non-Coal Mining** | No non-coal mining areas identified within 1km of the site. |
| **Mining Cavities** | No records are identified within 500m of the site. |
| **Johnson Poole and Bloomer** | No records are identified on the site. |
| **Coal Mining** | No records are identified on the site. |
| **Brine Areas** | No records are identified on the site. |
| **Gypsum Areas** | No records are identified on the site. |
| **Tin Mining** | No records are identified on the site. |
| **Clay Mining** | No records are identified on the site. |

The presence of natural cavities in the chalk is very rare and solution features, if present, can be expected to be infilled with Quaternary deposits such as the Head. The infill material may be significantly weaker than the surrounding chalk. Solution features can comprise pipes extending to several metres deep into the chalk or conical depressions and basin shaped structures.

Historically, chalk deposits were often mined locally. Most commonly historical mines characteristically comprise a narrow shaft with a number of chambers radiating from the base. These structures are colloquially known as "deneholes", "chalk-wells" or "chalkangles".

The depth of the features reflects the depth to the underlying chalk bedrock. The shaft width was commonly in the order of 2m to 3m, widening out into galleries at depth. The chalk was extracted for soil improvement and was usually applied directly to fields though sometimes the chalk was processed, typically by burning in kilns where the chalk was used to produce quicklime (calcium oxide).

Once they had reached their limits the mines were commonly capped. Various capping techniques were used; examples include the use of upturned trees or brick arching. Records pertaining to the distribution of these localised mines are incomplete, usually being limited to features marked as shafts or the occurrence of circular depressions on historic Ordnance Survey maps. In the field they are most likely to be visible as shallow depressions, if at all.

Inspection of historical maps extending back in time to 1873 does not reveal the presence of any significant features at the site though, for reasons given above, their presence cannot be fully discounted. It is therefore recommended that all stripped formation levels should be inspected for evidence of historical backfilled shafts as a precaution.

### *3.1.4 Radon*

*Table 4. Radon*

| Section | Risk Assessment |
|---|---|
| **Radon Affected Areas** | The site is reported to be within an area where between 1% and 3% of properties are above the action level requiring radon gas protection measures to be installed in new buildings. |
| **Radon Protection Measures** | No radon protection measures are reported by the British Geological Survey to be necessary in the construction of new dwellings or extensions. |

### *3.1.5 Soil Chemistry*

The estimated background soil chemistry does not pose an unacceptable risk in the context of the site. Detailed assessment of the chemistry of the soils encountered at the site is presented in Section 9 of this report.

## 3.2 Hydrogeological and Hydrological Data Review

### *3.2.1 Groundwater Abstractions*

The closest groundwater abstraction licence is recorded to lie 646m to the south east of the site. This refers to a historical abstraction for "Animal Watering and General Use in Non Farming Situations".

### 3.2.2 Surface Water Abstractions

The closest surface water abstraction licence is recorded to lie 1900m to the north east of the site.

### 3.2.3 Potable Abstractions

No potable abstraction licences are indicated within 2km of the site.

### 3.2.4 Groundwater Source Protection Zones

The site does not lie within an Environment Agency Source Protection Zone.

### 3.2.5 Surface Water Features

The nearest recorded significant surface water feature is reported to be a river 54m south of the site.

### 3.2.6 Flood Risk

The table below summarises the flood risk data provided by the Groundsure report.

*Table 5. Flooding*

| | On Site | Within 50m of the Site |
|---|---|---|
| **Risk of Flooding from Rivers and Seas (RoFRaS)** | Low | Low |
| **Historical Flood Events** | None Identified | None Identified |
| **Flood Defences** | None Identified | None Identified |
| **Areas Benefitting from Flood Defences** | None Identified | None Identified |
| **Flood Storage Areas** | None Identified | None Identified |
| **Environment Agency Flood Zone 2** | On site | - |
| **Environment Agency Flood Zone 3** | On site | - |
| **Surface Water Flooding** | Highest Risk: Negligible | Highest Risk: 1 in 30 year event Depth between 0.1m-0.3m |
| **Groundwater Flooding** | Highest Risk: Moderate-High | Highest Risk: Moderate-High |

## 3.3 Geo-Environmental Data Review

### *3.3.1 Historical Industrial Sites*

The following table summarises past land uses of the site and the surrounding area extracted from 1:10,000 and 1:10,560 historical maps.

*Table 6. Historical Industrial Sites*

| Section | Remarks |
|---|---|
| **Historical Industrial Land Uses Identified from 1:10,560 and 1:10,000 scale mapping** | The site is recorded as being part of a larger Nursery. |
| **Historical Tank Database Identified from 1:1,250 and 1:2,500 scale mapping** | No historical tanks are identified within 100m of the site. |
| **Historical Energy Features Identified from 1:1,250 and 1:2,500 scale mapping** | Substations are identified 42m north west and 63m south west. Given the distance from the site these are not considered to represent potential sources of contamination which could impact the site. |
| **Historical Petrol Stations Identified from 1:1,250 and 1:2,500 scale mapping** | No historical petrol stations are identified within 100m of the site. |
| **Historical Garages Identified from 1:1,250 and 1:2,500 scale mapping** | No historical garages are identified within 100m of the site. |
| **Historical Military Sites** | No historical military sites are identified within 100m of the site. |

### *3.3.2 Landfill and Other Waste Sites*

The following table summarises the location of waste sites either on the site or within the surrounding area (within 250m of the site).

*Table 7. Landfill and Other Waste Sites*

| Section | Remarks |
|---|---|
| **Active or Recent Landfills** | No active or recent landfills are identified within 250m of the site. |
| **Historical Landfill (BGS Records/LA/Mapping Records EA Records)** | No historical landfills are identified within 250m of the site. |
| **Historical Waste Sites** | No historical waste sites are identified within 250m of the site. |
| **Licensed Waste Sites** | No licensed waste sites are identified within 250m of the site. |
| **Waste Exemptions** | No waste exemptions are identified within 250m of the site. |

### 3.3.3 Current Industrial Land Use

The relevant current industrial land uses are discussed in the table below.

*Table 8. Current Industrial Land Uses*

| Section | Remarks |
|---|---|
| **Recent Industrial Land Use** | The closest entries refer to the substations discussed in Section 3.3.1. |
| **Current or Recent Petrol stations** | No current or recent petrol stations are identified within 100m of the site. |
| **Electricity Cables / Gas Pipelines** | No underground high voltage cables or high-pressure pipes are identified within 100m of the site. |
| **Sites determined as Contaminated Land** | No sites determined as contaminated land are identified within 100m of the site. |
| **Control of Major Accident Hazards (COMAH) Sites** | No COMAH sites are identified within 100m of the site. |
| **Regulated Explosive Sites** | No regulated explosive sites are identified within 100m of the site. |
| **Hazardous Substance Storage/Usage** | No consents have been granted for hazardous substance storage/usage within 100m of the site. |
| **Historical Licenced Industrial Activities (IPC)** | No records are recorded within 100m of the site. |
| **Licenced Industrial Activities (Part A(1))** | No records are identified within 100m of the site. |
| **Licenced Pollutant Release (Part A(2)/B)** | No records are identified within 100m of the site. |
| **Radioactive Substance Authorisations** | No records are identified within 100m of the site. |
| **Licenced Discharges to Controlled Waters** | The closest entry refers to a lapsed consent 68m south of the site. Given the distance from the site this is not considered to represent potential sources of contamination which could impact the site. |
| **Pollutant Release to Surface Water / Public Sewer** | No records are identified within 100m of the site. |
| **List 1 / List 2 Dangerous Substances** | No records are identified within 100m of the site. |
| **Pollution Incidents (EA/NRW)** | The closest entry refers to an incident in 2001 recorded as being a Category 3 water impact caused by "Oils and Fuels". Given the distance from the site this is not considered to represent potential sources of contamination which could impact the site. |
| **Pollution Inventory Substances / Waste Transfers / Radioactive Waste** | No records are identified within 100m of the site. |

### 3.3.4 Sensitive Land Use

No sensitive land uses at risk from contamination are identified within 1km of the site.

### 3.3.5 Railway Infrastructure and Projects

No current railway or associated features are identified within 250m of the site.

# 4. HISTORICAL MAP REVIEW

Historical Ordnance Survey maps covering the area of the site have been reviewed and are summarised in the following table.

It is noted that each map presents information applicable at the time of the survey (or revision date) and is subject to surveying and cartographic errors and/or advances. Revisions to maps are made at irregular intervals and it is possible that significant developments may have taken place on or within the vicinity of the site that are not shown on the maps.

'In the Vicinity of the Site' generally refers to features of relevance within approximately 250m of the site boundary but may also include more distant features if considered to be pertinent to the assessment of the development history.

*Table 9. Summary of Significant Features Identified on Historical Maps*

| Map Details | On-Site | In the Vicinity of the Site |
|---|---|---|
| **1873 1:2,500** | The site comprises part of an open field. | The site is surrounded by open land. |
| **1943 1:2,500** | The site now lies within a large open area labelled as a Nursery. | Further Nurseries, with a number of large glass houses, are present to the west of the site. |
| **1966 1:2,500** | The site now contains several rows of what appear to be domestic garages on the footprint of the existing development. | The site is surrounded by housing. |

# 5. PRELIMINARY CONTAMINATION RISK ASSESSMENT

## 5.1 Introduction

The risk assessment considers the potential sources of contamination identified, the receptors that may be present in view of the development proposals and the contaminant pathways by which these may be linked. A complete pollutant linkage is only deemed to exist where all three are present and a site is considered suitable for use where no complete pollutant linkages are identified.

Where a complete pollutant linkage is deemed to be present, an assessment of the level of risk associated with the pollutant linkage has been carried out in line with current guidance[1].

The level of risk is determined using the risk matrix presented in the following table. Classifications of probability, consequence and risk are presented in Appendix C.

*Table 10. Risk Assessment Matrix*

| | | **Probability** | | | |
|---|---|---|---|---|---|
| | | **Very Low** | **Low** | **Moderate** | **High** |
| **Consequence** | **Very Minor** | Negligible | Very Low | Low | Low/Moderate |
| | **Minor** | Very Low | Low | Low/Moderate | Moderate |
| | **Moderate** | Low | Low/Moderate | Moderate | High |
| | **Severe** | Low/Moderate | Moderate | High | Very High |

## 5.2 Basis of Assessment

The development is to comprise new residential buildings together with areas of private garden where end users can expect to come into contact with the underlying soils, where soil derived dusts may be generated and where the growing of fruit and vegetables may feasibly occur.

The proposed development layout is presented in Appendix A. Should the proposed development plans be altered, a revised risk assessment may be required.

It is noted that an asbestos survey of existing structures and infrastructure[2] was beyond the brief of this report. The risk assessment has been undertaken on the basis that should asbestos be identified within buildings or infrastructure, these materials will be removed appropriately by licensed contractors and asbestos materials disposed of in accordance with legal requirements prior to demolition or other works in order to avoid contaminating soils at the site.

The findings of the preliminary contamination assessment have been used to inform the ground investigation works which are discussed in the following section of the report.

[1] Contaminated Land Risk Assessment: A guide to good practice, CIRIA C552, 2001.
[2] As defined under Section 5(a) of the Control of Asbestos Regulations, 2012.

## 5.3 Potential Contamination Sources Identified

The following potential sources of contamination have been identified by the preliminary contamination risk assessment:

- Historical and current land use as garages with extensive hard standing.
- Historical use of the site as a Nursery.

Given the presence of hard standing across the site, there is the potential that this has been constructed above a variable depth of imported fill material, which can often contain a range of common contaminants, and may also have resulted in some degree of made ground being present.

## 5.4 Preliminary Conceptual Model

The preliminary conceptual model for the proposed development is presented in Appendix D.

# 6. GROUND INVESTIGATION

## 6.1 Introduction

The ground investigation comprised the drilling of a series of dynamic sampler boreholes and excavation of hand dug pits, together with accompanying in-situ geotechnical testing. Groundwater monitoring standpipes were installed in selected exploratory holes and monitored on subsequent site visits. The intrusive work was carried out on 3rd February and 14th March 2022. The exploratory hole locations are shown on Figure 2.

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole records given in Appendix E, together with notes to assist in their interpretation.

## 6.2 Exploratory Holes

### *6.2.1 Dynamic Sampler Boreholes*

Five boreholes, designated WS01 to WS05, were drilled to depths of between 3.00m and 4.00m below ground level.

The boreholes were formed by a series of 1.0m long, open ended, hollow steel tubes of up to 100mm diameter, each containing a removable plastic liner. The tubes, progressively reducing in diameter, were driven into the ground by means of a track-mounted drop weight. Each tube was extracted from the ground using a hydraulically operated jack and the enclosed sample was recovered in its plastic liner.

The system enables sub-samples to be taken for detailed examination and laboratory testing.

### *6.2.2 Trial Pits*

Two trial pits, designated PP01 and ST01, were dug using hand tools to respective depths of 0.85m and 1.00m below ground level to enable in-situ falling head infiltration testing to be carried out.

## 6.3 Sampling

Disturbed samples of soil were taken at the depths shown in the exploratory hole records and were collected in plastic bags, plastic tubs or amber jars fitted with gas tight lids.

On collection the amber jars were stored in cool boxes with cooling blocks to maintain temperatures below 4°C until transferred to refrigerators upon return to the office and subsequently forwarded to the external accredited chemical testing laboratory.

## 6.4 In-situ Testing

The depths of in-situ testing, together with the test results, are either given on the exploratory hole records or are summarised separately in Appendix E.

### 6.4.1 Standard Penetration Testing

Standard penetration testing (SPT) was carried out within dynamic sampler borehole WS01 to assist interpretation of the strength of fine-grained soils. The SPT tests were carried out in accordance with BS EN ISO 22476-3:2005.

### 6.4.2 DPSH Dynamic Probe (Super Heavy) Testing

Continuous dynamic probe tests were undertaken adjacent to boreholes WS02 to WS05. The tests were conducted to a depth of 5.00m below ground level using a super heavy DPSH-B[3] probing geometry.

The DPSH-B configuration is similar to that of the standard penetration test (SPT); the main differences being that the tip comprises a 90° cone, the driving rods are lighter than those used for SPT testing and the blow counts are recorded over 100mm increments rather than 300mm, as is the case for the SPT.

The blow counts recorded and the calculated dynamic point resistances, which account for inertia of the anvil and driving rods, are presented on the borehole records and separately in Appendix E.

### 6.4.3 Undrained Shear Strength

Undrained shear strength determinations were made in-situ within the fine-grained soils using a Geonor hand shear vane.

Additionally, undrained shear strength determinations were made within samples of the fine-grained soils held in the dynamic sampler liners using a hand penetrometer.

### 6.4.4 Soakage Testing

Falling head soakage testing was undertaken in trial pit ST01 in accordance with BRE guidance[4], with the pit being backfilled with free draining material surrounding a standpipe containing a datalogger used to record the fall in water levels. The trial pit was filled on three separate occasions.

In addition, falling head infiltration testing was also undertaken in the shallower trial pit PP01. This trial pit remained open for the period of testing, was of limited size and the number of fills with water was limited to that achievable in a single day.

## 6.5 Installations

A groundwater monitoring standpipe was installed to a depth of 4.00m in borehole WS01. A description of the installation is shown on the exploratory hole record in Appendix E.

The depths to groundwater were recorded within the standpipes on four occasions between 10th February and 3rd March 2022. The readings are presented in Appendix E.

[3] As defined by BS EN ISO 22476-2:2005.
[4] Section 3.2.3 of Building Research Establishment (BRE) Digest 365, 2016.

## 6.6 Laboratory Testing

Laboratory testing was scheduled by Ashdown Site Investigation Ltd. Results from the laboratory tests are provided in Appendix F.

### *6.6.1 Geotechnical Testing*

Geotechnical testing was undertaken by Ashdown Site Investigation Ltd in accordance with the methods given in BS1377[5]. Chemical testing to enable classification of the chemical environment of soils in accordance with BRE SD1[6] was undertaken by an external UKAS accredited laboratory.

### *6.6.2 Chemical Testing*

Chemical (contamination) testing of selected samples was undertaken by a laboratory with recognised (UKAS and MCERTS) accreditation for quality control.

[5] BS1377:1990 Parts 1 to 8, Methods of test for soils for civil engineering purposes.
[6] BRE Special Digest 1:2005 Concrete in Aggressive Ground.

# 7. GROUND CONDITIONS

## 7.1 Stratigraphy

### *7.1.1 Surface Covering*

Each of the exploratory holes was excavated through a surface cover of asphalt (30mm to 50mm thick) over concrete some 150mm to 250mm in total thickness.

### *7.1.2 Made Ground*

Made ground, generally comprising gravelly sandy silty clay and/or gravelly sand, was recorded to depths of between 0.40m and 0.80m below ground level. The gravel fraction comprised variable quantities of flint, brick, glass, chalk, organic matter, slate, shell fragments, sandstone, ash-like material, clinker-like material and charcoal-like material.

A black stained gravel layer was noted beneath the surfacing within boreholes WS03, WS04 and WS05 extending to depths of between 0.25m and 0.30m below ground level.

### *7.1.3 Head*

Underlying the made ground, the investigation progressed into undisturbed typically firm, locally becoming stiff, slightly gravelly slightly sandy clay soils. These soils were recorded to the full depths of exploratory holes ST01 (1.00m) PP01 (0.85m) and WS03 (3.00m) and to depths of between 2.25m and 2.70m in boreholes WS02, WS04 and WS05.

These soils are considered to represent the Head deposits indicated on the published geological map.

Within borehole WS01, these clay soils were recorded to be of very soft/soft consistency below a depth of 1.90m below ground level, with zero blows being recorded during the standard penetration testing at depths of 2.00m and 3.00m and for the first 225mm of the test undertaken at 4.00m. It is also noted that very poor sample recovery was achieved between 3.00m and 4.00m below ground level and as such whilst very wet comminuted chalk was recorded the exact depth of the Head soils at this position is not known.

### *7.1.4 White Chalk Subgroup*

Beneath the Head deposits, where penetrated, dynamic sampler boreholes WS02, WS04 and WS05 encountered chalk deposits which continued to the full depth of the investigation. As discussed above similar soils were recorded at the base of WS01 although the exact depth that they were penetrated is unknown.

These deposits are considered to be representative of the White Chalk Subgroup indicated on the published geology map.

## 7.2 Stability

Instability and poor sampler recovery was recorded locally within the soils encountered.

## 7.3 Groundwater Conditions

During the intrusive works groundwater was recorded at depths of between 2.20m and 2.85m below ground level within boreholes WS01, WS04 and WS05. It should be noted that water levels within the exploratory holes during excavation/drilling may not have equilibrated with the groundwater table at the time the readings were recorded.

During the subsequent monitoring period, groundwater was recorded at depths of between 2.05m and 2.30m below ground level within the standpipe installed in borehole WS01.

Groundwater levels should be expected to fluctuate seasonally.

# 8. GEOTECHNICAL ASSESSMENT

The geotechnical assessment has been prepared in connection with the development proposals shown on the drawing included in Appendix A.

In summary the proposed development is understood to comprise demolition of the existing garages and the construction of 7 no. two-storey residential dwellings with new areas of private and communal soft landscaping and parking.

At the time of writing, no details were available concerning the specific loads likely to be applied to the foundations.

## 8.1 Foundations

### *8.1.1 Soil Shrinkage/Heave Potential*

The fine-grained soils of the Head have been classified as clays with modified plasticity indices in the range of 7% to 24%, the soils may be expected to exhibit up to a medium volume change potential.

It is recommended that the design of precautions against shrinkage and heave for any new foundation system (spread footings and ground beams etc.) should assume a medium volume change potential for the fine-grained Head soils and take into account current guidance such as that given by the Building Research Establishment (BRE)[7] or the National House Builders Council (NHBC)[8].

The undisturbed chalk deposits of the White Chalk Subgroup may be considered to be non-plastic and hence non-shrinkable.

Whilst this report has been prepared to provide advice to assist designers in undertaking detailed design, the report itself does not represent a detailed design statement. It is recommended that an arboricultural survey of the site that identifies the species and maturity of the existing trees in the areas of the proposed new buildings should be provided to engineers responsible for the foundation design. The locations of any felled trees that may affect foundation design should in addition be provided. Information on proposed planting schemes and the findings of this report should also be provided to the structural engineer responsible for the detailed design of foundation systems, to enable their assessment of minimum founding depths required for spread foundations and requirements for placement of void formers et cetera.

### *8.1.2 Spread Foundations*

#### *8.1.2.1 Foundation Depths for Spread Foundations*

Foundations should be constructed to bear below soils that are likely to be affected by significant soil volume changes caused by seasonal changes in moisture content to avoid damage to foundations that could otherwise arise. In addition, all made ground and any soils disturbed by the construction or removal of any previously existing foundations or services should be regarded as being variable in nature and state of compaction and, as such, unsuitable as a founding medium for shallow footings. New footings should be constructed so as to bear below made

[7] www.bre.co.uk : BRE Digests 240, 241 and 242, Low rise buildings on shrinkable clay soils, parts 1, 2 and 3; and BRE Digest 298 , The influence of trees on house foundations in clay soils and BRE Digest 412, Desiccation in clay soils.
[8] http://www.nhbc.co.uk/ : NHBC Standards, Chapter 4.2.

ground / disturbed natural soils and soil subject to seasonal soil volume changes, whichever is the deeper, and onto undisturbed, competent, natural deposits.

Summary guidance on suitable minimum foundation depths to protect against the effects of seasonal soil volume changes is presented in the table below but designers undertaking detailed design of foundations should follow the detailed guidance provided within Chapter 4.2 of the NHBC Standards.

*Table 11. Indicative Minimum Foundation Depths*

| Tree Type | Water Demand of Tree | Tree Distance to Tree Height Ratio (D/H) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.80 | 1.00 | 1.25 |
| | | Minimum Foundation Depth Required in Medium Volume Change Potential Soils (m) | | | | | | | | | |
| Broad Leaf | High | † | | | 2.50 | 2.35 | 2.20 | 2.00 | 1.70 | 1.35 | 0.90* |
| | Moderate | 2.00 | 1.85 | 1.70 | 1.60 | 1.45 | 1.30 | 1.15 | 0.90* | 0.90* | 0.90* |
| | Low | 1.50 | 1.40 | 1.30 | 1.15 | 1.05 | 0.90* | 0.90* | 0.90* | 0.90* | 0.90* |
| Coniferous | High | † | | 2.30 | 1.95 | 1.60 | 1.25 | 0.90* | 0.90* | 0.90* | 0.90* |
| | Moderate | 2.00 | 1.70 | 1.40 | 1.10 | 0.90* | 0.90* | 0.90 | 0.90* | 0.90* | 0.90* |

* Minimum foundation depth required to protect against soil volume changes.
† Foundations deeper than 2.50m require specialist design to protect against soil volume changes.

Details on the water demand and mature height of common trees is given within Table 3 of Chapter 4.2 of the NHBC standards which should be referred to when assessing minimum foundation depths required for the proposed development. A summary is provided in the table below.

*Table 12. Indicative Summary of Water Demand and Mature Height of Common Trees*

| Tree Type | High Water Demand | | Moderate Water Demand | | Low Water Demand | |
|---|---|---|---|---|---|---|
| | Tree | Height (m) | Tree | Height (m) | Tree | Height (m) |
| Broad Leaf | Elm | 18 – 24* | Acacia | 18 | Birch | 14 |
| | Oak | 16 – 24* | Alder | 18 | Elder | 10 |
| | Poplar | 15 – 28* | Apple | 10 | Fig | 8 |
| | Willow | 16 – 24* | Ash | 11 – 23* | Hazel | 8 |
| | Eucalyptus | 18 | Laurel | 10 | Holly | 12 |
| | Hawthorn | 10 | Beech | 20 | Honey Locust | 14 |
| | | | Blackthorn | 8 | Hornbeam | 17 |
| | | | Cherry | 8 – 17* | Laburnum | 12 |
| | | | Chestnut | 20 – 24* | Magnolia | 9 |
| | | | Lime | 22 | Mulberry | 9 |
| | | | Maple | 8 – 18* | Tulip Tree | 20 |
| | | | Pear | 12 | | |
| | | | Plane | 26 | | |
| | | | Plum | 10 | | |
| | | | Sycamore | 22 | | |

| Tree Type | High Water Demand | | Moderate Water Demand | | Low Water Demand | |
|---|---|---|---|---|---|---|
| | Tree | Height (m) | Tree | Height (m) | Tree | Height (m) |
| | | | Tree of Heaven | 20 | | |
| | | | Walnut | 18 | | |
| | | | Whitebeam | 12 | | |
| Coniferous | Cypress | 18 – 20* | Cedar | 20 | | |
| | | | Douglas Fir | 20 | | |
| | | | Larch | 20 | | |
| | | | Monkey Puzzle | 18 | | |
| | | | Pine | 20 | | |
| | | | Spruce | 18 | | |
| | | | Wellingtonia | 30 | | |
| | | | Yew | 12 | | |

* Dependent on particular species.

### 8.1.2.2 Bearing Capacity for Spread Foundations

For design purposes, a net allowable bearing capacity of 100kN/m$^2$ may be assumed for spread (pad or strip) foundations up to 1.0m across bearing within the Head soils of at least firm consistency or medium dense relative density. The quoted bearing capacity is expected to limit settlement to less than 25mm.

Whilst in general firm or medium dense soils were typically encountered below depths of 1.00m below ground level, at the position of borehole WS01 very soft to soft soils were encountered to depths of some 3.00m to 4.00m below ground level. Given the significant depth of very soft soils in the vicinity of borehole WS01, it is recommended that further works are undertaken for any proposed structures in the vicinity of this borehole once foundation design layouts have been finalised.

Attention is drawn to the presence of interbedded fine-grained soils, coarse-grained soils and chalk deposits beneath the site. As there is the potential for mixed soil conditions to be present beneath footings, designers should consider the need for foundations to be reinforced due to the potential for differential cracking to develop as a result of chalk deposits, coarse-grained and fine-grained soils settling at different rates under loading.

## 8.1.3 Piled Foundations

Whilst assessment of ground conditions for the purpose of providing information for piled foundation design was beyond the brief of this report, consideration may need to be given to supporting the proposed structure on piled foundations as an alternative to deep spread foundations, particularly in the vicinity of borehole WS01. Further ground investigation works would be required, including deep cable percussion boreholes, in order to provide suitable information to enable detailed piled foundation design.

## 8.2 Groundwater

Groundwater was recorded between depths of 2.20m and 2.85m during the intrusive works and between 2.05m and 2.30m depth below ground level during the subsequent monitoring period.

For excavations extending below the groundwater, particularly within coarse-grained soils or chalk deposits, groundwater control will be required to maintain adequately dry working conditions and excavation stability. In such circumstances it is recommended that trial pumping from proposed formation depths should be undertaken in advance of detailed design to fully establish requirements for groundwater control at this site.

## 8.3 Stability of Excavations

All made ground, coarse-grained natural soils and structureless chalk deposits exposed in excavations should be assumed to be unstable, even in the short term. Whilst fine-grained natural soils and structured chalk deposits may remain stable for a short period of time if not subjected to surcharge loads (such as may be imposed by existing foundations, traffic or storage of materials), the stability of these deposits if left unsupported should be assumed to have the potential to deteriorate. Where stable excavations are required, excavations should either be suitably supported or, where space permits, side slopes could be battered back to a safe angle of repose.

All excavations requiring human entry must be shored or battered as necessary to conform to current best practice, as accepted by the Health and Safety Executive (HSE)[9]. Current legislation requires that where personnel access is required into any excavation a competent person must inspect excavation supports or battering of slopes at the start of the working shift and at other specified times. No work should take place until the excavation is safe. Excavations should also be inspected after any event that may have affected their stability, such as a significant weather event, changes in surcharge loadings imposed by temporary storage of materials or changes in site traffic plans or alteration of support systems. Inspections should be formally recorded and any faults that are found should be corrected immediately.

Particular attention must be paid to ensuring the stability of nearby structures, services and neighbouring sites.

## 8.4 Aggressivity to Concrete

The aggressivity of the soils to concrete has been assessed in accordance with guidance published by the BRE[10].

In consideration of the soils encountered beneath the site it is considered that 'natural ground conditions' may be assumed for the purpose of assessing the aggressivity of the chemical environment for concrete classification (ACEC class). Given the noted occurrence of groundwater, 'mobile groundwater' conditions should be conservatively assumed.

The following table summarises the characteristic values indicated from the chemical analysis of the soils present beneath the site.

[9] Relevant guidance is given on the HSE website, www.hse.gov.uk
[10] BRE Special Digest 1:2005 Concrete in Aggressive Ground.

*Table 13. Assessment of the Chemical Analysis of the Soil*

| | Characteristic Value | Design Sulfate Class | ACEC Classification |
|---|---|---|---|
| **pH** | 7.7 | - | - |
| **Water Soluble Sulphate (mg/l as SO4) *** | 100 | DS-1 | AC-1 |

**Notes:** * Characteristic value rounded to nearest 100.

In accordance with the guidance, a DS-1 Design Sulfate Class and an AC-1 ACEC classification should be assumed as a minimum for the design of concrete in contact with the ground.

## 8.5 Ground Floors

In view of the variable thickness of made ground and the presence of soils of medium volume change potential underlying the site, it is recommended that ground floors should be suspended.

Current guidance[11] suggests that ground bearing floor slabs may, however, be considered where made ground soils are not present or are to be removed from beneath building footprints and the depth of foundations required to protect against seasonal soil volume changes close to trees is less than 1.5m. In such circumstances further works should be undertaken to demonstrate, that close to the time of construction, no significant soil desiccation is present. If ground bearing floors are adopted it is recommended that the potential for differential movement, both between the floor slab and walls and across the floor slab itself, should be anticipated. Such floors should be fully debonded from walls. Formations should be adequately proof rolled and any excessively soft materials excavated and replaced with a suitable, well graded granular fill. The depth of any fill should be limited to a maximum of 600mm unless placed to an engineering specification designed to limit internal settlement of the fill materials to a tolerance to be advised by the designer.

The detailing of services through, or under, ground-bearing floors should incorporate flexible connections and, where appropriate, enhanced falls.

## 8.6 Stormwater Infiltration Systems

In-situ infiltration testing[12] was carried out in trial pit ST01. In addition, testing was also carried out in trial pit PP01 in general accordance with the guidance except that the pit was of limited size and depth.

For each test the soil infiltration rate (f) was calculated by dividing the volume of water lost between 75% and 25% of the initial test depth by the sum of the average surface area of the sides of the trial pit in contact with the water during the test monitoring period, and its base area. This figure was then divided by the test duration (time taken for the water level to fall between 75% and 25% of the initial test depth) to give the soil infiltration rate in metres per second.

The infiltration rates derived from the tests are summarised in the following table.

[11] http://www.nhbc.co.uk/ : NHBC Standards, Chapter 4.2.
[12] Conducted in general accordance with the requirements of BRE 365, Soakaway Design.

*Table 14. Calculated Infiltration Rates*

| Exploratory Hole | Test Response Zone Depth (m) | | Stratum | Infiltration Rate (f) (m/sec) |
|---|---|---|---|---|
| | Top | Bottom | | |
| **ST01 Test 1** | 0.00 | 1.00 | Made Ground and Head | $6.60 \times 10^{-5}$ |
| **ST01 Test 2** | 0.07 | 1.00 | Made Ground and Head | $6.24 \times 10^{-5}$ |
| **ST01 Test 3** | 0.07 | 1.00 | Made Ground and Head | $5.95 \times 10^{-5}$ |
| **PP01 Test 1** | 0.60 | 0.85 | Head | $1.17 \times 10^{-3}$ |
| **PP01 Test 2** | 0.63 | 0.85 | Head | $1.00 \times 10^{-3}$ |
| **PP01 Test 3** | 0.65 | 0.85 | Head | $1.71 \times 10^{-4}$ |

The value 'f' is equivalent to the soil infiltration coefficient 'q' quoted in the Construction Industry Research and Information Association (CIRIA) Report 156.

The results from the infiltration tests indicate that the made ground and Head soils possess moderate to good infiltration characteristics. The results from the infiltration tests should be provided to engineers responsible for the design of the drainage system.

To comply with building regulations[13], point discharging infiltration systems (conventional ring or trench soakaways) are required to be constructed a minimum of 5.0m away from proposed or existing buildings. However, CIRIA guidance[14] recommends that where soakaways are to be sited on chalk deposits, they should be constructed a minimum of 10m away from buildings.

[13] The Building Regulations 2010; Part H; Drainage and Waste Disposal
[14] CIRIA C574: Engineering in Chalk

# 9. QUANTITATIVE CONTAMINATION ASSESSMENT

## 9.1 Introduction

The ground investigation comprised a spread of non-targeted boreholes across the site. Shallow samples of the made ground soils encountered were obtained and tested for the range of commonly occurring contaminants identified in the preliminary conceptual model.

In addition, where visual and/or olfactory evidence of contamination was encountered, samples were also obtained and tested as required.

## 9.2 Analysis of Contamination Test Results

Comparison of the results of the laboratory testing has been made against the 'Suitable For Use Levels' (S4UL)[15] or, in lieu of an S4UL being developed for lead, the Category 4 Screening Level (C4SL)[16]. These are collectively referred to as soil screening values (SSV).

In view of the development proposal, the SSV utilised in this assessment are those calculated for the generic "Residential" land use[17]. The critical receptor for this land use is considered to be a young female child resident on site from birth to age 6. Exposure routes that are considered include the potential for direct ingestion of the soil, the outdoor and indoor ingestion of dust, the potential inhalation of dust and vapours, ingestion of site grown vegetables and ingestion of soil attached to vegetables.

For the assessment of risk to controlled waters a qualitative assessment has been undertaken based upon the concentrations of contaminants recorded within the soil samples and the information obtained about the sensitivity of the underlying strata or nearby surface water receptors.

### *9.2.1 Heavy Metals*

The following table summarises the SSV along with the maximum and minimum concentrations of the heavy metals tested for.

*Table 15. Summary of Test Results for Heavy Metals*

| Contaminant | SSV (mg/kg) | No. of Samples | Minimum Concentration (mg/kg) | Maximum concentration (mg/kg) | Limit of Detection (mg/kg) | No of exceedances |
|---|---|---|---|---|---|---|
| Arsenic | 37 | 5 | 9.7 | 44 | 1 | 1 |
| Cadmium | 11 | 5 | <LOD | 1.2 | 0.5 | 0 |
| Chromium | 910 | 5 | 21.5 | 49.4 | 5 | 0 |
| Copper | 2400 | 5 | 28.8 | 298 | 5 | 0 |
| Lead | 200 | 5 | 110 | 207 | 5 | 1 |
| Mercury | 40 | 5 | 0.5 | 3.2 | 0.5 | 0 |
| Nickel | 180 | 5 | 16 | 143 | 5 | 0 |

[15] Nathanail, C.P, et al., The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015, Land Quality Press, Nottingham. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3071.
[16] SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report, published by DEFRA, 2014.
[17] As defined within Science Report SC050021/SR3, January 2009, with the amendments discussed in the LQM/CIEH report.

| Contaminant | SSV (mg/kg) | No. of Samples | Minimum Concentration (mg/kg) | Maximum concentration (mg/kg) | Limit of Detection (mg/kg) | No of exceedances |
|---|---|---|---|---|---|---|
| Selenium | 250 | 5 | <LOD | <LOD | 1 | 0 |
| Zinc | 3700 | 5 | 73.3 | 669 | 5 | 0 |
| Hexavalent Chromium | 6 | 5 | <LOD | <LOD | 0.8 | 0 |
| Water Soluble Boron | 290 | 5 | <LOD | 2.1 | 0.5 | 0 |

One of the five samples of made ground recorded concentrations of lead and arsenic slightly above the published screening values.

Given the relatively small size of the dataset obtained by the investigation and the nature of the shallow made ground observed at each of the exploratory hole positions, there is a reasonable likelihood that further testing of this material would encounter similar or higher concentrations of lead and/or arsenic elsewhere within the made ground soils on the site.

As such, it should be assumed at this stage that the concentrations of lead and arsenic within the shallow made ground may pose an unacceptable risk to end users of the site and that remedial measures to sever the pollutant linkage will be required.

At the concentrations recorded, none of the heavy metals would be expected to exhibit significant mobility within the soils and are therefore not considered to pose an unacceptable risk to controlled waters beneath the site.

### *9.2.2 Asbestos*

No suspected asbestos materials were noted within any of the exploratory holes undertaken at the site.

Five samples of the made ground were screened for the presence of asbestos. None of the samples recorded the presence of any asbestos materials.

In view of the screening carried out, there does not appear to be a significant risk to end users from asbestos materials within soils. However, due to the heterogeneity of made ground, there will always remain the potential for localised asbestos materials to be encountered during construction works, though the likelihood of this is considered to be very low. All workers at the site should be made aware of what actions to take in the event that suspected asbestos materials are identified at any time during the development works.

An asbestos survey of existing structures and infrastructure[18] was beyond the scope of this investigation. The potential for asbestos containing materials to be present within the fabric of buildings or infrastructure located on the site cannot be dismissed by reference to the soil test results contained within this report.

It is recommended that relevant asbestos registers/surveys be inspected prior to commencing any demolition works at the site. Where asbestos is identified to be present within buildings or infrastructure, these materials should be appropriately removed by licensed contractors and asbestos materials disposed of in accordance with legal requirements prior to demolition to avoid contaminating soils at the site.

[18] As defined under Section 5(a) of the Control of Asbestos Regulations, 2012.

### 9.2.3 Polycyclic Aromatic Hydrocarbon (PAH) Compounds

The following table summarises the soil screening values, maximum and minimum concentrations for the PAH compounds tested for.

*Table 16. Summary of Test Results for PAH Compounds*

| Contaminant | SSV (mg/kg) | No. of Samples | Minimum Concentration (mg/kg) | Maximum concentration (mg/kg) | Limit of Detection (mg/kg) | No of exceedances |
|---|---|---|---|---|---|---|
| Naphthalene | 2.3 | 5 | <LOD | <LOD | 0.1 | 0 |
| Acenaphthylene | 170 | 5 | <LOD | <LOD | 0.1 | 0 |
| Acenaphthene | 210 | 5 | <LOD | <LOD | 0.1 | 0 |
| Fluorene | 170 | 5 | <LOD | <LOD | 0.1 | 0 |
| Phenanthrene | 95 | 5 | <LOD | 0.6 | 0.1 | 0 |
| Anthracene | 2400 | 5 | <LOD | 0.1 | 0.1 | 0 |
| Fluoranthene | 280 | 5 | <LOD | 1.7 | 0.1 | 0 |
| Pyrene | 620 | 5 | <LOD | 1.4 | 0.1 | 0 |
| Benz(a)anthracene | 7.2 | 5 | <LOD | 0.6 | 0.1 | 0 |
| Chrysene | 15 | 5 | <LOD | 0.8 | 0.1 | 0 |
| Benzo(b)fluoranthene | 2.6 | 5 | <LOD | 1 | 0.1 | 0 |
| Benzo(k)fluoranthene | 77 | 5 | <LOD | 1 | 0.1 | 0 |
| Benzo(a)pyrene | 2.2 | 5 | <LOD | 0.9 | 0.1 | 0 |
| Indeno(123-cd)pyrene | 27 | 5 | <LOD | 0.7 | 0.1 | 0 |
| Dibenz(ah)anthracene | 0.24 | 5 | <LOD | 0.2 | 0.1 | 0 |
| Benzo(ghi)perylene | 320 | 5 | <LOD | 0.9 | 0.1 | 0 |

None of the samples tested recorded concentrations of individual PAH compounds above their respective SSV. The concentrations of PAH compounds present within the shallow soils are not considered to pose an unacceptable risk to end users of the site.

At the low concentrations recorded, PAH compounds would not be expected to exhibit significant mobility within the soils and are therefore not considered to pose an unacceptable risk to controlled waters beneath the site.

### 9.2.4 Petroleum Hydrocarbons

The following table lists the SSV for petroleum hydrocarbon equivalent carbon weight fractions calculated for 1% organic content.

*Table 17. Soil Screening Values for petroleum hydrocarbon equivalent carbon weight fractions*

| Petroleum Hydrocarbon Fraction | SSV (mg/kg) | Petroleum Hydrocarbon Fraction | SSV (mg/kg) |
|---|---|---|---|
| Aliphatic EC 5-6 | 42 | Aromatic EC 5-7 | 70 |
| Aliphatic EC >6-8 | 100 | Aromatic EC >7-8 | 130 |
| Aliphatic EC >8-10 | 27 | Aromatic EC >8-10 | 34 |
| Aliphatic EC >10-12 | 130 | Aromatic EC >10-12 | 74 |
| Aliphatic EC >12-16 | 1100 | Aromatic EC >12-16 | 140 |
| Aliphatic EC >16-35 | 65000 | Aromatic EC >16-21 | 260 |
| Aliphatic EC >35-44 | 65000 | Aromatic EC >21-35 | 1100 |

| Petroleum Hydrocarbon Fraction | SSV (mg/kg) | Petroleum Hydrocarbon Fraction | SSV (mg/kg) |
|---|---|---|---|
| | | Aromatic EC >35-44 | 1100 |

Whilst full speciation of the concentrations of petroleum hydrocarbons by aromatic and aliphatic fractions was not undertaken, the results of the testing undertaken can still be compared with the more stringent of the screening values for the respective equivalent carbon weight fraction and, where the concentration recorded is found to be lower, it can be reasonably concluded that no significant risk is present.

None of the samples from across the site recorded any concentrations of individual weight fractions above the more stringent screening values.

Comparison of the test results with screening criteria for PE water supply pipes[19] did not identify any concentrations above the threshold limits.

## 9.3 Quantitative Contamination Risk Assessment

### *9.3.1 Contamination Sources Identified*

The following sources of contamination have been identified by the quantitative contamination risk assessment:

- Made Ground soils across the site containing elevated concentrations of heavy metals.

### *9.3.2 Quantitative Conceptual Model*

The quantitative conceptual model for the proposed development is presented in Appendix G.

## 9.4 Risks to Other Potential Receptors

All construction workers must undertake their own risk assessment, based upon the works to be carried out and the proposed method by which this will be achieved, in accordance with current health and safety legislation. Their assessment should take into account all available information about the site, including that present within this report.

Appropriate working procedures and PPE should be adopted to ensure the health and safety of the site operatives. Instruction should be given in the recognition of potentially hazardous materials. All site personnel should be appropriately briefed on the discovery strategy, presented below, and what actions they must take in the event that further evidence of contamination is identified or suspected.

[19] Set out within Table 3.1 of the Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, UK Water Industry Research, 2010.

## 9.5 Recommendations

Asbestos registers/surveys must be inspected prior to commencing any demolition works at the site. Where asbestos is identified to be present within buildings or infrastructure, these materials should be appropriately removed by licensed contractors and asbestos materials disposed of in accordance with legal requirements prior to demolition to avoid contaminating soils at the site.

Remedial works will be required within proposed garden or communal soft landscaping areas to sever the identified pollutant linkage.

It is noted that the granular sub base materials present directly beneath the hard surfacing were not targeted for testing. Where they may remain beneath areas of hard standing or building cover, these materials would not be considered to represent an unacceptable risk to end users of the site.

Any risk associated with these materials within soft landscaped areas would be ameliorated by the remedial works required in respect of the made ground soils.

This risk assessment should be submitted to the local authority for their review and approval. Following approval of the assessment, a remediation strategy should be prepared detailing the works necessary to ameliorate the identified pollutant linkages, along with a verification plan setting out how evidence of these works will be collected and presented in the final verification report.

Following site clearance and the removal of the existing hardstanding, it is recommended that the formation level is inspected for any visual or olfactory evidence of suspected contamination, in particular any staining or odours which may indicate the presence of localised petroleum hydrocarbon contamination.

In the event of any such suspected contamination being identified, further investigation and testing should be carried out to ensure that any potential risks are properly assessed and, if necessary, appropriate mitigations put in place.

Whilst the testing indicates that the protection of water supply services is unlikely to be required, it is noted that the testing undertaken to date does not encompass all of the contaminants that may be required by water supply companies for assessment purposes. It is therefore strongly recommended that designers consult with the proposed water supply company to ascertain whether they require further laboratory testing and assessment specific to proposed routes of services.

## 9.6 Discovery Strategy

If, during the course of the site clearance and development works, any materials not previously identified by the investigation that are suspected of being 'contaminants' are encountered, then the following procedure should apply:

- All works in that area should cease and the site manager should be informed.
- Advice should be sought from suitably qualified and experienced personnel as to whether any further site inspection, sampling, testing and/or assessment is deemed necessary.
- If required, the conclusions of any assessment and any proposed remedial works (if required) should be agreed by the local authority.
- If necessary, full details of any remedial works should be included in the verification report for the site.

Suspected 'contamination' may take the following form, though it is noted that this list is not exhaustive and site operatives should ask if they are at all unsure of any findings:

- Soil or water looks oily and/or has an oily odour
- Soil or water has a solvent type of odour
- Significant quantities of man-made materials within fill such as paint cans, car parts, glass fragments
- Suspected asbestos containing materials (insulating boards, cement, loose fibres etc.)
- Significant volumes of clinker like or ashy material
- Sand bags, and/or subsurface concrete structures
- Animal carcasses or evidence of animal burial pits

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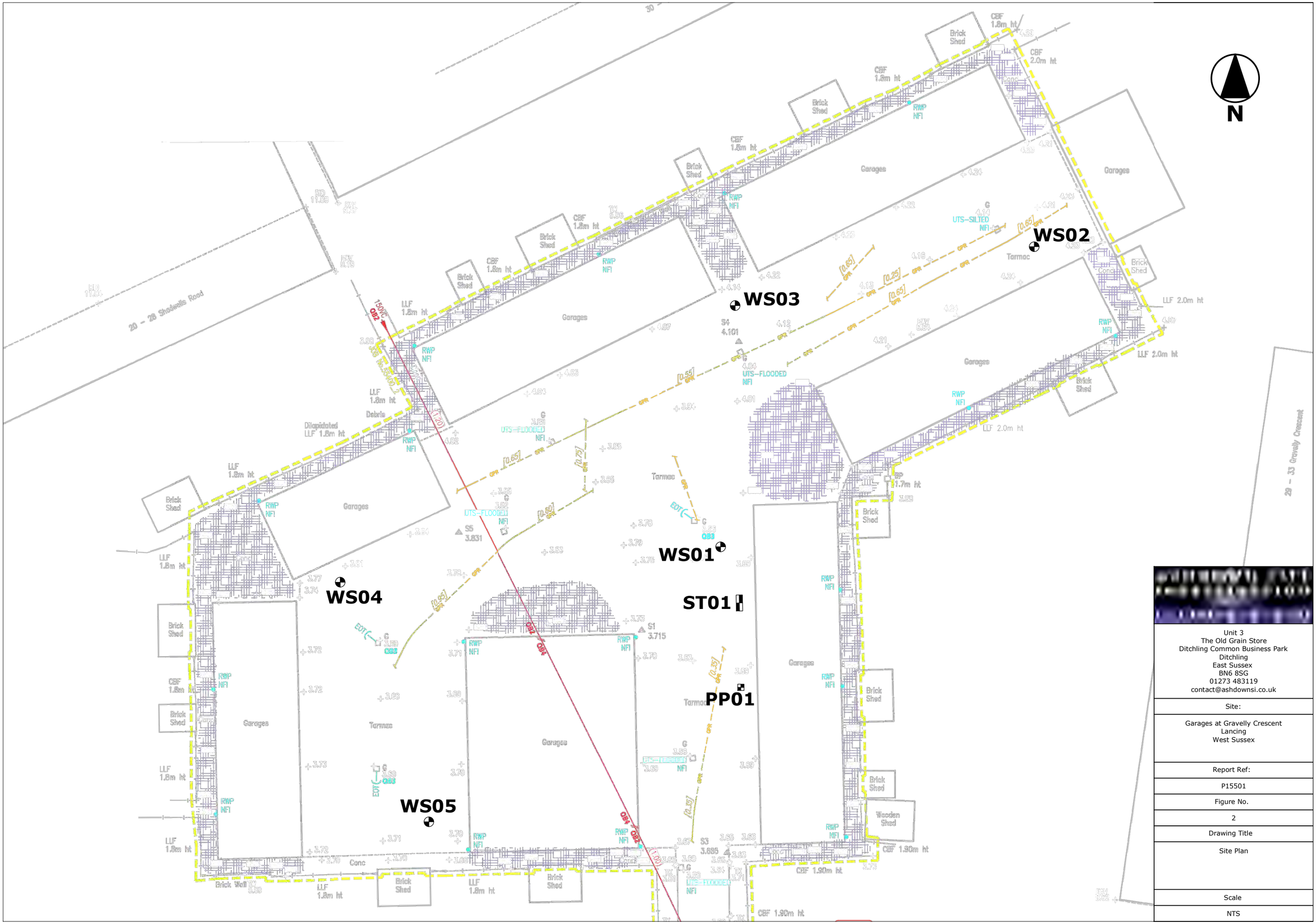
## FIGURES

Figure 1 Site Location Plan
Figure 2 Site Plan




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| ASHDOWN SITE INVESTIGATION LIMITED | Site Location Plan | Site Name | Figure No. | Project Reference |
|---|---|---|---|---|
| | | Garages at Gravelly Crescent, Lancing, West Sussex | 1 | P15501 |




Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
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01273 483119
contact@ashdownsi.co.uk

Site:

Garages at Gravelly Crescent
Lancing
West Sussex

Report Ref:

P15501

Figure No.

2

Drawing Title

Site Plan

Scale

NTS

## APPENDIX A

Proposed Development Layout

# 1.4 Site Plan

The proposal utilises the existing access to site, with 8 parking spaces, including 2 disabled access, at the forefront upon arriving. This allows for the best ease of access from both residents, and facilities such as deliveries and refuse collection, whilst retaining access to the existing substation.

3 x 2 bed 4 person houses are proposed to sit upon the existing higher ground level, west side. East side, 2 x 2 bed 4 person houses and 1 x 1 bed 2 person bungalow is proposed.

Landscaping is proposed centrally across the site, to mediate the relationship between parking and house fronts, acting as a low level buffer.




1:500 @ A3

Scale in Metres

0 5 10 15 20 30 40 50

## APPENDIX B

Site Walkover Photographs

| | |
|---|---|
|  | View to the north east from the western boundary. |
|  | View to the south along the entrance way. |
|  | View to the south west from the centre of the site. |

| **Site Walkover Photographs** | **Project Name** | **Project Ref** |
|---|---|---|
| | Garages at Gravelly Crescent, Lancing, West Sussex | P15501 |

## APPENDIX C

Classification of Probability, Consequence and Risk

| Probability of risk being realised | |
|---|---|
| Classification | Definition |
| High | There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution. |
| Moderate | There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. |
| Low | There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term. |
| Very Low | There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term. |

| Consequence of risk being realised | | |
|---|---|---|
| Classification | Category | Definition |
| Severe | Human Health | Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. |
| | Controlled Waters | Short term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. |
| | Property | Catastrophic damage to buildings/property. |
| | Ecological Systems | A short term risk to a particular ecosystem or organisation forming part of such ecosystem. |
| Moderate | Human Health | Chronic damage to Human Health. |
| | Controlled Waters | Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution). |
| | Ecological System | A significant change in a particular ecosystem or organism forming part of such ecosystem. |
| Minor | Controlled Waters | Pollution of non-sensitive water resources. |
| | Property | Significant damage to crops, buildings, structures and services. |
| | Ecological Systems | Damage to sensitive buildings/structures/services or the environment. |
| Very Minor | Human Health | Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). |
| | Property | Easily repairable effects of damage to buildings, structures and services. |
| | Project | Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. |

| Risk classification definitions | |
|---|---|
| Very High | There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required. |
| High | Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the long term. |
| Moderate | It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term. |
| Low | It is possible that harm could arise to a designated receptor from an identified hazard, but there is a low likelihood of this hazard occurring and if realised, harm would at worst normally be mild. |
| Very Low | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe. |

# APPENDIX D

Preliminary Conceptual Model

| Gravelly Crescent, Lancing | | | | Preliminary Conceptual Model | | P15501 | |
|---|---|---|---|---|---|---|---|
| **Potential Source** | **Potential Receptor** | **Potential Contaminants** | **Potential Pathway** | **Complete Linkage Present?** | **Probability** | **Consequence** | **Risk** |
| • Historical and current land use as garages with extensive hard standing | End Users | Asbestos, Heavy Metals, PAH Compounds and Petroleum Hydrocarbons | Dermal contact with soil and dust (indoor & outdoor) | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Ingestion of soil and indoor dust | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Consumption of home-grown produce and attached soil | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Inhalation of soil dust (indoor and outdoor) | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Inhalation of soil vapours | Yes | P1: Very Low | C3: Moderate | Low |
| | | | Inhalation of soil gases/ Risk of explosion | No potential gas source identified | | | N/A |
| | End Users (via Water Supply Pipework) | Petroleum Hydrocarbons | Contamination of incoming services | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | Groundwater | Heavy Metals, PAH Compounds and Petroleum Hydrocarbons | Migration to groundwater | Yes | P1: Very Low | C1: Very Minor | Negligible |
| • Historical use of the site as a Nursery. | End Users | Heavy Metals | Dermal contact with soil and dust (indoor & outdoor) | Yes | P1: Very Low | C3: Moderate | Low |
| | | | Ingestion of soil and indoor dust | Yes | P1: Very Low | C3: Moderate | Low |
| | | | Consumption of home-grown produce and attached soil | Yes | P1: Very Low | C3: Moderate | Low |
| | | | Inhalation of soil dust (indoor and outdoor) | Yes | P1: Very Low | C3: Moderate | Low |
| | | | Inhalation of soil vapours | No potential contaminants identified | | | N/A |
| | | | Inhalation of soil gases/ Risk of explosion | No potential gas source identified | | | N/A |
| | End Users (via Water Supply Pipework) | | Contamination of incoming services | No potential contaminants identified | | | N/A |
| | Groundwater | Heavy Metals | Migration to groundwater | Yes | P1: Very Low | C1: Very Minor | Negligible |

## APPENDIX E

Exploratory Hole Notes
Exploratory Hole Records
DPSH-B Dynamic Probe Records
Trial Pit Falling Head Soakage Test Results
Groundwater Monitoring Results

# NOTES FOR THE INTERPRETATION OF EXPLORATORY HOLE RECORDS

## 1 Symbols and abbreviations

*Samples*

U 'Undisturbed' Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
$U_o$ Sample not obtained
U* Full penetration of sample not obtained
Pi Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
D Disturbed Sample
R Root Sample
B Bulk Disturbed Sample
W Water Sample
J Jar Sample (sample taken in amber glass jar fitted with gas tight lid)
T Tub Sample
Vi Vial Sample

*In situ Testing*

S Standard penetration test (SPT): Using the split spoon sampler.

C Standard Penetration Test (SPT): using a solid cone instead of the sampler - conducted usually in coarse grained soils or weak rocks.

V Shear Vane Test: Undrained shear strength (cohesion) ($kN/m^2$) shown within the Vane/Pen Test and N Value column.

H Hand penetrometer Test: Undrained shear strength (cohesion) ($kN/m^2$) shown within the Vane/Pen Test and N Value column.

P Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

*Excavation Method*

CP Cable Percussion Borehole
WLS Dynamic Sampler Borehole using windowless sampler tubes
WS Dynamic Sampler Borehole using window sampler tubes
TP Trial Pit excavated using mechanic excavator
HDP Trial Pit excavated using hand tools

## 2 Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

## 3 Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

## 4 Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

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**Site Name:** Garages at Gravelly Crescent, Lancing, West Sussex

**Job Number:** P15501

**Start Date:** 03/02/2022

**End Date:** 03/02/2022

**Borehole Number:** **WS01**



| Standpipe | Sample/ Test Type | Depth From (m) | Depth To (m) | Test Result | Dynamic Probe Blows/100mm (0 5 10 15 20 25 30) | Legend | Depth | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.00 | Asphalt. |
| | | | | | | | 0.05 | Concrete. |
| | J T | 0.30 | | | | | 0.25 | MADE GROUND: Dark brown gravelly sandy silty clay. Gravel is angular to subrounded fine to coarse flint, ash-like material, clinker-like material and rare glass. |
| | J T | 0.50 | | | | | 0.45 | MADE GROUND: Orange brown and grey mottled slightly gravelly sandy silty clay. Gravel is angular to subrounded fine flint and glass with rare brick. |
| | H | 0.70 | | 30 | | | 0.70 | Firm brown slightly sandy CLAY with occasional pockets of fine to coarse gravel of sandstone and flint. (Head) |
| | D | 0.80 | | | | | | |
| | J T | 0.90 | | | | | | |
| | H | 0.90 | | 60 | | | | |
| | V | 1.00 | | 90 | | | | |
| | S | 1.00 | | N=4 (1,0/1,1,1,1) | | | | |
| | D | 1.20 | | | | | | |
| | H | 1.20 | | 75 | | | | |
| | D | 1.50 | | | | | | |
| | H | 1.50 | | 50 | | | | |
| | D | 1.80 | | | | | | becoming slightly gravelly (gravel is flint) below 1.75m depth. |
| | H | 1.90 | | <25 | | | | becoming very soft to soft below 1.90m depth. |
| | V | 2.00 | | 10 | | | | |
| | S | 2.00 | | N=0 (0,0/0,0,0,0) | | | | |
| | D | 2.50 | | | | | | |
| | D | 2.60 | | | | | | |
| | H | 2.60 | | <25 | | | 2.70 | Soft light brown gravelly CLAY. Gravel is subangular to subrounded fine to medium chalk. (Head) |
| | D | 2.80 | | | | | | |
| | H | 2.80 | | <25 | | | | |
| | D | 3.00 | 4.00 | | | | 3.00 | Off white CHALK recovered as very wet comminuted chalk. (White Chalk Subgroup) |
| | S | 3.00 | | N=0 (0,0/0,0,0,0) | | | | with very poor recovery of soil sample below 3.00m depth. Exact depth to chalk strata unknown. |
| | S | 4.00 | | N=4 (0,0/0,1,1,2) | | | 4.00 | End of borehole at 4.00m |

## Remarks

**Groundwater:** Groundwater recorded at 2.20m depth on completion of borehole.

**Stability:** Borehole stable on completion.

**Notes:** Standpipe installed to 4.00m depth; 4.00m to 2.00m slotted pipe with gravel surround; 2.00m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

**Excavation Method:** WLS

**Borehole Diameter:** Various

**Made By:** TM/SL

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Tel: 01273 483119

**Site Name:** Garages at Gravelly Crescent, Lancing, West Sussex

**Job Number:** P15501

**Start Date:** 03/02/2022

**End Date:** 03/02/2022

**Borehole Number:** **WS02**



| Standpipe | Sample/ Test Type | Depth From (m) | Depth To (m) | Test Result | Dynamic Probe Blows/100mm (0 5 10 15 20 25 30) | Legend | Depth | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.00 | Asphalt. |
| | | | | | | | 0.05 | Concrete. |
| | J T | 0.20 | | | | | 0.15 | MADE GROUND: Black stained gravelly sandy silty clay. Gravel is angular to subrounded fine to coarse flint with occasional brick, ash-like material, clinker-like material and chalk. |
| | J T | 0.35 | | | | | 0.25 | |
| | J T | 0.50 | | | | | 0.40 | |
| | D | 0.90 | | | | | | MADE GROUND: Dark grey slightly gravelly slightly sandy silty clay. Gravel is angular to subrounded fine flint with rare brick, ash-like material, clinker-like material, organic material and shell fragments. |
| | V | 1.00 | | 70 | | | | Firm brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to medium flint. (Head) |
| | D | 1.25 | | | | | | |
| | H | 1.25 | | 90 | | | | |
| | D | 1.60 | | | | | | |
| | H | 1.60 | | 90 | | | | |
| | D | 1.80 | | | | | 1.75 | Firm varying stiff light brown gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to medium chalk and flint. (Head) |
| | | | | | | | 2.25 | Off white CHALK recovered as comminuted chalk. (White Chalk Subgroup) |
| | D | 2.50 | | | | | | |
| | | | | | | | 3.00 | End of borehole at 3.00m |

## Remarks

**Groundwater:** Borehole dry on completion.

**Stability:** Borehole unstable below 2.70m depth.

**Notes:** n/a

**Excavation Method:** WLS

**Borehole Diameter:** Various

**Made By:** TM/SL

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**Site Name:** Garages at Gravelly Crescent, Lancing, West Sussex

**Job Number:** P15501

**Start Date:** 03/02/2022

**End Date:** 03/02/2022

**Borehole Number:** **WS03**



| Standpipe | Sample/ Test Type | Depth From (m) | Depth To (m) | Test Result | Dynamic Probe Blows/100mm (0 5 10 15 20 25 30) | Legend | Depth | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.00 | Asphalt. |
| | | | | | | | 0.05 | Concrete. |
| | J T | 0.25 | | | | | 0.17 | MADE GROUND: Black stained sandy silty angular to subrounded fine to coarse gravel of brick with rare ash-like material, clinker-like material, slate, chalk and concrete. |
| | J T | 0.35 | | | | | 0.30 | |
| | J T | 0.50 | | | | | 0.40 | MADE GROUND: Dark brown slightly gravelly sandy silty clay. Gravel is subangular to rounded fine to medium flint with rare brick, ash-like material, clinker-like material, organic material and shell fragments. |
| | H | 0.80 | | 170 | | | | Firm varying stiff brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to medium flint and rare chalk. (Head) |
| | D | 0.90 | | | | | | |
| | V | 1.00 | | >130 | | | | |
| | H | 1.20 | | 130 | | | | |
| | D | 1.30 | | | | | | |
| | D | 1.60 | | | | | | with a pocket of comminuted chalk between 1.55m and 1.80m depth. |
| | D | 1.85 | | | | | 1.80 | Medium dense light brown gravelly SAND. Gravel is subangular to subrounded fine to medium chalk. (Head) |
| | D | 2.25 | 2.30 | | | | | with a pocket of off white comminuted chalk between 2.25m and 2.30m depth. |
| | D | 2.40 | | | | | | becoming slightly gravelly below 2.50m depth. |
| | D | 2.85 | | | | | 3.00 | End of borehole at 3.00m |

## Remarks

**Groundwater:** Borehole dry on completion.

**Stability:** Borehole unstable below 2.70m depth.

**Notes:** n/a

**Excavation Method:** WLS

**Borehole Diameter:** Various

**Made By:** TM/SL

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**Site Name:** Garages at Gravelly Crescent, Lancing, West Sussex

**Job Number:** P15501

**Start Date:** 03/02/2022

**End Date:** 03/02/2022

**Borehole Number:** **WS04**



| Standpipe | Sample/ Test Type | Depth From (m) | Depth To (m) | Test Result | Dynamic Probe Blows/100mm (0 5 10 15 20 25 30) | Legend | Depth | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.00 | Asphalt. |
| | | | | | | | 0.03 | Concrete. |
| | J T | 0.20 | | | | | 0.15 | MADE GROUND: Black stained gravel over orange sandy clayey silt with rare gravel of chalk. |
| | J T | 0.35 | | | | | 0.25 | MADE GROUND: Brown grey slightly gravelly slightly sandy silty clay. Gravel is angular to subrounded fine to medium flint. |
| | | | | | | | 0.70 | becoming orange with rare gravel of brick, ash-like material, clinker-like material and chalk with depth. |
| | J T | 0.80 | | | | | | Firm brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to medium flint. (Head) |
| | D | 0.90 | | | | | | becoming stiff below 1.00m depth. |
| | H | 0.90 | | 60 | | | | |
| | V | 1.00 | | 90 | | | | |
| | D | 1.20 | | | | | | |
| | H | 1.20 | | 100 | | | | |
| | | | | | | | 1.60 | |
| | D | 1.70 | | | | | | Stiff brown and light grey slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine chalk and flint. (Head) |
| | H | 1.70 | | 115 | | | | |
| | D | 2.40 | | | | | | |
| | H | 2.40 | | 140 | | | | |
| | | | | | | | 2.65 | |
| | D | 2.70 | | | | | | Off white CHALK recovered as comminuted chalk. (White Chalk Subgroup) |
| | | | | | | | 3.00 | End of borehole at 3.00m |

## Remarks

**Groundwater:** Groundwater recorded at 2.35m depth on completion of borehole.

**Stability:** Borehole stable on completion.

**Notes:** n/a

**Excavation Method:** WLS

**Borehole Diameter:** Various

**Made By:** TM/SL

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**Site Name:** Garages at Gravelly Crescent, Lancing, West Sussex

**Job Number:** P15501

**Start Date:** 03/02/2022

**End Date:** 03/02/2022

**Borehole Number:** **WS05**



| Standpipe | Sample/ Test Type | Depth From (m) | Depth To (m) | Test Result | Dynamic Probe Blows/100mm (0 5 10 15 20 25 30) | Legend | Depth | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.00 | Asphalt. |
| | | | | | | | 0.05 | Concrete. |
| | J T | 0.20 | | | | | 0.15 | MADE GROUND: Black stained gravel over orange sandy clayey silt with rare gravel of chalk. |
| | J T | 0.40 | | | | | 0.25 | MADE GROUND: Dark brown slightly gravelly slightly sandy silty clay. Gravel is angular to subrounded fine to coarse flint with rare brick, chalk, ash-like material and clinker-like material. |
| | J T | 0.80 | | | | | 0.80 | Firm brown slightly gravelly slightly sandy CLAY. Gravel is subangular to rounded fine to medium flint. (Head) |
| | D | 0.90 | | | | | | |
| | H | 0.90 | | 40 | | | | |
| | V | 1.00 | | 50 | | | | |
| | H | 1.30 | | 75 | | | | |
| | D | 1.35 | | | | | | becoming stiff below 1.50m depth. becoming gravelly below 1.60m depth. |
| | D | 1.80 | | | | | 2.00 | Stiff light brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to medium chalk and flint. (Head) |
| | D | 2.30 | | | | | 2.70 | Off white CHALK recovered as comminuted chalk. (White Chalk Subgroup) |
| | D | 2.80 | | | | | 3.00 | End of borehole at 3.00m |

**Remarks**

**Groundwater:** Groundwater recorded at 2.85m depth on completion of borehole.

**Stability:** Borehole stable on completion.

**Notes:** n/a

**Excavation Method:** WLS

**Borehole Diameter:** Various

**Made By:** TM/SFL

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**Site Name:** Garages at Gravelly Crescent, Lancing, West Sussex

**Job Number:** P15501

**Start Date:** 14/03/2022

**End Date:** 14/03/2022

**Trial Pit Number:** **ST01**



| Samples and In Situ Testing | | | | Legend | Depth/ Reduced Level | Stratum Description |
|---|---|---|---|---|---|---|
| Sample/ Test Type | Depth From (m) | Depth To (m) | Test Result | | | |
| | | | | | 0.00 | Asphalt. |
| | | | | | 0.05 | Concrete. |
| | | | | | 0.15 | MADE GROUND: Brown gravelly fine to coarse sand. Gravel is fine to coarse flint, brick and concrete. |
| | | | | | 0.30 | MADE GROUND: Grey slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse flint, brick, concrete and charcoal-like material. |
| | | | | | 0.50 | Brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint. (Head) |
| | | | | | 1.00 | End of trial pit at 1.00m |

**Remarks**

**Groundwater:** Trial pit dry on completion.

**Stability:** Trial pit stable on completion.

**Notes:** n/a

**Excavation Method:** HDP

**Pit Length:** 1.00m

**Pit Width:** 0.30m

**Made By:** BA

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**Site Name:** Garages at Gravelly Crescent, Lancing, West Sussex

**Job Number:** P15501

**Start Date:** 14/03/2022

**End Date:** 14/03/2022

**Trial Pit Number:** **PP01**



| Samples and In Situ Testing | | | | Legend | Depth/ Reduced Level | Stratum Description |
|---|---|---|---|---|---|---|
| Sample/ Test Type | Depth From (m) | Depth To (m) | Test Result | | | |
| | | | | | 0.00 | Asphalt. |
| | | | | | 0.05 | Concrete. |
| D | 0.30 | | | | 0.20 | MADE GROUND: Brown gravelly sandy clay. Gravel is subangular to subrounded fine to coarse sandstone, brick, flint, clinker-like material and ash-like material. |
| D | 0.50 | | | | 0.25 | MADE GROUND: Orange brown clayey gravelly sand. Gravel is angular to subrounded fine to medium flint and sandstone. |
| D | 0.70 | | | | 0.40 | MADE GROUND: Grey slightly gravelly clay. Gravel is subangular to subrounded fine to coarse flint with rare clinker-like material and ash-like material. |
| | | | | | 0.60 | Brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint. (Head) with a pocket of sandy gravel at 0.80m depth. |
| | | | | | 0.85 | End of trial pit at 0.85m |

**Remarks**

**Groundwater:** Trial pit dry on completion.

**Stability:** Trial pit stable on completion.

**Notes:** n/a

**Excavation Method:** HDP

**Pit Length:** 0.30m

**Pit Width:** 0.30m

**Made By:** JW

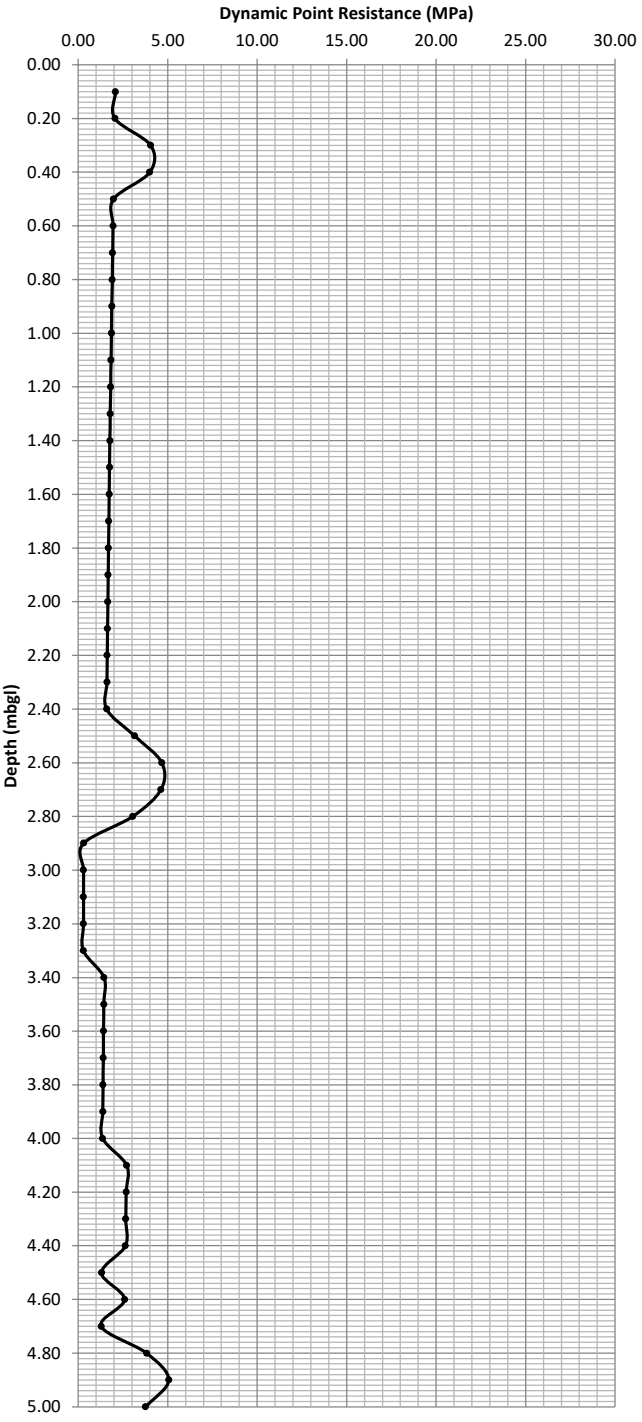
# ASHDOWN SITE INVESTIGATION LTD

## Dynamic Probe Record

**SITE** Garages at Gravelly Crescent, Lancing, West Sussex **Report Ref.** P15501

| Test Location Reference | WS02 |
|---|---|

| Depth (mbgl) | Blows (per 100mm) | Average Penetration per Blow (m) | Unit Point Resistance (MPa) | Dynamic Point Resistance (MPa) |
|---|---|---|---|---|
| 0.10 | 1 | 0.10 | 2.14 | 2.08 |
| 0.20 | 1 | 0.10 | 2.14 | 2.05 |
| 0.30 | 2 | 0.05 | 4.29 | 4.05 |
| 0.40 | 2 | 0.05 | 4.29 | 4.00 |
| 0.50 | 1 | 0.10 | 2.14 | 1.98 |
| 0.60 | 1 | 0.10 | 2.14 | 1.95 |
| 0.70 | 1 | 0.10 | 2.14 | 1.93 |
| 0.80 | 1 | 0.10 | 2.14 | 1.90 |
| 0.90 | 1 | 0.10 | 2.14 | 1.88 |
| 1.00 | 1 | 0.10 | 2.14 | 1.86 |
| 1.10 | 1 | 0.10 | 2.14 | 1.83 |
| 1.20 | 1 | 0.10 | 2.14 | 1.81 |
| 1.30 | 1 | 0.10 | 2.14 | 1.79 |
| 1.40 | 1 | 0.10 | 2.14 | 1.77 |
| 1.50 | 1 | 0.10 | 2.14 | 1.75 |
| 1.60 | 1 | 0.10 | 2.14 | 1.73 |
| 1.70 | 1 | 0.10 | 2.14 | 1.71 |
| 1.80 | 1 | 0.10 | 2.14 | 1.69 |
| 1.90 | 1 | 0.10 | 2.14 | 1.68 |
| 2.00 | 1 | 0.10 | 2.14 | 1.66 |
| 2.10 | 1 | 0.10 | 2.14 | 1.64 |
| 2.20 | 1 | 0.10 | 2.14 | 1.62 |
| 2.30 | 1 | 0.10 | 2.14 | 1.61 |
| 2.40 | 1 | 0.10 | 2.14 | 1.59 |
| 2.50 | 2 | 0.05 | 4.29 | 3.15 |
| 2.60 | 3 | 0.03 | 6.43 | 4.67 |
| 2.70 | 3 | 0.03 | 6.43 | 4.63 |
| 2.80 | 2 | 0.05 | 4.29 | 3.05 |
| 2.90 | 0.2 | 0.50 | 0.43 | 0.30 |
| 3.00 | 0.2 | 0.50 | 0.43 | 0.30 |
| 3.10 | 0.2 | 0.50 | 0.43 | 0.30 |
| 3.20 | 0.2 | 0.50 | 0.43 | 0.29 |
| 3.30 | 0.2 | 0.50 | 0.43 | 0.29 |
| 3.40 | 1 | 0.10 | 2.14 | 1.44 |
| 3.50 | 1 | 0.10 | 2.14 | 1.43 |
| 3.60 | 1 | 0.10 | 2.14 | 1.42 |
| 3.70 | 1 | 0.10 | 2.14 | 1.40 |
| 3.80 | 1 | 0.10 | 2.14 | 1.39 |
| 3.90 | 1 | 0.10 | 2.14 | 1.38 |
| 4.00 | 1 | 0.10 | 2.14 | 1.37 |
| 4.10 | 2 | 0.05 | 4.29 | 2.71 |
| 4.20 | 2 | 0.05 | 4.29 | 2.68 |
| 4.30 | 2 | 0.05 | 4.29 | 2.66 |
| 4.40 | 2 | 0.05 | 4.29 | 2.64 |
| 4.50 | 1 | 0.10 | 2.14 | 1.31 |
| 4.60 | 2 | 0.05 | 4.29 | 2.59 |
| 4.70 | 1 | 0.10 | 2.14 | 1.29 |
| 4.80 | 3 | 0.03 | 6.43 | 3.83 |
| 4.90 | 4 | 0.03 | 8.57 | 5.06 |
| 5.00 | 3 | 0.03 | 6.43 | 3.77 |




Notes:

| | |
|---|---|
| Hammer Mass | 63.5 kg |
| Fall Height | 0.76 m |
| Cone Area | 0.0019 $m^2$ |
| $E_{theor}$ | 473 J |
| Energy Ratio | 0.86 |
| Anvil Mass | 1 kg |
| Rod Mass | 8.79 kg/m |

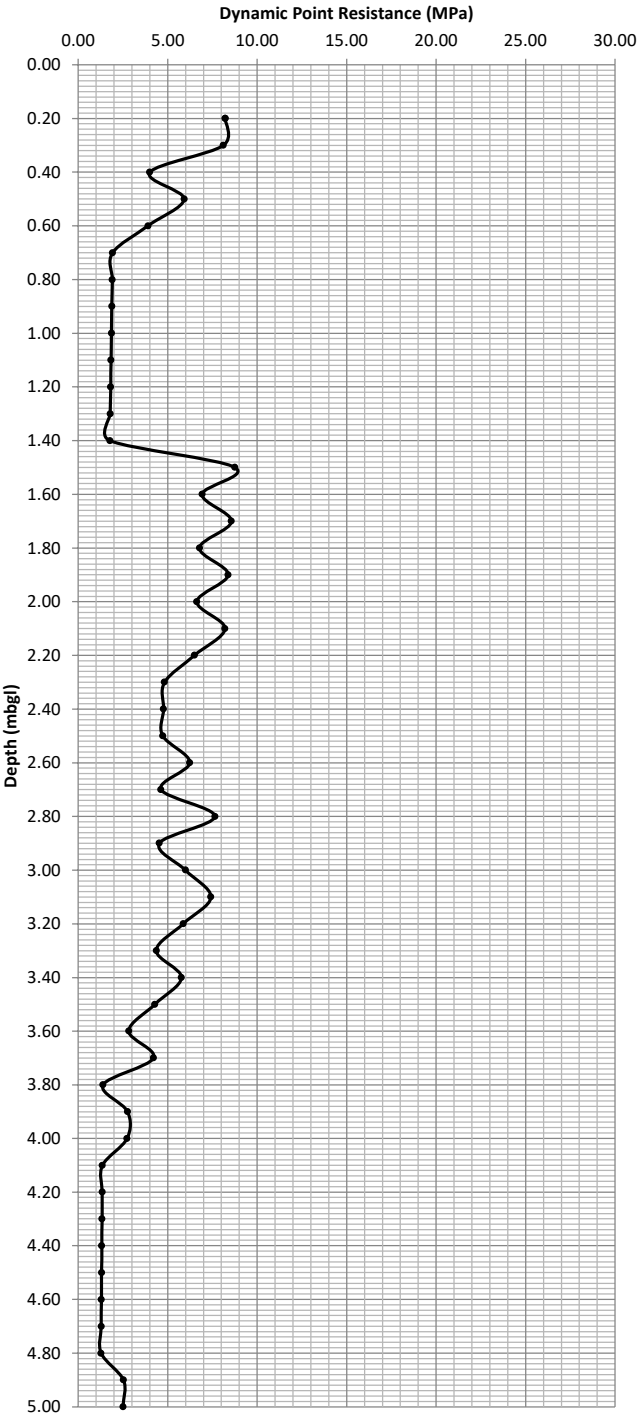
# ASHDOWN SITE INVESTIGATION LTD

## Dynamic Probe Record

**SITE** Garages at Gravelly Crescent, Lancing, West Sussex **Report Ref.** P15501

| Test Location Reference | WS03 |
|---|---|

| Depth (mbgl) | Blows (per 100mm) | Average Penetration per Blow (m) | Unit Point Resistance (MPa) | Dynamic Point Resistance (MPa) |
|---|---|---|---|---|
| 0.10 | | | | |
| 0.20 | 4 | 0.03 | 8.57 | 8.21 |
| 0.30 | 4 | 0.03 | 8.57 | 8.11 |
| 0.40 | 2 | 0.05 | 4.29 | 4.00 |
| 0.50 | 3 | 0.03 | 6.43 | 5.93 |
| 0.60 | 2 | 0.05 | 4.29 | 3.90 |
| 0.70 | 1 | 0.10 | 2.14 | 1.93 |
| 0.80 | 1 | 0.10 | 2.14 | 1.90 |
| 0.90 | 1 | 0.10 | 2.14 | 1.88 |
| 1.00 | 1 | 0.10 | 2.14 | 1.86 |
| 1.10 | 1 | 0.10 | 2.14 | 1.83 |
| 1.20 | 1 | 0.10 | 2.14 | 1.81 |
| 1.30 | 1 | 0.10 | 2.14 | 1.79 |
| 1.40 | 1 | 0.10 | 2.14 | 1.77 |
| 1.50 | 5 | 0.02 | 10.71 | 8.76 |
| 1.60 | 4 | 0.03 | 8.57 | 6.93 |
| 1.70 | 5 | 0.02 | 10.71 | 8.57 |
| 1.80 | 4 | 0.03 | 8.57 | 6.78 |
| 1.90 | 5 | 0.02 | 10.71 | 8.38 |
| 2.00 | 4 | 0.03 | 8.57 | 6.63 |
| 2.10 | 5 | 0.02 | 10.71 | 8.20 |
| 2.20 | 4 | 0.03 | 8.57 | 6.49 |
| 2.30 | 3 | 0.03 | 6.43 | 4.82 |
| 2.40 | 3 | 0.03 | 6.43 | 4.77 |
| 2.50 | 3 | 0.03 | 6.43 | 4.72 |
| 2.60 | 4 | 0.03 | 8.57 | 6.23 |
| 2.70 | 3 | 0.03 | 6.43 | 4.63 |
| 2.80 | 5 | 0.02 | 10.71 | 7.64 |
| 2.90 | 3 | 0.03 | 6.43 | 4.54 |
| 3.00 | 4 | 0.03 | 8.57 | 5.99 |
| 3.10 | 5 | 0.02 | 10.71 | 7.42 |
| 3.20 | 4 | 0.03 | 8.57 | 5.88 |
| 3.30 | 3 | 0.03 | 6.43 | 4.37 |
| 3.40 | 4 | 0.03 | 8.57 | 5.77 |
| 3.50 | 3 | 0.03 | 6.43 | 4.29 |
| 3.60 | 2 | 0.05 | 4.29 | 2.83 |
| 3.70 | 3 | 0.03 | 6.43 | 4.21 |
| 3.80 | 1 | 0.10 | 2.14 | 1.39 |
| 3.90 | 2 | 0.05 | 4.29 | 2.76 |
| 4.00 | 2 | 0.05 | 4.29 | 2.73 |
| 4.10 | 1 | 0.10 | 2.14 | 1.35 |
| 4.20 | 1 | 0.10 | 2.14 | 1.34 |
| 4.30 | 1 | 0.10 | 2.14 | 1.33 |
| 4.40 | 1 | 0.10 | 2.14 | 1.32 |
| 4.50 | 1 | 0.10 | 2.14 | 1.31 |
| 4.60 | 1 | 0.10 | 2.14 | 1.30 |
| 4.70 | 1 | 0.10 | 2.14 | 1.29 |
| 4.80 | 1 | 0.10 | 2.14 | 1.28 |
| 4.90 | 2 | 0.05 | 4.29 | 2.53 |
| 5.00 | 2 | 0.05 | 4.29 | 2.51 |




Notes:

| | | |
|---|---|---|
| Hammer Mass | 63.5 | kg |
| Fall Height | 0.76 | m |
| Cone Area | 0.0019 | $m^2$ |
| $E_{theor}$ | 473 | J |
| Energy Ratio | 0.86 | |
| Anvil Mass | 1 | kg |
| Rod Mass | 8.79 | kg/m |

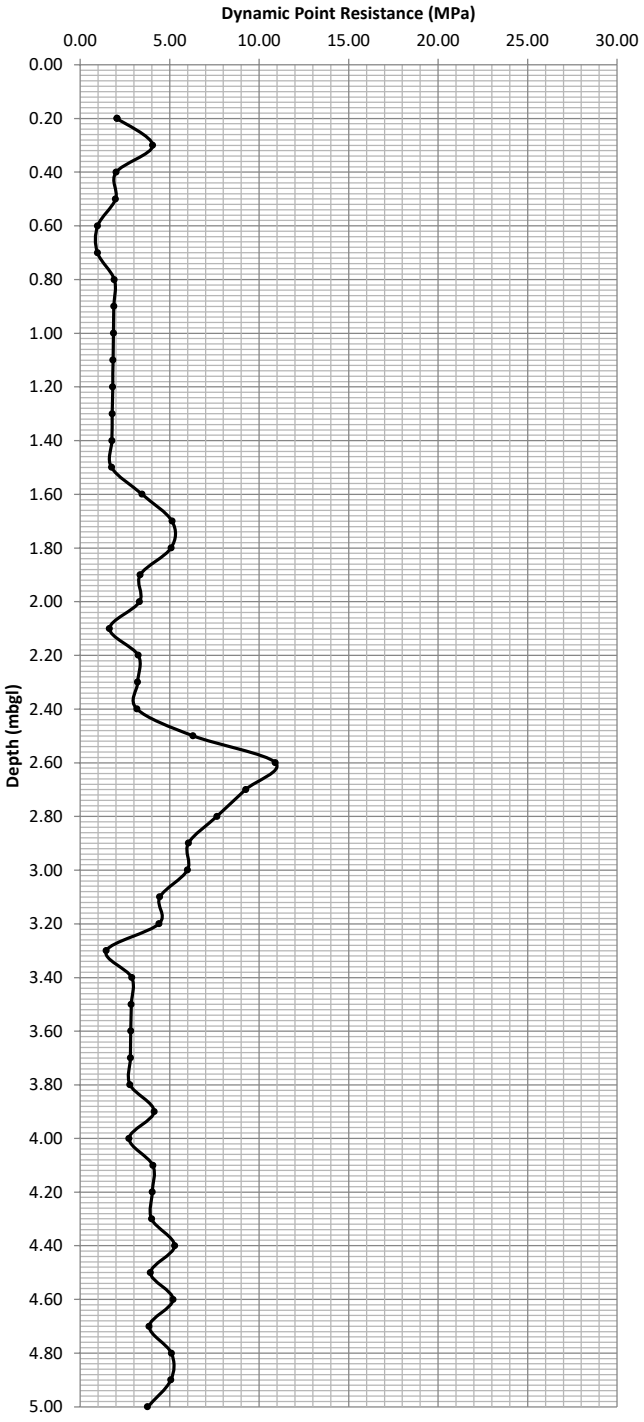
# ASHDOWN SITE INVESTIGATION LTD

## Dynamic Probe Record

**SITE** Garages at Gravelly Crescent, Lancing, West Sussex **Report Ref.** P15501

| Test Location Reference | WS04 |
|---|---|

| Depth (mbgl) | Blows (per 100mm) | Average Penetration per Blow (m) | Unit Point Resistance (MPa) | Dynamic Point Resistance (MPa) |
|---|---|---|---|---|
| 0.10 | | | | |
| 0.20 | 1 | 0.10 | 2.14 | 2.05 |
| 0.30 | 2 | 0.05 | 4.29 | 4.05 |
| 0.40 | 1 | 0.10 | 2.14 | 2.00 |
| 0.50 | 1 | 0.10 | 2.14 | 1.98 |
| 0.60 | 0.5 | 0.20 | 1.07 | 0.98 |
| 0.70 | 0.5 | 0.20 | 1.07 | 0.96 |
| 0.80 | 1 | 0.10 | 2.14 | 1.90 |
| 0.90 | 1 | 0.10 | 2.14 | 1.88 |
| 1.00 | 1 | 0.10 | 2.14 | 1.86 |
| 1.10 | 1 | 0.10 | 2.14 | 1.83 |
| 1.20 | 1 | 0.10 | 2.14 | 1.81 |
| 1.30 | 1 | 0.10 | 2.14 | 1.79 |
| 1.40 | 1 | 0.10 | 2.14 | 1.77 |
| 1.50 | 1 | 0.10 | 2.14 | 1.75 |
| 1.60 | 2 | 0.05 | 4.29 | 3.46 |
| 1.70 | 3 | 0.03 | 6.43 | 5.14 |
| 1.80 | 3 | 0.03 | 6.43 | 5.08 |
| 1.90 | 2 | 0.05 | 4.29 | 3.35 |
| 2.00 | 2 | 0.05 | 4.29 | 3.32 |
| 2.10 | 1 | 0.10 | 2.14 | 1.64 |
| 2.20 | 2 | 0.05 | 4.29 | 3.25 |
| 2.30 | 2 | 0.05 | 4.29 | 3.21 |
| 2.40 | 2 | 0.05 | 4.29 | 3.18 |
| 2.50 | 4 | 0.03 | 8.57 | 6.30 |
| 2.60 | 7 | 0.01 | 15.00 | 10.91 |
| 2.70 | 6 | 0.02 | 12.86 | 9.25 |
| 2.80 | 5 | 0.02 | 10.71 | 7.64 |
| 2.90 | 4 | 0.03 | 8.57 | 6.05 |
| 3.00 | 4 | 0.03 | 8.57 | 5.99 |
| 3.10 | 3 | 0.03 | 6.43 | 4.45 |
| 3.20 | 3 | 0.03 | 6.43 | 4.41 |
| 3.30 | 1 | 0.10 | 2.14 | 1.46 |
| 3.40 | 2 | 0.05 | 4.29 | 2.88 |
| 3.50 | 2 | 0.05 | 4.29 | 2.86 |
| 3.60 | 2 | 0.05 | 4.29 | 2.83 |
| 3.70 | 2 | 0.05 | 4.29 | 2.81 |
| 3.80 | 2 | 0.05 | 4.29 | 2.78 |
| 3.90 | 3 | 0.03 | 6.43 | 4.13 |
| 4.00 | 2 | 0.05 | 4.29 | 2.73 |
| 4.10 | 3 | 0.03 | 6.43 | 4.06 |
| 4.20 | 3 | 0.03 | 6.43 | 4.03 |
| 4.30 | 3 | 0.03 | 6.43 | 3.99 |
| 4.40 | 4 | 0.03 | 8.57 | 5.28 |
| 4.50 | 3 | 0.03 | 6.43 | 3.92 |
| 4.60 | 4 | 0.03 | 8.57 | 5.19 |
| 4.70 | 3 | 0.03 | 6.43 | 3.86 |
| 4.80 | 4 | 0.03 | 8.57 | 5.10 |
| 4.90 | 4 | 0.03 | 8.57 | 5.06 |
| 5.00 | 3 | 0.03 | 6.43 | 3.77 |




Notes:

| | | |
|---|---|---|
| Hammer Mass | 63.5 | kg |
| Fall Height | 0.76 | m |
| Cone Area | 0.0019 | $m^2$ |
| $E_{theor}$ | 473 | J |
| Energy Ratio | 0.86 | |
| Anvil Mass | 1 | kg |
| Rod Mass | 8.79 | kg/m |

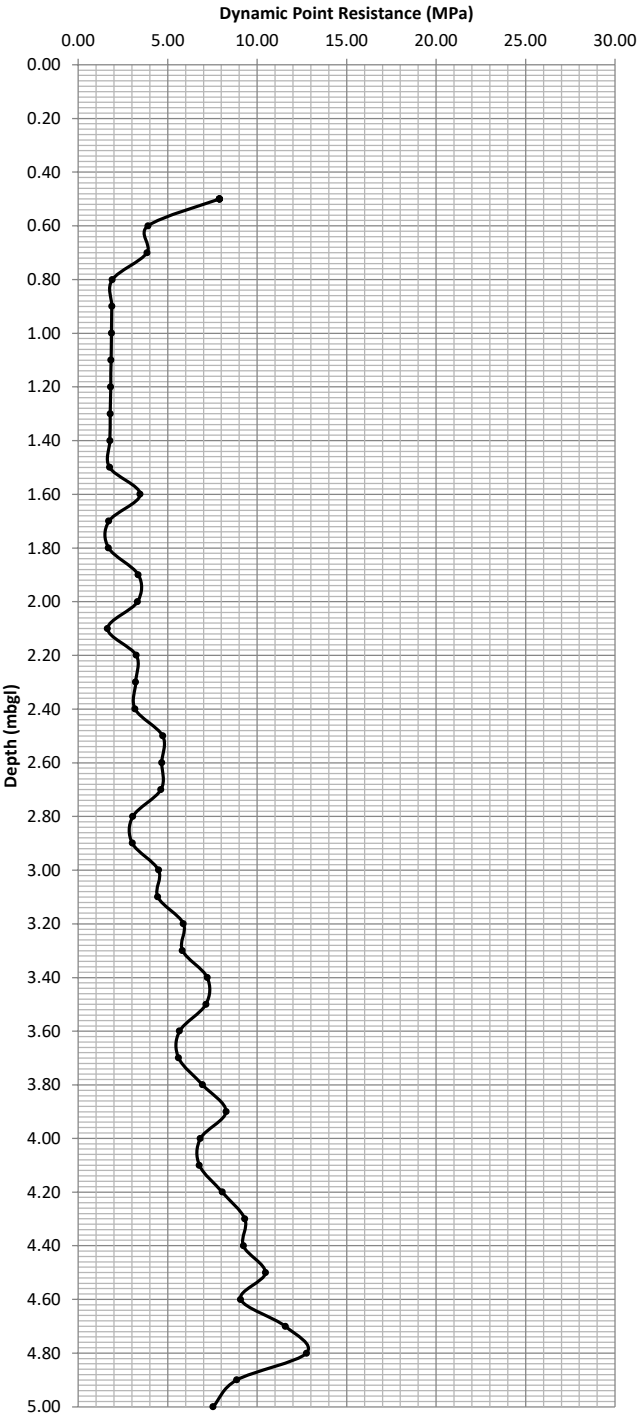
# ASHDOWN SITE INVESTIGATION LTD

## Dynamic Probe Record

**SITE** Garages at Gravelly Crescent, Lancing, West Sussex **Report Ref.** P15501

| Test Location Reference | WS05 |
|---|---|

| Depth (mbgl) | Blows (per 100mm) | Average Penetration per Blow (m) | Unit Point Resistance (MPa) | Dynamic Point Resistance (MPa) |
|---|---|---|---|---|
| 0.10 | | | | |
| 0.20 | | | | |
| 0.30 | | | | |
| 0.40 | | | | |
| 0.50 | 4 | 0.03 | 8.57 | 7.90 |
| 0.60 | 2 | 0.05 | 4.29 | 3.90 |
| 0.70 | 2 | 0.05 | 4.29 | 3.85 |
| 0.80 | 1 | 0.10 | 2.14 | 1.90 |
| 0.90 | 1 | 0.10 | 2.14 | 1.88 |
| 1.00 | 1 | 0.10 | 2.14 | 1.86 |
| 1.10 | 1 | 0.10 | 2.14 | 1.83 |
| 1.20 | 1 | 0.10 | 2.14 | 1.81 |
| 1.30 | 1 | 0.10 | 2.14 | 1.79 |
| 1.40 | 1 | 0.10 | 2.14 | 1.77 |
| 1.50 | 1 | 0.10 | 2.14 | 1.75 |
| 1.60 | 2 | 0.05 | 4.29 | 3.46 |
| 1.70 | 1 | 0.10 | 2.14 | 1.71 |
| 1.80 | 1 | 0.10 | 2.14 | 1.69 |
| 1.90 | 2 | 0.05 | 4.29 | 3.35 |
| 2.00 | 2 | 0.05 | 4.29 | 3.32 |
| 2.10 | 1 | 0.10 | 2.14 | 1.64 |
| 2.20 | 2 | 0.05 | 4.29 | 3.25 |
| 2.30 | 2 | 0.05 | 4.29 | 3.21 |
| 2.40 | 2 | 0.05 | 4.29 | 3.18 |
| 2.50 | 3 | 0.03 | 6.43 | 4.72 |
| 2.60 | 3 | 0.03 | 6.43 | 4.67 |
| 2.70 | 3 | 0.03 | 6.43 | 4.63 |
| 2.80 | 2 | 0.05 | 4.29 | 3.05 |
| 2.90 | 2 | 0.05 | 4.29 | 3.02 |
| 3.00 | 3 | 0.03 | 6.43 | 4.49 |
| 3.10 | 3 | 0.03 | 6.43 | 4.45 |
| 3.20 | 4 | 0.03 | 8.57 | 5.88 |
| 3.30 | 4 | 0.03 | 8.57 | 5.82 |
| 3.40 | 5 | 0.02 | 10.71 | 7.21 |
| 3.50 | 5 | 0.02 | 10.71 | 7.14 |
| 3.60 | 4 | 0.03 | 8.57 | 5.66 |
| 3.70 | 4 | 0.03 | 8.57 | 5.61 |
| 3.80 | 5 | 0.02 | 10.71 | 6.95 |
| 3.90 | 6 | 0.02 | 12.86 | 8.27 |
| 4.00 | 5 | 0.02 | 10.71 | 6.83 |
| 4.10 | 5 | 0.02 | 10.71 | 6.77 |
| 4.20 | 6 | 0.02 | 12.86 | 8.05 |
| 4.30 | 7 | 0.01 | 15.00 | 9.31 |
| 4.40 | 7 | 0.01 | 15.00 | 9.23 |
| 4.50 | 8 | 0.01 | 17.14 | 10.46 |
| 4.60 | 7 | 0.01 | 15.00 | 9.08 |
| 4.70 | 9 | 0.01 | 19.29 | 11.58 |
| 4.80 | 10 | 0.01 | 21.43 | 12.76 |
| 4.90 | 7 | 0.01 | 15.00 | 8.86 |
| 5.00 | 6 | 0.02 | 12.86 | 7.53 |




Notes:

| | | |
|---|---|---|
| Hammer Mass | 63.5 | kg |
| Fall Height | 0.76 | m |
| Cone Area | 0.0019 | $m^2$ |
| $E_{theor}$ | 473 | J |
| Energy Ratio | 0.86 | |
| Anvil Mass | 1 | kg |
| Rod Mass | 8.79 | kg/m |

# Infiltration Test Results

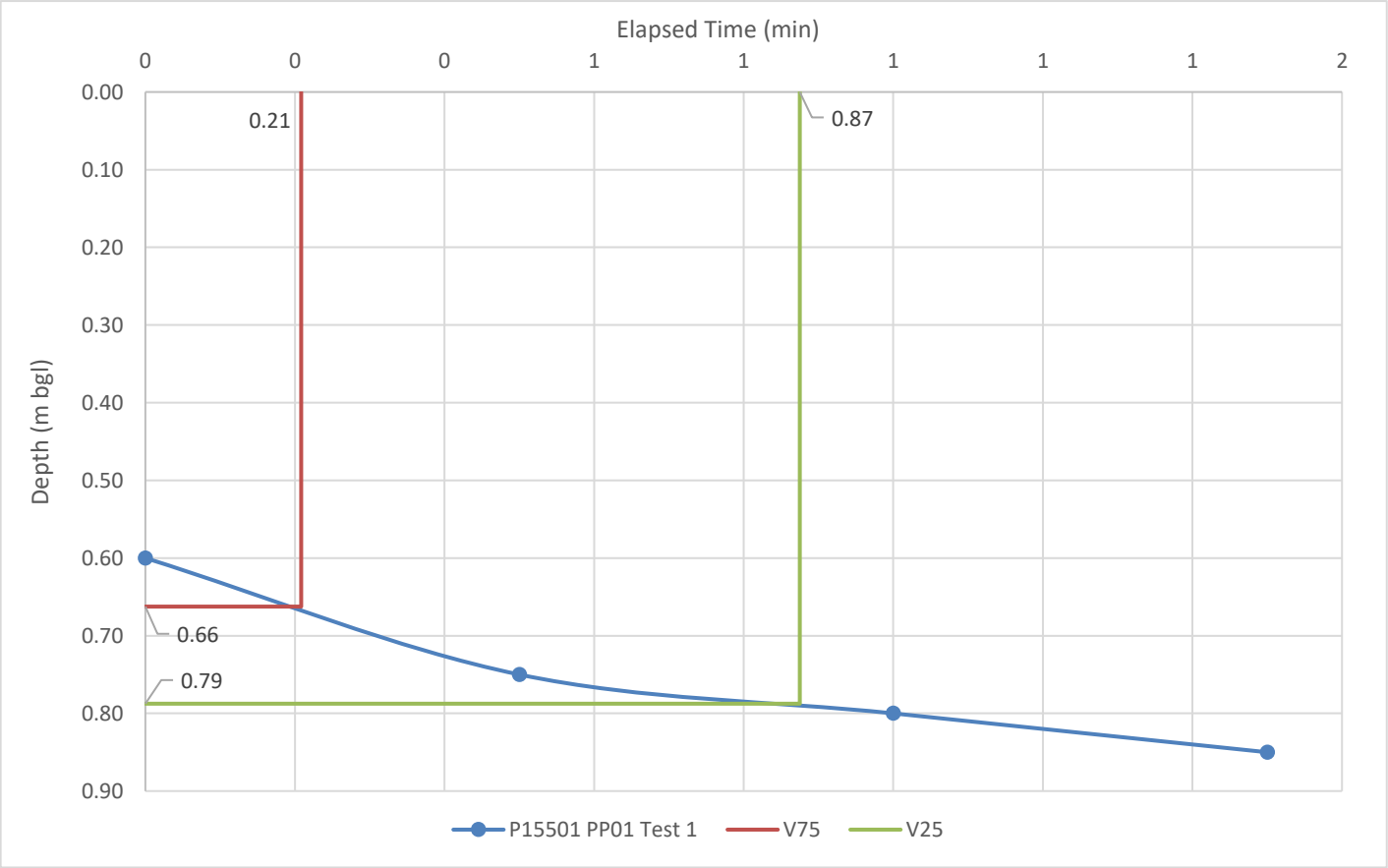
| | |
|---|---|
| Test Position | PP01 |
| Test No. | Test 1 |
| Project No. | P15501 |
| Project Name | Garages at Gravelly Crescent, Lancing, West Sussex |

| | | | |
|---|---|---|---|
| Width of Pit | 0.30 | m | W |
| Length of Pit | 0.30 | m | L |
| Depth of Pit | 0.85 | m | D |
| Pit type | Open | | |

| | | | |
|---|---|---|---|
| Volume of water introduced into pit | 0.023 | $m^3$ | |
| Initial head of water | 0.25 | m | $h_o$ |
| Water level at start of test | 0.60 | m | |
| Water level at end of test | 0.85 | m | |
| Volume of water discharged from pit | 0.023 | $m^3$ | |
| Duration of test | 2 | min | |
| Average soaked surface area | 0.24 | $m^2$ | |
| Time for water level to fall to 75% of initial head | 0.21 | min | $t_{p75}$ |
| Time for water level to fall to 25% of initial head | 0.87 | min | $t_{p25}$ |
| Depth to water at 75% of initial head | 0.66 | m | $d_{75}$ |
| Depth to water at 25% of initial head | 0.79 | m | $d_{25}$ |
| Time for the water level to fall from 75% to 25% of initial head | 0.67 | min | $t_{p75-25}$ |
| Effective storage volume of water in the soakage trial pit between 75% and 25% of initial head | 0.011 | $m^3$ | $V_{p75-25}$ |
| Internal surface area of the soakage trial pit up to 50% of initial head and including the base area | 0.24 | $m^2$ | $a_{s50}$ |

| | | | |
|---|---|---|---|
| **Infiltration rate** | **1.17E-03** | **m/sec** | **f** |

Calculation method: BRE 365



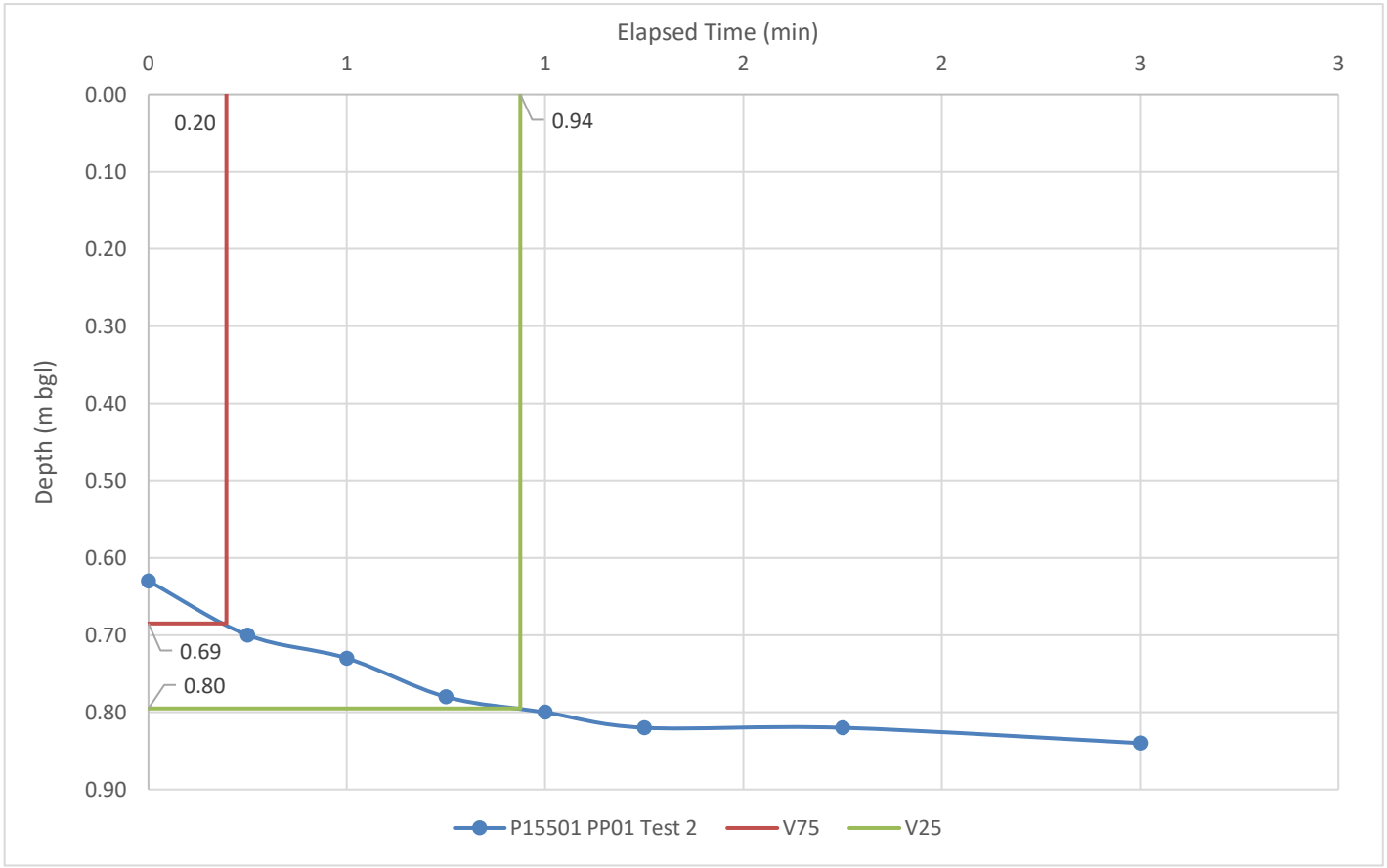
# Infiltration Test Results

| | |
|---|---|
| Test Position | PP01 |
| Test No. | Test 2 |
| Project No. | P15501 |
| Project Name | Garages at Gravelly Crescent, Lancing, West Sussex |

| | | | |
|---|---|---|---|
| Width of Pit | 0.30 | m | W |
| Length of Pit | 0.30 | m | L |
| Depth of Pit | 0.85 | m | D |
| Pit type | Open | | |

| | | | |
|---|---|---|---|
| Volume of water introduced into pit | 0.020 | $m^3$ | |
| Initial head of water | 0.22 | m | $h_o$ |
| Water level at start of test | 0.63 | m | |
| Water level at end of test | 0.84 | m | |
| Volume of water discharged from pit | 0.019 | $m^3$ | |
| Duration of test | 3 | min | |
| Average soaked surface area | 0.23 | $m^2$ | |
| Time for water level to fall to 75% of initial head | 0.20 | min | $t_{p75}$ |
| Time for water level to fall to 25% of initial head | 0.94 | min | $t_{p25}$ |
| Depth to water at 75% of initial head | 0.69 | m | $d_{75}$ |
| Depth to water at 25% of initial head | 0.80 | m | $d_{25}$ |
| Time for the water level to fall from 75% to 25% of initial head | 0.74 | min | $t_{p75-25}$ |
| Effective storage volume of water in the soakage trial pit between 75% and 25% of initial head | 0.010 | $m^3$ | $V_{p75-25}$ |
| Internal surface area of the soakage trial pit up to 50% of initial head and including the base area | 0.22 | $m^2$ | $a_{s50}$ |

| | | | |
|---|---|---|---|
| **Infiltration rate** | **1.00E-03** | **m/sec** | **f** |
| Calculation method: | BRE 365 | | |



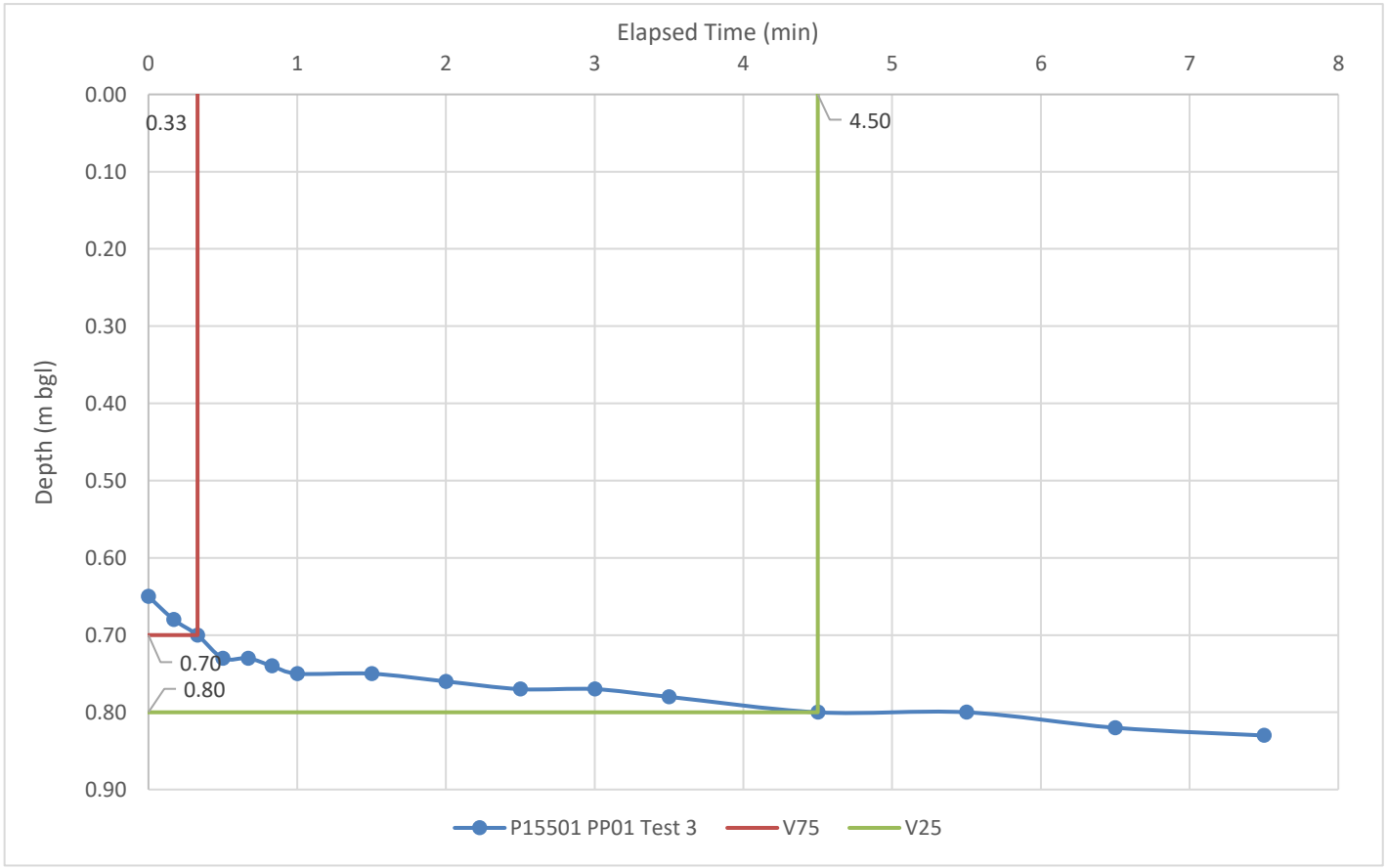
# Infiltration Test Results

| | |
|---|---|
| Test Position | PP01 |
| Test No. | Test 3 |
| Project No. | P15501 |
| Project Name | Garages at Gravelly Crescent, Lancing, West Sussex |

| | | | |
|---|---|---|---|
| Width of Pit | 0.30 | m | W |
| Length of Pit | 0.30 | m | L |
| Depth of Pit | 0.85 | m | D |
| Pit type | Open | | |

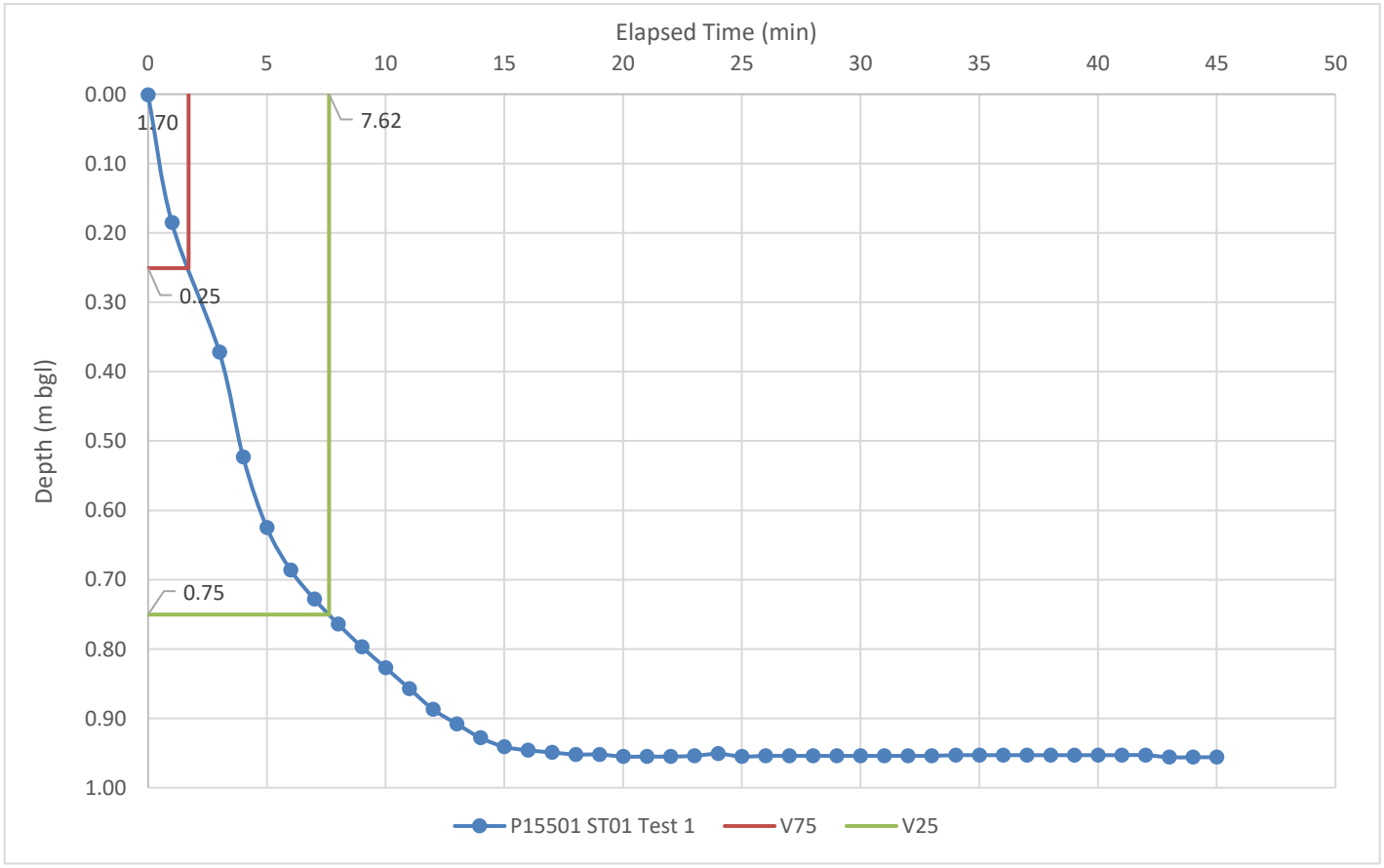
| | | | |
|---|---|---|---|
| Volume of water introduced into pit | 0.018 | $m^3$ | |
| Initial head of water | 0.20 | m | $h_o$ |
| Water level at start of test | 0.65 | m | |
| Water level at end of test | 0.83 | m | |
| Volume of water discharged from pit | 0.016 | $m^3$ | |
| Duration of test | 8 | min | |
| Average soaked surface area | 0.22 | $m^2$ | |
| Time for water level to fall to 75% of initial head | 0.33 | min | $t_{p75}$ |
| Time for water level to fall to 25% of initial head | 4.50 | min | $t_{p25}$ |
| Depth to water at 75% of initial head | 0.70 | m | $d_{75}$ |
| Depth to water at 25% of initial head | 0.80 | m | $d_{25}$ |
| Time for the water level to fall from 75% to 25% of initial head | 4.17 | min | $t_{p75-25}$ |
| Effective storage volume of water in the soakage trial pit between 75% and 25% of initial head | 0.009 | $m^3$ | $V_{p75-25}$ |
| Internal surface area of the soakage trial pit up to 50% of initial head and including the base area | 0.21 | $m^2$ | $a_{s50}$ |
| **Infiltration rate** | **1.71E-04** | **m/sec** | **f** |

Calculation method: BRE 365



# Infiltration Test Results

| | | | |
|---|---|---|---|
| Test Position | ST01 | | |
| Test No. | Test 1 | | |
| Project No. | P15501 | | |
| Project Name | Garages at Gravelly Crescent, Lancing, West Sussex | | |
| Width of Pit | 0.30 | m | W |
| Length of Pit | 1.00 | m | L |
| Depth of Pit | 1.00 | m | D |
| Pit type | Gravel backfilled | | |
| Void ratio of gravel backfill | 0.25 | | |
| Volume of water introduced into pit | 0.075 | $m^3$ | |
| Initial head of water | 1.00 | m | $h_o$ |
| Water level at start of test | 0.00 | m | |
| Water level at end of test | 0.96 | m | |
| Volume of water discharged from pit | 0.072 | $m^3$ | |
| Duration of test | 45 | min | |
| Average soaked surface area | 1.66 | $m^2$ | |
| Time for water level to fall to 75% of initial head | 1.70 | min | $t_{p75}$ |
| Time for water level to fall to 25% of initial head | 7.62 | min | $t_{p25}$ |
| Depth to water at 75% of initial head | 0.25 | m | $d_{75}$ |
| Depth to water at 25% of initial head | 0.75 | m | $d_{25}$ |
| Time for the water level to fall from 75% to 25% of initial head | 5.91 | min | $t_{p75-25}$ |
| Effective storage volume of water in the soakage trial pit between 75% and 25% of initial head | 0.037 | $m^3$ | $V_{p75-25}$ |
| Internal surface area of the soakage trial pit up to 50% of initial head and including the base area | 1.60 | $m^2$ | $a_{s50}$ |
| **Infiltration rate** | **6.60E-05** | **m/sec** | **f** |
| Calculation method: | BRE 365 | | |

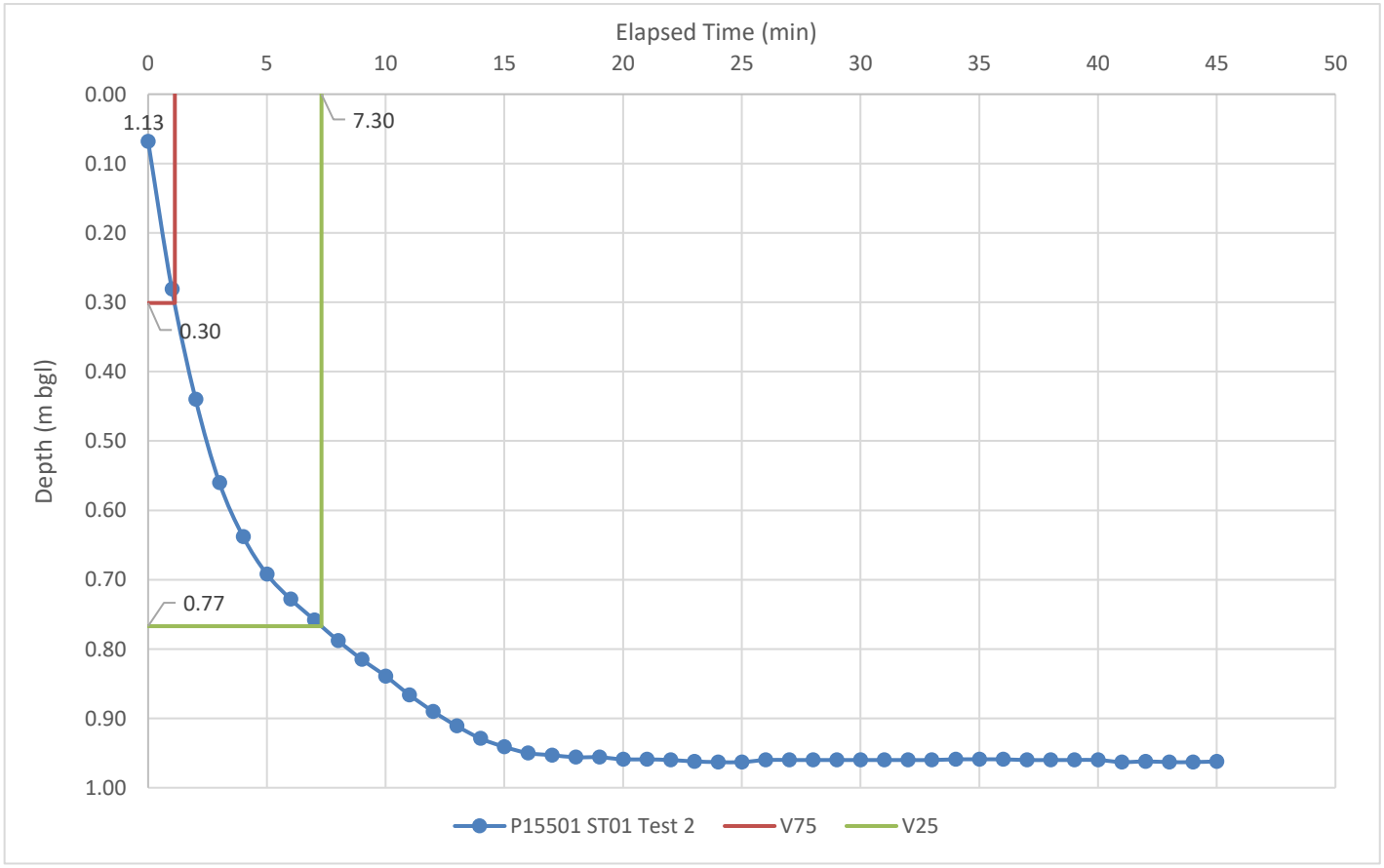


# Infiltration Test Results

| | |
|---|---|
| Test Position | ST01 |
| Test No. | Test 2 |
| Project No. | P15501 |
| Project Name | Garages at Gravelly Crescent, Lancing, West Sussex |

| | | | |
|---|---|---|---|
| Width of Pit | 0.30 | m | W |
| Length of Pit | 1.00 | m | L |
| Depth of Pit | 1.00 | m | D |
| Pit type | Gravel backfilled | | |
| Void ratio of gravel backfill | 0.25 | | |
| Volume of water introduced into pit | 0.070 | $m^3$ | |
| Initial head of water | 0.93 | m | $h_o$ |
| Water level at start of test | 0.07 | m | |
| Water level at end of test | 0.96 | m | |
| Volume of water discharged from pit | 0.067 | $m^3$ | |
| Duration of test | 45 | min | |
| Average soaked surface area | 1.56 | $m^2$ | |
| Time for water level to fall to 75% of initial head | 1.13 | min | $t_{p75}$ |
| Time for water level to fall to 25% of initial head | 7.30 | min | $t_{p25}$ |
| Depth to water at 75% of initial head | 0.30 | m | $d_{75}$ |
| Depth to water at 25% of initial head | 0.77 | m | $d_{25}$ |
| Time for the water level to fall from 75% to 25% of initial head | 6.17 | min | $t_{p75-25}$ |
| Effective storage volume of water in the soakage trial pit between 75% and 25% of initial head | 0.035 | $m^3$ | $V_{p75-25}$ |
| Internal surface area of the soakage trial pit up to 50% of initial head and including the base area | 1.51 | $m^2$ | $a_{s50}$ |
| **Infiltration rate** | **6.24E-05** | **m/sec** | **f** |

Calculation method: BRE 365

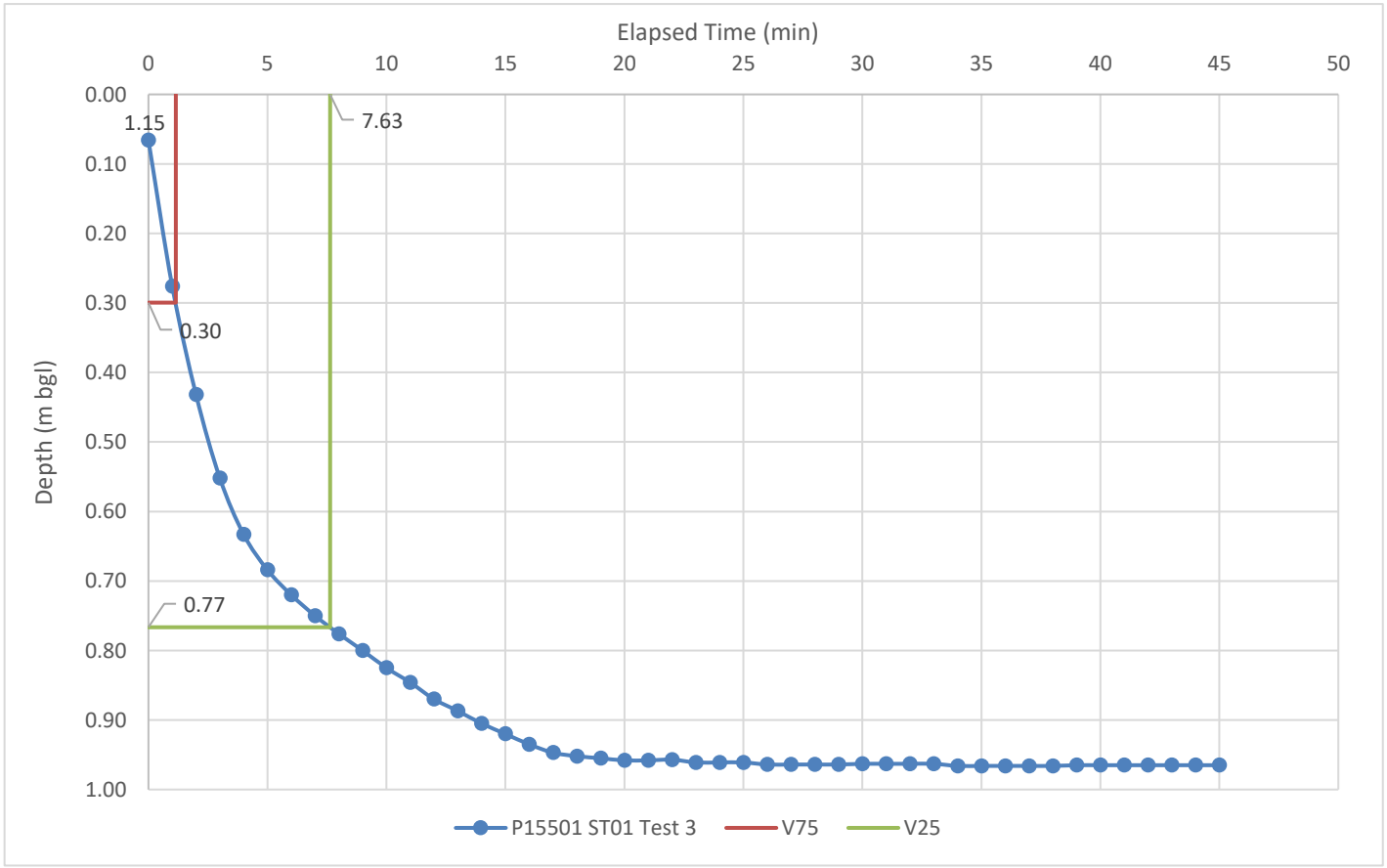


# Infiltration Test Results

| | |
|---|---|
| Test Position | ST01 |
| Test No. | Test 3 |
| Project No. | P15501 |
| Project Name | Garages at Gravelly Crescent, Lancing, West Sussex |

| | | | |
|---|---|---|---|
| Width of Pit | 0.30 | m | W |
| Length of Pit | 1.00 | m | L |
| Depth of Pit | 1.00 | m | D |
| Pit type | Gravel backfilled | | |
| Void ratio of gravel backfill | 0.25 | | |
| Volume of water introduced into pit | 0.070 | $m^3$ | |
| Initial head of water | 0.93 | m | $h_o$ |
| Water level at start of test | 0.07 | m | |
| Water level at end of test | 0.97 | m | |
| Volume of water discharged from pit | 0.068 | $m^3$ | |
| Duration of test | 45 | min | |
| Average soaked surface area | 1.56 | $m^2$ | |
| Time for water level to fall to 75% of initial head | 1.15 | min | $t_{p75}$ |
| Time for water level to fall to 25% of initial head | 7.63 | min | $t_{p25}$ |
| Depth to water at 75% of initial head | 0.30 | m | $d_{75}$ |
| Depth to water at 25% of initial head | 0.77 | m | $d_{25}$ |
| Time for the water level to fall from 75% to 25% of initial head | 6.48 | min | $t_{p75-25}$ |
| Effective storage volume of water in the soakage trial pit between 75% and 25% of initial head | 0.035 | $m^3$ | $V_{p75-25}$ |
| Internal surface area of the soakage trial pit up to 50% of initial head and including the base area | 1.51 | $m^2$ | $a_{s50}$ |
| **Infiltration rate** | **5.95E-05** | **m/sec** | **f** |

Calculation method: BRE 365



# Groundwater Monitoring Results

| Site Name: | | Garages at Gravelly Crescent, Lancing, West Sussex |
|---|---|---|
| Project Ref: | | P15501 |
| Position | Date | Standing Water Depth (m bgl) |
| WS01 | 10/02/22 | 2.30 |
| WS01 | 11/02/22 | 2.15 |
| WS01 | 17/02/22 | 2.20 |
| WS01 | 03/03/22 | 2.05 |

# APPENDIX F

Geotechnical Laboratory Test Results
Contamination Laboratory Test Results

# ASHDOWN SITE INVESTIGATION LIMITED

## Soil Classification Summary

| Site Name: | Garages at Gravelly Crescent, Lancing, West Sussex | Job No: | P15501 |
|---|---|---|---|

| BH/TP No. | Depth (m) | Nat. Moist. Cont. (w %) | Equiv. Moist. Cont. ($w_a$ %) | Atterberg Limits | | | Class'n | Cons. Index ($I_c$) | % passing 425 µm sieve | Visual Description of Sample |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $W_l$ % | $W_p$ % | $I_p$ % | | | | |
| WS01 | 2.60 | 24 | | 42 | 18 | 24 | ClM | 0.75* | 98 | Stiff brown slightly gravelly slightly sandy CLAY. Gravel is fine flint. |
| WS02 | 1.25 | 21 | | 40 | 17 | 23 | ClM | 0.83* | 95 | Stiff brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium flint. |
| WS04 | 1.70 | 17 | | 32 | 18 | 14 | ClL | 1.07* | 75 | Very stiff brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium chalk and flint. |
| WS05 | 1.80 | 14 | | 28 | 15 | 13 | ClL | 1.08* | 55 | Very stiff brown gravelly slighty sandy CLAY. Gravel is fine to medium chalk and flint. |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Test Method: Classification Tests BS1377: Part 2: 1990: Method 4.4, 5.3 and 5.4

Sheet No. 1

* Consistency index based on natural moisture content and not the equivalent moisture content.

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**THE ENVIRONMENTAL LABORATORY LTD**

| | |
|---|---|
| **Analytical Report Number:** | 22-38615 |
| **Issue:** | 1 |
| **Date of Issue:** | 16/02/2022 |
| **Contact:** | Lab Results |
| **Customer Details:** | Ashdown Site Investigation Ltd<br>Unit 3 The Grain Store<br>Ditchling Common Business Park<br>Ditchling Common<br>West SussexBN6 8SG |
| **Quotation No:** | Q15-00267 |
| **Order No:** | 10147 |
| **Customer Reference:** | P15501_740 |
| **Date Received:** | 09/02/2022 |
| **Date Approved:** | 16/02/2022 |
| **Details:** | Gravelly Crescent, Lancing, West Sussex |
| **Approved by:** | [redacted] |

Mike Varley, General Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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## Sample Summary

**Report No.: 22-38615, issue number 1**

| Elab No. | Client's Ref. | Date Sampled | Date Scheduled | Description | Deviations |
|---|---|---|---|---|---|
| 267485 | WS02 1.60 | 03/02/2022 | 09/02/2022 | Silty clayey loam | |
| 267486 | WS03 0.90 | 03/02/2022 | 09/02/2022 | Silty clayey loam | |
| 267487 | WS04 2.70 | 03/02/2022 | 09/02/2022 | Chalk + silty loam | |
| 267488 | WS05 1.35 | 03/02/2022 | 09/02/2022 | Silty clayey loam | |

# Results Summary

2683

**Report No.: 22-38615, issue number 1**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | ELAB Reference | 267485 | 267486 | 267487 | 267488 |
| | | | Customer Reference | | | | |
| | | | Sample ID | | | | |
| | | | Sample Type | SOIL | SOIL | SOIL | SOIL |
| | | | Sample Location | WS02 | WS03 | WS04 | WS05 |
| | | | Sample Depth (m) | 1.60 | 0.90 | 2.70 | 1.35 |
| | | | Sampling Date | 03/02/2022 | 03/02/2022 | 03/02/2022 | 03/02/2022 |
| **Determinand** | **Codes** | **Units** | **LOD** | | | | |
| **Soil sample preparation parameters** | | | | | | | |
| Moisture Content | N | % | 0.1 | 14.7 | 16.7 | 16.5 | 16.0 |
| Material removed | N | % | 0.1 | 51.8 | 50.2 | < 0.1 | 47.9 |
| Description of Inert material removed | N | | 0 | Stones | Stones | None | Stones |
| **Anions** | | | | | | | |
| Water Soluble Sulphate | M | g/l | 0.02 | 0.06 | 0.03 | ^ < 0.02 | < 0.02 |
| **Miscellaneous** | | | | | | | |
| pH | M | pH units | 0.1 | 8.1 | 7.7 | ^ 8.2 | 7.7 |

2683

## Method Summary

**Report No.: 22-38615, issue number 1**

| Parameter | Codes | Analysis Undertaken On | Date Tested | Method Number | Technique |
|---|---|---|---|---|---|
| **Soil** | | | | | |
| pH | M | Air dried sample | 16/02/2022 | 113 | Electromeric |
| Water soluble anions | M | Air dried sample | 11/02/2022 | 172 | Ion Chromatography |

# Report Information

**Report No.: 22-38615, issue number 1**

**Key**

| | |
|---|---|
| U | hold UKAS accreditation |
| M | hold MCERTS and UKAS accreditation |
| N | do not currently hold UKAS accreditation |
| ^ | MCERTS accreditation not applicable for sample matrix |
| * | UKAS accreditation not applicable for sample matrix |
| S | Subcontracted to approved laboratory UKAS Accredited for the test |
| SM | Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test |
| NS | Subcontracted to approved laboratory. UKAS accreditation is not applicable. |
| I/S | Insufficient Sample |
| U/S | Unsuitable sample |
| n/t | Not tested |
| < | means "less than" |
| > | means "greater than" |
| LOD | LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination. |
| | Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed. |
| | ELAB are unable to provide an interpretation or opinion on the content of this report. |
| | The results relate only to the sample received. |
| | PCB congener results may include any coeluting PCBs |
| | Uncertainty of measurement for the determinands tested are available upon request |
| | Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results. |

**Deviation Codes**

| | |
|---|---|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

**Sample Retention and Disposal**

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

**TPH Classification - HWOL Acronym System**

| | |
|---|---|
| HS | Headspace analysis |
| EH | Extractable Hydrocarbons - i.e. everything extracted by the solvent |
| CU | Clean-up - e.g. by florisil, silica gel |
| 1D | GC - Single coil gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics only |
| AR | Aromatics only |
| 2D | GC-GC - Double coil gas chromatography |
| #1 | EH_Total but with humics mathematically subtracted |
| #2 | EH_Total but with fatty acids mathematically subtracted |
| _ | Operator - underscore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |
| MS | Mass Spectrometry |

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**THE ENVIRONMENTAL LABORATORY LTD**

| | |
|---|---|
| **Analytical Report Number:** | 22-38562 |
| **Issue:** | 1 |
| **Date of Issue:** | 18/02/2022 |
| **Contact:** | Lab Results |
| **Customer Details:** | Ashdown Site Investigation Ltd<br>Unit 3 The Grain Store<br>Ditchling Common Business Park<br>Ditchling Common<br>West SussexBN6 8SG |
| **Quotation No:** | Q15-00267 |
| **Order No:** | 10146 |
| **Customer Reference:** | P15501_738 |
| **Date Received:** | 07/02/2022 |
| **Date Approved:** | 18/02/2022 |
| **Details:** | Gravelly Crescent, Lancing, West Sussex |
| **Approved by:** | [redacted] |

Mike Varley, General Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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## Sample Summary

**Report No.: 22-38562, issue number 1**

| Elab No. | Client's Ref. | Date Sampled | Date Scheduled | Description | Deviations |
|---|---|---|---|---|---|
| 267175 | WS01 0.30 | 03/02/2022 | 07/02/2022 | Sandy loam | |
| 267176 | WS01 0.50 | 03/02/2022 | 07/02/2022 | Sandy silty loam | |
| 267177 | WS01 0.90 | 03/02/2022 | 07/02/2022 | Silty loam | |
| 267178 | WS02 0.20 | 03/02/2022 | 07/02/2022 | Loamy sand | |
| 267179 | WS02 0.35 | 03/02/2022 | 07/02/2022 | Silty loam | |
| 267180 | WS02 0.50 | 03/02/2022 | 07/02/2022 | Silty loam | |
| 267181 | WS03 0.25 | 03/02/2022 | 07/02/2022 | Sandy loam | |
| 267182 | WS03 0.35 | 03/02/2022 | 07/02/2022 | Silty loam | |
| 267183 | WS03 0.50 | 03/02/2022 | 07/02/2022 | Silty loam | |
| 267184 | WS04 0.35 | 03/02/2022 | 07/02/2022 | Silty loam | |
| 267185 | WS04 0.80 | 03/02/2022 | 07/02/2022 | Silty loam | |
| 267186 | WS05 0.20 | 03/02/2022 | 07/02/2022 | Sandy loam | |
| 267187 | WS05 0.40 | 03/02/2022 | 07/02/2022 | Sandy silty loam | |
| 267188 | WS05 0.80 | 03/02/2022 | 07/02/2022 | Silty loam | |

# Results Summary

**Report No.: 22-38562, issue number 1**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ELAB Reference | | | | 267175 | 267176 | 267177 | 267178 | 267179 |
| Customer Reference | | | | | | | | |
| Sample ID | | | | | | | | |
| Sample Type | | | | SOIL | SOIL | SOIL | SOIL | SOIL |
| Sample Location | | | | WS01 | WS01 | WS01 | WS02 | WS02 |
| Sample Depth (m) | | | | 0.30 | 0.50 | 0.90 | 0.20 | 0.35 |
| Sampling Date | | | | 03/02/2022 | 03/02/2022 | 03/02/2022 | 03/02/2022 | 03/02/2022 |
| **Determinand** | **Codes** | **Units** | **LOD** | | | | | |
| **Soil sample preparation parameters** | | | | | | | | |
| Moisture Content | N | % | 0.1 | 12.8 | n/t | n/t | n/t | 17.7 |
| Material removed | N | % | 0.1 | 32.7 | n/t | n/t | n/t | < 0.1 |
| Description of Inert material removed | N | | 0 | Stones | n/t | n/t | n/t | None |
| **Metals** | | | | | | | | |
| Arsenic | M | mg/kg | 1 | 44.0 | n/t | n/t | n/t | 9.7 |
| Cadmium | M | mg/kg | 0.5 | 1.2 | n/t | n/t | n/t | < 0.5 |
| Chromium | M | mg/kg | 5 | 49.4 | n/t | n/t | n/t | 29.1 |
| Copper | M | mg/kg | 5 | 298 | n/t | n/t | n/t | 32.7 |
| Lead | M | mg/kg | 5 | 207 | n/t | n/t | n/t | 138 |
| Mercury | M | mg/kg | 0.5 | 1.0 | n/t | n/t | n/t | 2.9 |
| Nickel | M | mg/kg | 5 | 143 | n/t | n/t | n/t | 19.5 |
| Selenium | M | mg/kg | 1 | < 1.0 | n/t | n/t | n/t | < 1.0 |
| Zinc | M | mg/kg | 5 | 669 | n/t | n/t | n/t | 87.1 |
| **Inorganics** | | | | | | | | |
| Hexavalent Chromium | N | mg/kg | 0.8 | < 0.8 | n/t | n/t | n/t | < 0.8 |
| Acid Soluble Sulphate (SO4) | U | % | 0.02 | 0.35 | n/t | n/t | n/t | 0.06 |
| Acid Soluble Sulphate (SO4) | N | mg/kg | 200 | 3500 | n/t | n/t | n/t | 610 |
| Water Soluble Boron | N | mg/kg | 0.5 | 0.7 | n/t | n/t | n/t | 1.7 |
| **Miscellaneous** | | | | | | | | |
| pH | M | pH units | 0.1 | 11.6 | n/t | n/t | n/t | 8.8 |
| Soil Organic Matter | U | % | 0.1 | 4.0 | n/t | n/t | n/t | 2.3 |
| **Organics** | | | | | | | | |
| >C8-C10 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C10-C12 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C12-C16 BCB (EH_1D_Total) | N | mg/kg | 1 | 1.7 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C16-C21 BCB (EH_1D_Total) | N | mg/kg | 1 | 4.7 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C21-C35 BCB (EH_1D_Total) | N | mg/kg | 1 | 172 | 7.8 | 1.7 | 15.1 | < 1.0 |
| >C35-C40 BCB (EH_1D_Total) | N | mg/kg | 1 | 46.0 | 6.9 | 2.7 | 2.6 | < 1.0 |
| Total (>C8-C40) BCB (EH_1D_Total) | N | mg/kg | 1 | 225 | 14.7 | 4.4 | 17.8 | < 1.0 |
| **Polyaromatic hydrocarbons** | | | | | | | | |
| Naphthalene | M | mg/kg | 0.1 | < 0.1 | n/t | n/t | n/t | < 0.1 |
| Acenaphthylene | M | mg/kg | 0.1 | < 0.1 | n/t | n/t | n/t | < 0.1 |
| Acenaphthene | M | mg/kg | 0.1 | < 0.1 | n/t | n/t | n/t | < 0.1 |
| Fluorene | M | mg/kg | 0.1 | < 0.1 | n/t | n/t | n/t | < 0.1 |
| Phenanthrene | M | mg/kg | 0.1 | 0.6 | n/t | n/t | n/t | < 0.1 |
| Anthracene | M | mg/kg | 0.1 | 0.1 | n/t | n/t | n/t | < 0.1 |
| Fluoranthene | M | mg/kg | 0.1 | 1.7 | n/t | n/t | n/t | 0.4 |
| Pyrene | M | mg/kg | 0.1 | 1.4 | n/t | n/t | n/t | 0.3 |
| Benzo(a)anthracene | M | mg/kg | 0.1 | 0.6 | n/t | n/t | n/t | 0.2 |
| Chrysene | M | mg/kg | 0.1 | 0.8 | n/t | n/t | n/t | 0.2 |
| Benzo(b)fluoranthene | M | mg/kg | 0.1 | 1.0 | n/t | n/t | n/t | 0.2 |
| Benzo(k)fluoranthene | M | mg/kg | 0.1 | 1.0 | n/t | n/t | n/t | 0.2 |
| Benzo(a)pyrene | M | mg/kg | 0.1 | 0.9 | n/t | n/t | n/t | 0.2 |
| Indeno(1,2,3-cd)pyrene | M | mg/kg | 0.1 | 0.7 | n/t | n/t | n/t | 0.2 |
| Dibenzo(a,h)anthracene | M | mg/kg | 0.1 | 0.2 | n/t | n/t | n/t | < 0.1 |
| Benzo[g,h,i]perylene | M | mg/kg | 0.1 | 0.9 | n/t | n/t | n/t | 0.2 |
| Total PAH(16) | M | mg/kg | 0.4 | 10.1 | n/t | n/t | n/t | 2.3 |

Tests marked N are not UKAS accredited.

# Results Summary

**Report No.: 22-38562, issue number 1**

| | | | | ELAB Reference | 267180 | 267181 | 267182 | 267183 | 267184 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Customer Reference | | | | | |
| | | | | Sample ID | | | | | |
| | | | | Sample Type | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Sample Location | WS02 | WS03 | WS03 | WS03 | WS04 |
| | | | | Sample Depth (m) | 0.50 | 0.25 | 0.35 | 0.50 | 0.35 |
| | | | | Sampling Date | 03/02/2022 | 03/02/2022 | 03/02/2022 | 03/02/2022 | 03/02/2022 |
| **Determinand** | **Codes** | **Units** | **LOD** | | | | | | |
| **Soil sample preparation parameters** | | | | | | | | | |
| Moisture Content | N | % | 0.1 | | n/t | n/t | 13.2 | n/t | 16.5 |
| Material removed | N | % | 0.1 | | n/t | n/t | 23.6 | n/t | 15.8 |
| Description of Inert material removed | N | | 0 | | n/t | n/t | Stones | n/t | Stones/Clinker |
| **Metals** | | | | | | | | | |
| Arsenic | M | mg/kg | 1 | | n/t | n/t | 10.0 | n/t | 13.0 |
| Cadmium | M | mg/kg | 0.5 | | n/t | n/t | < 0.5 | n/t | < 0.5 |
| Chromium | M | mg/kg | 5 | | n/t | n/t | 26.7 | n/t | 21.5 |
| Copper | M | mg/kg | 5 | | n/t | n/t | 28.8 | n/t | 30.8 |
| Lead | M | mg/kg | 5 | | n/t | n/t | 111 | n/t | 110 |
| Mercury | M | mg/kg | 0.5 | | n/t | n/t | 3.2 | n/t | 0.6 |
| Nickel | M | mg/kg | 5 | | n/t | n/t | 17.5 | n/t | 16.0 |
| Selenium | M | mg/kg | 1 | | n/t | n/t | < 1.0 | n/t | < 1.0 |
| Zinc | M | mg/kg | 5 | | n/t | n/t | 84.6 | n/t | 73.3 |
| **Inorganics** | | | | | | | | | |
| Hexavalent Chromium | N | mg/kg | 0.8 | | n/t | n/t | < 0.8 | n/t | < 0.8 |
| Acid Soluble Sulphate (SO4) | U | % | 0.02 | | n/t | n/t | 0.05 | n/t | 0.03 |
| Acid Soluble Sulphate (SO4) | N | mg/kg | 200 | | n/t | n/t | 490 | n/t | 340 |
| Water Soluble Boron | N | mg/kg | 0.5 | | n/t | n/t | 2.1 | n/t | 1.0 |
| **Miscellaneous** | | | | | | | | | |
| pH | M | pH units | 0.1 | | n/t | n/t | 8.3 | n/t | 8.4 |
| Soil Organic Matter | U | % | 0.1 | | n/t | n/t | 2.4 | n/t | 1.6 |
| **Organics** | | | | | | | | | |
| >C8-C10 BCB (EH_1D_Total) | N | mg/kg | 1 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C10-C12 BCB (EH_1D_Total) | N | mg/kg | 1 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C12-C16 BCB (EH_1D_Total) | N | mg/kg | 1 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C16-C21 BCB (EH_1D_Total) | N | mg/kg | 1 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| >C21-C35 BCB (EH_1D_Total) | N | mg/kg | 1 | | < 1.0 | 1.0 | 7.2 | < 1.0 | < 1.0 |
| >C35-C40 BCB (EH_1D_Total) | N | mg/kg | 1 | | < 1.0 | < 1.0 | 5.2 | < 1.0 | < 1.0 |
| Total (>C8-C40) BCB (EH_1D_Total) | N | mg/kg | 1 | | < 1.0 | 1.0 | 12.5 | < 1.0 | < 1.0 |
| **Polyaromatic hydrocarbons** | | | | | | | | | |
| Naphthalene | M | mg/kg | 0.1 | | n/t | n/t | < 0.1 | n/t | < 0.1 |
| Acenaphthylene | M | mg/kg | 0.1 | | n/t | n/t | < 0.1 | n/t | < 0.1 |
| Acenaphthene | M | mg/kg | 0.1 | | n/t | n/t | < 0.1 | n/t | < 0.1 |
| Fluorene | M | mg/kg | 0.1 | | n/t | n/t | < 0.1 | n/t | < 0.1 |
| Phenanthrene | M | mg/kg | 0.1 | | n/t | n/t | 0.1 | n/t | < 0.1 |
| Anthracene | M | mg/kg | 0.1 | | n/t | n/t | < 0.1 | n/t | < 0.1 |
| Fluoranthene | M | mg/kg | 0.1 | | n/t | n/t | 0.3 | n/t | 0.3 |
| Pyrene | M | mg/kg | 0.1 | | n/t | n/t | 0.2 | n/t | 0.2 |
| Benzo(a)anthracene | M | mg/kg | 0.1 | | n/t | n/t | 0.1 | n/t | 0.1 |
| Chrysene | M | mg/kg | 0.1 | | n/t | n/t | 0.1 | n/t | 0.2 |
| Benzo(b)fluoranthene | M | mg/kg | 0.1 | | n/t | n/t | 0.1 | n/t | 0.2 |
| Benzo(k)fluoranthene | M | mg/kg | 0.1 | | n/t | n/t | 0.2 | n/t | 0.2 |
| Benzo(a)pyrene | M | mg/kg | 0.1 | | n/t | n/t | 0.2 | n/t | 0.2 |
| Indeno(1,2,3-cd)pyrene | M | mg/kg | 0.1 | | n/t | n/t | 0.2 | n/t | 0.1 |
| Dibenzo(a,h)anthracene | M | mg/kg | 0.1 | | n/t | n/t | < 0.1 | n/t | < 0.1 |
| Benzo[g,h,i]perylene | M | mg/kg | 0.1 | | n/t | n/t | 0.1 | n/t | 0.1 |
| Total PAH(16) | M | mg/kg | 0.4 | | n/t | n/t | 1.7 | n/t | 1.7 |

Tests marked N are not UKAS accredited.

# Results Summary

**Report No.: 22-38562, issue number 1**

| | | | | ELAB Reference | 267185 | 267186 | 267187 | 267188 |
|---|---|---|---|---|---|---|---|---|
| | | | | Customer Reference | | | | |
| | | | | Sample ID | | | | |
| | | | | Sample Type | SOIL | SOIL | SOIL | SOIL |
| | | | | Sample Location | WS04 | WS05 | WS05 | WS05 |
| | | | | Sample Depth (m) | 0.80 | 0.20 | 0.40 | 0.80 |
| | | | | Sampling Date | 03/02/2022 | 03/02/2022 | 03/02/2022 | 03/02/2022 |
| **Determinand** | **Codes** | **Units** | **LOD** | | | | | |
| **Soil sample preparation parameters** | | | | | | | | |
| Moisture Content | N | % | 0.1 | n/t | 15.6 | n/t | n/t | |
| Material removed | N | % | 0.1 | n/t | 27.2 | n/t | n/t | |
| Description of Inert material removed | N | | 0 | n/t | Stones | n/t | n/t | |
| **Metals** | | | | | | | | |
| Arsenic | M | mg/kg | 1 | n/t | 15.0 | n/t | n/t | |
| Cadmium | M | mg/kg | 0.5 | n/t | < 0.5 | n/t | n/t | |
| Chromium | M | mg/kg | 5 | n/t | 22.4 | n/t | n/t | |
| Copper | M | mg/kg | 5 | n/t | 51.2 | n/t | n/t | |
| Lead | M | mg/kg | 5 | n/t | 147 | n/t | n/t | |
| Mercury | M | mg/kg | 0.5 | n/t | 0.5 | n/t | n/t | |
| Nickel | M | mg/kg | 5 | n/t | 27.1 | n/t | n/t | |
| Selenium | M | mg/kg | 1 | n/t | < 1.0 | n/t | n/t | |
| Zinc | M | mg/kg | 5 | n/t | 141 | n/t | n/t | |
| **Inorganics** | | | | | | | | |
| Hexavalent Chromium | N | mg/kg | 0.8 | n/t | < 0.8 | n/t | n/t | |
| Acid Soluble Sulphate (SO4) | U | % | 0.02 | n/t | 0.11 | n/t | n/t | |
| Acid Soluble Sulphate (SO4) | N | mg/kg | 200 | n/t | 1100 | n/t | n/t | |
| Water Soluble Boron | N | mg/kg | 0.5 | n/t | < 0.5 | n/t | n/t | |
| **Miscellaneous** | | | | | | | | |
| pH | M | pH units | 0.1 | n/t | 10.9 | n/t | n/t | |
| Soil Organic Matter | U | % | 0.1 | n/t | 1.6 | n/t | n/t | |
| **Organics** | | | | | | | | |
| >C8-C10 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | |
| >C10-C12 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | |
| >C12-C16 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | |
| >C16-C21 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | 1.5 | |
| >C21-C35 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | |
| >C35-C40 BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | |
| Total (>C8-C40) BCB (EH_1D_Total) | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 | 1.5 | |
| **Polyaromatic hydrocarbons** | | | | | | | | |
| Naphthalene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Acenaphthylene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Acenaphthene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Fluorene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Phenanthrene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Anthracene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Fluoranthene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Pyrene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Benzo(a)anthracene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Chrysene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Benzo(b)fluoranthene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Benzo(k)fluoranthene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Benzo(a)pyrene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Indeno(1,2,3-cd)pyrene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Dibenzo(a,h)anthracene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Benzo[g,h,i]perylene | M | mg/kg | 0.1 | n/t | < 0.1 | n/t | n/t | |
| Total PAH(16) | M | mg/kg | 0.4 | n/t | < 0.4 | n/t | n/t | |

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# Results Summary

**Report No.: 22-38562, issue number 1**

## Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

| Elab No | Depth (m) | Clients Reference | Description of Sample Matrix # | Asbestos Identification | Gravimetric Analysis Total (%) | Gravimetric Analysis by ACM Type (%) | Free Fibre Analysis (%) | Total Asbestos (%) |
|---|---|---|---|---|---|---|---|---|
| 267175 | 0.30 | WS01 | Brown sandy soil, stones, crushed concrete, clinker | No asbestos detected | n/t | n/t | n/t | n/t |
| 267179 | 0.35 | WS02 | Brown soil, stones | No asbestos detected | n/t | n/t | n/t | n/t |
| 267182 | 0.35 | WS03 | Brown soil | No asbestos detected | n/t | n/t | n/t | n/t |
| 267184 | 0.35 | WS04 | Brown soil, stones | No asbestos detected | n/t | n/t | n/t | n/t |
| 267186 | 0.20 | WS05 | Brown soil, stones, clinker | No asbestos detected | n/t | n/t | n/t | n/t |

# Method Summary

**Report No.: 22-38562, issue number 1**

| Parameter | Codes | Analysis Undertaken On | Date Tested | Method Number | Technique |
|---|---|---|---|---|---|
| **Soil** | | | | | |
| Hexavalent chromium | N | As submitted sample | 10/02/2022 | 110 | Colorimetry |
| pH | M | Air dried sample | 11/02/2022 | 113 | Electromeric |
| Acid Soluble Sulphate | U | Air dried sample | 11/02/2022 | 115 | Ion Chromatography |
| Aqua regia extractable metals | M | Air dried sample | 10/02/2022 | 118 | ICPMS |
| PAH (GC-FID) | M | As submitted sample | 10/02/2022 | 133 | GC-FID |
| Water soluble boron | N | Air dried sample | 10/02/2022 | 202 | Colorimetry |
| Basic carbon banding in soil | N | As submitted sample | 10/02/2022 | 218 | GC-FID |
| Asbestos identification | U | Air dried sample | 17/02/2022 | 280 | Microscopy |
| Soil organic matter | U | Air dried sample | 14/02/2022 | BS1377:P3 | Titrimetry |

Tests marked N are not UKAS accredited

## Report Information

**Report No.: 22-38562, issue number 1**

**Key**

| | |
|---|---|
| U | hold UKAS accreditation |
| M | hold MCERTS and UKAS accreditation |
| N | do not currently hold UKAS accreditation |
| ^ | MCERTS accreditation not applicable for sample matrix |
| * | UKAS accreditation not applicable for sample matrix |
| S | Subcontracted to approved laboratory UKAS Accredited for the test |
| SM | Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test |
| NS | Subcontracted to approved laboratory. UKAS accreditation is not applicable. |
| I/S | Insufficient Sample |
| U/S | Unsuitable sample |
| n/t | Not tested |
| < | means "less than" |
| > | means "greater than" |
| LOD | LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination. |
| | Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed. |
| | ELAB are unable to provide an interpretation or opinion on the content of this report. |
| | The results relate only to the sample received. |
| | PCB congener results may include any coeluting PCBs |
| | Uncertainty of measurement for the determinands tested are available upon request |
| | Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results. |

**Deviation Codes**

| | |
|---|---|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

**Sample Retention and Disposal**

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

**TPH Classification - HWOL Acronym System**

| | |
|---|---|
| HS | Headspace analysis |
| EH | Extractable Hydrocarbons - i.e. everything extracted by the solvent |
| CU | Clean-up - e.g. by florisil, silica gel |
| 1D | GC - Single coil gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics only |
| AR | Aromatics only |
| 2D | GC-GC - Double coil gas chromatography |
| #1 | EH_Total but with humics mathematically subtracted |
| #2 | EH_Total but with fatty acids mathematically subtracted |
| _ | Operator - underscore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |
| MS | Mass Spectrometry |

# APPENDIX G

Quantitative Conceptual Model

| Gravelly Crescent, Lancing | | | | Quantitative Conceptual Model | | P15501 | |
|---|---|---|---|---|---|---|---|
| **Source** | **Receptor** | **Contaminants** | **Pathway** | **Complete Linkage Present?** | **Probability** | **Consequence** | **Risk** |
| • Made Ground soils across the site | End Users | Heavy Metals | Dermal contact with soil and dust (indoor & outdoor) | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Ingestion of soil and indoor dust | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Consumption of home-grown produce and attached soil | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Inhalation of soil dust (indoor and outdoor) | Yes | P2: Low | C3: Moderate | Low/Moderate |
| | | | Inhalation of soil vapours | Identified contaminant(s) do not pose a risk via this pathway | | | N/A |
| | | | Inhalation of soil gases/ Risk of explosion | Identified contaminant(s) do not pose a risk via this pathway | | | N/A |
| | End Users (via Water Supply Pipework) | | Contamination of incoming services | No contaminants present above screening criteria | | | N/A |
| | Groundwater | | Migration to groundwater | No contaminants present at concentrations posing risk to groundwater | | | N/A |

## APPENDIX H

Groundsure Enviro+Geo Insight Report
Historical Maps

Groundsure
LOCATION INTELLIGENCE

# Enviro+Geo Insight

## GARAGE COMPOUND, GRAVELLY CRESCENT, LANCING, BN15 9EG

## Order Details

**Date:** 01/02/2022

**Your ref:** P15501

**Our Ref:** GS-8486277

**Client:** Ashdown Site Investigation Ltd

## Site Details

**Location:** 518710 105022

**Area:** 0.16 ha

**Authority:** Adur and Worthing Council





**Summary of findings** p. 2

**OS MasterMap site plan** p.13

**Aerial image** p. 8

**groundsure.com/insightuserguide**



Contact us with any questions at:
info@groundsure.com
08444 159 000

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 14 | 1.1 | Historical industrial land uses | 1 | 1 | 9 | 10 | - |
| 15 | 1.2 | Historical tanks | 0 | 0 | 2 | 4 | - |
| 16 | 1.3 | Historical energy features | 0 | 1 | 6 | 3 | - |
| 17 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 17 | 1.5 | Historical garages | 0 | 0 | 0 | 2 | - |
| 17 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 18 | 2.1 | Historical industrial land uses | 1 | 2 | 10 | 13 | - |
| 20 | 2.2 | Historical tanks | 0 | 0 | 7 | 5 | - |
| 20 | 2.3 | Historical energy features | 0 | 3 | 12 | 6 | - |
| 21 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 22 | 2.5 | Historical garages | 0 | 0 | 0 | 4 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 23 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 23 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 24 | 3.3 | Historical landfill (LA/mapping records) | 0 | 0 | 0 | 0 | - |
| 24 | 3.4 | Historical landfill (EA/NRW records) | 0 | 0 | 0 | 0 | - |
| 24 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| 24 | 3.6 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 24 | 3.7 | Waste exemptions | 0 | 0 | 0 | 4 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 26 | 4.1 | Recent industrial land uses | 0 | 0 | 6 | - | - |
| 27 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 1 | - |
| 27 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| 27 | 4.4 | Gas pipelines | 0 | 0 | 0 | 0 | - |
| 28 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 28 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 28 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |
| 28 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 28 | 4.9 | Historical licensed industrial activities (IPC) | 0 | 0 | 0 | 0 | - |
| 29 | 4.10 | Licensed industrial activities (Part A(1)) | 0 | 0 | 0 | 0 | - |
| 29 | 4.11 | Licensed pollutant release (Part A(2)/B) | 0 | 0 | 0 | 0 | - |
| 29 | 4.12 | Radioactive Substance Authorisations | 0 | 0 | 0 | 0 | - |
| **29** | **4.13** | **Licensed Discharges to controlled waters** | 0 | 0 | 8 | 1 | - |
| 31 | 4.14 | Pollutant release to surface waters (Red List) | 0 | 0 | 0 | 0 | - |
| 31 | 4.15 | Pollutant release to public sewer | 0 | 0 | 0 | 0 | - |
| 31 | 4.16 | List 1 Dangerous Substances | 0 | 0 | 0 | 0 | - |
| 31 | 4.17 | List 2 Dangerous Substances | 0 | 0 | 0 | 0 | - |
| **31** | **4.18** | **Pollution Incidents (EA/NRW)** | 0 | 0 | 1 | 2 | - |
| 32 | 4.19 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 32 | 4.20 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 32 | 4.21 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **33** | **5.1** | **Superficial aquifer** | Identified (within 500m) | | | | |
| **35** | **5.2** | **Bedrock aquifer** | Identified (within 500m) | | | | |
| **37** | **5.3** | **Groundwater vulnerability** | Identified (within 50m) | | | | |
| **38** | **5.4** | **Groundwater vulnerability- soluble rock risk** | Identified (within 0m) | | | | |
| 38 | 5.5 | Groundwater vulnerability- local information | None (within 0m) | | | | |
| **39** | **5.6** | **Groundwater abstractions** | 0 | 0 | 0 | 0 | 3 |
| **40** | **5.7** | **Surface water abstractions** | 0 | 0 | 0 | 0 | 1 |
| 41 | 5.8 | Potable abstractions | 0 | 0 | 0 | 0 | 0 |
| 41 | 5.9 | Source Protection Zones | 0 | 0 | 0 | 0 | - |
| 41 | 5.10 | Source Protection Zones (confined aquifer) | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **42** | **6.1** | **Water Network (OS MasterMap)** | 0 | 0 | 14 | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 44 | 6.2 | Surface water features | 0 | 0 | 3 | - | - |
| 44 | 6.3 | WFD Surface water body catchments | 1 | - | - | - | - |
| 44 | 6.4 | WFD Surface water bodies | 0 | 0 | 0 | - | - |
| 45 | 6.5 | WFD Groundwater bodies | 1 | - | - | - | - |
| Page | Section | River and coastal flooding | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 46 | 7.1 | Risk of flooding from rivers and the sea | Low (within 50m) | | | | |
| 47 | 7.2 | Historical Flood Events | 0 | 0 | 3 | - | - |
| 47 | 7.3 | Flood Defences | 0 | 0 | 0 | - | - |
| 48 | 7.4 | Areas Benefiting from Flood Defences | 0 | 0 | 0 | - | - |
| 48 | 7.5 | Flood Storage Areas | 0 | 0 | 0 | - | - |
| 49 | 7.6 | Flood Zone 2 | Identified (within 50m) | | | | |
| 50 | 7.7 | Flood Zone 3 | Identified (within 50m) | | | | |
| Page | Section | Surface water flooding | | | | | |
| 51 | 8.1 | Surface water flooding | 1 in 30 year, 0.1m - 0.3m (within 50m) | | | | |
| Page | Section | Groundwater flooding | | | | | |
| 53 | 9.1 | Groundwater flooding | Moderate-High (within 50m) | | | | |
| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 54 | 10.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 0 | 1 |
| 55 | 10.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 55 | 10.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 |
| 55 | 10.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 55 | 10.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |
| 56 | 10.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 2 |
| 56 | 10.7 | Designated Ancient Woodland | 0 | 0 | 0 | 0 | 0 |
| 56 | 10.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 1 |
| 57 | 10.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 57 | 10.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| 57 | 10.11 | Green Belt | 0 | 0 | 0 | 0 | 0 |
| 57 | 10.12 | Proposed Ramsar sites | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 57 | 10.13 | Possible Special Areas of Conservation (pSAC) | 0 | 0 | 0 | 0 | 0 |
| 58 | 10.14 | Potential Special Protection Areas (pSPA) | 0 | 0 | 0 | 0 | 0 |
| 58 | 10.15 | Nitrate Sensitive Areas | 0 | 0 | 0 | 0 | 0 |
| **58** | **10.16** | **Nitrate Vulnerable Zones** | 1 | 0 | 0 | 0 | 1 |
| **59** | **10.17** | **SSSI Impact Risk Zones** | 1 | - | - | - | - |
| **60** | **10.18** | **SSSI Units** | 0 | 0 | 0 | 0 | 3 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 62 | 11.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 62 | 11.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 62 | 11.3 | National Parks | 0 | 0 | 0 | - | - |
| 62 | 11.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 63 | 11.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 63 | 11.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 63 | 11.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **64** | **12.1** | **Agricultural Land Classification** | Grade 2 (within 250m) | | | | |
| 65 | 12.2 | Open Access Land | 0 | 0 | 0 | - | - |
| 65 | 12.3 | Tree Felling Licences | 0 | 0 | 0 | - | - |
| 65 | 12.4 | Environmental Stewardship Schemes | 0 | 0 | 0 | - | - |
| 66 | 12.5 | Countryside Stewardship Schemes | 0 | 0 | 0 | - | - |
| Page | Section | Habitat designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 67 | 13.1 | Priority Habitat Inventory | 0 | 0 | 0 | - | - |
| **67** | **13.2** | **Habitat Networks** | 0 | 0 | 1 | - | - |
| 68 | 13.3 | Open Mosaic Habitat | 0 | 0 | 0 | - | - |
| 68 | 13.4 | Limestone Pavement Orders | 0 | 0 | 0 | - | - |
| Page | Section | Geology 1:10,000 scale | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **69** | **14.1** | **10k Availability** | Identified (within 500m) | | | | |
| 70 | 14.2 | Artificial and made ground (10k) | 0 | 0 | 0 | 0 | - |
| **71** | **14.3** | **Superficial geology (10k)** | 2 | 0 | 3 | 3 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 72 | 14.4 | Landslip (10k) | 0 | 0 | 0 | 0 | - |
| **73** | **14.5** | **Bedrock geology (10k)** | 2 | 0 | 0 | 0 | - |
| 74 | 14.6 | Bedrock faults and other linear features (10k) | 0 | 0 | 0 | 0 | - |
| Page | Section | Geology 1:50,000 scale | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **75** | **15.1** | **50k Availability** | Identified (within 500m) | | | | |
| 76 | 15.2 | Artificial and made ground (50k) | 0 | 0 | 0 | 0 | - |
| 76 | 15.3 | Artificial ground permeability (50k) | 0 | 0 | - | - | - |
| **77** | **15.4** | **Superficial geology (50k)** | 1 | 0 | 3 | 1 | - |
| **78** | **15.5** | **Superficial permeability (50k)** | Identified (within 50m) | | | | |
| 78 | 15.6 | Landslip (50k) | 0 | 0 | 0 | 0 | - |
| 78 | 15.7 | Landslip permeability (50k) | None (within 50m) | | | | |
| **79** | **15.8** | **Bedrock geology (50k)** | 1 | 0 | 0 | 0 | - |
| **80** | **15.9** | **Bedrock permeability (50k)** | Identified (within 50m) | | | | |
| 80 | 15.10 | Bedrock faults and other linear features (50k) | 0 | 0 | 0 | 0 | - |
| Page | Section | Boreholes | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **81** | **16.1** | **BGS Boreholes** | 0 | 0 | 2 | - | - |
| Page | Section | Natural ground subsidence | | | | | |
| **82** | **17.1** | **Shrink swell clays** | Very low (within 50m) | | | | |
| **83** | **17.2** | **Running sands** | Very low (within 50m) | | | | |
| **84** | **17.3** | **Compressible deposits** | Negligible (within 50m) | | | | |
| **85** | **17.4** | **Collapsible deposits** | Very low (within 50m) | | | | |
| **86** | **17.5** | **Landslides** | Very low (within 50m) | | | | |
| **87** | **17.6** | **Ground dissolution of soluble rocks** | Very low (within 50m) | | | | |
| Page | Section | Mining, ground workings and natural cavities | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 89 | 18.1 | Natural cavities | 0 | 0 | 0 | 0 | - |
| 90 | 18.2 | BritPits | 0 | 0 | 0 | 0 | - |
| **90** | **18.3** | **Surface ground workings** | 0 | 0 | 1 | - | - |
| 90 | 18.4 | Underground workings | 0 | 0 | 0 | 0 | 0 |
| 90 | 18.5 | Historical Mineral Planning Areas | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **91** | **18.6** | **Non-coal mining** | 2 | 0 | 0 | 0 | 0 |
| 91 | 18.7 | Mining cavities | 0 | 0 | 0 | 0 | 0 |
| 91 | 18.8 | JPB mining areas | None (within 0m) | | | | |
| 92 | 18.9 | Coal mining | None (within 0m) | | | | |
| 92 | 18.10 | Brine areas | None (within 0m) | | | | |
| 92 | 18.11 | Gypsum areas | None (within 0m) | | | | |
| 92 | 18.12 | Tin mining | None (within 0m) | | | | |
| 92 | 18.13 | Clay mining | None (within 0m) | | | | |

| Page | Section | Radon | | | | | |
|---|---|---|---|---|---|---|---|
| **93** | **19.1** | **Radon** | Between 1% and 3% (within 0m) | | | | |

| Page | Section | Soil chemistry | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **94** | **20.1** | **BGS Estimated Background Soil Chemistry** | 3 | 0 | - | - | - |
| 94 | 20.2 | BGS Estimated Urban Soil Chemistry | 0 | 0 | - | - | - |
| 94 | 20.3 | BGS Measured Urban Soil Chemistry | 0 | 0 | - | - | - |

| Page | Section | Railway infrastructure and projects | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 95 | 21.1 | Underground railways (London) | 0 | 0 | 0 | - | - |
| 95 | 21.2 | Underground railways (Non-London) | 0 | 0 | 0 | - | - |
| 95 | 21.3 | Railway tunnels | 0 | 0 | 0 | - | - |
| 95 | 21.4 | Historical railway and tunnel features | 0 | 0 | 0 | - | - |
| 95 | 21.5 | Royal Mail tunnels | 0 | 0 | 0 | - | - |
| 96 | 21.6 | Historical railways | 0 | 0 | 0 | - | - |
| 96 | 21.7 | Railways | 0 | 0 | 0 | - | - |
| 96 | 21.8 | Crossrail 1 | 0 | 0 | 0 | 0 | - |
| 96 | 21.9 | Crossrail 2 | 0 | 0 | 0 | 0 | - |
| 96 | 21.10 | HS2 | 0 | 0 | 0 | 0 | - |

## Recent aerial photograph




Capture Date: 28/06/2018

Site Area: 0.16ha

# Recent site history - 2015 aerial photograph




Capture Date: 30/06/2015

Site Area: 0.16ha

# Recent site history - 2012 aerial photograph




Capture Date: 13/09/2012

Site Area: 0.16ha

# Recent site history - 2009 aerial photograph




Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2022. All Rights Reserved.

Capture Date: 27/09/2009

Site Area: 0.16ha

# Recent site history - 1999 aerial photograph




Capture Date: 29/08/1999

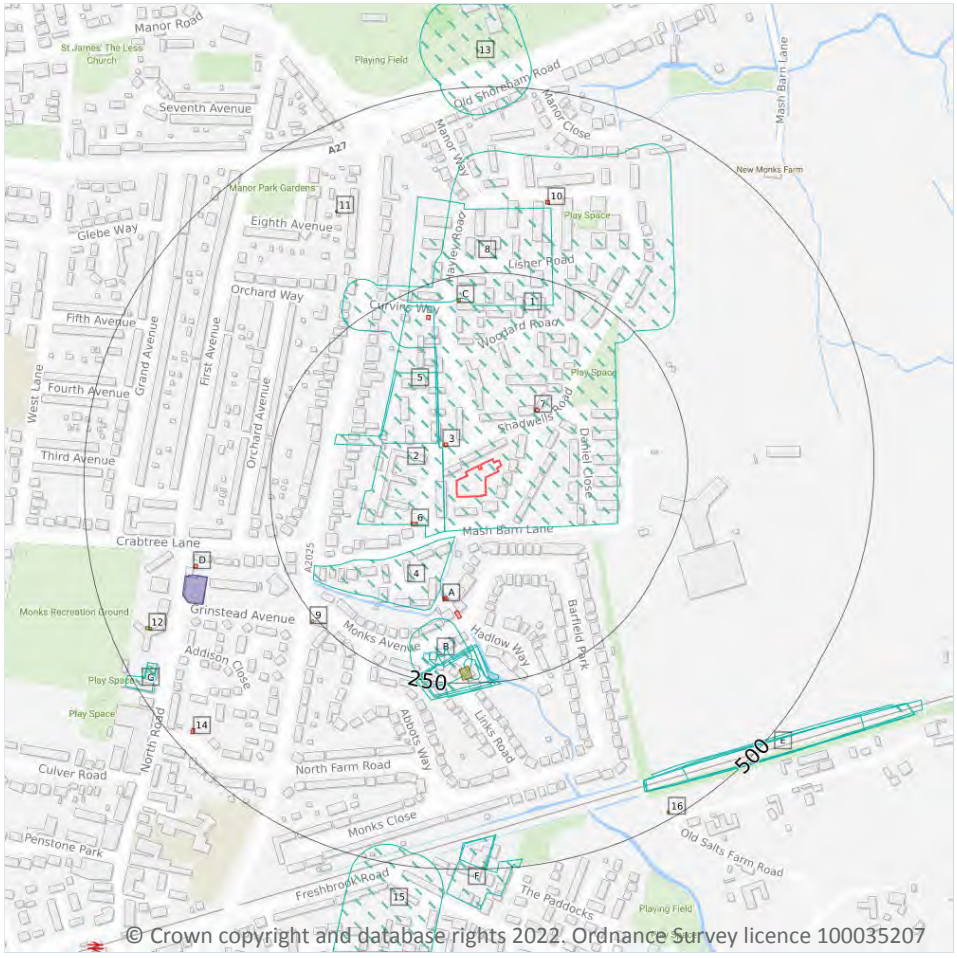
Site Area: 0.16ha

## OS MasterMap site plan




Site Area: 0.16ha

# 1 Past land use




Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

## 1.1 Historical industrial land uses

| Records within 500m | 21 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **1** | **On site** | **Nursery** | **1947 - 1950** | **2200968** |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 2 | 18m W | Nursery | 1950 | 2211053 |
| 4 | 54m S | Nursery | 1962 | 2161082 |
| 5 | 54m NW | Nurseries | 1957 | 2168189 |
| B | 165m S | Unspecified Depot | 1981 | 2233009 |
| B | 199m S | Unspecified Commercial/Industrial | 1971 | 2130652 |
| B | 199m S | Sewage Works | 1932 | 2142184 |
| B | 201m S | Unspecified Depot | 1969 | 2172233 |
| B | 206m S | Unspecified Depot | 1950 | 2221900 |
| 8 | 206m N | Nursery | 1957 | 2287240 |
| B | 217m S | Unspecified Tanks | 1932 | 2143636 |
| E | 436m SE | Cuttings | 1909 - 1932 | 2205639 |
| E | 437m SE | Cuttings | 1950 | 2218748 |
| E | 438m SE | Cuttings | 1875 | 2249206 |
| E | 450m SE | Cuttings | 1896 | 2224123 |
| F | 455m S | Unspecified Works | 1971 | 2242476 |
| F | 456m S | Unspecified Works | 1981 | 2252149 |
| G | 461m SW | Police Station | 1962 - 1971 | 2293882 |
| 13 | 463m N | Fire Engine Station | 1947 | 2140081 |
| G | 466m SW | Police Station | 1981 | 2230486 |
| 15 | 475m S | Nursery | 1896 | 2220872 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| **Records within 500m** | **6** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| C | 216m N | Unspecified Tank | 1963 - 1970 | 385046 |
| B | 228m S | Tanks | 1952 - 1960 | 397730 |
| 9 | 254m SW | Unspecified Tank | 1912 | 360114 |
| 11 | 390m NW | Unspecified Tank | 1951 | 359945 |
| 12 | 446m SW | Unspecified Tank | 1952 | 393653 |
| 16 | 489m SE | Unspecified Tank | 1932 | 360115 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| **Records within 500m** | **10** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 3 | 42m NW | Electricity Substation | 1970 - 1994 | 281606 |
| 6 | 63m SW | Electricity Substation | 1970 - 1994 | 259215 |
| 7 | 82m NE | Electricity Substation | 1970 - 1994 | 269090 |
| A | 134m S | Electricity Substation | 1952 | 259227 |
| A | 136m S | Electricity Substation | 1952 - 1956 | 259508 |
| A | 153m S | Electricity Substation | 1970 - 1994 | 271259 |
| C | 205m NW | Electricity Substation | 1980 - 1994 | 282258 |
| 10 | 350m N | Electricity Substation | 1980 - 1994 | 273560 |
| D | 360m W | Electricity Substation | 1979 - 1992 | 288643 |
| 14 | 470m SW | Electricity Substation | 1979 - 1992 | 276050 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 2 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| D | 352m W | Garage | 1979 | 77831 |
| D | 353m W | Garage | 1960 - 1966 | 83066 |

*This data is sourced from Ordnance Survey / Groundsure.*

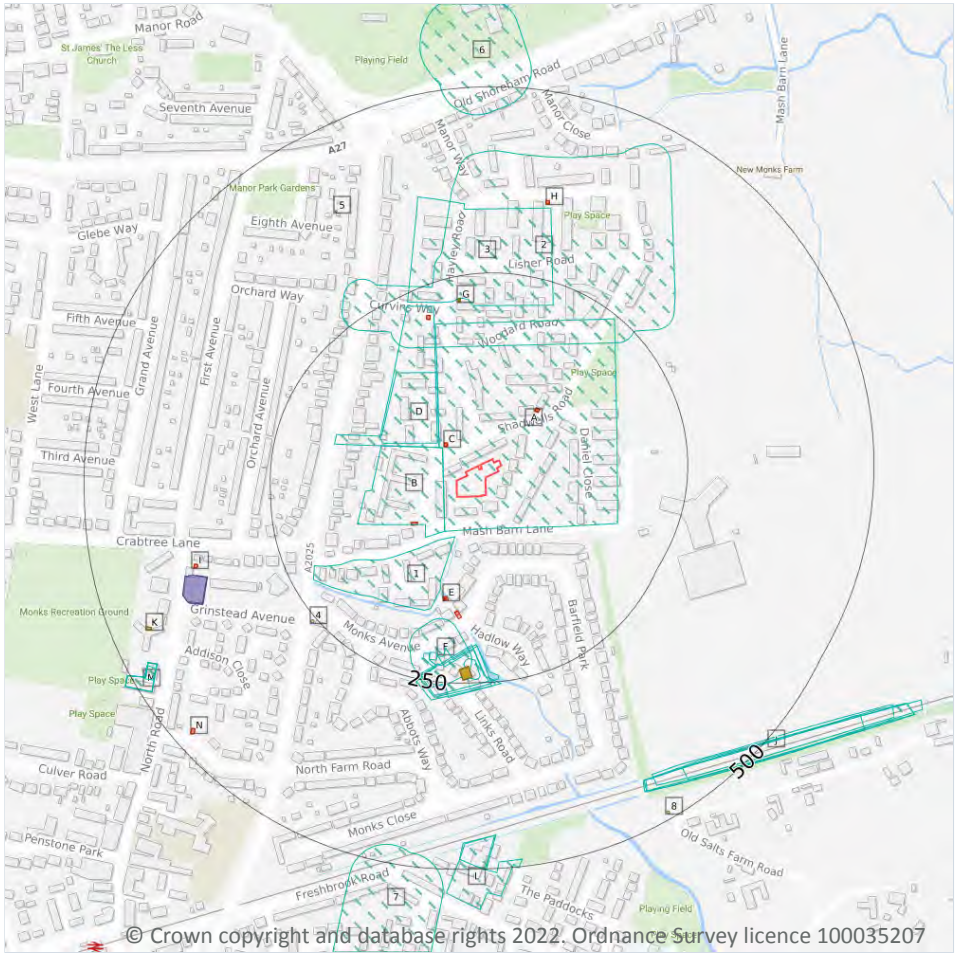
## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped




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Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

## 2.1 Historical industrial land uses

| Records within 500m | 26 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Nursery** | **1950** | **2200968** |
| B | 18m W | Nursery | 1950 | 2211053 |
| D | 49m NW | Nursery | 1950 | 2211053 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 1 | 54m S | Nursery | 1962 | 2161082 |
| D | 54m NW | Nurseries | 1957 | 2168189 |
| 2 | 152m N | Nursery | 1947 | 2200968 |
| F | 165m S | Unspecified Depot | 1981 | 2233009 |
| F | 199m S | Unspecified Commercial/Industrial | 1971 | 2130652 |
| F | 199m S | Sewage Works | 1932 | 2142184 |
| F | 201m S | Unspecified Depot | 1969 | 2172233 |
| F | 206m S | Unspecified Depot | 1950 | 2221900 |
| 3 | 206m N | Nursery | 1957 | 2287240 |
| F | 217m S | Unspecified Tanks | 1932 | 2143636 |
| J | 436m SE | Cuttings | 1909 | 2205639 |
| J | 437m SE | Cuttings | 1950 | 2218748 |
| J | 438m SE | Cuttings | 1932 | 2205639 |
| J | 438m SE | Cuttings | 1875 | 2249206 |
| J | 450m SE | Cuttings | 1896 | 2224123 |
| L | 455m S | Unspecified Works | 1971 | 2242476 |
| L | 456m S | Unspecified Works | 1981 | 2252149 |
| M | 461m SW | Police Station | 1962 | 2293882 |
| M | 461m SW | Police Station | 1969 | 2293882 |
| M | 461m SW | Police Station | 1971 | 2293882 |
| 6 | 463m N | Fire Engine Station | 1947 | 2140081 |
| M | 466m SW | Police Station | 1981 | 2230486 |
| 7 | 475m S | Nursery | 1896 | 2220872 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| **Records within 500m** | **12** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| G | 216m N | Unspecified Tank | 1970 | 385046 |
| G | 216m N | Unspecified Tank | 1963 | 385046 |
| G | 216m N | Unspecified Tank | 1963 | 385046 |
| F | 228m S | Tanks | 1960 | 397730 |
| F | 228m S | Tanks | 1952 | 397730 |
| F | 228m S | Tanks | 1956 | 397730 |
| F | 228m S | Tanks | 1952 | 397730 |
| 4 | 254m SW | Unspecified Tank | 1912 | 360114 |
| 5 | 390m NW | Unspecified Tank | 1951 | 359945 |
| K | 446m SW | Unspecified Tank | 1952 | 393653 |
| K | 446m SW | Unspecified Tank | 1952 | 393653 |
| 8 | 489m SE | Unspecified Tank | 1932 | 360115 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

| **Records within 500m** | **21** |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| C | 42m NW | Electricity Substation | 1994 | 281606 |
| C | 43m NW | Electricity Substation | 1980 | 281606 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| C | 43m NW | Electricity Substation | 1970 | 281606 |
| B | 63m SW | Electricity Substation | 1970 | 259215 |
| B | 63m SW | Electricity Substation | 1994 | 259215 |
| A | 82m NE | Electricity Substation | 1994 | 269090 |
| A | 83m NE | Electricity Substation | 1980 | 269090 |
| A | 83m NE | Electricity Substation | 1970 | 269090 |
| E | 134m S | Electricity Substation | 1952 | 259227 |
| E | 136m S | Electricity Substation | 1956 | 259508 |
| E | 136m S | Electricity Substation | 1952 | 259508 |
| E | 153m S | Electricity Substation | 1994 | 271259 |
| E | 153m S | Electricity Substation | 1970 | 271259 |
| G | 205m NW | Electricity Substation | 1994 | 282258 |
| G | 206m NW | Electricity Substation | 1980 | 282258 |
| H | 350m N | Electricity Substation | 1994 | 273560 |
| H | 350m N | Electricity Substation | 1980 | 273560 |
| I | 360m W | Electricity Substation | 1979 | 288643 |
| I | 360m W | Electricity Substation | 1992 | 288643 |
| N | 470m SW | Electricity Substation | 1979 | 276050 |
| N | 470m SW | Electricity Substation | 1992 | 276050 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| **Records within 500m** | **0** |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| **Records within 500m** | **4** |
|---|---|

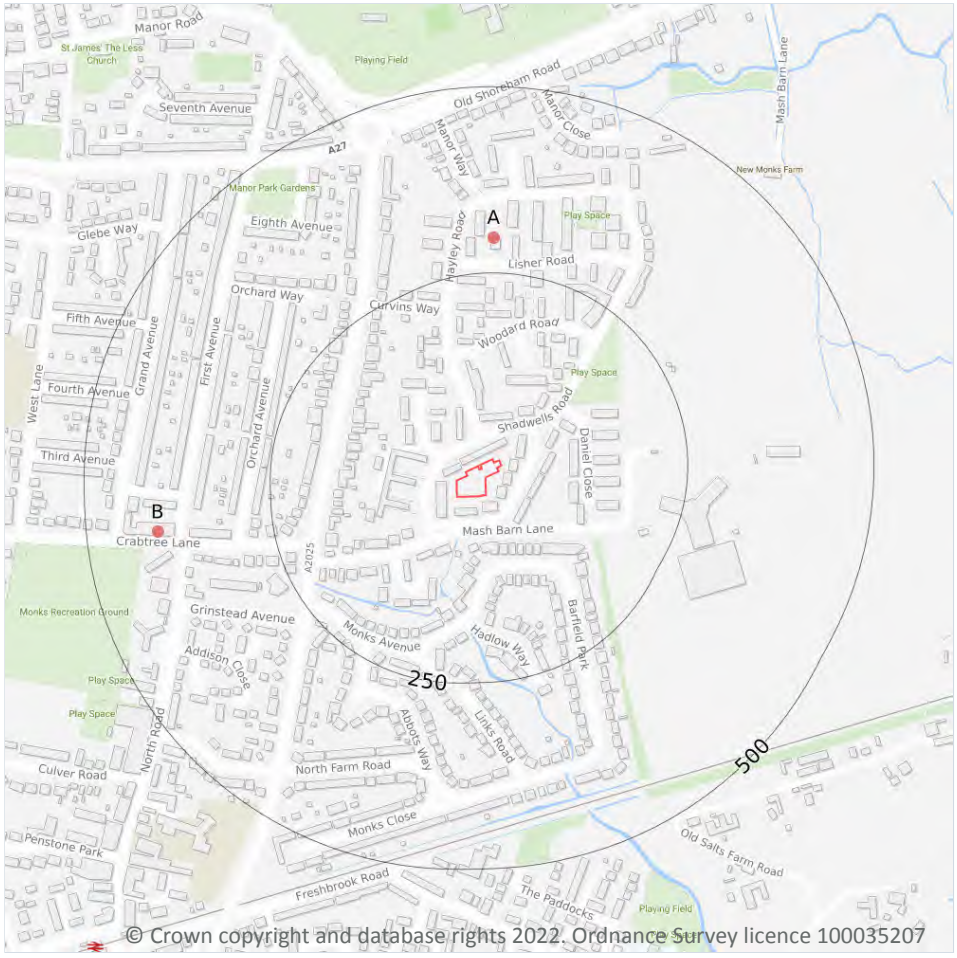
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| I | 352m W | Garage | 1979 | 77831 |
| I | 353m W | Garage | 1966 | 83066 |
| I | 353m W | Garage | 1960 | 83066 |
| I | 353m W | Garage | 1960 | 83066 |

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill




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Site Outline

Search buffers in metres (m)

Waste exemptions

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Historical landfill (EA/NRW records)

| Records within 500m | 0 |
|---|---|

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

## 3.6 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 3.7 Waste exemptions

| Records within 500m | 4 |
|---|---|

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

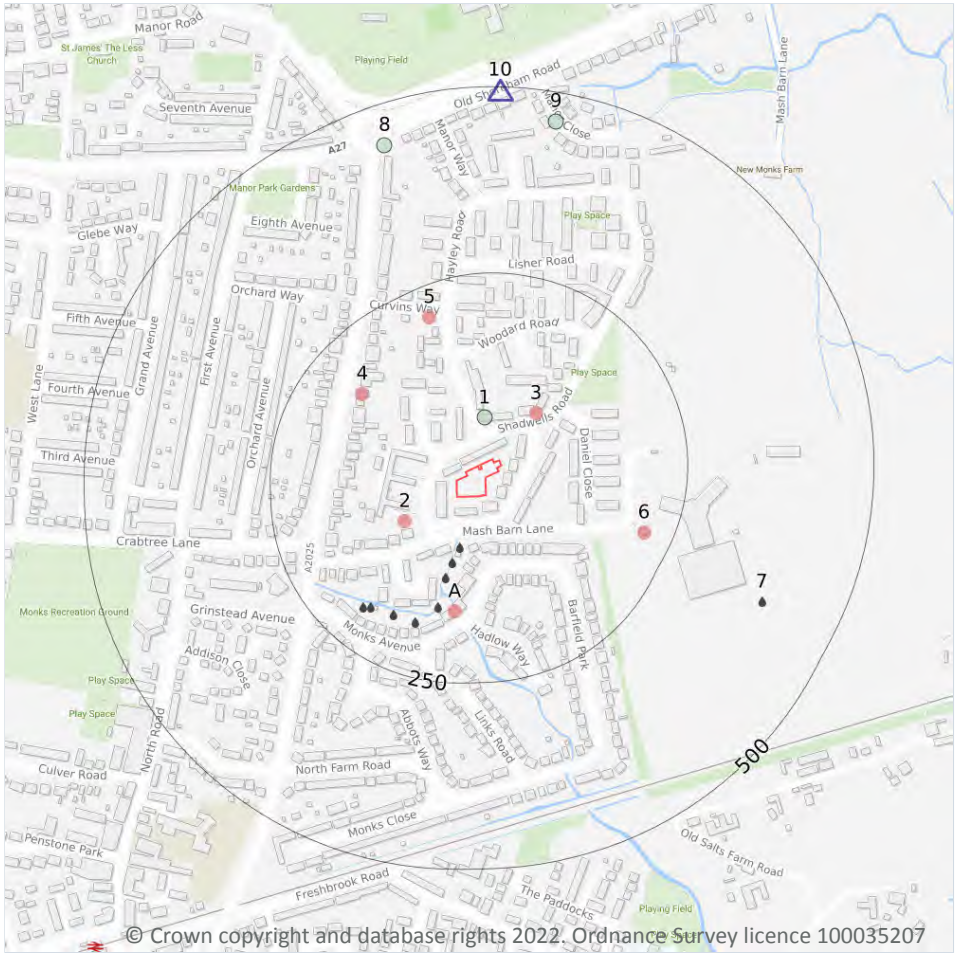
Features are displayed on the Waste and landfill map on **page 23**

| ID | Location | Site | Reference | Category | Sub-Category | Description |
|---|---|---|---|---|---|---|
| A | 297m N | 11, LISHER ROAD, LANCING, BN15 9EY | WEX276954 | Using waste exemption | Not on a farm | Use of waste to manufacture finished goods |

| ID | Location | Site | Reference | Category | Sub-Category | Description |
|---|---|---|---|---|---|---|
| A | 297m N | 11, LISHER ROAD, LANCING, BN15 9EY | WEX135522 | Using waste exemption | Not on a farm | Use of waste to manufacture finished goods |
| B | 405m W | - | WEX261578 | Treating waste exemption | Not on a farm | Sorting and de-naturing of controlled drugs for disposal |
| B | 405m W | 58, CRABTREE LANE, LANCING, BN15 9PJ | WEX121736 | Treating waste exemption | Not on a farm | Sorting and de-naturing of controlled drugs for disposal |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 4 Current industrial land use




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Site Outline

Search buffers in metres (m)

Recent industrial land uses

Current or recent petrol stations

Licensed Discharges to controlled waters

Pollution Incidents (EA/NRW)

## 4.1 Recent industrial land uses

| **Records within 250m** | **6** |
|---|---|

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 26**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| 2 | 78m SW | Electricity Sub Station | West Sussex, BN15 | Electrical Features | Infrastructure and Facilities |
| 3 | 80m NE | Electricity Sub Station | West Sussex, BN15 | Electrical Features | Infrastructure and Facilities |
| A | 154m S | Electricity Sub Station | West Sussex, BN15 | Electrical Features | Infrastructure and Facilities |

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| 4 | 172m NW | C & R Plant Hire Ltd | 69, Grinstead Lane, Lancing, West Sussex, BN15 9DT | Construction and Tool Hire | Hire Services |
| 5 | 209m NW | Electricity Sub Station | West Sussex, BN15 | Electrical Features | Infrastructure and Facilities |
| 6 | 211m SE | Electricity Sub Station | West Sussex, BN15 | Electrical Features | Infrastructure and Facilities |

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| **Records within 500m** | **1** |
|---|---|

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 26**

| ID | Location | Company | Address | LPG | Status |
|---|---|---|---|---|---|
| 10 | 496m N | OBSOLETE | 18, Old Shoreham Road, Lancing, West Sussex, BN15 0QT | Not Applicable | Obsolete |

*This data is sourced from Experian.*

## 4.3 Electricity cables

| **Records within 500m** | **0** |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| **Records within 500m** | **0** |
|---|---|

High pressure underground gas transmission pipelines.

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Historical licensed industrial activities (IPC)

| Records within 500m | 0 |
|---|---|

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.10 Licensed industrial activities (Part A(1))

| Records within 500m | 0 |
|---|---|

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.11 Licensed pollutant release (Part A(2)/B)

| Records within 500m | 0 |
|---|---|

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

*This data is sourced from Local Authority records.*

## 4.12 Radioactive Substance Authorisations

| Records within 500m | 0 |
|---|---|

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.13 Licensed Discharges to controlled waters

| Records within 500m | 9 |
|---|---|

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 26**

| ID | Location | Address | Details | |
|---|---|---|---|---|
| A | 68m S | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |
| A | 89m S | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |

| ID | Location | Address | Details | |
|---|---|---|---|---|
| A | 110m S | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |
| A | 151m S | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |
| A | 177m S | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |
| A | 180m SW | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |
| A | 188m SW | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |
| A | 195m SW | DEVELOPMENT AT BRIERLEY GARDENS, MASH BARN LANE, LANCING WEST SUSSEX | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: S01865<br>Permit Version: 1<br>Receiving Water: FRESHWATER RIVER | Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995<br>Issue date: 08/10/1969<br>Effective Date: 08/10/1969<br>Revocation Date: 31/03/1997 |
| 7 | 394m SE | BHFC TRAINING GROUND, BRIGHTON & HOVE ALBION FC, MARSH BARN LANE, LANCING, WEST SUSSEX, BN15 9DG | Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED<br>Permit Number: EPRUP3424GB<br>Permit Version: 1<br>Receiving Water: LAND (TRAINING PITCHES) | Status: NEW ISSUED UNDER EPR 2010<br>Issue date: 18/03/2013<br>Effective Date: 01/07/2014<br>Revocation Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.14 Pollutant release to surface waters (Red List)

| Records within 500m | 0 |
|---|---|

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.15 Pollutant release to public sewer

| Records within 500m | 0 |
|---|---|

Discharges of Special Category Effluents to the public sewer.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.16 List 1 Dangerous Substances

| Records within 500m | 0 |
|---|---|

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.17 List 2 Dangerous Substances

| Records within 500m | 0 |
|---|---|

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.18 Pollution Incidents (EA/NRW)

| Records within 500m | 3 |
|---|---|

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 26**

| ID | Location | Details | |
|---|---|---|---|
| 1 | 56m N | Incident Date: 23/09/2001<br>Incident Identification: 32349<br>Pollutant: Oils and Fuel<br>Pollutant Description: Unidentified Oil | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| 8 | 445m N | Incident Date: 09/01/2003<br>Incident Identification: 130115<br>Pollutant: Sewage Materials<br>Pollutant Description: Crude Sewage | Water Impact: Category 3 (Minor)<br>Land Impact: Category 3 (Minor)<br>Air Impact: Category 4 (No Impact) |
| 9 | 461m N | Incident Date: 01/01/2003<br>Incident Identification: 128574<br>Pollutant: Sewage Materials<br>Pollutant Description: Other Sewage Material | Water Impact: Category 4 (No Impact)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.19 Pollution inventory substances

| Records within 500m | 0 |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.20 Pollution inventory waste transfers

| Records within 500m | 0 |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

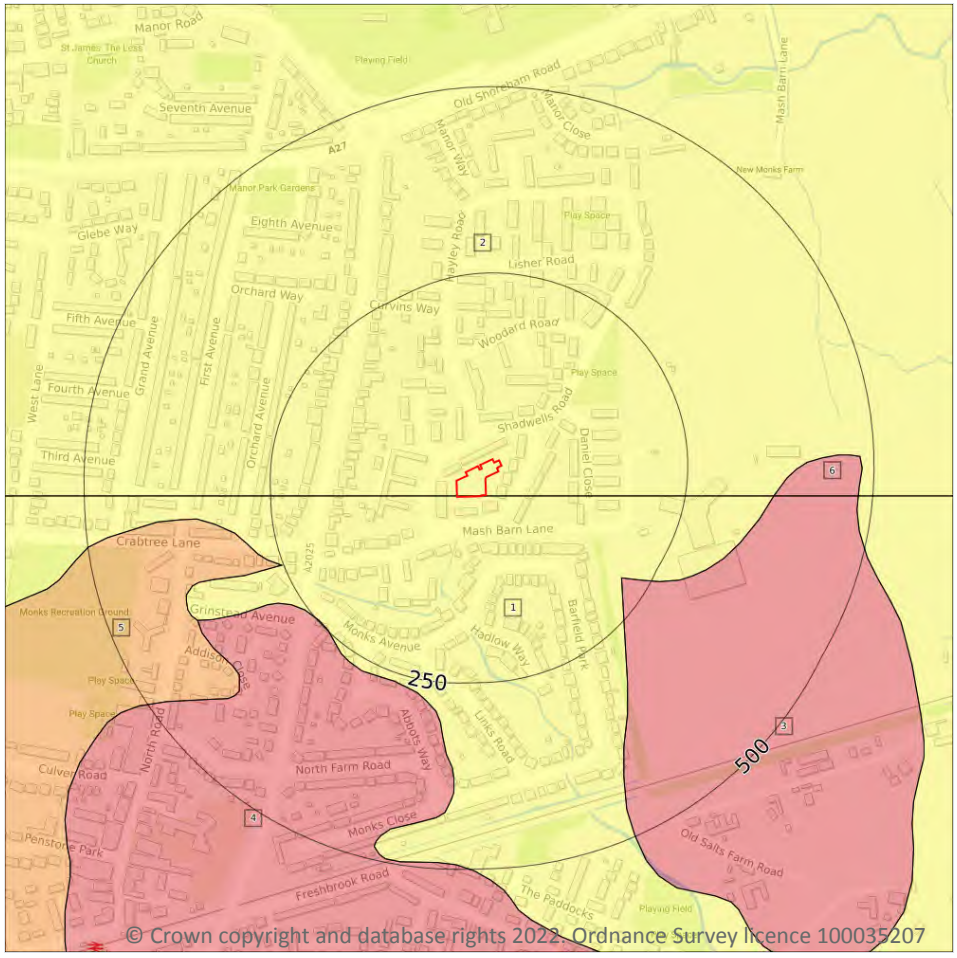
## 4.21 Pollution inventory radioactive waste

| Records within 500m | 0 |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Hydrogeology - Superficial aquifer




Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive
- Unknown

## 5.1 Superficial aquifer

| Records within 500m | 6 |
|---|---|

Aquifer status of groundwater held within superficial geology.

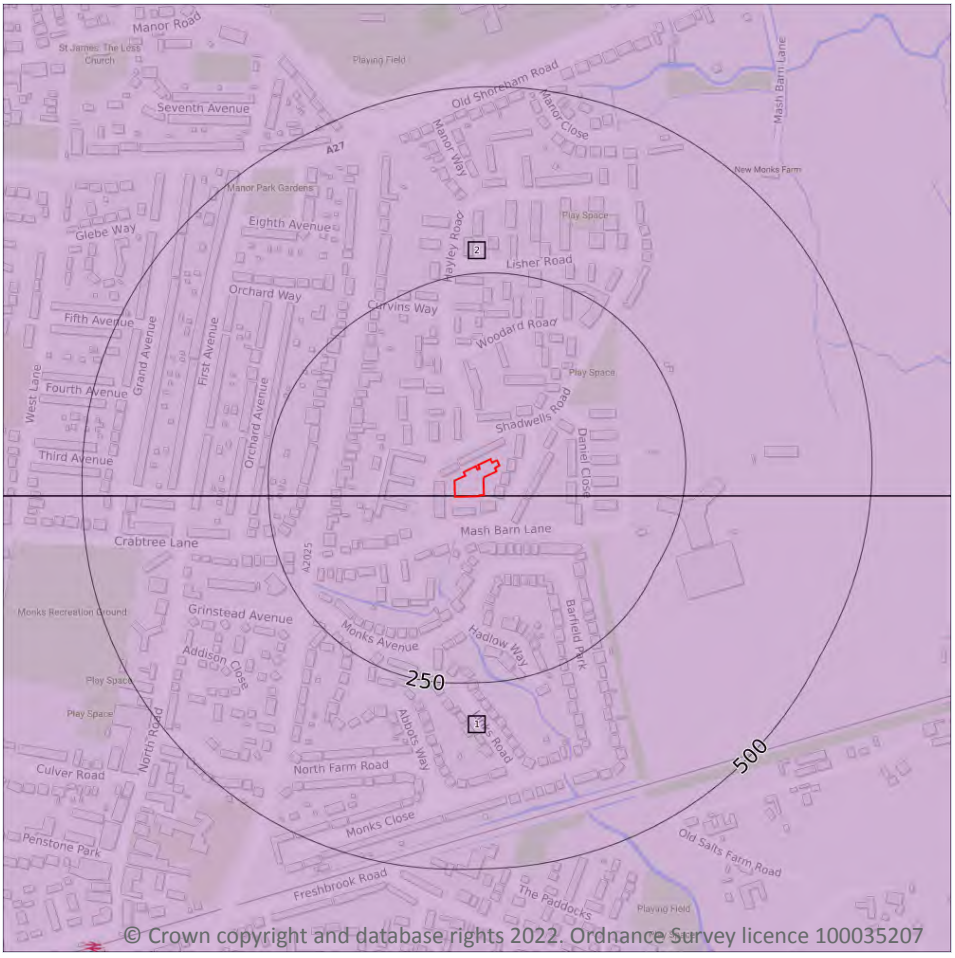
Features are displayed on the Hydrogeology map on **page 33**

| ID | Location | Designation | Description |
|---|---|---|---|
| 1 | On site | Secondary Undifferentiated | Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type |
| 2 | On site | Secondary Undifferentiated | Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type |

| ID | Location | Designation | Description |
|---|---|---|---|
| 3 | 213m SE | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |
| 4 | 249m SW | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |
| 5 | 253m W | Secondary B | Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers |
| 6 | 368m E | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

# Bedrock aquifer




Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

## 5.2 Bedrock aquifer

| Records within 500m | 2 |
|---|---|

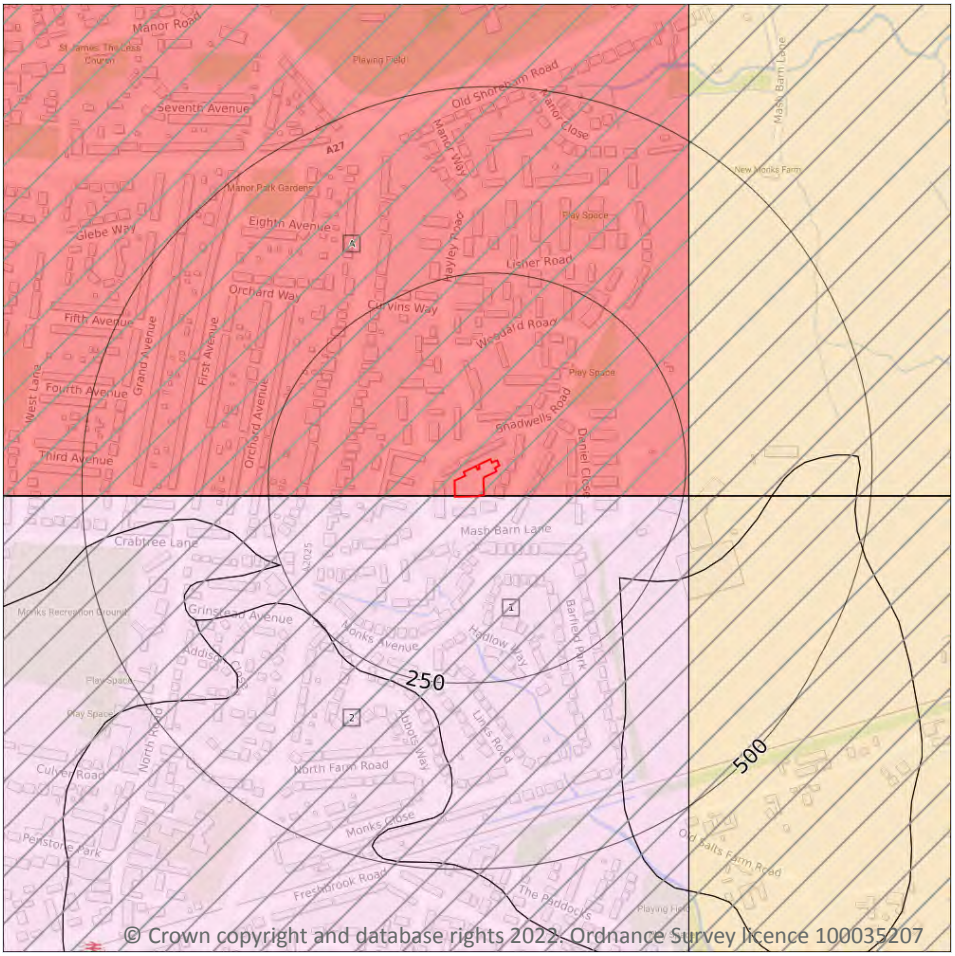
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 35**

| ID | Location | Designation | Description |
|---|---|---|---|
| 1 | On site | Principal | Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers |
| 2 | On site | Principal | Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

# Groundwater vulnerability




## 5.3 Groundwater vulnerability

| Records within 50m | 2 |
|---|---|

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 37**

| ID | Location | Summary | Soil / surface | Superficial geology | Bedrock geology |
|---|---|---|---|---|---|
| **1** | **On site** | **Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer** | **Leaching class: Intermediate Infiltration value: >70% Dilution value: 300-550mm/year** | **Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High** | **Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures** |
| **A** | **On site** | **Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer** | **Leaching class: Intermediate Infiltration value: >70% Dilution value: 300-550mm/year** | **Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data** | **Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures** |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

## 5.4 Groundwater vulnerability- soluble rock risk

| **Records on site** | **2** |
|---|---|

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

| ID | Maximum soluble risk category | Percentage of grid square covered by maximum risk |
|---|---|---|
| **2** | **Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.** | **57.99999999999999%** |
| **A** | **Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.** | **19.0%** |

*This data is sourced from the British Geological Survey and the Environment Agency.*

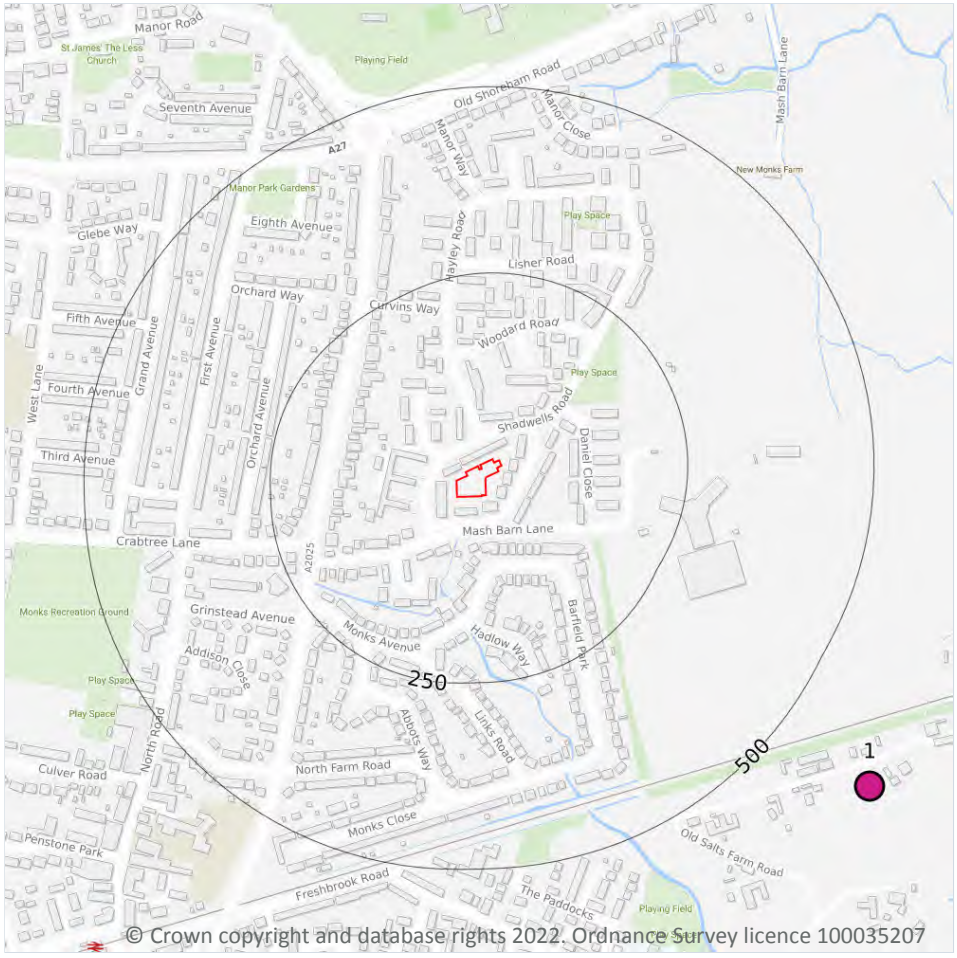
## 5.5 Groundwater vulnerability- local information

| **Records on site** | **0** |
|---|---|

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

*This data is sourced from the British Geological Survey and the Environment Agency.*

# Abstractions and Source Protection Zones




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Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

## 5.6 Groundwater abstractions

| Records within 2000m | 3 |
|---|---|

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| 1 | 646m SE | Status: Historical<br>Licence No: 10/41/311101<br>Details: Animal Watering & General Use In Non Farming Situations<br>Direct Source: Southern Region Groundwater<br>Point: OLD SALTS NURSERY LANCING<br>Data Type: Point<br>Name: Mark Fowler<br>Easting: 519240<br>Northing: 104610 | Annual Volume ($m^3$): 1591.1<br>Max Daily Volume ($m^3$): 136.4<br>Original Application No: -<br>Original Start Date: 12/01/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 01/04/2016<br>Version End Date: - |
| - | 1918m NE | Status: Active<br>Licence No: SO/041/0022/019<br>Details: Dewatering<br>Direct Source: Southern Region Groundwater<br>Point: PUMP STATION COFFERDAM AREA AT NEW MONKS FARM<br>Data Type: Poly4<br>Name: J.T.Mackley & Co.Limited<br>Easting: 520508<br>Northing: 105801 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 12/06/2020<br>Expiry Date: 31/03/2023<br>Issue No: 1<br>Version Start Date: 12/06/2020<br>Version End Date: - |
| - | 1927m N | Status: Active<br>Licence No: 10/41/311004<br>Details: General Farming & Domestic<br>Direct Source: Southern Region Groundwater<br>Point: APPLESHAM FARM<br>Data Type: Point<br>Name: W D Passmore & Sons<br>Easting: 519340<br>Northing: 106880 | Annual Volume ($m^3$): 5,751<br>Max Daily Volume ($m^3$): 21<br>Original Application No: -<br>Original Start Date: 02/03/1966<br>Expiry Date: -<br>Issue No: 102<br>Version Start Date: 01/04/2008<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.7 Surface water abstractions

| **Records within 2000m** | **1** |
|---|---|

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| - | 1900m NE | Status: Active<br>Licence No: SO/041/0022/016<br>Details: Dewatering<br>Direct Source: Southern Region Surface Waters<br>Point: RELIEF CHANNEL AT RIVER ADUR ESTUARY, NEW MONKS FARM<br>Data Type: Point<br>Name: J.T.Mackley & Co.Limited<br>Easting: 520415<br>Northing: 105950 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 05/06/2020<br>Expiry Date: 31/03/2023<br>Issue No: 1<br>Version Start Date: 05/06/2020<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.8 Potable abstractions

| Records within 2000m | 0 |
|---|---|

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.9 Source Protection Zones

| Records within 500m | 0 |
|---|---|

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

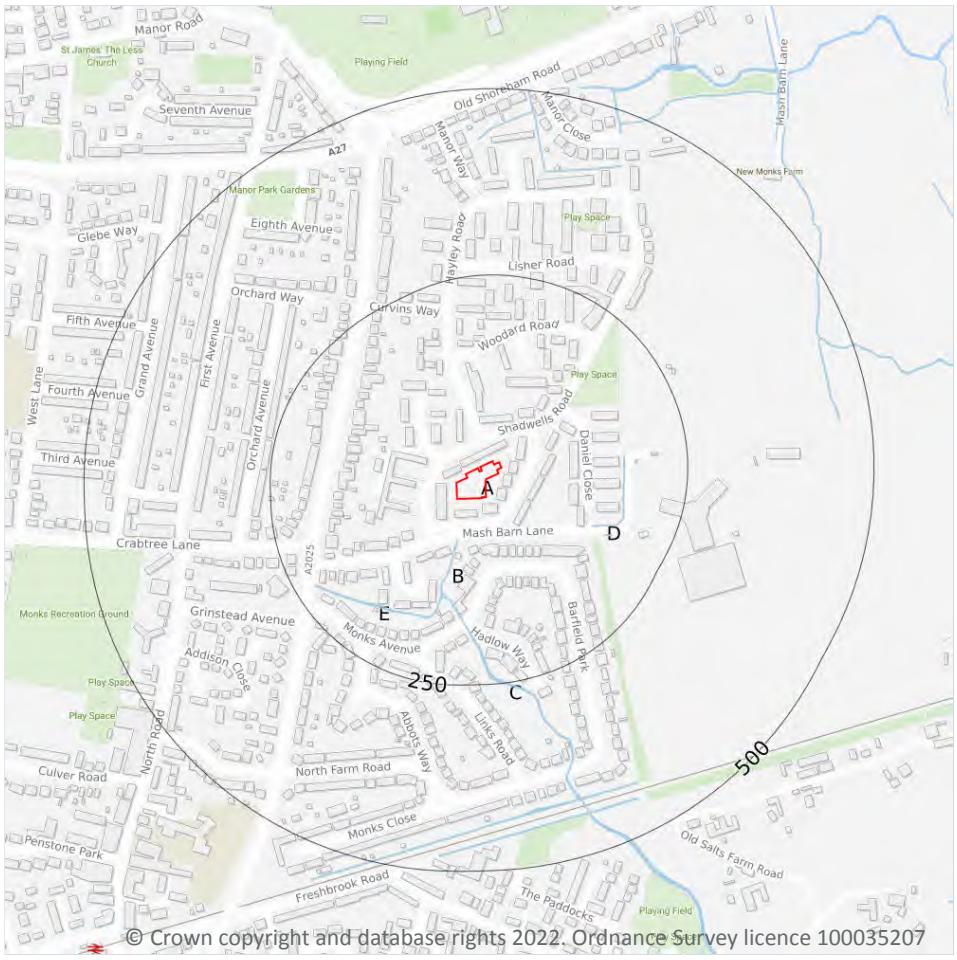
## 5.10 Source Protection Zones (confined aquifer)

| Records within 500m | 0 |
|---|---|

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 6 Hydrology




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## 6.1 Water Network (OS MasterMap)

| Records within 250m | 14 |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 42**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| B | 54m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| B | 131m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 131m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 135m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 143m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| E | 150m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 164m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 164m E | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 165m E | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| D | 166m E | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 174m SE | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| D | 178m E | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 179m E | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 179m E | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

*This data is sourced from the Ordnance Survey.*

## 6.2 Surface water features

| Records within 250m | 3 |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 42**

*This data is sourced from the Ordnance Survey.*

## 6.3 WFD Surface water body catchments

| Records on site | 1 |
|---|---|

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 42**

| ID | Location | Type | Water body catchment | Water body ID | Operational catchment | Management catchment |
|---|---|---|---|---|---|---|
| **A** | **On site** | **Coastal Catchment** | **Not part of a river WB catchment** | **196** | **Upper Adur** | **Adur and Ouse** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 6.4 WFD Surface water bodies

| Records identified | 0 |
|---|---|

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 6.5 WFD Groundwater bodies

| Records on site | 1 |
|---|---|

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 42**

| ID | Location | Name | Water body ID | Overall rating | Chemical rating | Quantitative | Year |
|---|---|---|---|---|---|---|---|
| **A** | **On site** | **Worthing chalk** | **GB40701G505300** | **Poor** | **Poor** | **Poor** | **2019** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 7 River and coastal flooding




Site Outline

Search buffers in metres (m)

River and coastal flooding:

- High
- Medium
- Low
- Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

## 7.1 Risk of flooding from rivers and the sea

| Records within 50m | 1 |
|---|---|

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on **page 46**

| Distance | Flood risk category |
|---|---|
| **On site** | **Low** |
| 0 - 50m | Low |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.2 Historical Flood Events

| **Records within 250m** | **3** |
|---|---|

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

Features are displayed on the River and coastal flooding map on **page 46**

| ID | Location | Event name | Date of flood | Flood source | Flood cause | Type of flood |
|---|---|---|---|---|---|---|
| A | 109m S | Lancing 1960 | 1960-11-01<br>1960-11-01 | Drainage | Local drainage/surface water | Fluvial |
| A | 133m S | Lancing 1974 | 1974-11-23<br>1974-11-23 | Drainage | Other | Fluvial |
| 4 | 216m SW | Lancing 1974 | 1974-11-23<br>1974-11-23 | Drainage | Other | Fluvial |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.3 Flood Defences

| **Records within 250m** | **0** |
|---|---|

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.4 Areas Benefiting from Flood Defences

| Records within 250m | 0 |
|---|---|

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

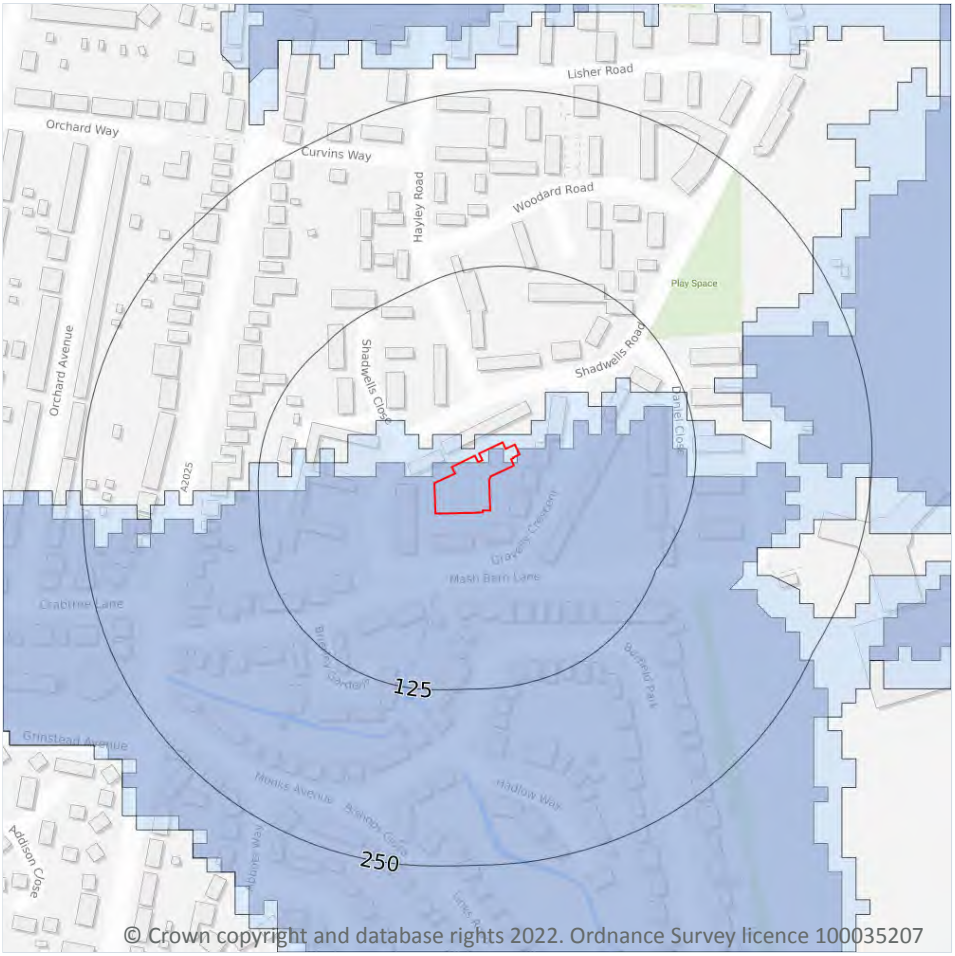
## 7.5 Flood Storage Areas

| Records within 250m | 0 |
|---|---|

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# River and coastal flooding - Flood Zones




Site Outline

Search buffers in metres (m)

Flood zone 2

Flood zone 3

## 7.6 Flood Zone 2

| Records within 50m | 1 |
|---|---|

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 46**

| Location | Type |
|---|---|
| **On site** | **Zone 2 - (Fluvial /Tidal Models)** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.7 Flood Zone 3

| Records within 50m | 1 |
|---|---|

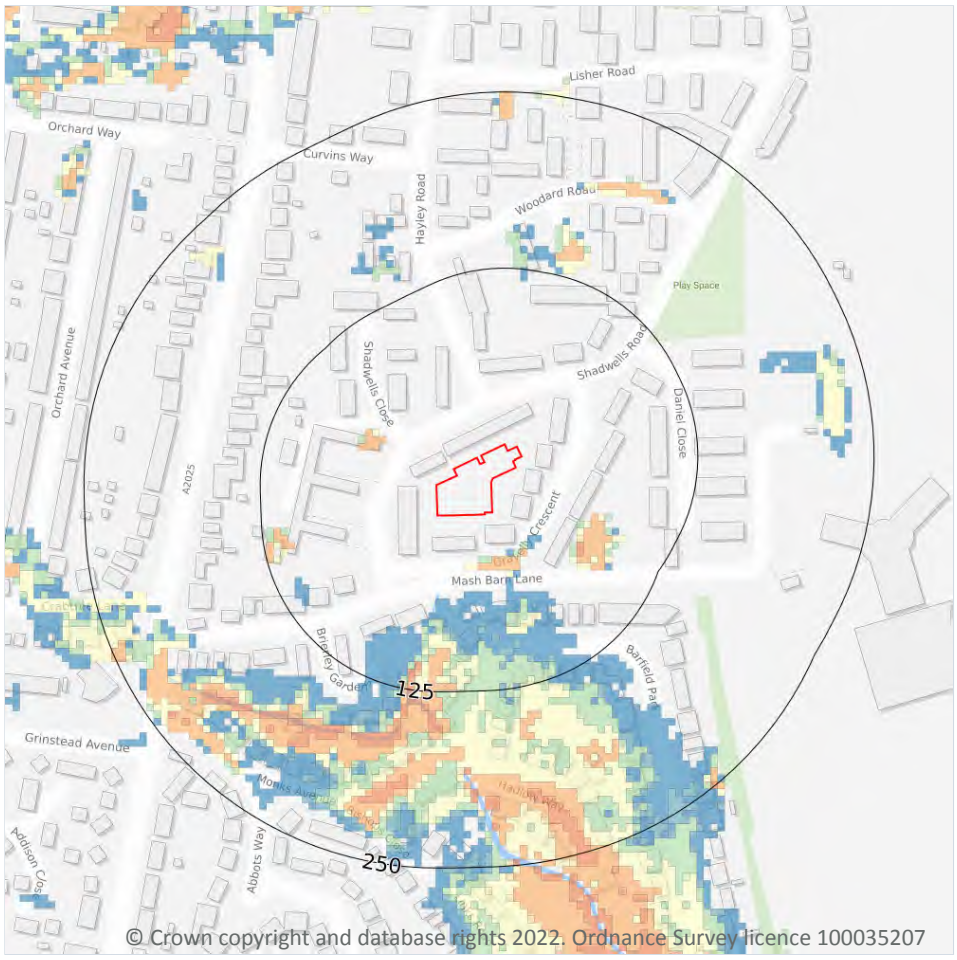
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 46**

| Location | Type |
|---|---|
| **On site** | **Zone 3 - (Fluvial Models)** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 8 Surface water flooding




Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 8.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **Negligible** |
| **Highest risk within 50m** | **1 in 30 year, 0.1m - 0.3m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 51**

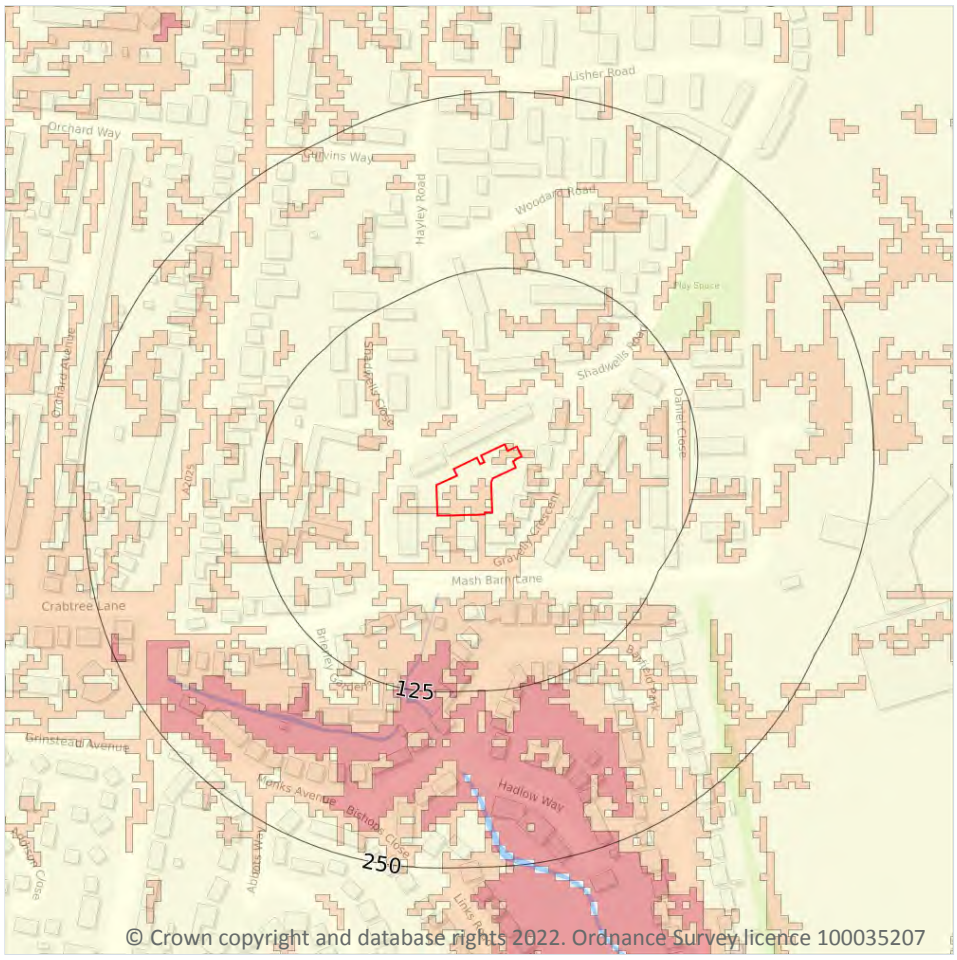
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Negligible |
| 1 in 250 year | Negligible |
| 1 in 100 year | Negligible |
| 1 in 30 year | Negligible |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Groundwater flooding




## 9.1 Groundwater flooding

| | |
|---|---|
| **Highest risk on site** | **Moderate-High** |
| **Highest risk within 50m** | **Moderate-High** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 53**

*This data is sourced from Ambiental Risk Analytics.*

# 10 Environmental designations




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Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Local Nature Reserves (LNR)

Biosphere Reserves

## 10.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 1 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 54**

| ID | Location | Name | Data source |
|---|---|---|---|
| - | 1907m NE | Adur Estuary | Natural England |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.2 Conserved wetland sites (Ramsar sites)

| Records within 2000m | 0 |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.3 Special Areas of Conservation (SAC)

| Records within 2000m | 0 |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.6 Local Nature Reserves (LNR)

| Records within 2000m | 2 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on **page 54**

| ID | Location | Name | Data source |
|---|---|---|---|
| 1 | 777m N | Lancing Ring | Natural England |
| 2 | 1185m SE | Widewater Lagoon | Natural England |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.7 Designated Ancient Woodland

| Records within 2000m | 0 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.8 Biosphere Reserves

| Records within 2000m | 1 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

Features are displayed on the Environmental designations map on **page 54**

| ID | Location | Name | Status |
|---|---|---|---|
| - | 1692m NE | Brighton and Lewes Downs | Declared |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 10.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.11 Green Belt

| Records within 2000m | 0 |
|---|---|

Areas designated to prevent urban sprawl by keeping land permanently open.

*This data is sourced from the Ministry of Housing, Communities and Local Government.*

## 10.12 Proposed Ramsar sites

| Records within 2000m | 0 |
|---|---|

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

*This data is sourced from Natural England.*

## 10.13 Possible Special Areas of Conservation (pSAC)

| Records within 2000m | 0 |
|---|---|

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

*This data is sourced from Natural England and Natural Resources Wales.*

## 10.14 Potential Special Protection Areas (pSPA)

| Records within 2000m | 0 |
|---|---|

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

*This data is sourced from Natural England.*

## 10.15 Nitrate Sensitive Areas

| Records within 2000m | 0 |
|---|---|

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

*This data is sourced from Natural England.*

## 10.16 Nitrate Vulnerable Zones

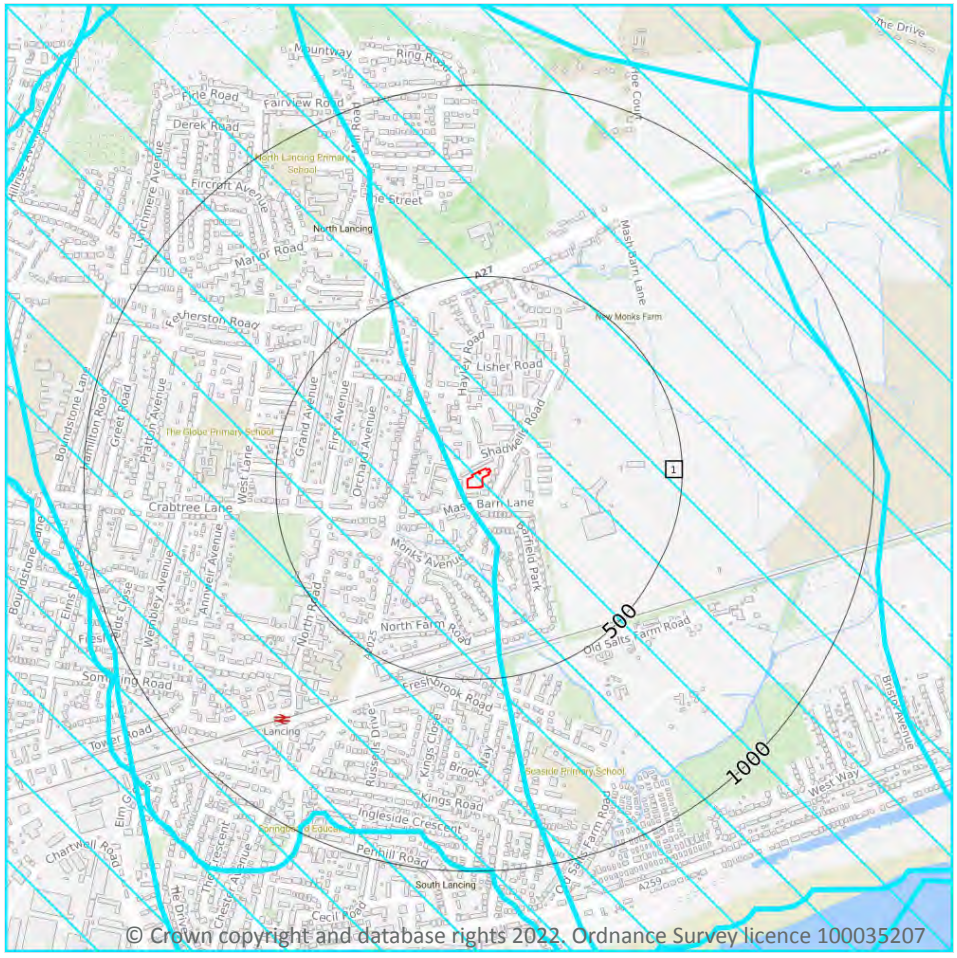
| Records within 2000m | 2 |
|---|---|

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

| Location | Name | Type | NVZ ID | Status |
|---|---|---|---|---|
| **On site** | **Sussex Chalk** | **Groundwater** | **56** | **Existing** |
| 933m N | Sussex Chalk | Groundwater | 56 | Existing |

*This data is sourced from Natural England and Natural Resources Wales.*

# SSSI Impact Zones and Units




Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

## 10.17 SSSI Impact Risk Zones

| Records on site | 1 |
|---|---|

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 59**

| ID | Location | Type of developments requiring consultation |
|---|---|---|
| 1 | On site | **Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.<br>Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines.<br>Minerals, Oil and Gas - Planning applications for quarries: new proposals or extensions, outside or extending outside existing settlements/urban areas affecting greenspace, farmland or semi natural habitats. oil & gas exploration/extraction.<br>Rural non-residential - Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha.<br>Residential - Residential development of 50 units or more.<br>Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.<br>Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t.<br>Waste - Landfill. incl: inert landfill, non-hazardous landfill, hazardous landfill.<br>Discharges - Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream.** |

*This data is sourced from Natural England.*

## 10.18 SSSI Units

**Records within 2000m** **3**

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 59**

ID: -
Location: 1907m NE
SSSI name: Adur Estuary
Unit name: 1
Broad habitat: Littoral Sediment
Condition: Unfavourable - Declining
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula | Unfavourable - Declining | 15/02/2021 |
| SM4-28 - Saltmarsh | Unfavourable - Declining | 15/02/2021 |

ID: -
Location: 1955m E
SSSI name: Adur Estuary
Unit name: Adur Mudflats
Broad habitat: Littoral Sediment
Condition: Unfavourable - Declining
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula | Unfavourable - Declining | 15/02/2021 |
| Littoral sediment | Not Recorded | 01/01/1900 |

ID: -
Location: 1980m NE
SSSI name: Adur Estuary
Unit name: 3
Broad habitat: Littoral Sediment
Condition: Favourable
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula | Unfavourable - Declining | 15/02/2021 |
| Littoral sediment | Not Recorded | 01/01/1900 |

*This data is sourced from Natural England and Natural Resources Wales.*

# 11 Visual and cultural designations

## 11.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 11.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 11.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

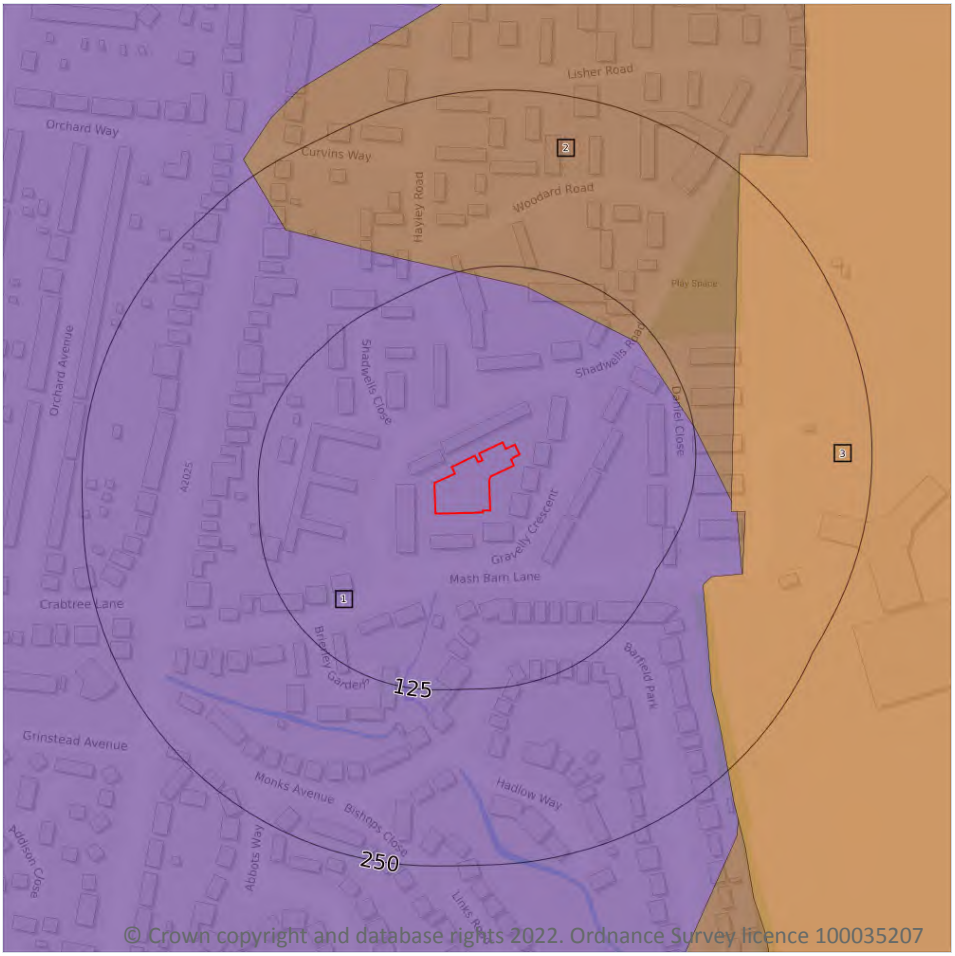
## 11.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 12 Agricultural designations




Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

## 12.1 Agricultural Land Classification

| Records within 250m | 3 |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 64**

| ID | Location | Classification | Description |
|---|---|---|---|
| **1** | **On site** | **Urban** | **-** |
| 2 | 104m NE | Grade 1 | Excellent quality agricultural land. Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality. |

| ID | Location | Classification | Description |
|---|---|---|---|
| 3 | 151m E | Grade 2 | Very good quality agricultural land. Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1. |

*This data is sourced from Natural England.*

## 12.2 Open Access Land

| **Records within 250m** | **0** |
|---|---|

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

*This data is sourced from Natural England and Natural Resources Wales.*

## 12.3 Tree Felling Licences

| **Records within 250m** | **0** |
|---|---|

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

*This data is sourced from the Forestry Commission.*

## 12.4 Environmental Stewardship Schemes

| **Records within 250m** | **0** |
|---|---|

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

*This data is sourced from Natural England.*

## 12.5 Countryside Stewardship Schemes

| Records within 250m | 0 |
|---|---|

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

*This data is sourced from Natural England.*

# 13 Habitat designations




Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks

Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

## 13.1 Priority Habitat Inventory

| Records within 250m | 0 |
|---|---|

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

*This data is sourced from Natural England.*

## 13.2 Habitat Networks

| Records within 250m | 1 |
|---|---|

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

Features are displayed on the Habitat designations map on **page 67**

| ID | Location | Type | Habitat |
|---|---|---|---|
| 1 | 181m SE | Network Enhancement Zone 2 | Not specified |

*This data is sourced from Natural England.*

## 13.3 Open Mosaic Habitat

| Records within 250m | 0 |
|---|---|

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

*This data is sourced from Natural England.*

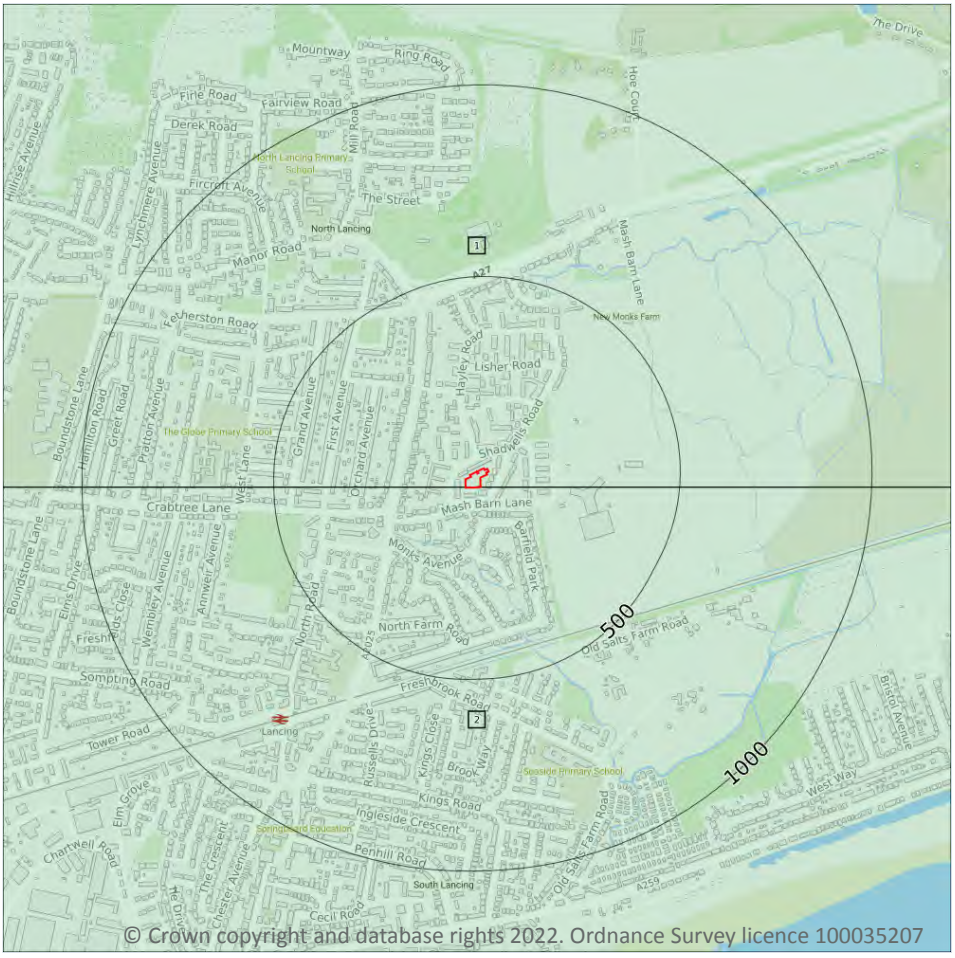
## 13.4 Limestone Pavement Orders

| Records within 250m | 0 |
|---|---|

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

*This data is sourced from Natural England.*

# 14 Geology 1:10,000 scale - Availability




Site Outline

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

## 14.1 10k Availability

| Records within 500m | 2 |
|---|---|

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 69**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **Full** | **Full** | **Full** | **No coverage** | **TQ10NE** |
| **2** | **On site** | **Full** | **Full** | **Full** | **No coverage** | **TQ10SE** |

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Artificial and made ground

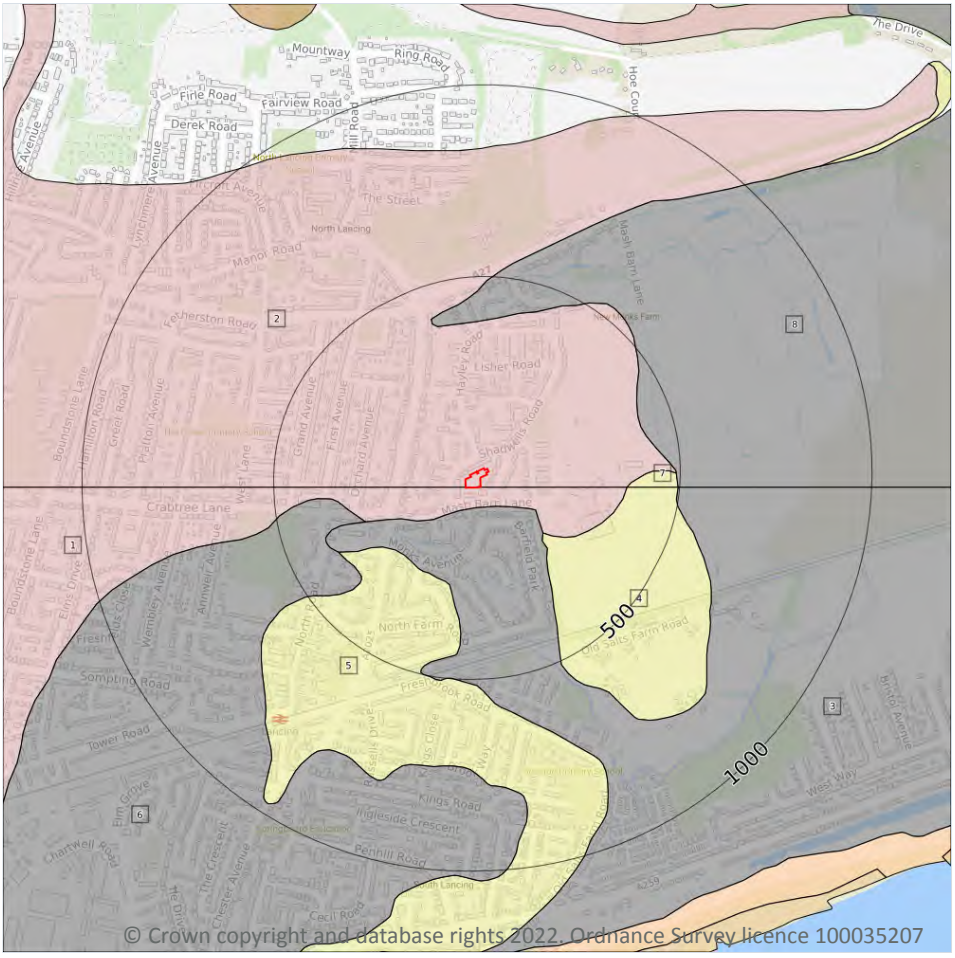
## 14.2 Artificial and made ground (10k)

| Records within 500m | 0 |
|---|---|

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Superficial




Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

## 14.3 Superficial geology (10k)

| Records within 500m | 8 |
|---|---|

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 71**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **HEAD-DMTN** | **Head - Diamicton** | **Diamicton** |
| **2** | **On site** | **HEAD-DMTN** | **Head - Diamicton** | **Diamicton** |
| 3 | 53m S | ALV-CZ | Alluvium - Silty Clay | Clay, Silty |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 4 | 203m SE | RBDU-XSV | Raised Beach Deposits - Sand And Gravel | Sand And Gravel |
| 5 | 238m SW | RBDU-XSV | Raised Beach Deposits - Sand And Gravel | Sand And Gravel |
| 6 | 276m W | BRK-XSZC | Brickearth - Sand, Silt And Clay | Sand, Silt And Clay |
| 7 | 364m E | RBDU-XSV | Raised Beach Deposits - Sand And Gravel | Sand And Gravel |
| 8 | 382m N | ALV-CZ | Alluvium - Silty Clay | Clay, Silty |

*This data is sourced from the British Geological Survey.*

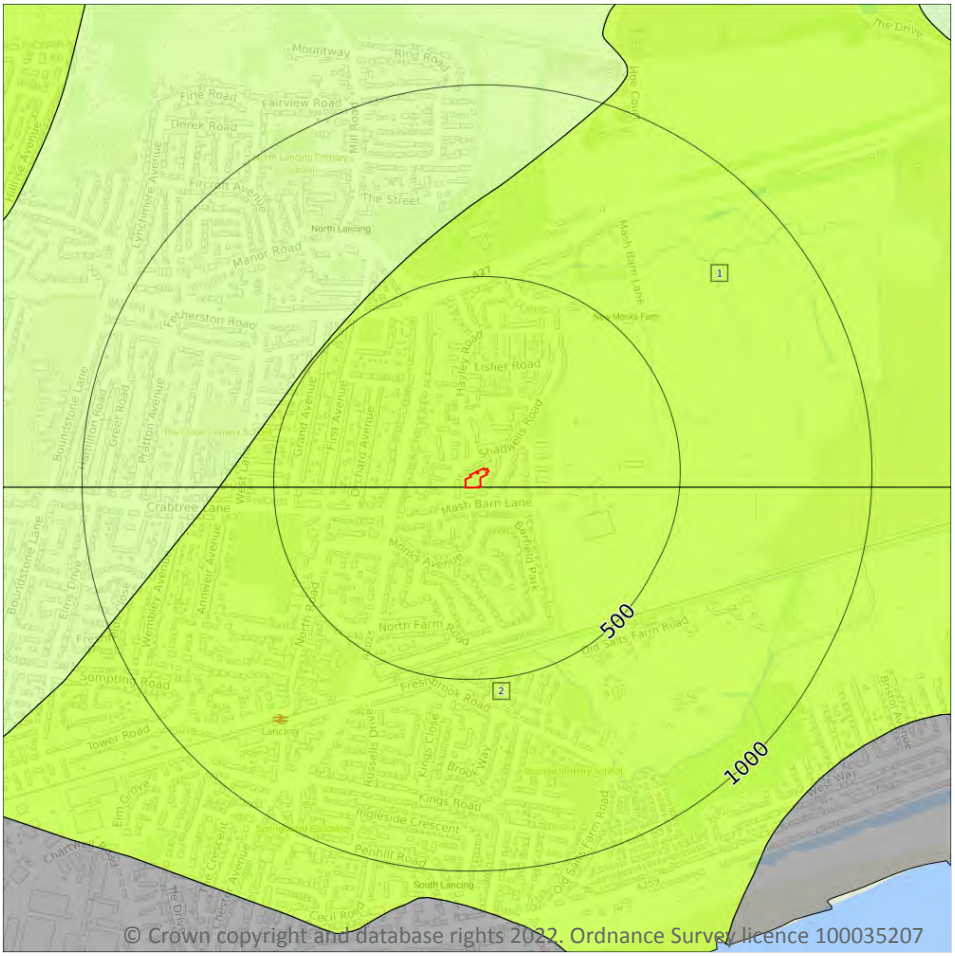
## 14.4 Landslip (10k)

| **Records within 500m** | **0** |
|---|---|

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Bedrock




Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

## 14.5 Bedrock geology (10k)

| Records within 500m | 2 |
|---|---|

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 73**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| 1 | On site | NCK-CHLK | Newhaven Chalk Formation - Chalk | Campanian Age - Santonian Age |
| 2 | On site | NCK-CHLK | Newhaven Chalk Formation - Chalk | Campanian Age - Santonian Age |

*This data is sourced from the British Geological Survey.*

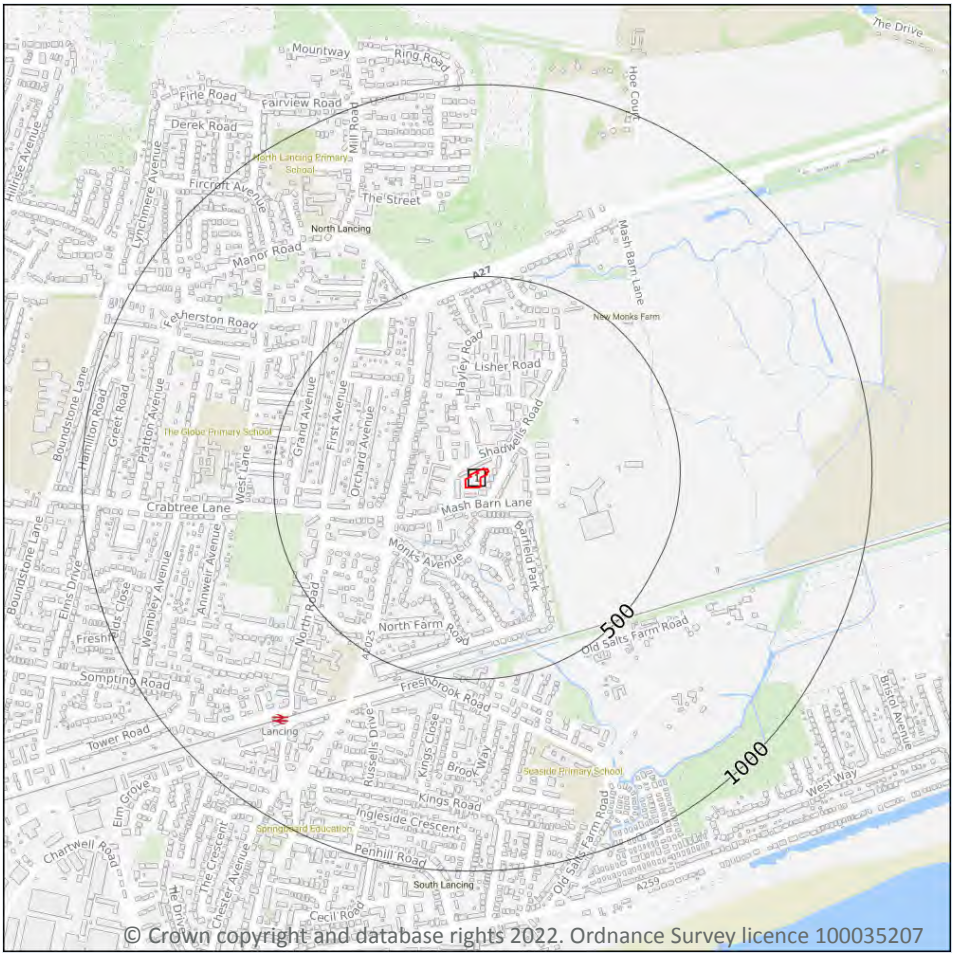
## 14.6 Bedrock faults and other linear features (10k)

| Records within 500m | 0 |
|---|---|

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

*This data is sourced from the British Geological Survey.*

# 15 Geology 1:50,000 scale - Availability




Site Outline

Search buffers in metres (m)

Geological map tile

## 15.1 50k Availability

| Records within 500m | 1 |
|---|---|

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 75**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **Full** | **Full** | **Full** | **Full** | **EW318_333_brighton_and_worthing_v4** |

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Artificial and made ground

## 15.2 Artificial and made ground (50k)

| Records within 500m | 0 |
|---|---|

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

*This data is sourced from the British Geological Survey.*

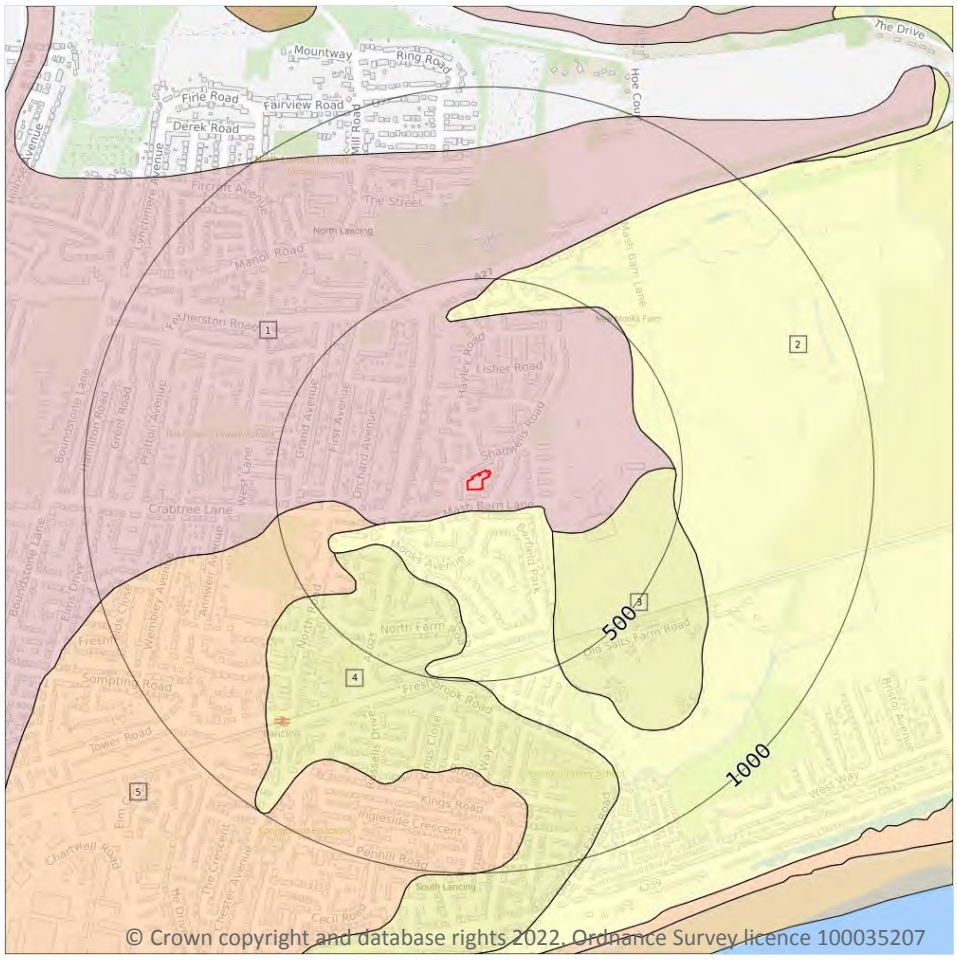
## 15.3 Artificial ground permeability (50k)

| Records within 50m | 0 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Superficial




Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

## 15.4 Superficial geology (50k)

**Records within 500m** **5**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 77**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **HEAD-XCZSV** | **HEAD** | **CLAY, SILT, SAND AND GRAVEL** |
| 2 | 56m S | ALV-XCZSP | ALLUVIUM | CLAY, SILT, SAND AND PEAT |
| 3 | 213m SE | RBDU-XSV | RAISED BEACH DEPOSITS | SAND AND GRAVEL |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 4 | 249m SW | RBDU-XSV | RAISED BEACH DEPOSITS | SAND AND GRAVEL |
| 5 | 253m W | RTDU-XSZC | RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) | SAND, SILT AND CLAY |

*This data is sourced from the British Geological Survey.*

## 15.5 Superficial permeability (50k)

| **Records within 50m** | **2** |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Mixed** | **High** | **Very Low** |
| **On site** | **Mixed** | **High** | **Very Low** |

*This data is sourced from the British Geological Survey.*

## 15.6 Landslip (50k)

| **Records within 500m** | **0** |
|---|---|

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

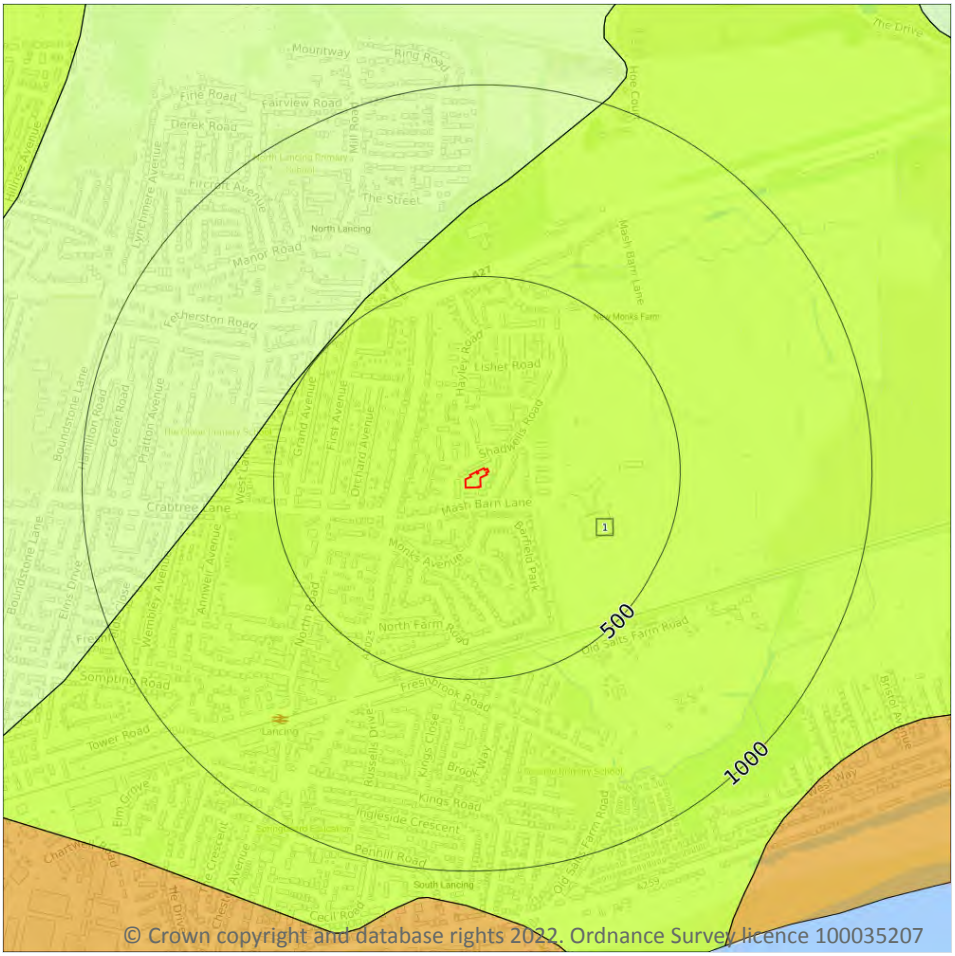
## 15.7 Landslip permeability (50k)

| **Records within 50m** | **0** |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Bedrock




Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

## 15.8 Bedrock geology (50k)

| Records within 500m | 1 |
|---|---|

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 79**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **NCK-CHLK** | **NEWHAVEN CHALK FORMATION - CHALK** | **SANTONIAN** |

*This data is sourced from the British Geological Survey.*

## 15.9 Bedrock permeability (50k)

| Records within 50m | 2 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Fracture** | **Very High** | **Very High** |
| **On site** | **Fracture** | **Very High** | **Very High** |

*This data is sourced from the British Geological Survey.*

## 15.10 Bedrock faults and other linear features (50k)

| Records within 500m | 0 |
|---|---|

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

*This data is sourced from the British Geological Survey.*

# 16 Boreholes




Site Outline

Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

## 16.1 BGS Boreholes

**Records within 250m** **2**

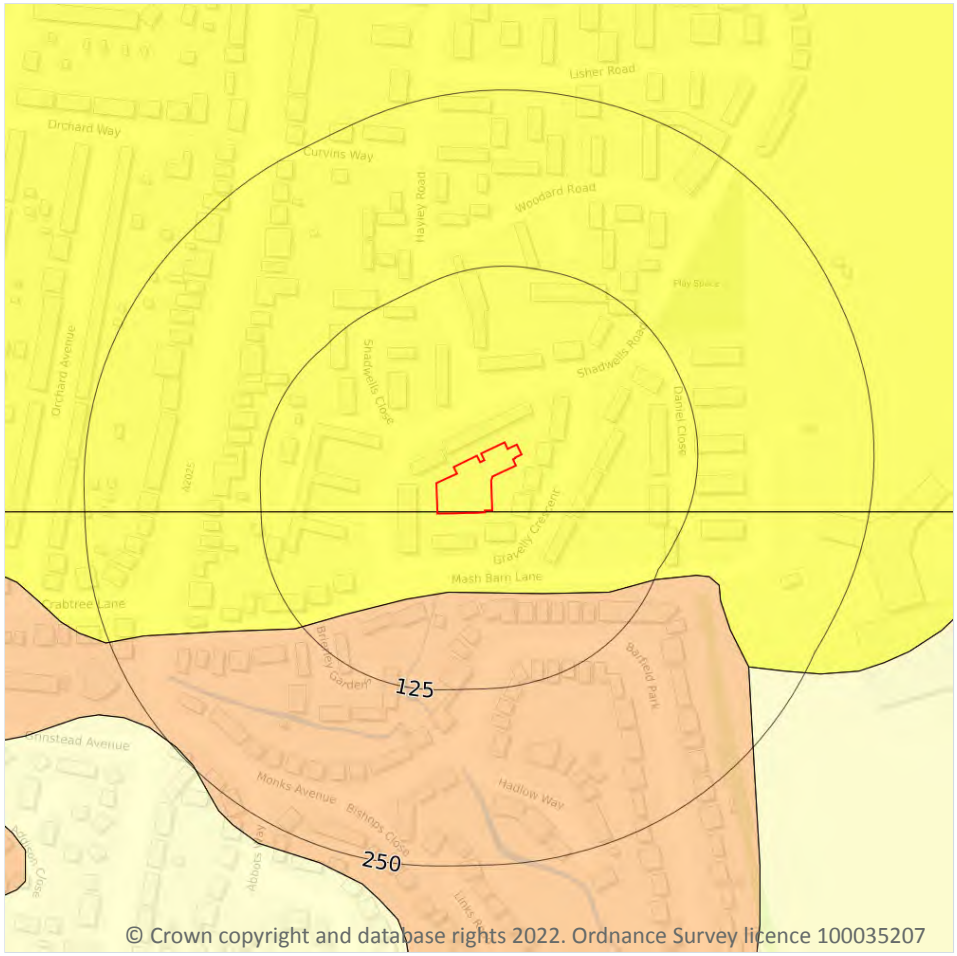
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 81**

| ID | Location | Grid reference | Name | Length | Confidential | Web link |
|---|---|---|---|---|---|---|
| 1 | 127m SE | 518830 104930 | SHOREHAM AIRPORT | 4.57 | N | 578009 |
| 2 | 214m W | 518480 104940 | GRINSTEAD LANE SOUTH LANCING | 2.43 | N | 577882 |

*This data is sourced from the British Geological Survey.*

# 17 Natural ground subsidence - Shrink swell clays




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.1 Shrink swell clays

| Records within 50m | 1 |
|---|---|

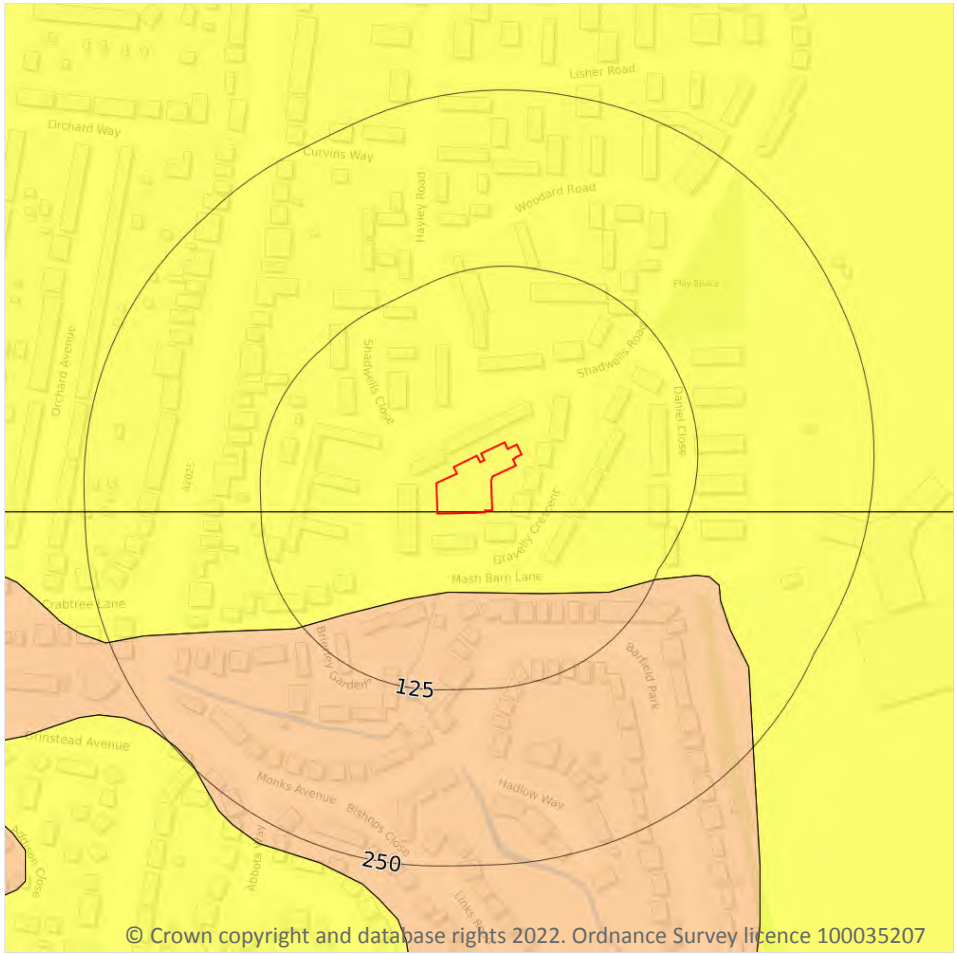
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 82**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Ground conditions predominantly low plasticity.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Running sands




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.2 Running sands

| Records within 50m | 1 |
|---|---|

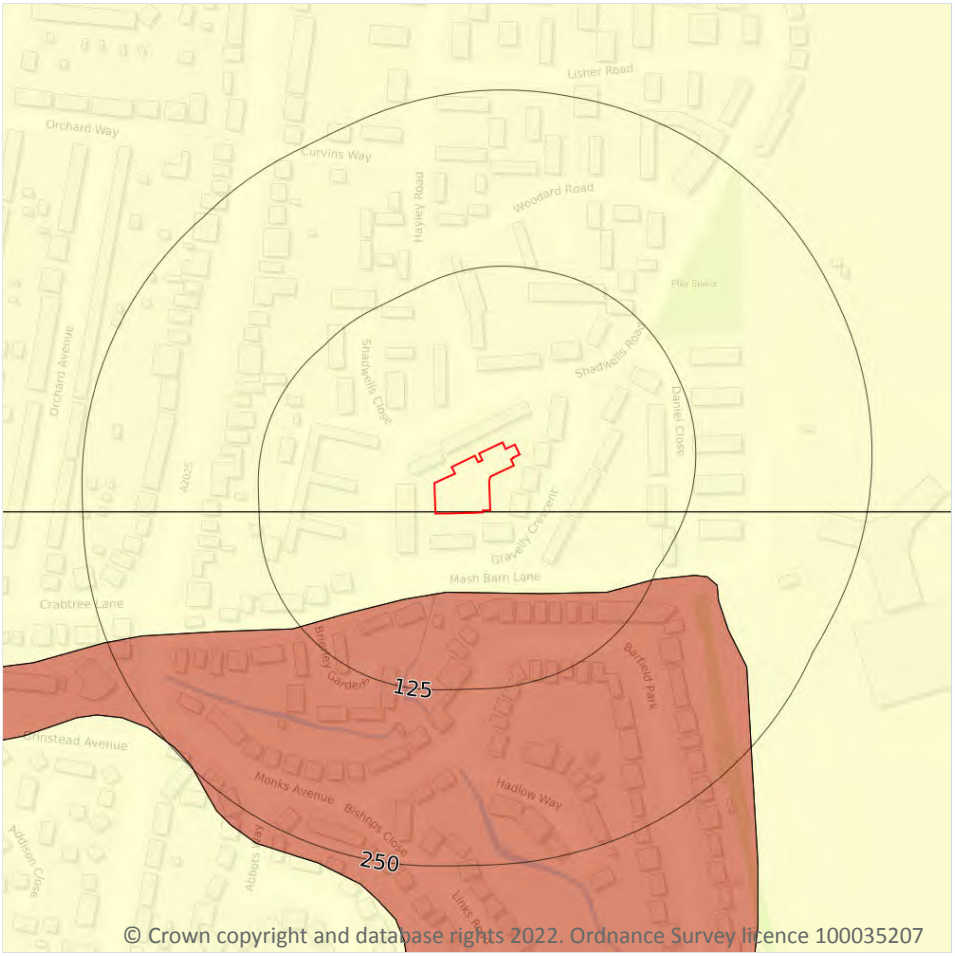
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 83**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Compressible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.3 Compressible deposits

| Records within 50m | 1 |
|---|---|

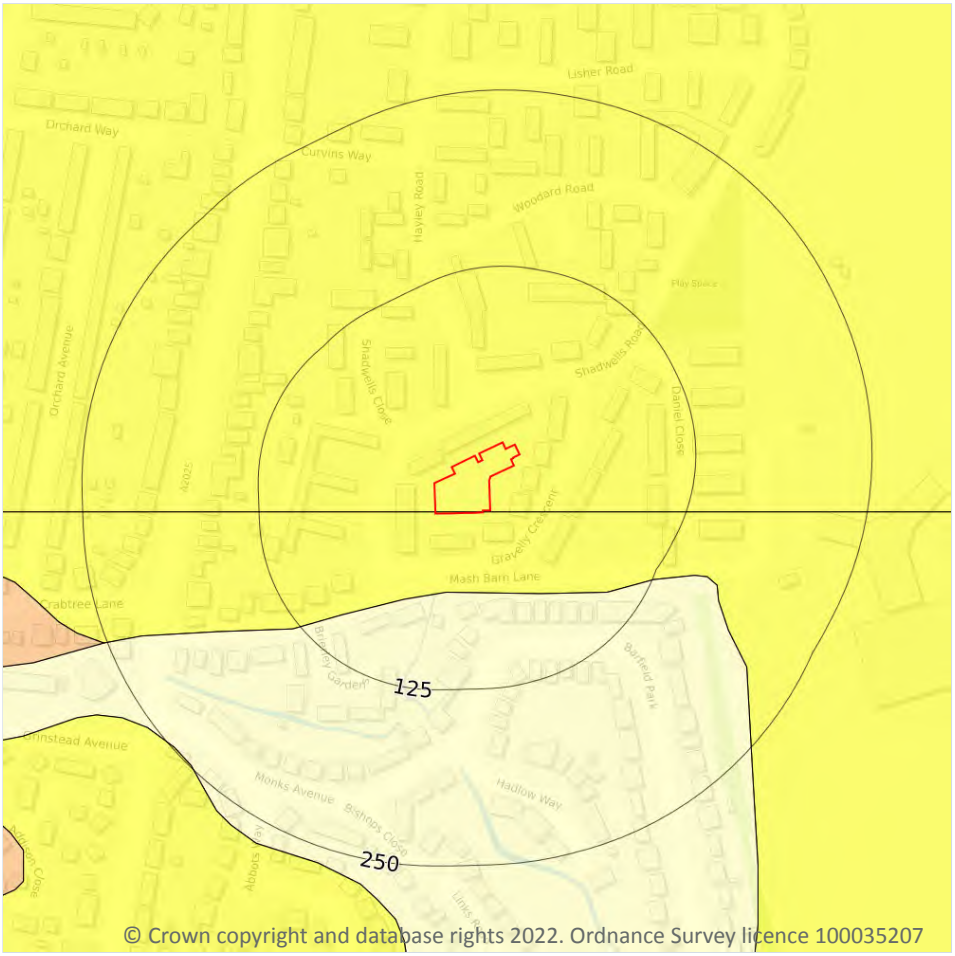
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 84**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Compressible strata are not thought to occur.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Collapsible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.4 Collapsible deposits

| Records within 50m | 1 |
|---|---|

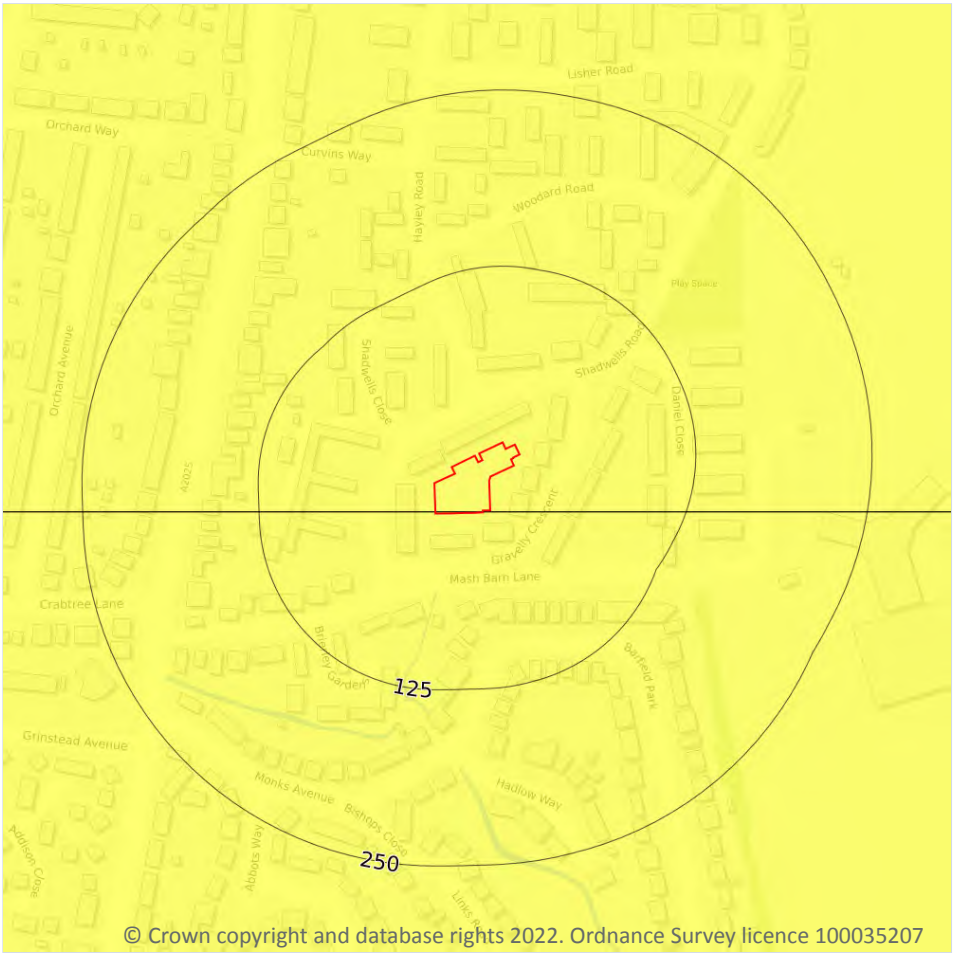
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 85**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Deposits with potential to collapse when loaded and saturated are unlikely to be present.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Landslides




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.5 Landslides

| Records within 50m | 1 |
|---|---|

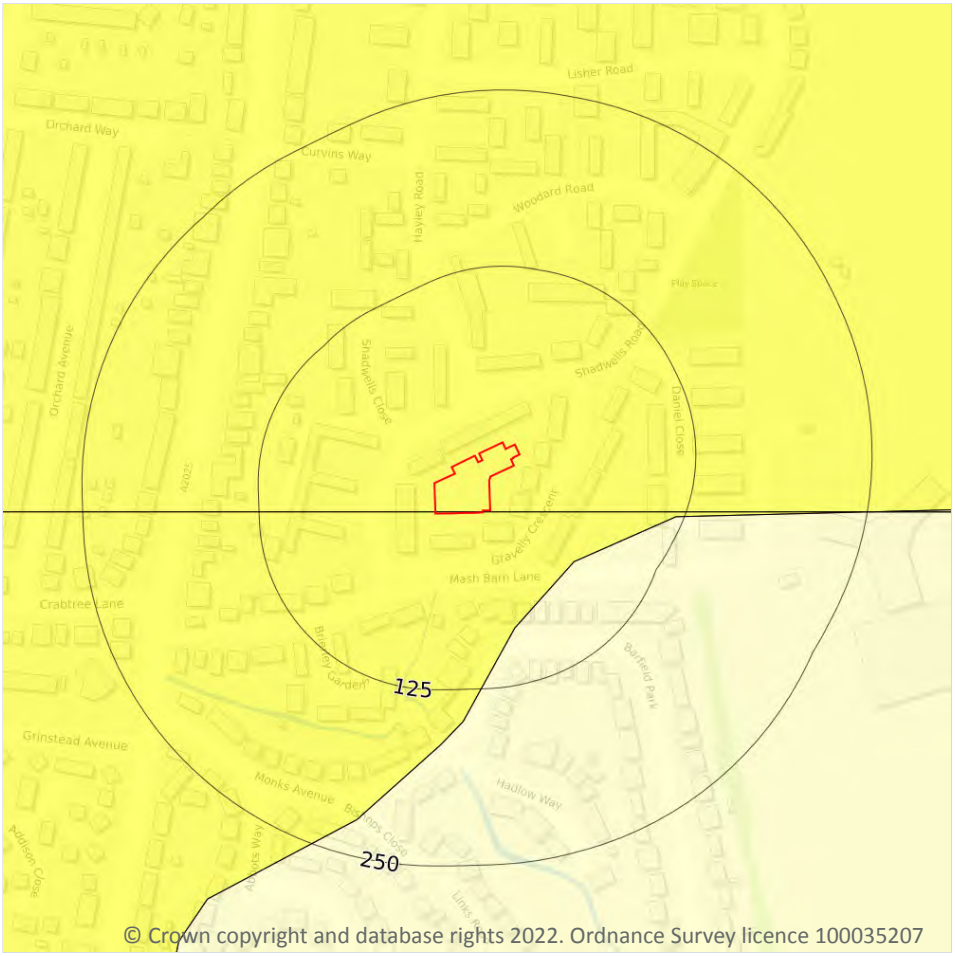
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 86**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Ground dissolution of soluble rocks




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.6 Ground dissolution of soluble rocks

| Records within 50m | 1 |
|---|---|

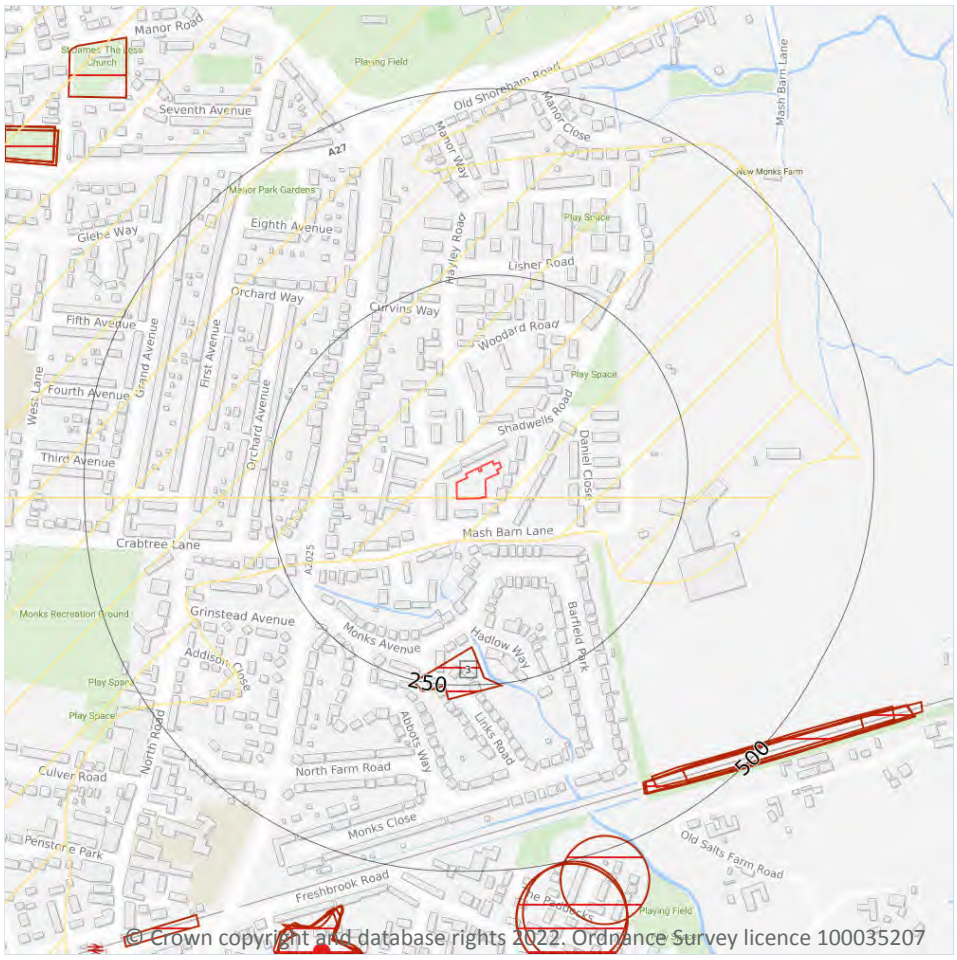
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 87**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.** |

*This data is sourced from the British Geological Survey.*

# 18 Mining, ground workings and natural cavities




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Site Outline

Search buffers in metres (m)

- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

## 18.1 Natural cavities

| Records within 500m | 0 |
|---|---|

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

*This data is sourced from Stantec UK Ltd.*

## 18.2 BritPits

| Records within 500m | 0 |
|---|---|

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

*This data is sourced from the British Geological Survey.*

## 18.3 Surface ground workings

| Records within 250m | 1 |
|---|---|

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 89**

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| 3 | 199m S | Sewage Works | 1932 | 1:10560 |

*This is data is sourced from Ordnance Survey/Groundsure.*

## 18.4 Underground workings

| Records within 1000m | 0 |
|---|---|

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

*This is data is sourced from Ordnance Survey/Groundsure.*

## 18.5 Historical Mineral Planning Areas

| Records within 500m | 0 |
|---|---|

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

*This data is sourced from the British Geological Survey.*

## 18.6 Non-coal mining

| Records within 1000m | 2 |
|---|---|

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining, ground workings and natural cavities map on **page 89**

| ID | Location | Name | Commodity | Class | Likelihood |
|---|---|---|---|---|---|
| **1** | **On site** | **Not available** | **Chalk** | **A** | **Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered** |
| **2** | **On site** | **Not available** | **Chalk** | **A** | **Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered** |

*This data is sourced from the British Geological Survey.*

## 18.7 Mining cavities

| Records within 1000m | 0 |
|---|---|

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

*This data is sourced from Stantec UK Ltd.*

## 18.8 JPB mining areas

| Records on site | 0 |
|---|---|

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

*This data is sourced from Johnson Poole and Bloomer.*

## 18.9 Coal mining

| Records on site | 0 |
|---|---|

Areas which could be affected by past, current or future coal mining.

*This data is sourced from the Coal Authority.*

## 18.10 Brine areas

| Records on site | 0 |
|---|---|

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

*This data is sourced from the Cheshire Brine Subsidence Compensation Board.*

## 18.11 Gypsum areas

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by gypsum extraction.

*This data is sourced from British Gypsum.*

## 18.12 Tin mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by historical tin mining.

*This data is sourced from Groundsure.*

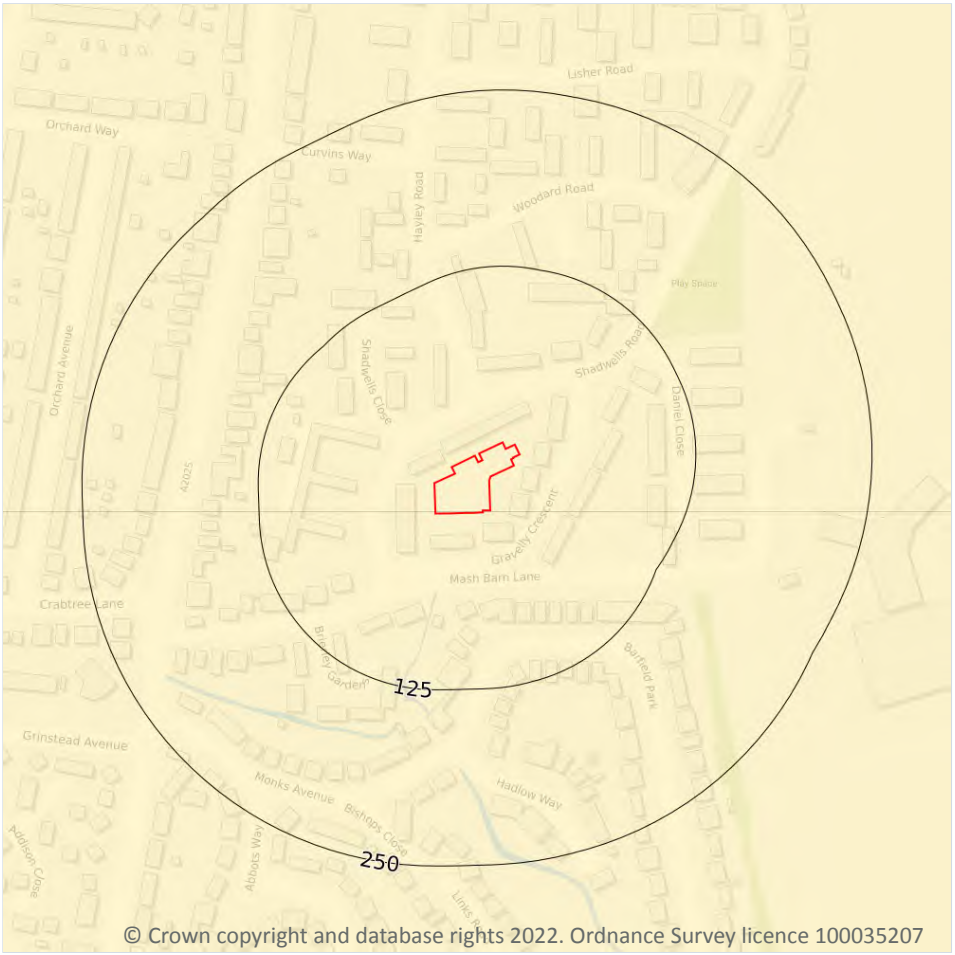
## 18.13 Clay mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by kaolin and ball clay extraction.

*This data is sourced from the Kaolin and Ball Clay Association (UK).*

# 19 Radon




Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

## 19.1 Radon

| Records on site | 1 |
|---|---|

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 93**

| Location | Estimated properties affected | Radon Protection Measures required |
|---|---|---|
| **On site** | **Between 1% and 3%** | **None** |

*This data is sourced from the British Geological Survey and Public Health England.*

# 20 Soil chemistry

## 20.1 BGS Estimated Background Soil Chemistry

| Records within 50m | 3 |
|---|---|

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 $km^2$. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 $km^2$; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

| Location | Arsenic | Bioaccessible Arsenic | Lead | Bioaccessible Lead | Cadmium | Chromium | Nickel |
|---|---|---|---|---|---|---|---|
| **On site** | **15 - 25 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |

*This data is sourced from the British Geological Survey.*

## 20.2 BGS Estimated Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per $km^2$).

*This data is sourced from the British Geological Survey.*

## 20.3 BGS Measured Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per $km^2$.

*This data is sourced from the British Geological Survey.*

# 21 Railway infrastructure and projects

## 21.1 Underground railways (London)

| Records within 250m | 0 |
|---|---|

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

*This data is sourced from publicly available information by Groundsure.*

## 21.2 Underground railways (Non-London)

| Records within 250m | 0 |
|---|---|

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

*This data is sourced from publicly available information by Groundsure.*

## 21.3 Railway tunnels

| Records within 250m | 0 |
|---|---|

Railway tunnels taken from contemporary Ordnance Survey mapping.

*This data is sourced from the Ordnance Survey.*

## 21.4 Historical railway and tunnel features

| Records within 250m | 0 |
|---|---|

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

*This data is sourced from Ordnance Survey/Groundsure.*

## 21.5 Royal Mail tunnels

| Records within 250m | 0 |
|---|---|

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

*This data is sourced from Groundsure/the Postal Museum.*

## 21.6 Historical railways

| Records within 250m | 0 |
|---|---|

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

*This data is sourced from OpenStreetMap.*

## 21.7 Railways

| Records within 250m | 0 |
|---|---|

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

*This data is sourced from Ordnance Survey and OpenStreetMap.*

## 21.8 Crossrail 1

| Records within 500m | 0 |
|---|---|

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

*This data is sourced from publicly available information by Groundsure.*

## 21.9 Crossrail 2

| Records within 500m | 0 |
|---|---|

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

*This data is sourced from publicly available information by Groundsure.*

## 21.10 HS2

| Records within 500m | 0 |
|---|---|

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

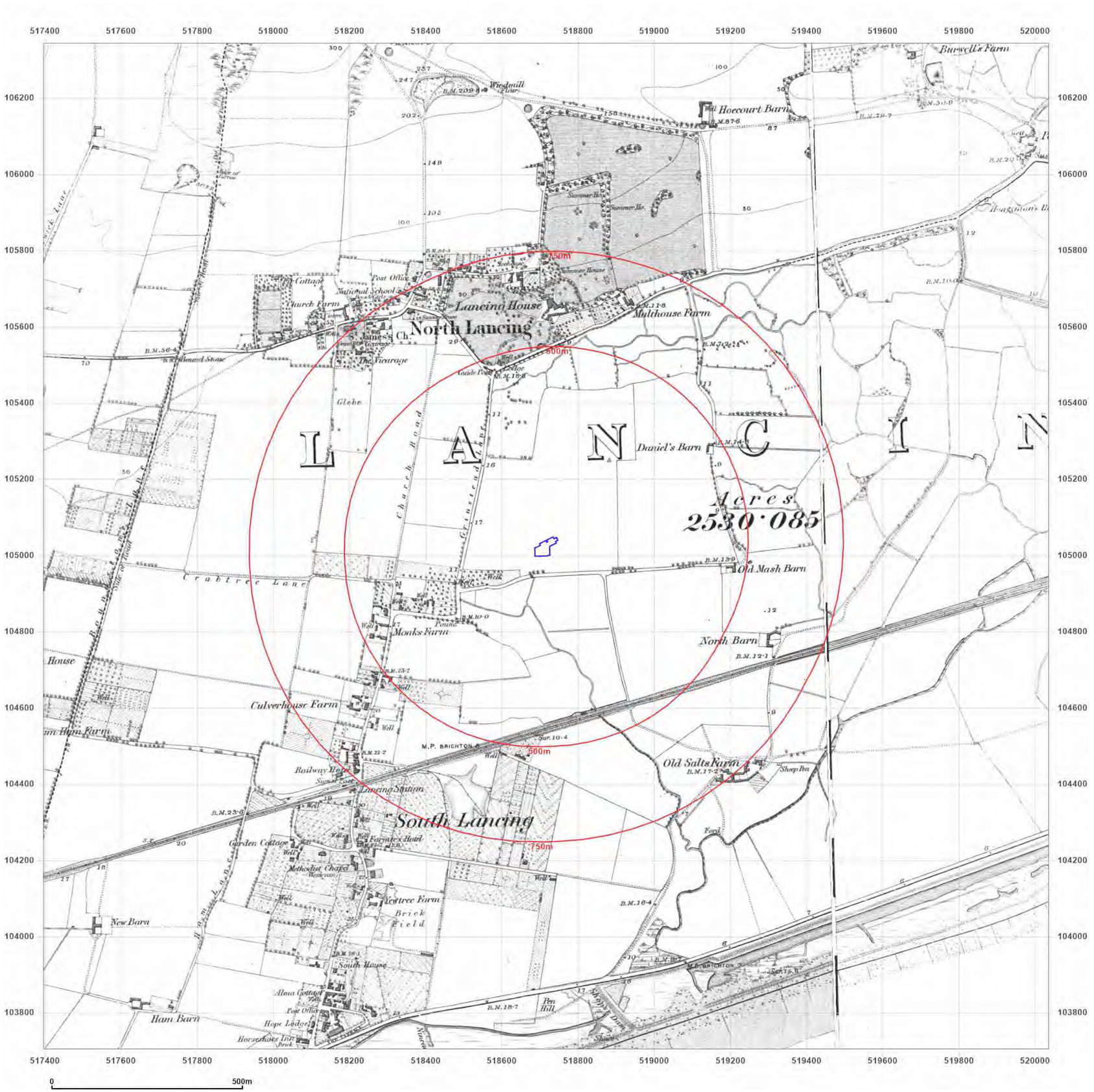
*This data is sourced from HS2 ltd.*

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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

**Map date:** **1873-1875**

**Scale:** 1:10,560

**Printed at:** 1:10,560

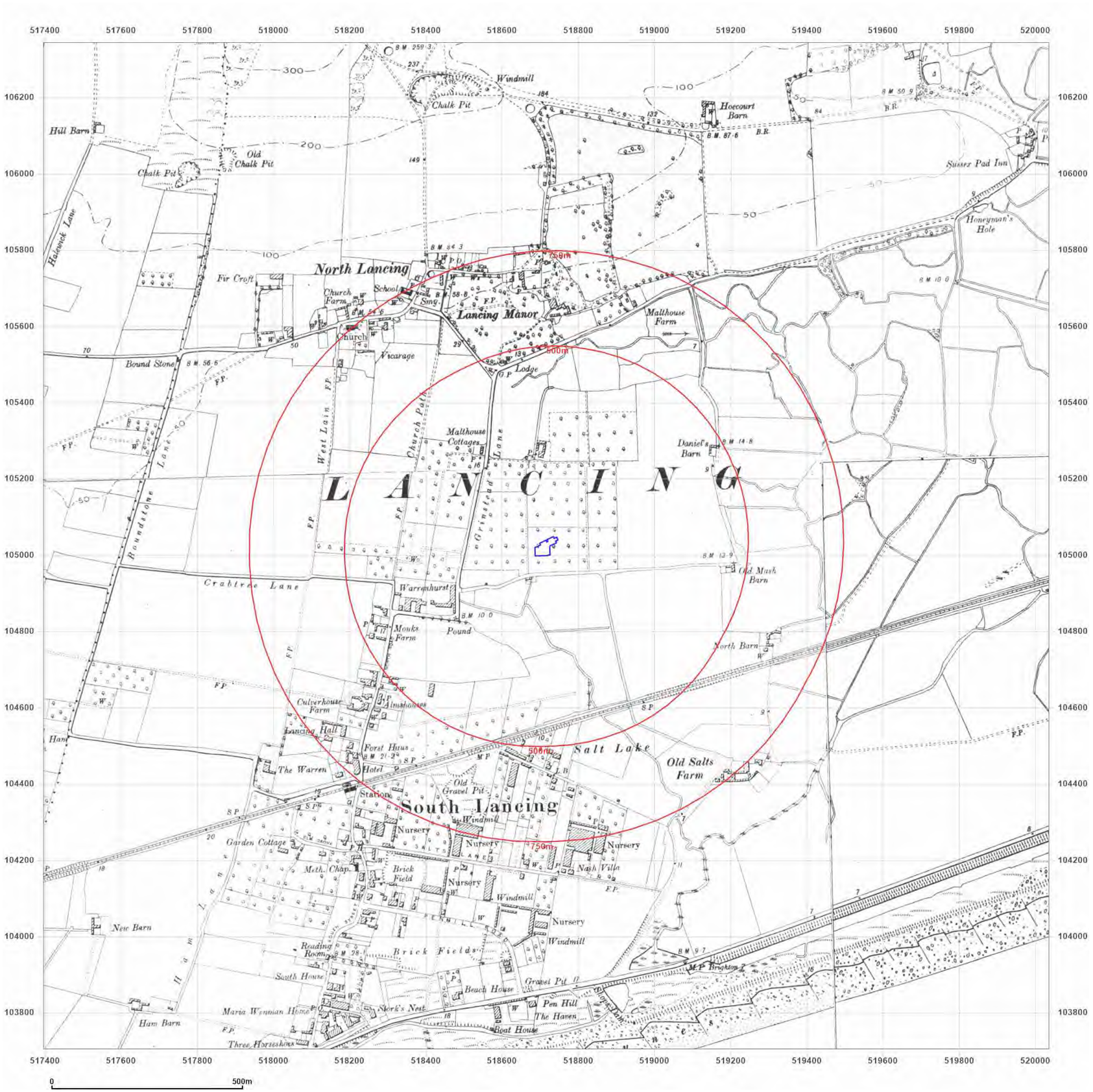
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

**Map date:** **1896**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1875
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1873
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1861
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

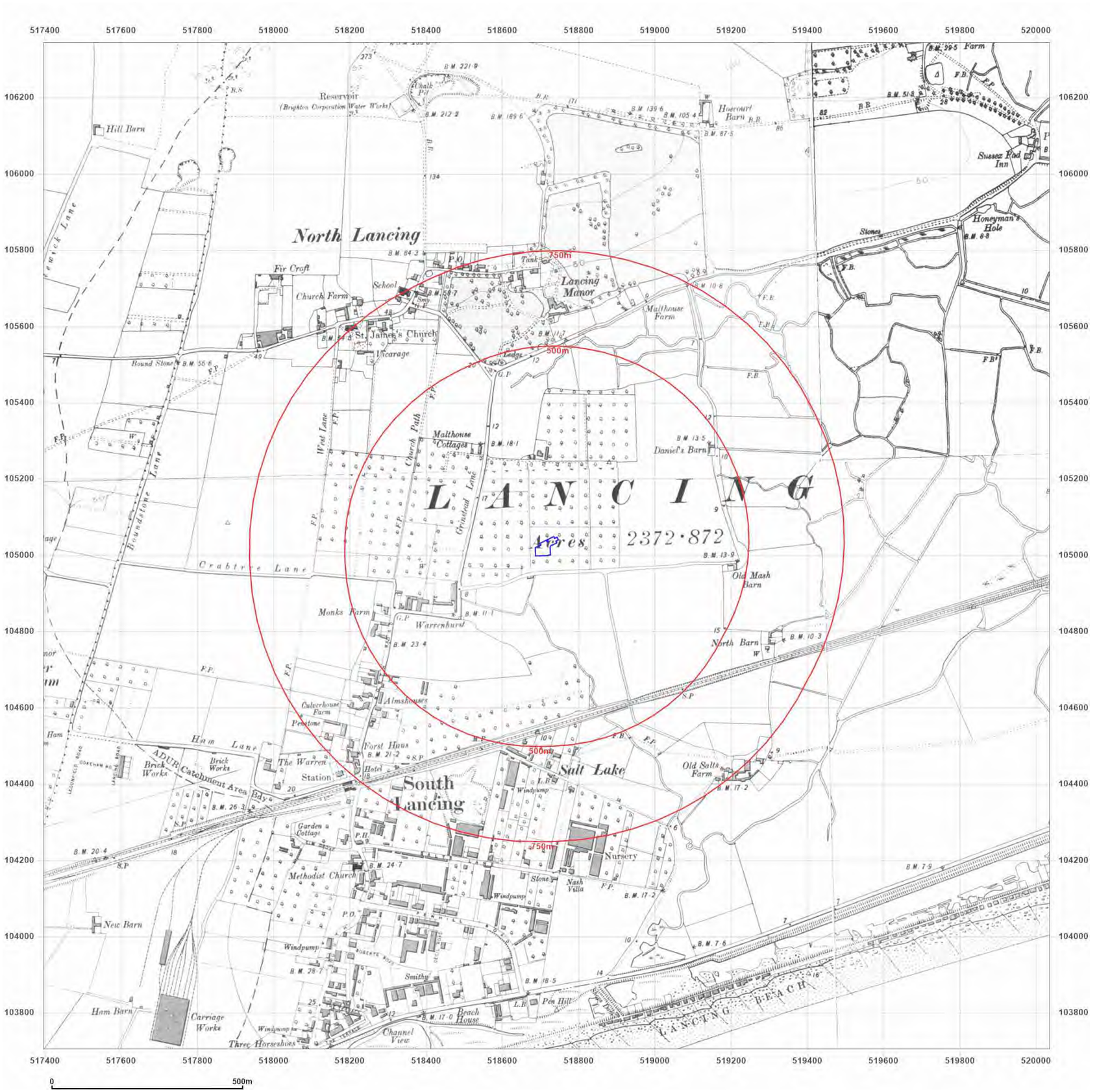
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

**Map date:** **1909**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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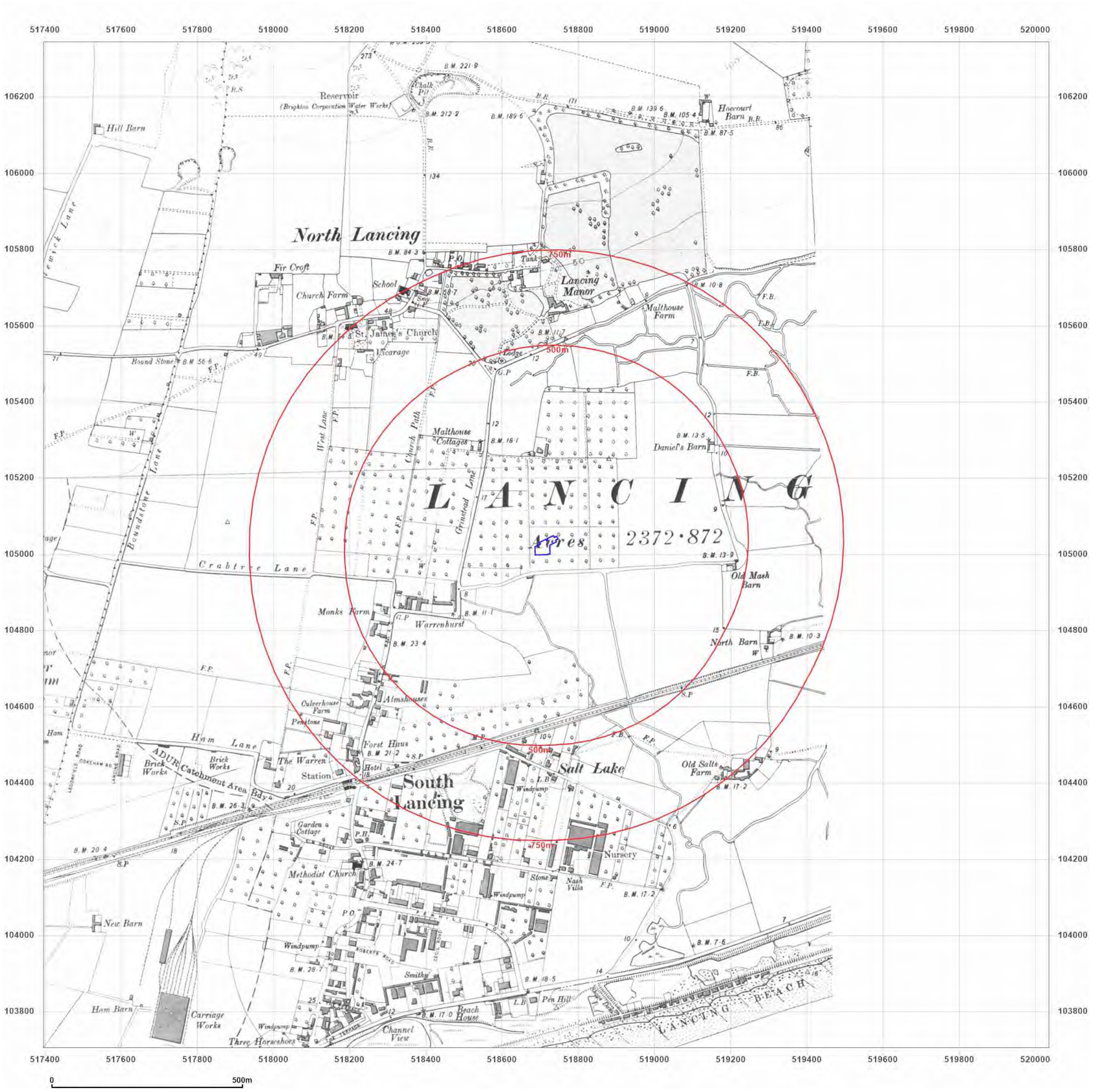
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

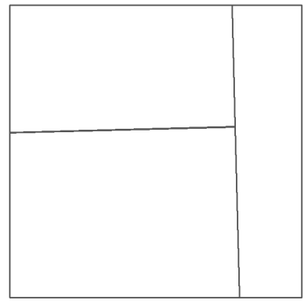
**Map date:** **1909**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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Surveyed 1873
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1875
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

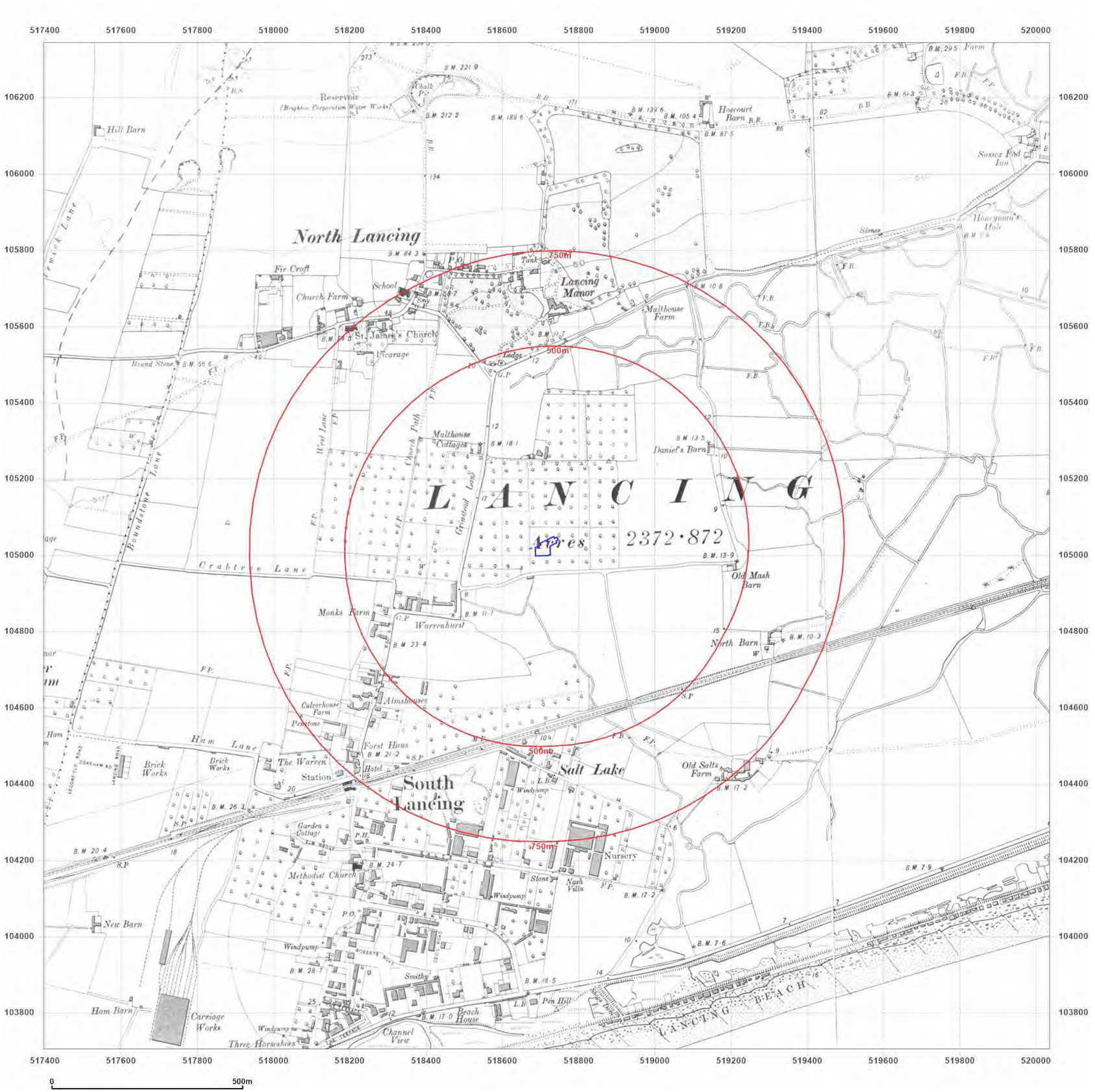
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

**Map date:** **1909-1912**

**Scale:** 1:10,560

**Printed at:** 1:10,560

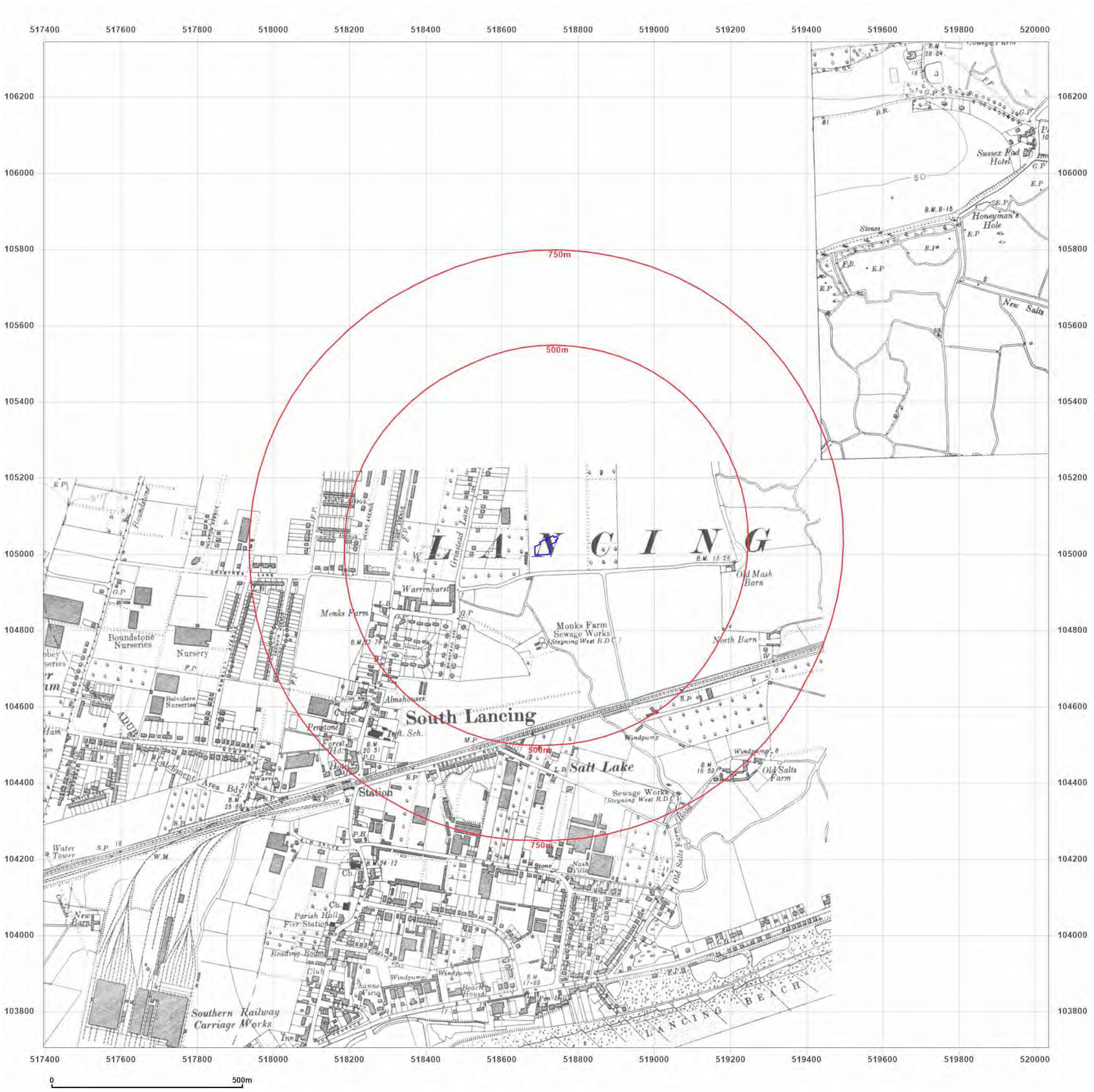
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**Client Ref:** P15501
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**Grid Ref:** 518715, 105024

**Map Name:** County Series

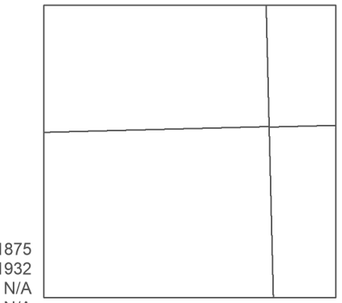
**Map date:** **1931-1932**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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Surveyed 1872
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1875
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

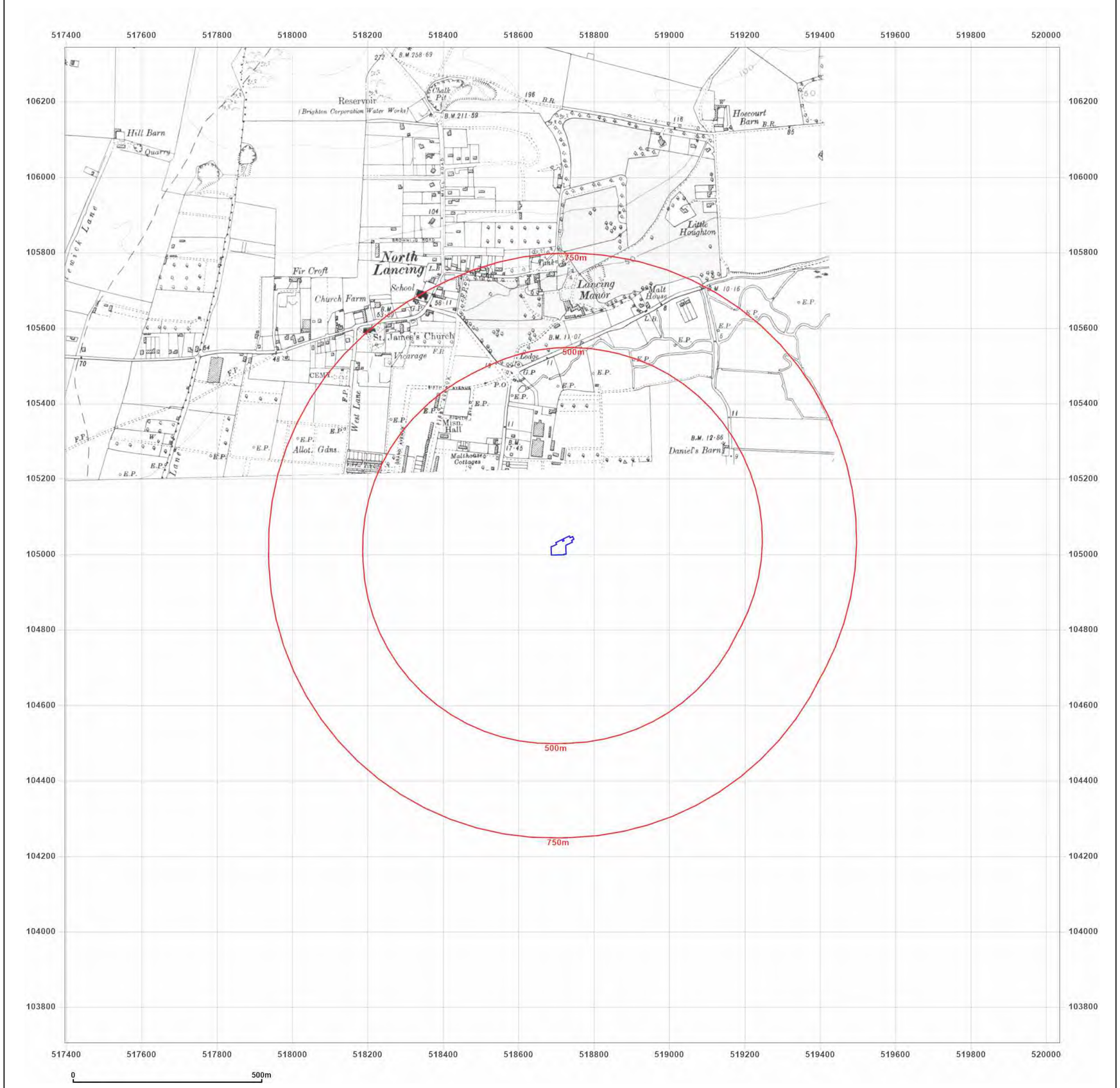
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**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

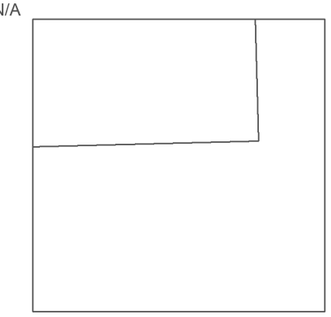
**Map date:** **1932**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1873
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



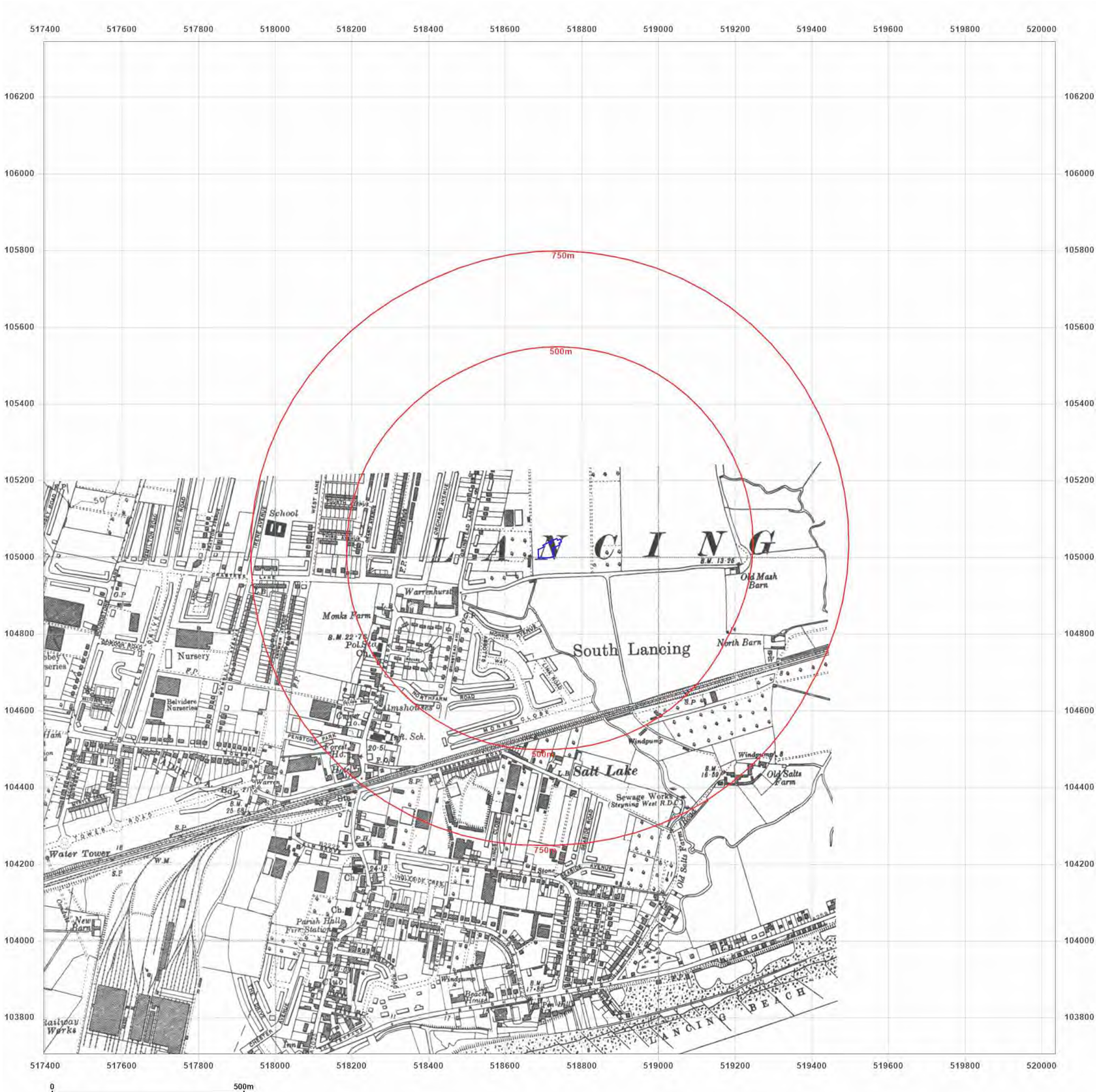
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**Grid Ref:** 518715, 105024

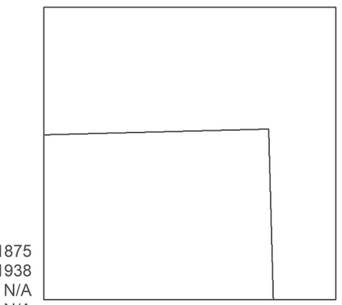
**Map Name:** County Series

**Map date:** **1938**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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Surveyed 1875
Revised 1938
Edition N/A
Copyright N/A
Levelled 1909

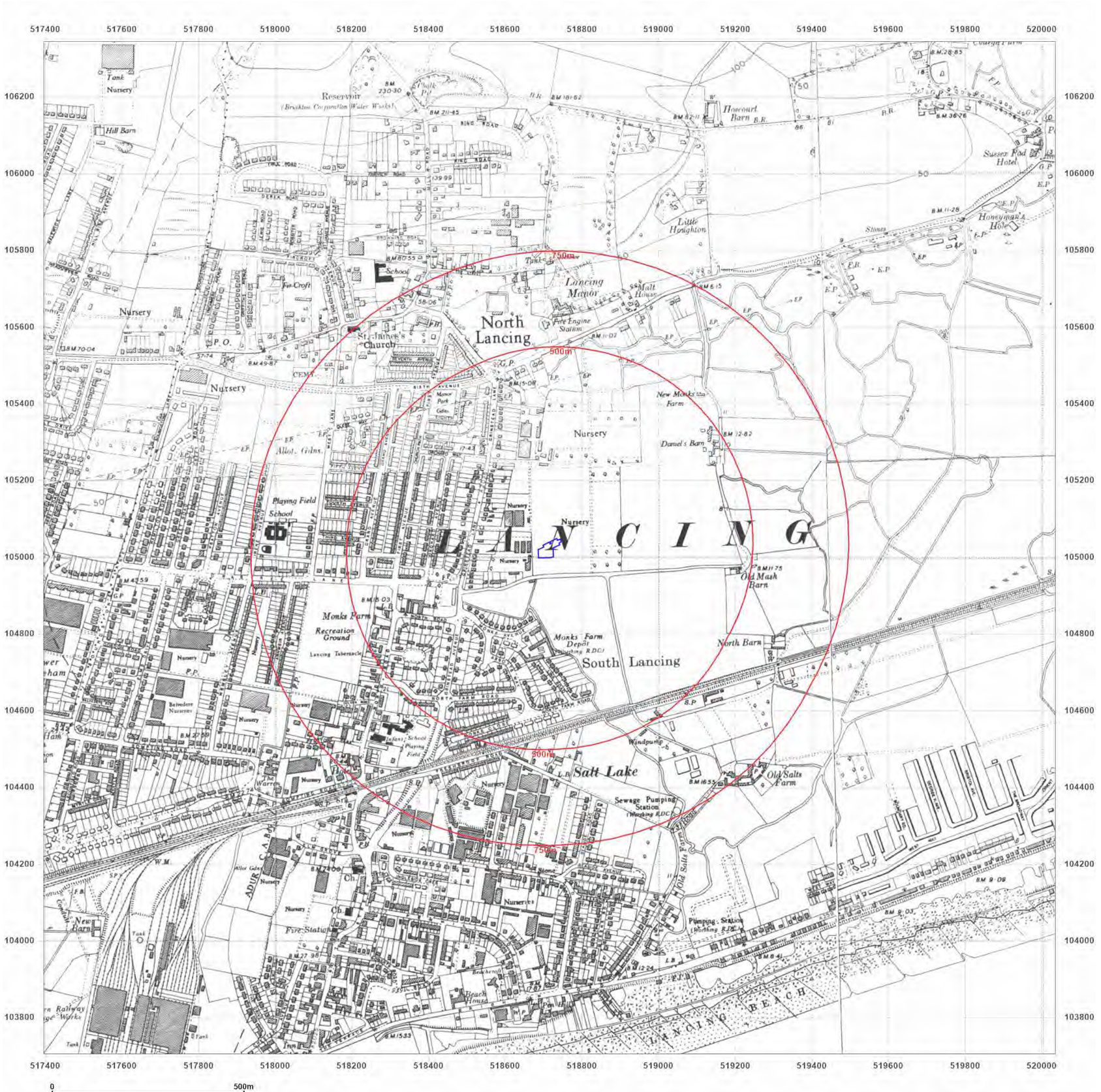
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

**Map date:** **1947-1950**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** Provisional

**Map date:** **1957-1962**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1957
Revised 1957
Edition N/A
Copyright N/A
Levelled N/A

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

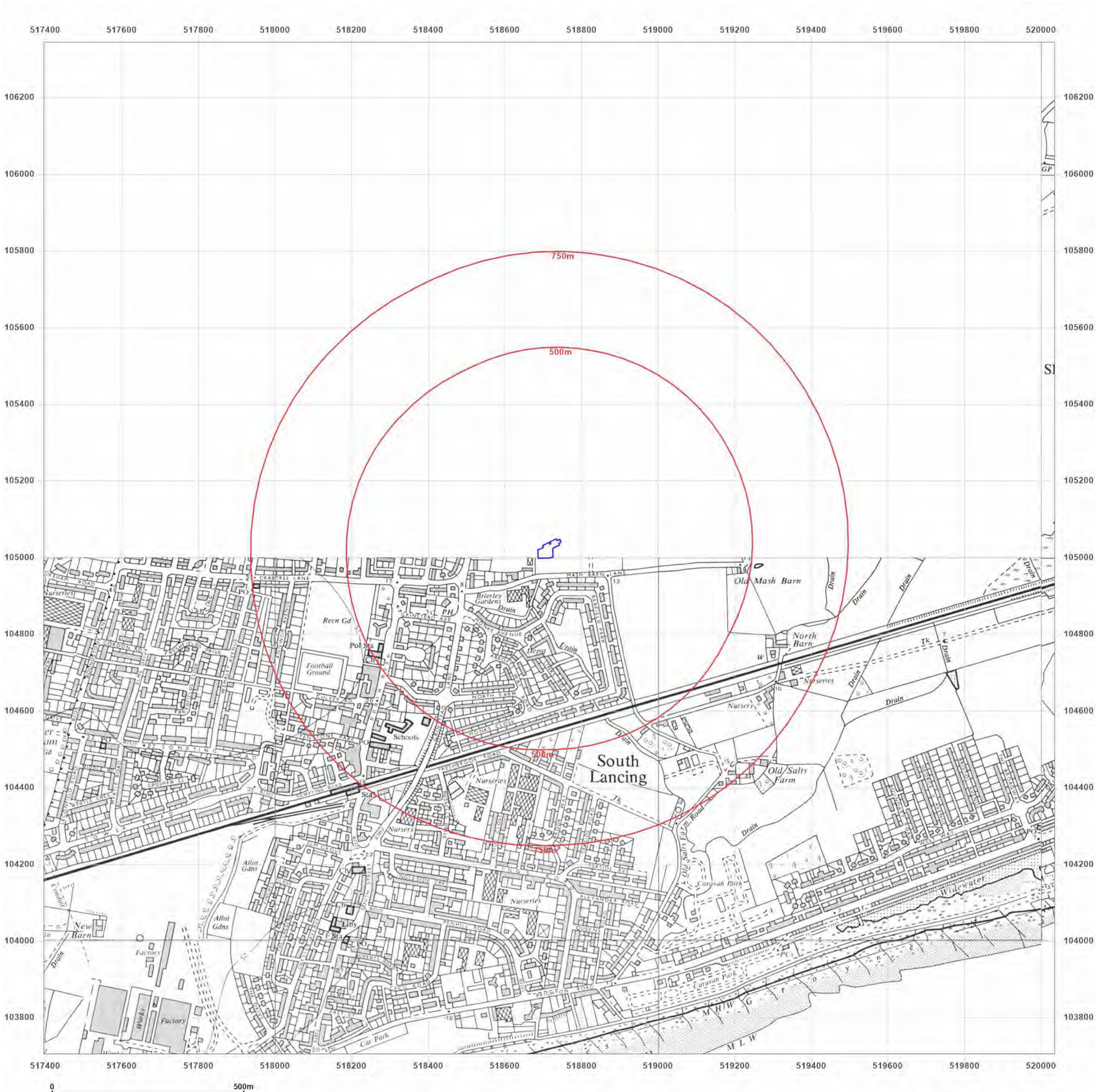
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** Provisional

**Map date:** **1968-1969**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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

Surveyed 1967
Revised 1969
Edition N/A
Copyright N/A
Levelled N/A

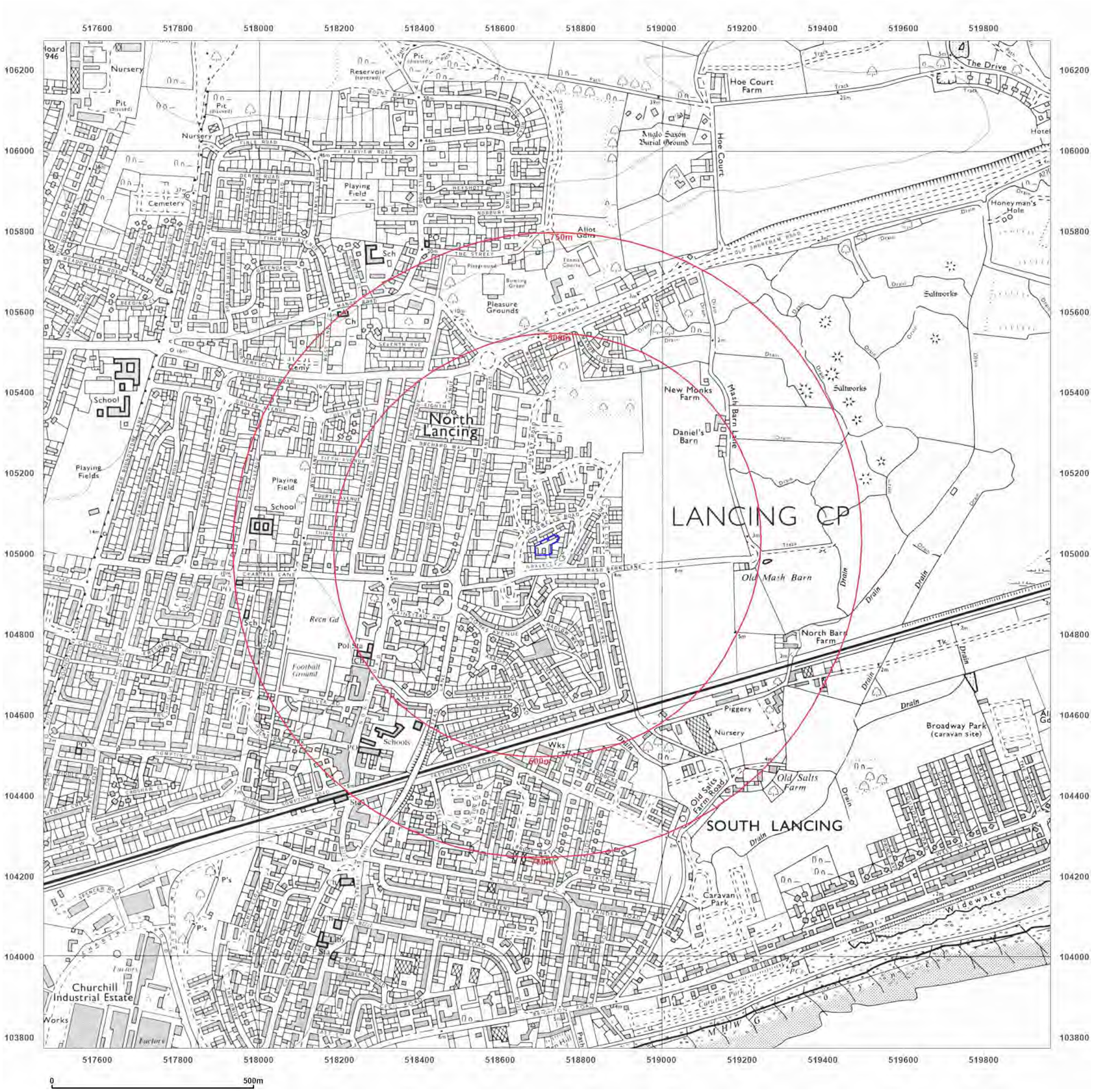
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1971-1974**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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

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

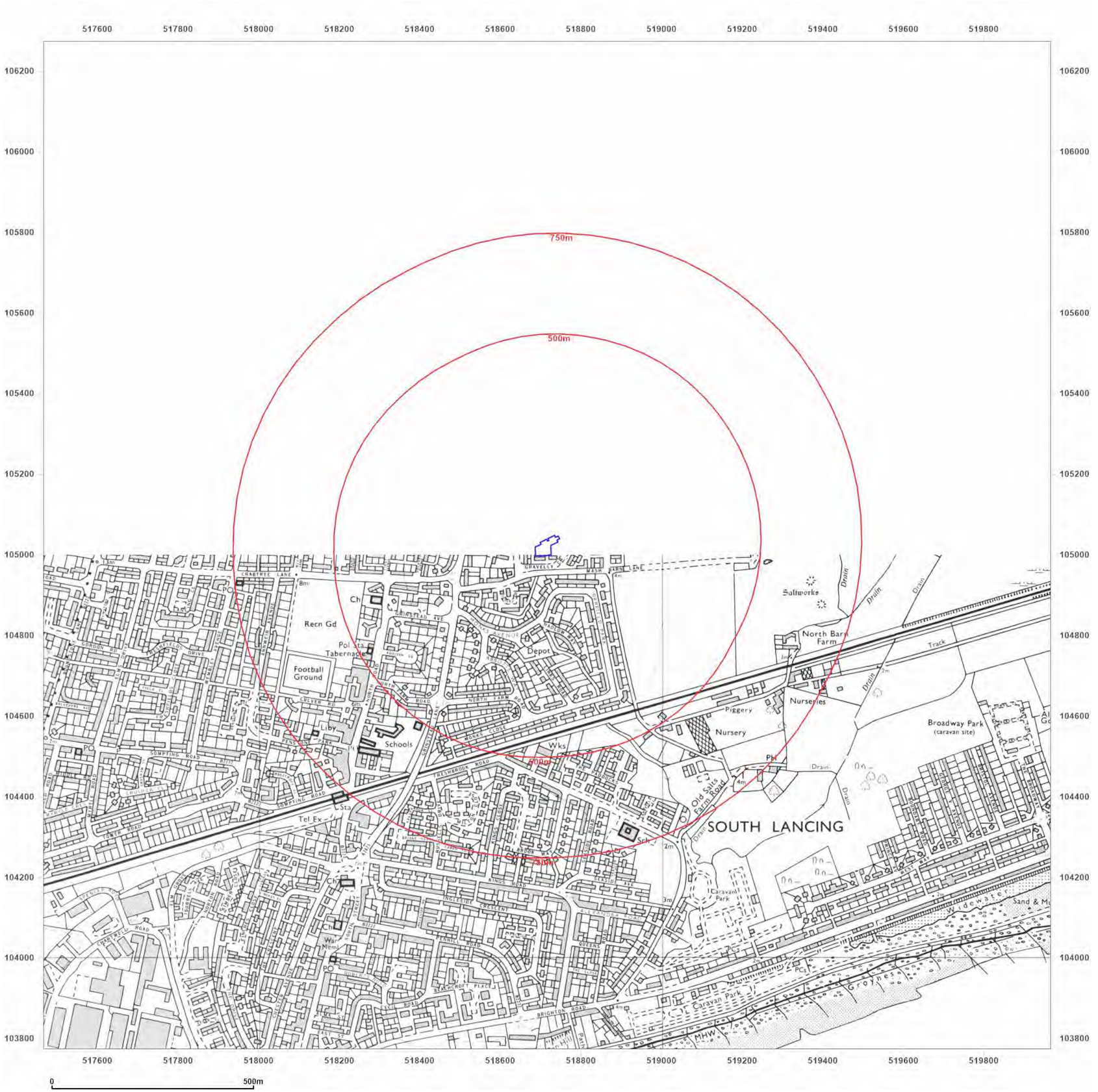
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1981**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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Surveyed 1975
Revised 1981
Edition N/A
Copyright N/A
Levelled N/A

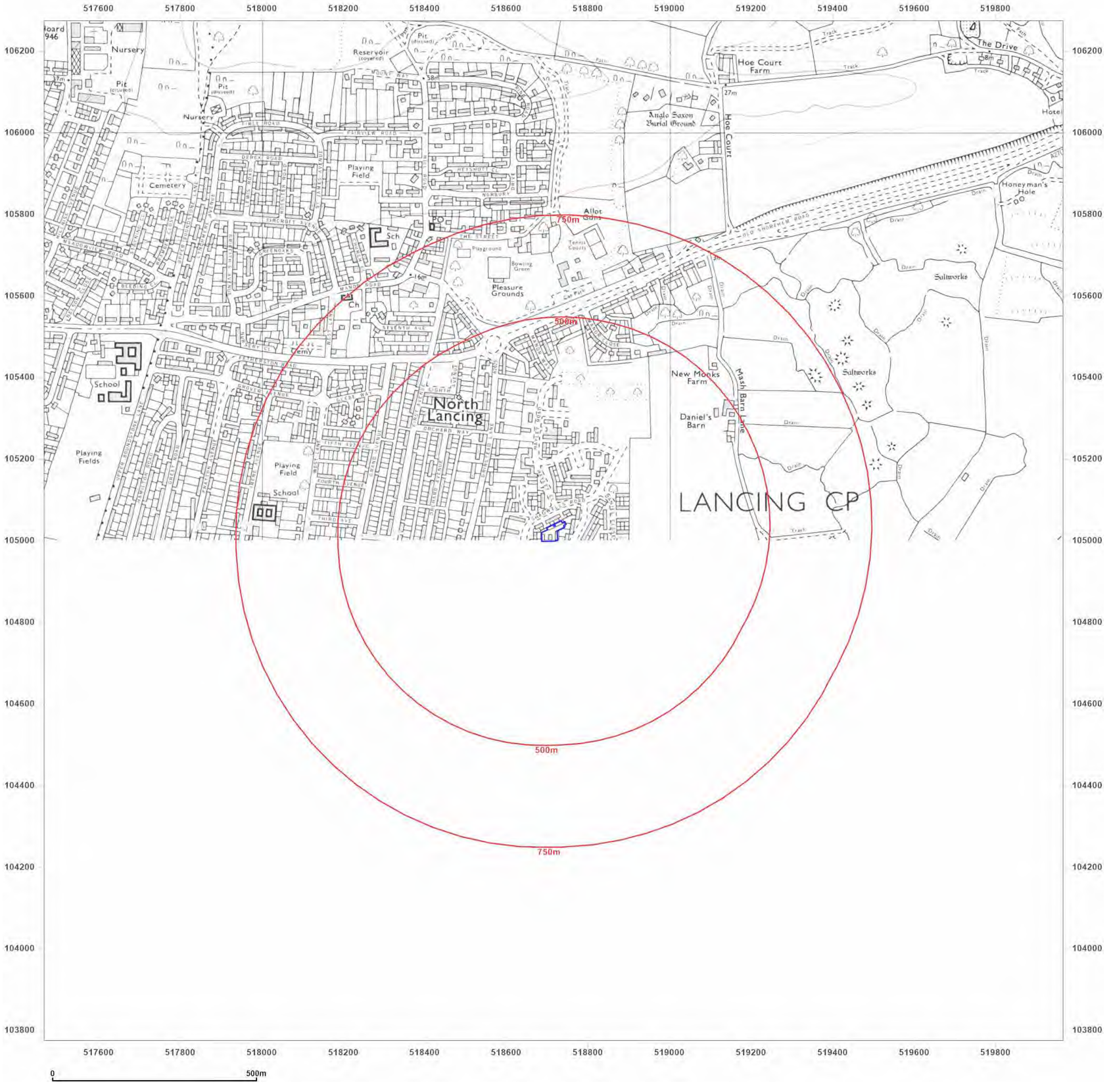
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1989**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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Surveyed 1973
Revised 1989
Edition N/A
Copyright N/A
Levelled N/A

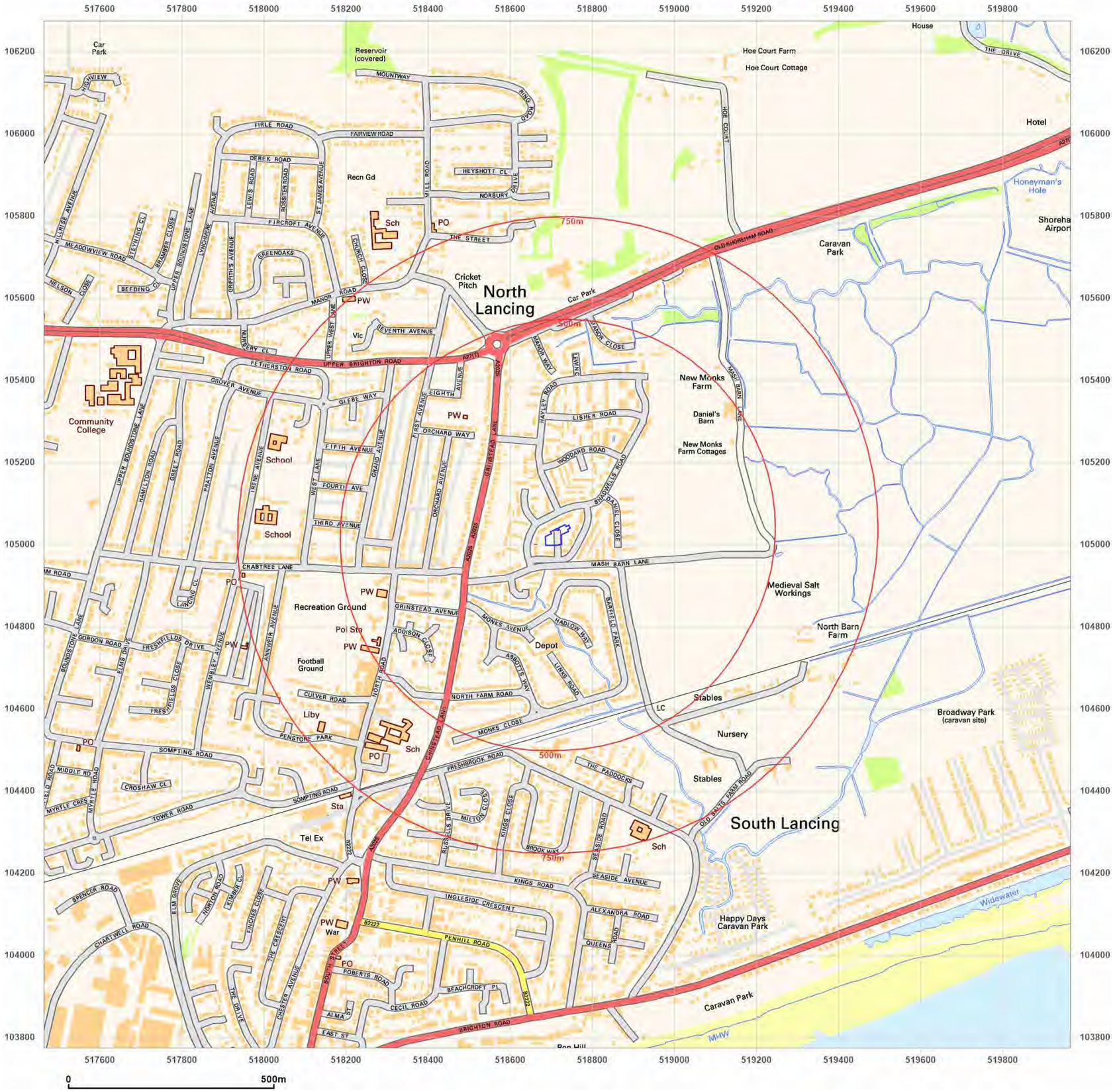
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104400
104200
104000
103800
North Lancing
South Lancing
Cricket Pitch
Recreation Ground
Football Ground
Community College
School
School
Reservoir (covered)
Car Park
Hoe Court Farm
Hoe Court Cottage
House
Hotel
Honeyman's Hole
Shoreham Airport
Caravan Park
New Monks Farm
Daniel's Barn
New Monks Farm Cottages
Medieval Salt Workings
North Barn Farm
Depot
Stables
Nursery
Broadway Park (caravan site)
Happy Days Caravan Park
Caravan Park
Widewater
MHW
Recn Gd
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PW
Vic
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Liby
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Tel Ex
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MOUNTWAY
FIRLE ROAD
FAIRVIEW ROAD
RING ROAD
DEREK ROAD
HEYSHOTT CL
NORBURY
FIRCROFT AVENUE
THE STREET
MEADOWVIEW ROAD
GREENOAKS
MANOR ROAD
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UPPER BRIGHTON ROAD
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FETHERSTON ROAD
GROVER AVENUE
GLEBE WAY
EIGHTH AVENUE
ORCHARD WAY
FIFTH AVENUE
FOURTH AVE
THIRD AVENUE
CRABTREE LANE
MASH BARN LANE
LISHER ROAD
WOODARD ROAD
SHOREWELLS ROAD
DANIEL CLOSE
GRINSTEAD AVENUE
MONKS AVENUE
HADLOW WAY
BARFIELD PARK
ASBOTTS WAY
LINKS ROAD
CULVER ROAD
NORTH FARM ROAD
MONKS CLOSE
PENSTONE PARK
SOMPTING ROAD
FRESHBROOK ROAD
THE PADDOCKS
OLD SHOREHAM ROAD
OLD SHOREHAM FARM ROAD
MILTON CLOSE
KINGS CLOSE
SEASIDE ROAD
BROOK WAY
KINGS ROAD
SEASIDE AVENUE
INGLESIDE CRESCENT
ALEXANDRA ROAD
QUEENS ROAD
PENHILL ROAD
ROBERTS ROAD
BEACHCROFT PL
CECIL ROAD
ALMA ST
EAST ST
BRIGHTON ROAD
B2222
A259
A27(T)
TOWER ROAD
MIDDLE ROAD
MYRTLE CRES
CROSHAW CL
SPENCER ROAD
CHARTWELL ROAD
ELM GROVE
NORTON ROAD
KIMBER CL
FINCHES CLOSE
THE CRESCENT
CHESTER AVENUE
THE DRIVE
GORDON ROAD
FRESHFIELDS DRIVE
FRESHFIELDS CLOSE
WEMBLEY AVENUE
ANNIVERA AVENUE
BOUNDSTONE LANE
EWS DRIVE
LANCING CL
HILLCREST AVENUE
STEYNING CL
BRAMBER CLOSE
UPPER BOUNDSTONE LANE
LONGHEREE AVENUE
GRIFFITH'S AVENUE
LEWIS ROAD
ROSSITER ROAD
ST JAMES AVENUE
CHURCH CLOSE
NELSON CLOSE
BEEDING CL
JOHN SERY CL
UPPER WEST LANE
HIGHVIEW
THE DRIVE
HOE COURT
RING ROAD
MILL ROAD
MANOR WAY
LENNOX
LANGLEY CLOSE
HAYLEY ROAD
MASH BARN LANE
GRADO AVENUE
WEST LANE
IRENE AVENUE
FIRST AVENUE
ORCHARD AVENUE
CRABTREE LANE
KINGS ROAD
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LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **2010**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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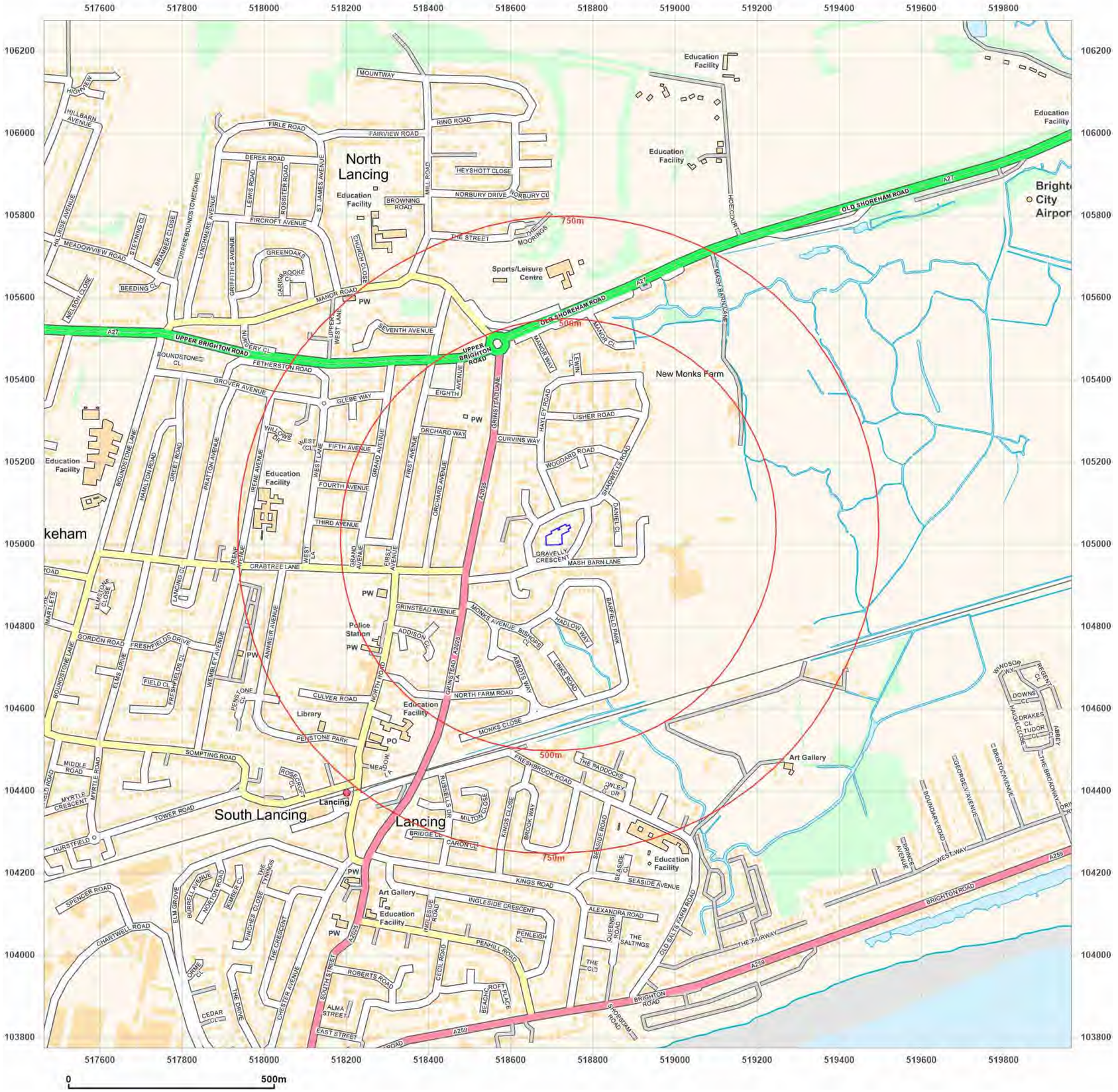
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**Site Details:**

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GRAVELLY CRESCENT,
LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **2022**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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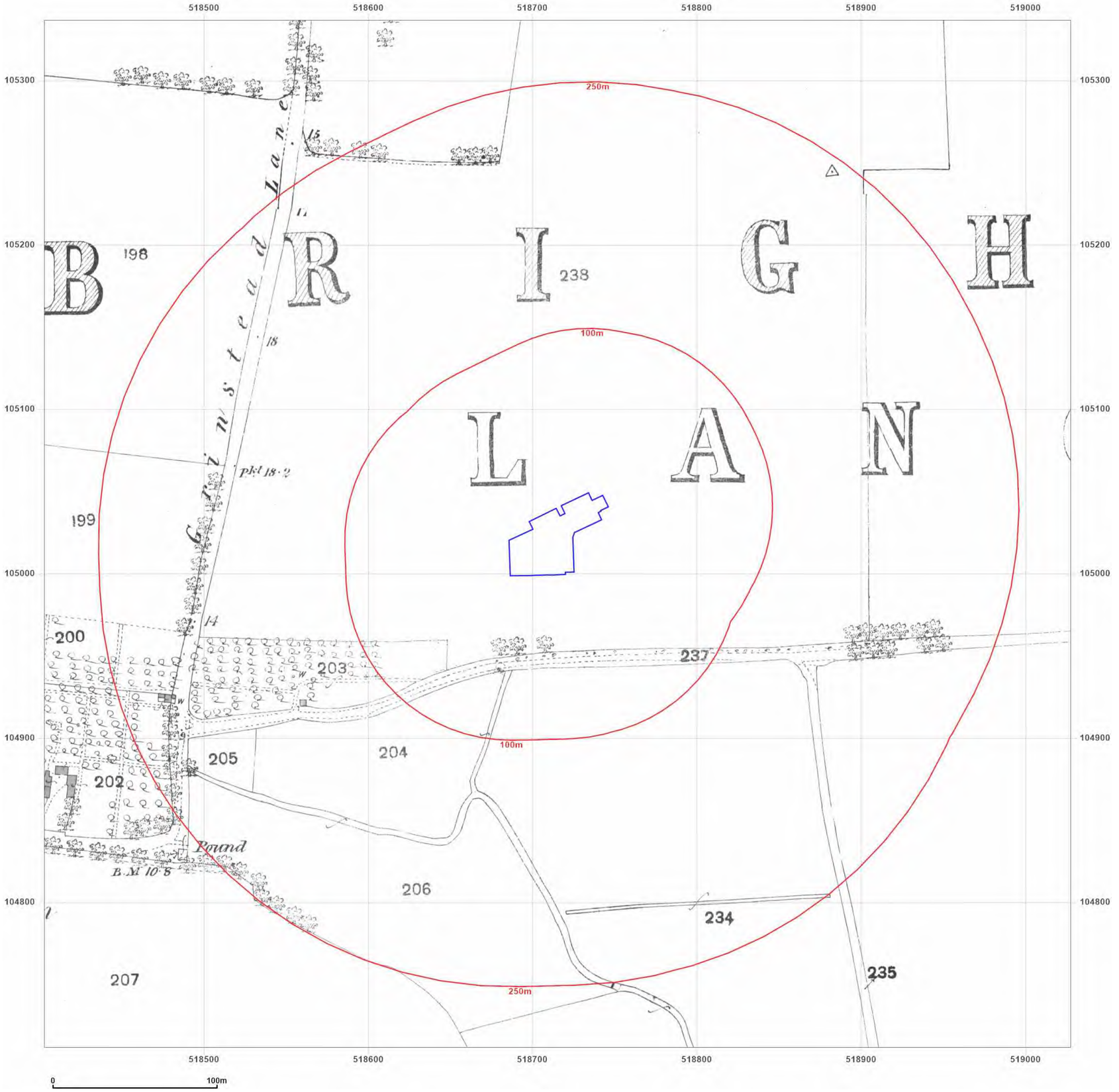
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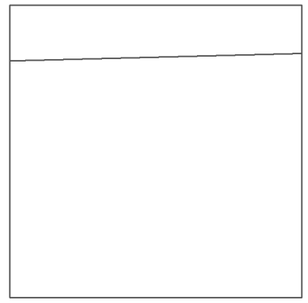
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GRAVELLY CRESCENT,
LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series
**Map date:** **1873**
**Scale:** 1:2,500
**Printed at:** 1:2,500

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Surveyed 1873
Revised 1873
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1873
Revised 1873
Edition N/A
Copyright N/A
Levelled N/A

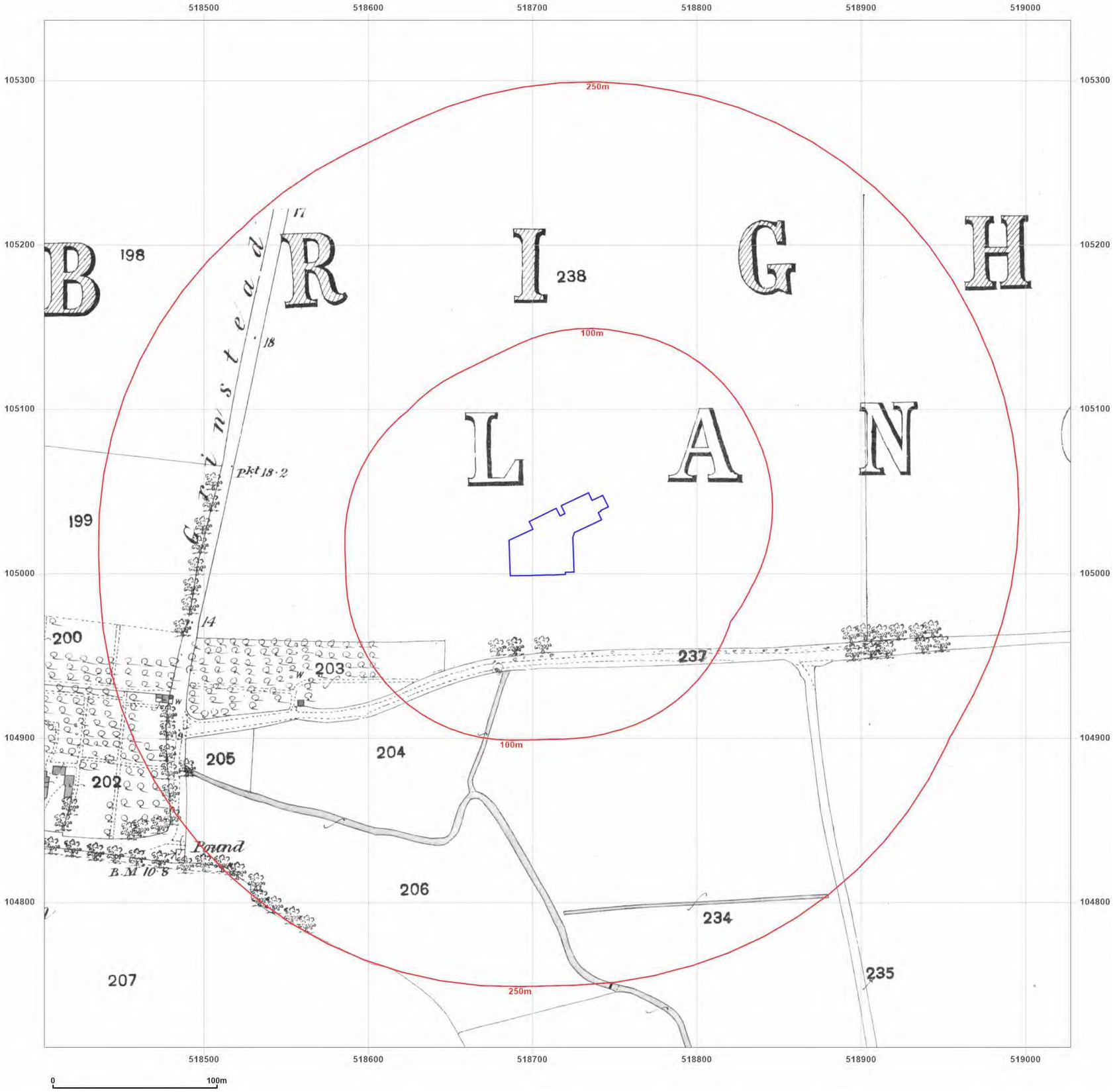
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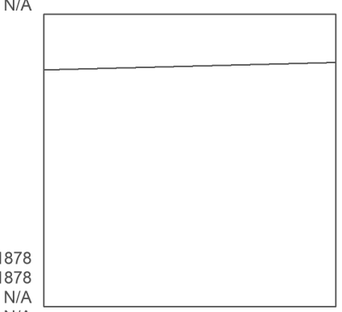
GARAGE COMPOUND,
GRAVELLY CRESCENT,
LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series
**Map date:** **1875-1878**
**Scale:** 1:2,500
**Printed at:** 1:2,500

N
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Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

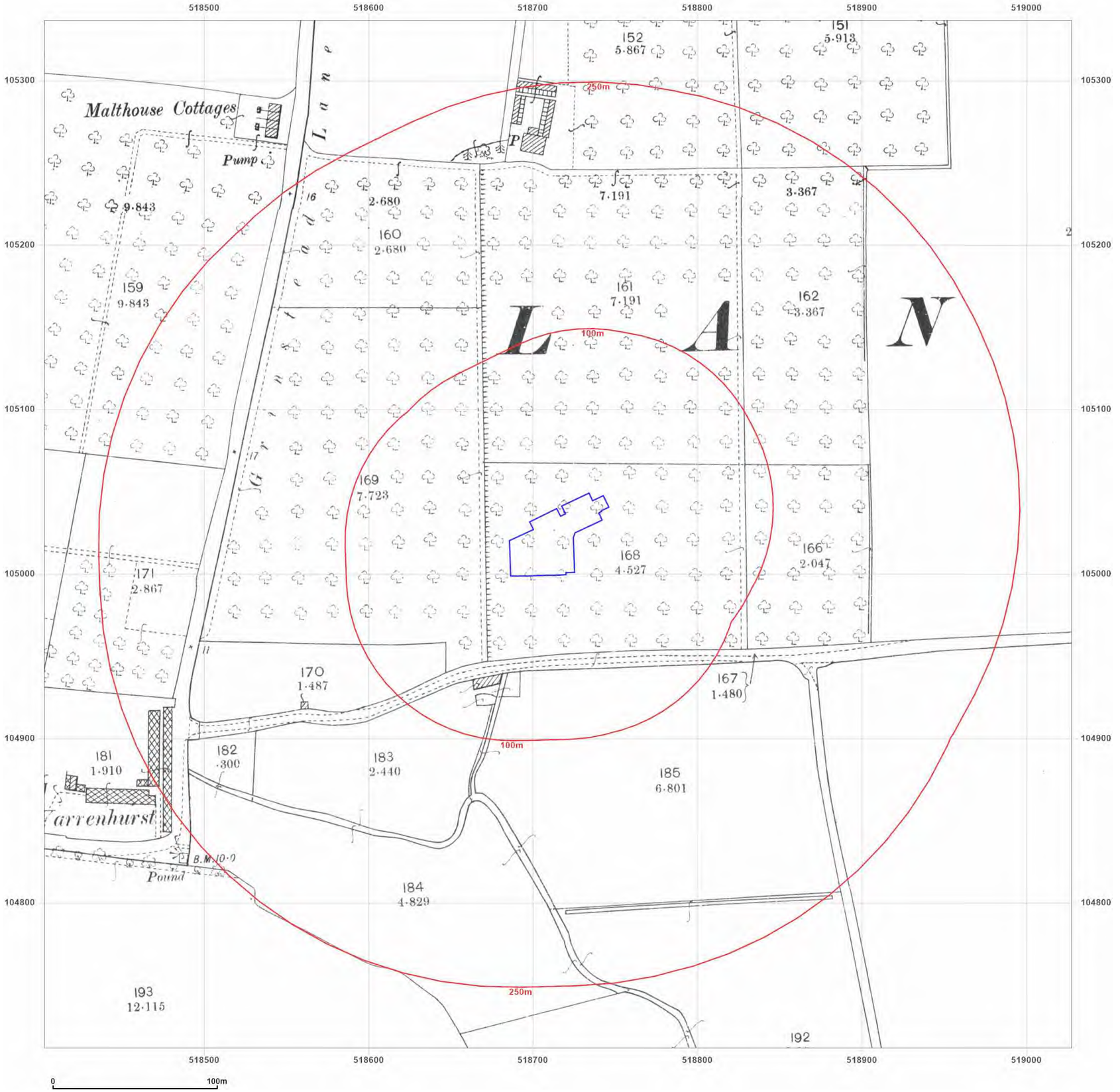
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LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

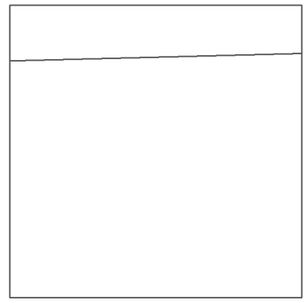
**Map date:** **1898**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

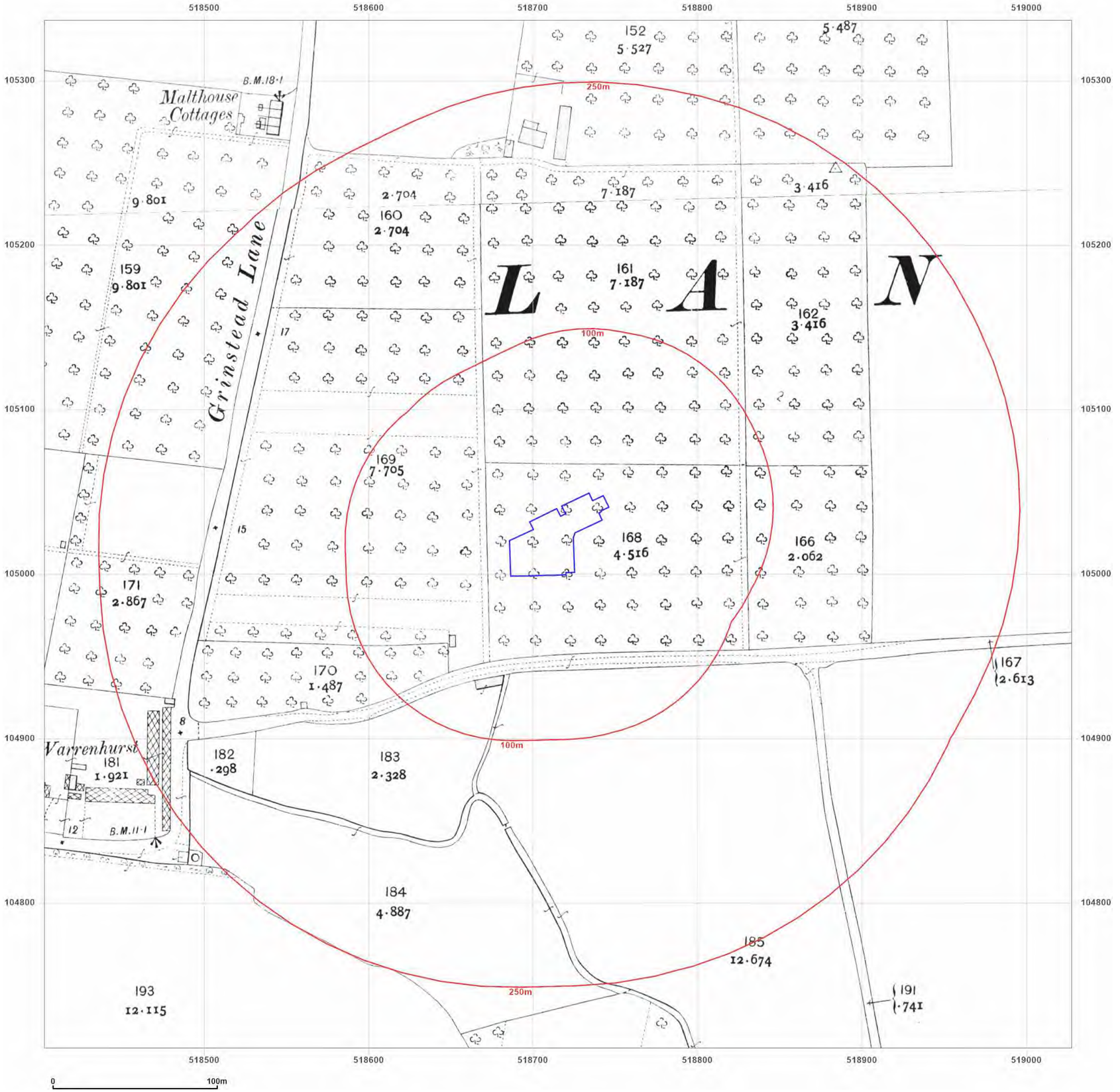
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LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

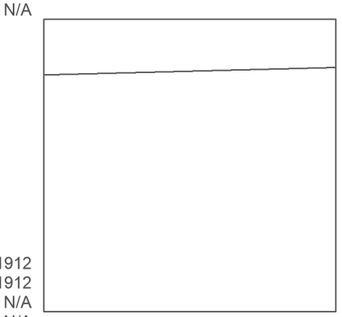
**Map date:** **1912**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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Surveyed 1912
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A



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Revised 1912
Edition N/A
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Levelled N/A

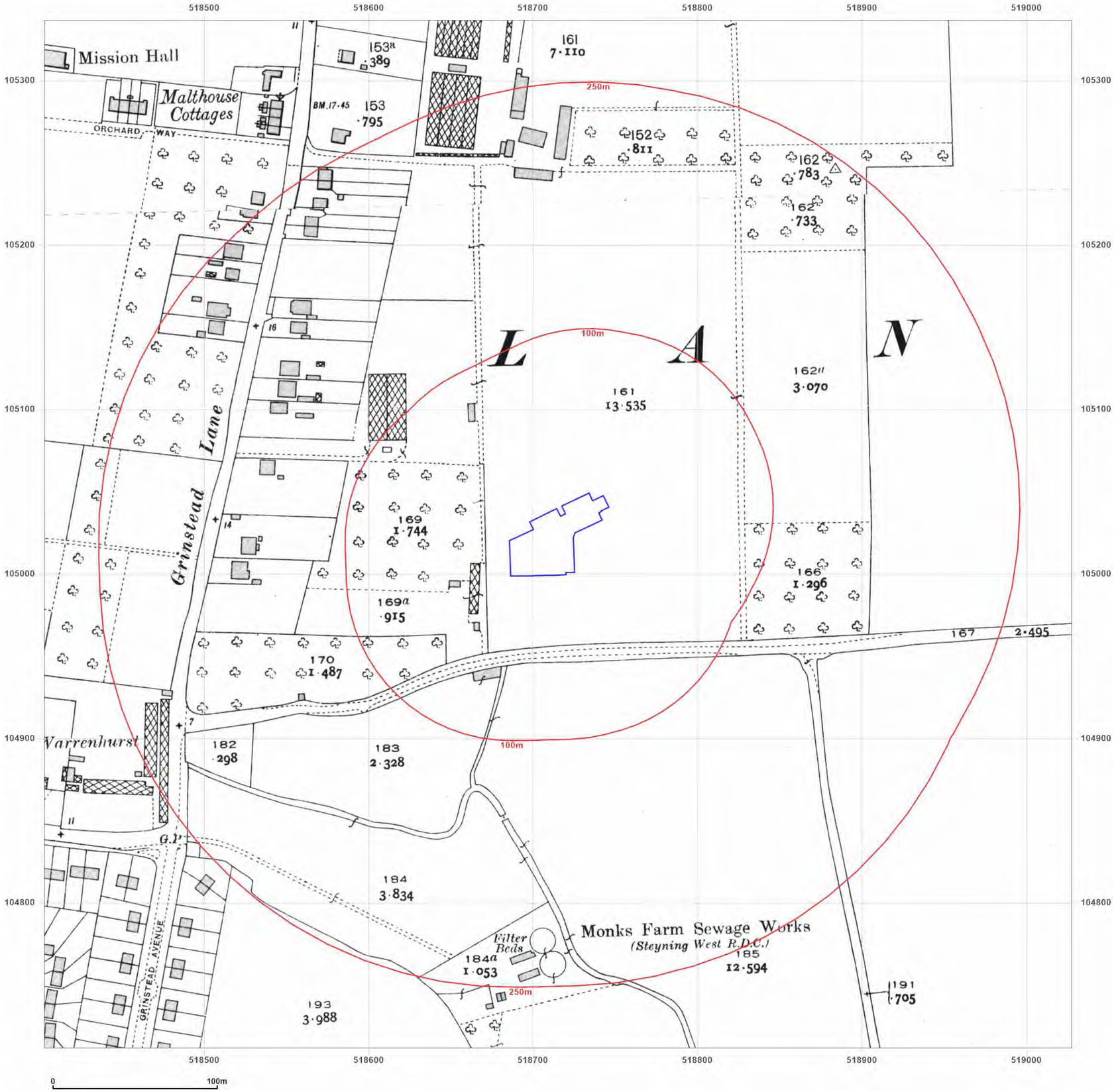
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GRAVELLY CRESCENT,
LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

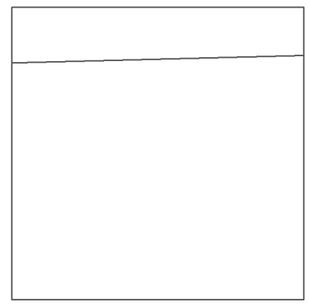
**Map date:** **1931-1932**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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Surveyed 1931
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

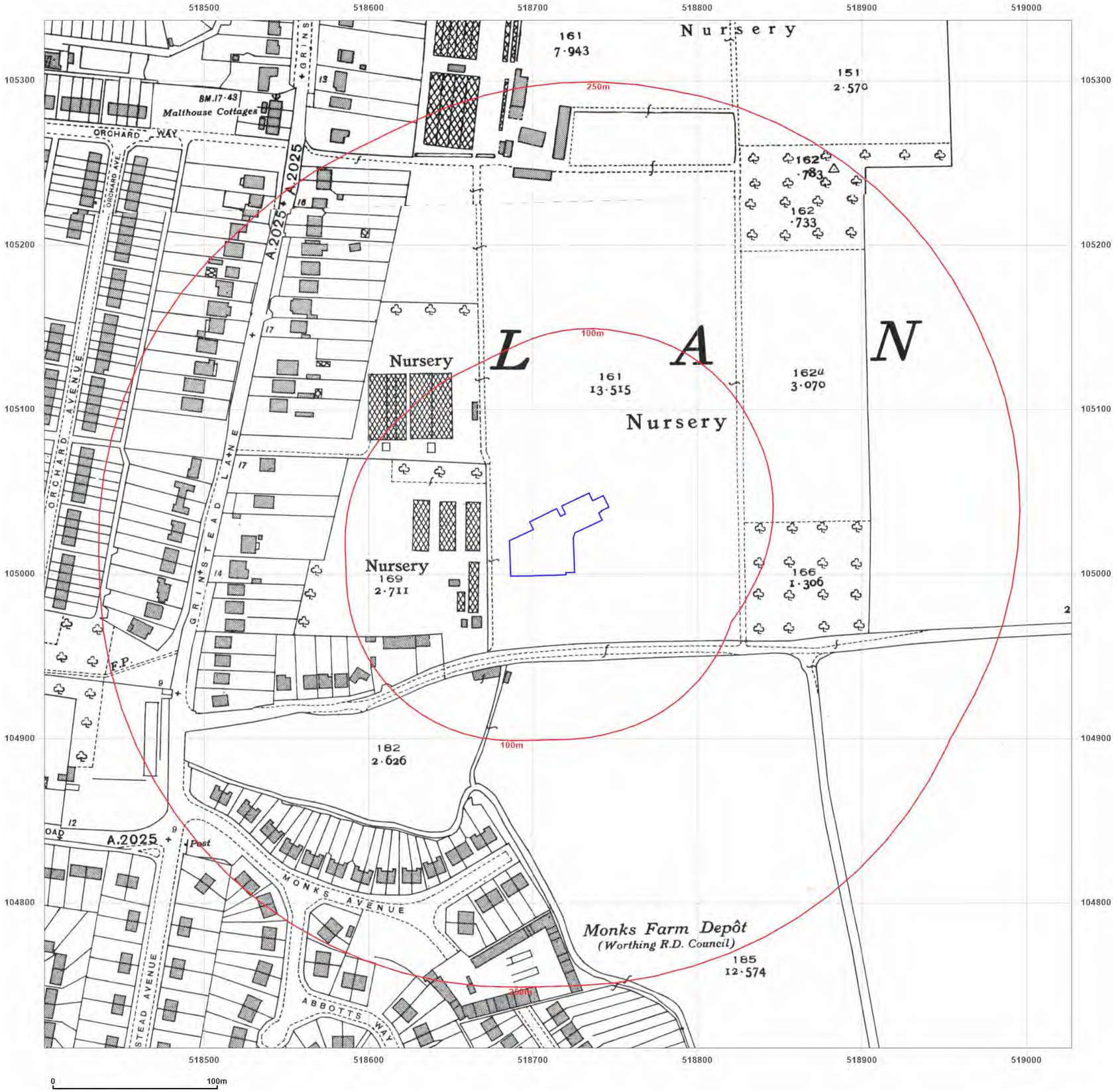
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LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** County Series

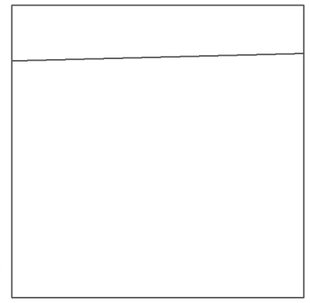
**Map date:** **1942-1943**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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Surveyed 1942
Revised 1942
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1943
Revised 1943
Edition N/A
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1951-1952**

**Scale:** 1:1,250

**Printed at:** 1:2,000

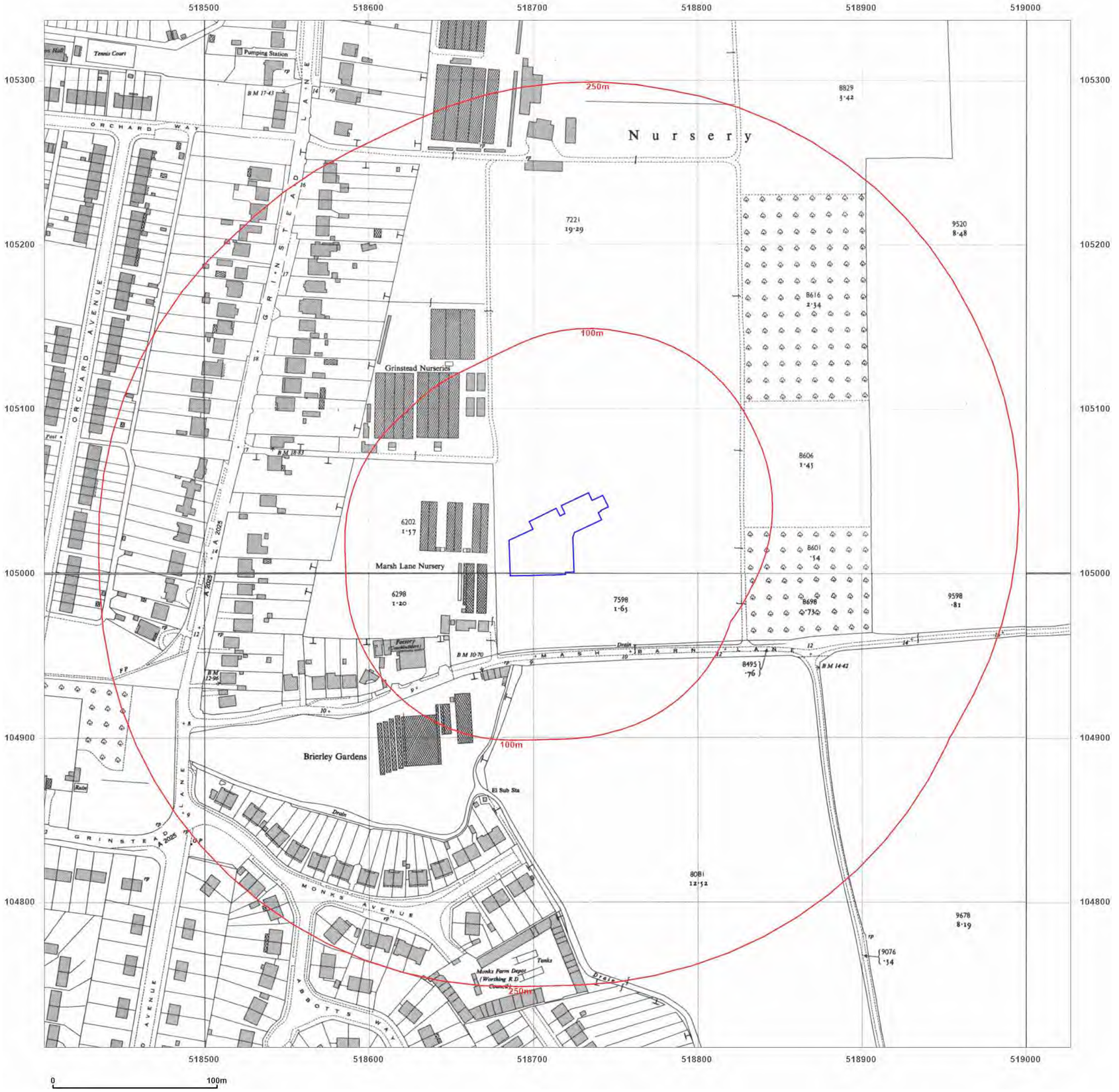
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1951-1952**

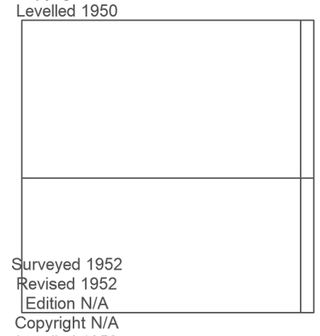
**Scale:** 1:2,500

**Printed at:** 1:2,500

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Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1950

Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1950



Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1950

Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1950

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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1953-1956**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

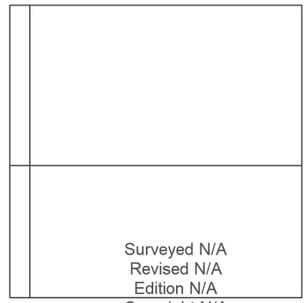
**Map date:** **1954-1957**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
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LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1960-1963**

**Scale:** 1:1,250

**Printed at:** 1:2,000

N
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Surveyed 1951
Revised 1963
Edition N/A
Copyright 1964
Levelled 1959

Surveyed 1952
Revised 1960
Edition N/A
Copyright 1960
Levelled 1950

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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1964-1965**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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

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

Surveyed 1960
Revised 1960
Edition 1964
Copyright 1964
Levelled 1950

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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1964-1965**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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Surveyed 1963
Revised 1963
Edition 1965
Copyright 1965
Levelled 1959

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

Surveyed N/A
Revised N/A
Edition N/A
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1964-1966**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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

Surveyed 1966
Revised 1966
Edition N/A
Copyright 1966
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1970**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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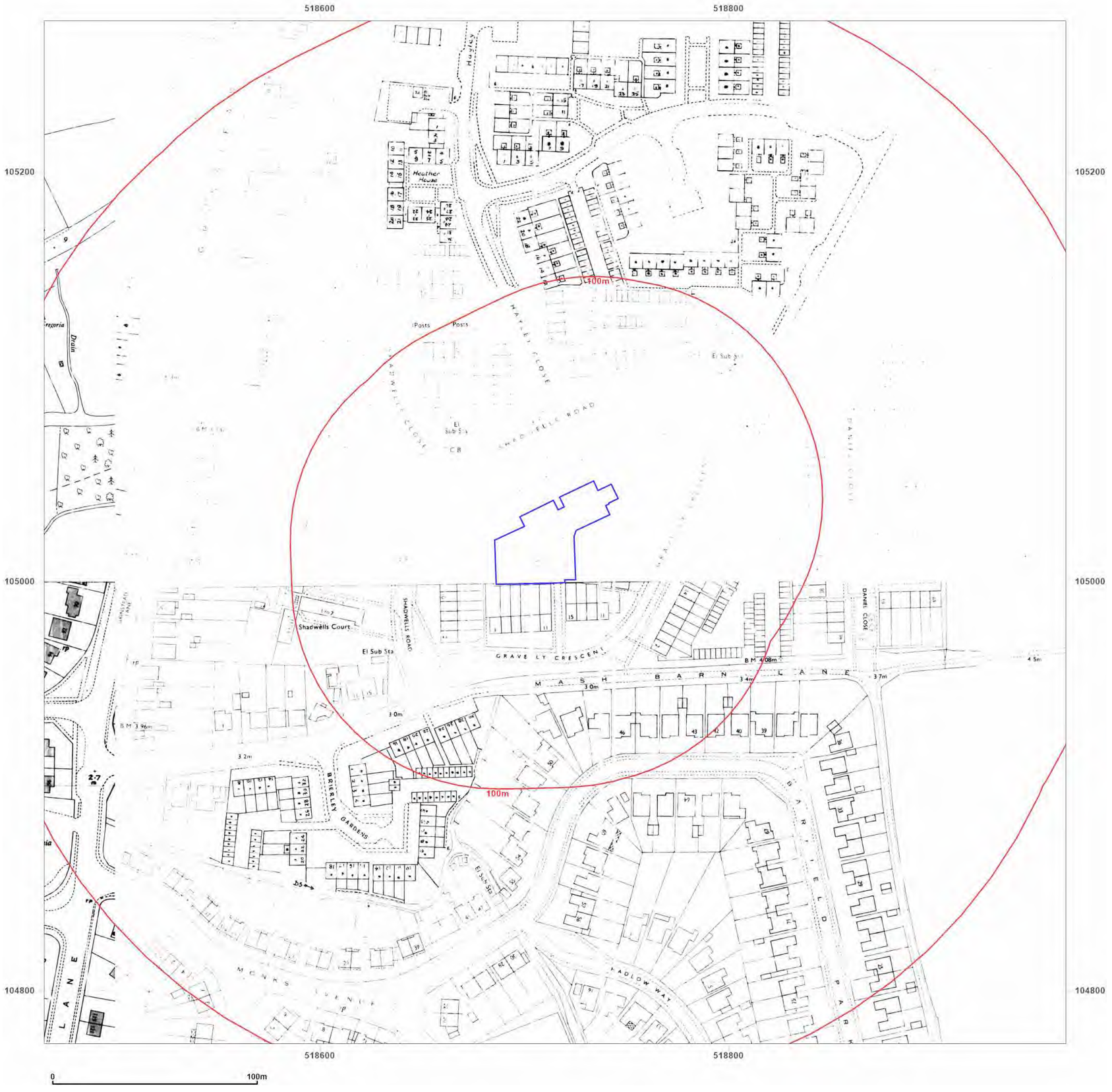
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LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1974-1976**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1977**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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Revised N/A
Edition N/A
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1974-1979**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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

Surveyed 1979
Revised 1979
Edition N/A
Copyright 1979
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
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**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1980**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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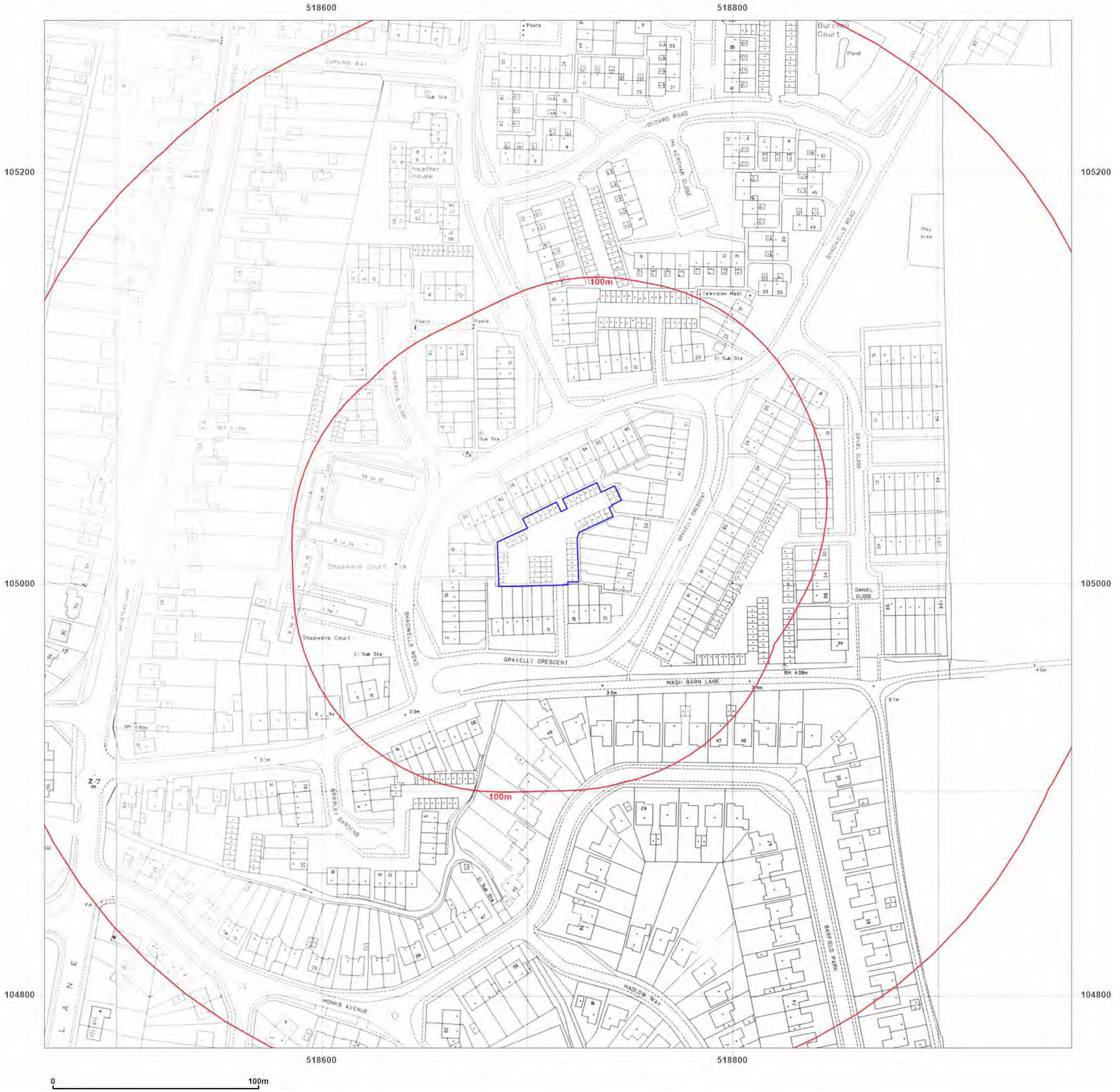
Surveyed 1951
Revised 1979
Edition N/A
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GRAVELLY CRESCENT,
LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

**Map Name:** National Grid

**Map date:** **1992-1994**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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GRAVELLY CRESCENT,
LANCING, BN15 9EG

**Client Ref:** P15501
**Report Ref:** GS-8486276
**Grid Ref:** 518715, 105024

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

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Production date: 01 February 2022

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