

McCARTHY & STONE RETIREMENT LIFESTYLES LIMITED

GRFC BOWLS CLUB, CHURCH WALK, GRAVESEND, KENT, DA12 2TU

DESK STUDY APPRAISAL

The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Tel: 01926 815678
Fax: 01926 815222

mail@crossfield-consulting.co.uk

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www.crossfield-consulting.co.uk

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1. INTRODUCTION

A residential development is proposed at GRFC Bowls Club, Church Walk, Gravesend, Kent. The site is currently occupied by a bowls club, comprising a bowling green and a pavilion, and part of a sports ground. The proposed development comprises a three- to four storey block of apartments, together with car parking, and managed landscaping areas. Residents of the development will be of retirement age.

Crossfield Consulting Limited has been commissioned to undertake a Desk Study Appraisal of the site to identify possible constraints to the development relating to the ground conditions as indicated at the site.

The desk study includes a review of historical maps of the site and surrounding area and an appraisal of the published geological data and information from regulatory authorities. The report presents the results of the study, together with an assessment of the likely ground conditions, including a Preliminary Risk Assessment (PRA) of potential contamination (with a Conceptual Site Model), Mining Risk Assessment and an initial appraisal of foundation solutions.

The report includes information and assessment compatible with a Preliminary Investigation, as defined in BS 10175:2011+A2:2017, and a Desk Study, as defined in BS 5930:2015+A1:2020, except that the site reconnaissance element of the works is based on available site photographs and aerial images.

The report has been prepared under the direction and supervision of a Chartered Geologist/Registered Specialist in Land Condition (SiLC).

It is considered that the report complies with the National Planning Policy Framework and is in general accordance with guidance published by the Environment Agency, and NHBC.

2. THE SITE

2.1 Location

The site is located adjacent to Church Walk, approximately 0.9 km to southeast of Gravesend town centre, as shown on Figure 1. The National Grid Reference for the site is TQ 6572 7378. The site is bounded by Milton Road to the north, Church Walk to the east, a road identified as Ellerslie on the western boundary and sports ground playing fields on the southern boundary, as shown on Figure 2.

2.2 Site Description

The following description is based on a topographical survey, presented as Figure 3, together with online maps and photographs in the public domain. A site reconnaissance has not been undertaken by staff from Crossfield Consulting at this stage.

The overall site is irregular in shape, with an approximate area of 0.65 ha. The topographical survey indicates that the site slopes down gently to the northeast, with a fall of approximately 4 m from the southwestern corner to the northeastern corner, the majority of the change of elevation occurs in the western part of the site.

The majority of the site is occupied by Gravesend Rugby Football Club (GRFC) Bowls Club, which comprises a bowling green with a single-storey, wooden pavilion present to the west of the green. The club is separated from the remainder of the site by a hedge and wooden fence. The rest of the site comprises open grassed

area. Trees are present along the northern site boundary. It is understood that a main sewer runs beneath the western half of the site.

2.3 Site History

The site history has been researched with reference to old editions of the County Series and National Grid Ordnance Survey Plans obtained from Emapsite. Extracts from a selection of these plans are presented in Appendix I. The plans indicate that the following development has taken place on and around the site.

The County Series Plan, dated 1866, identifies that the site was part of undeveloped land to the south of Milton Road. A road of buildings is shown immediately to the northeast of the site and Milton Road which included a school and a church with a graveyard. A lane, now known as Church Walk, is shown to the east beyond which a rectory and associated landscaped grounds was present. The western and southern sides of the site are surrounded by undeveloped land.

By 1897, Milton Road had been realigned to its current orientation and a school had been constructed to the north and some development, including a house and 'Drill Hall' had been built to the west.

The 1932 map identifies that the bowling green and associated pavilion for the bowls club had been built by this time. The undeveloped land to the south of the site was now shown as a sports ground with an access driveway from Milton Road, present to the west.

The 1974-1978 map edition identifies that the east boundary of the site bisects some allotment gardens.

No changes within the site area are identified on the 1980-1983 map edition. With regards to the surrounding area, the rectory to the east of the site was relocated approximately 50 m south and the original building is identified as a 'meletune'. The road identified as Ellerslie on the western boundary and associated residential development to the west had been constructed by this time.

By 1993, the school immediately north of the site had been redeveloped as a garage (car dealership).

No significant changes to the site or the surrounding area appear to have occurred since the 1990s.

3. PUBLISHED GEOLOGY

Geological map data, published by the British Geological Survey (BGS), online and in print, on the 1:50,000 scale Sheet No. 271 (Dartford), and in the related Memoirs indicate that the site is underlain by superficial Head Deposits comprising clay, silt, sand, and gravel. Underlying the superficial deposits, the solid strata beneath the site are indicated to comprise chalk associated with the Lewes Nodular Chalk Formation, Seaford Chalk Formation, and the Newhaven Chalk Formation.

4. DESK STUDY ENQUIRIES

Enquiries were made to the Groundsure Environmental and Geological Databases, British Geological Survey regarding the site and surrounding area. Information obtained from these enquiries is presented in Appendix II and summarised below.

The Groundsure Environmental Database indicates that there are no active or historical landfills recorded within 250 m of the site.

It is indicated that there are three records of industrial land uses within 100 m of the site. The closest relates to the car dealership present 34 m north of the site. The other two records relate to electricity sub stations present 79 m north and 85 m south of the site.

Neither the site nor land in close proximity is designated as contaminated land under Part 2a of the Environmental Protection Act 1990. There are no active discharge consents listed with 250 m of the site. A pollution incident is listed as taking place 28 m to the west of the site. The incident, which occurred in 2003, related to a release of petrol which had no environmental impact.

Hydrogeological information indicates that the superficial deposits underlying the site are classified as 'Secondary Undifferentiated' aquifer strata. The bedrock strata underlying the site are classified as 'Principal' strata. The site is not located within a groundwater Source Protection Zone.

There are no licensed groundwater abstraction records within 500 m of the site. There are no surface water features within 250 m of the site.

The site does not lie within an area with an environmental designation.

Natural ground subsidence geohazards, as classified by the BGS, indicates that there is a 'moderate' hazard rating for ground dissolution of soluble rocks over the southeastern part of the site and a 'very low' hazard rating over the remainder, and a 'very low' or 'negligible' hazard rating for shrink swell clays, compressible deposits, running sands, collapsible deposits and landslides beneath the site.

There are no records of underground workings or mining or mining cavities within 1 km of the site. There are no surface ground workings recorded within 250 m and there are no solution features or natural cavities recorded within 1 km of the site.

BRE BR211 (2015) and the Groundsure report (based on BGS/Public Health England data) indicate that the site is not within an area where radon precautions are required in new buildings.

Borehole records from the BGS show that two boreholes were sunk immediately north of the site. The records indicate that ground conditions comprise approximately 2.0 m to 3.5 m of superficial Head Deposits, consisting of silty clay/clayey silt/silty sand overlying chalk. Groundwater was present at 4.8 m depth.

5. ASSESSMENT OF GROUND CONDITIONS

5.1 Ground Conditions

Buried foundations associated with the current pavilion will be present beneath the site together with any associated buried drains and services. A mains sewer is also understood to run beneath the site.

Ground conditions beneath the site are expected to include a thickness of Made Ground associated with the construction of the Bowls Club. Below the Made Ground and topsoil in undeveloped areas, superficial head deposits of clay, silt, sand, and gravel overlying chalk is anticipated. Shallow groundwater, less than 3 m depth, is not anticipated.

5.2 Preliminary Environmental Risk Assessment

Made Ground materials may have been imported to form a development platform for the bowls club, such materials may have included include demolition and ashy waste, such that the potential presence of toxic and

phytotoxic metals, polyaromatic hydrocarbons (PAHs) and asbestos containing materials cannot be entirely discounted.

With respect to potential sources of off-site contamination, the surrounding land comprises a sports grounds and typically residential properties. A car dealership/garage is located 34 m to the north of the site on the opposite side of Milton Road. Based on the available information, it appears that the car dealership/garage was constructed in the late 1980s/early 1990s and has not been used as a fuel filling station. Hence it is considered that the potential for a significant contaminant source is very low. Based on the indicated topography, the garage is at a lower level than the site such that any potential migration pathways associated with the garage should be away from the site.

There are no recorded active or historical landfills within influencing distance of the site. The site is not located within an area requiring radon protection measures. Therefore, the available information has identified no potential sources of ground gases.

The available information has been used to produce a preliminary Conceptual Site Model for this site, in accordance with CIRIA C552 (2001), BS 10175:2011+A2:2017, BS EN ISO 21365:2020 and Environment Agency Land Contamination Risk Management (LCRM) (2020), and this is presented in Table 1.

With regard to the health of end users, the proposed building and areas of hardstanding should provide an effective barrier between the existing ground and end users. However, within the proposed managed soft landscaping areas, potential contaminants, if present, could be returned to the surface by the activity of soil organisms and root mixing. Therefore, it may be necessary to place a suitable thickness topsoil/subsoil capping layer in such areas to provide an effective barrier for the protection of human health. The requirement for any capping layer, or confirmation of capping layer thickness, is subject to review following completion of a ground investigation. Alternatively, localised potentially contaminated materials may be removed from areas of proposed soft landscaping.

Groundworkers may be exposed to the potential contaminants identified above during construction works. Whilst this is a relatively short-term exposure, it is recommended that appropriate personal protective equipment be provided and worn at all times. Soils should be kept damp during groundworks to mitigate aerial migration/dust emissions to neighbouring properties in compliance with standard good practice.

Based on the guidance published by UKWIR (2010), the site has not been associated with historical fuel and/or chemical storage. Therefore, the site should not be considered as 'brownfield', with respect to the protection of pipes for potable water. Based on the guidance provided by UKWIR, conventional plastic materials should be appropriate for potable water supply pipes without any requirements for specific testing subject to the requirements of the local water supply company.

Based on the available information, it is considered that there should be no requirement for ground gas protection measures within the proposed new development at the site as no significant gas source has been identified.

5.3 Assessment of Ground Stability

The site is not within an area of recorded underground mining or other such mineral extraction, nor are there any quarries recorded at, or in close proximity to, the site. Therefore, it is unlikely that the proposed development would be constrained by ground stability issues associated with mining or quarrying.

Available information suggests that the ground conditions beneath the site comprise chalk strata. Chalk strata can be dissolved by water and solution features can fill with loose superficial deposits. Such deposits can be

susceptible to collapse settlement (if loads are applied) or to inundation settlement (if large volumes of water are introduced to the superficial materials). Furthermore, based on the geological database information, part of the site has been classified as having a 'moderate' hazard rating for ground dissolution of soluble rocks. It would, therefore, be prudent, during investigation works, to remain vigilant to the presence of potentially anomalous ground conditions that could be indicative of mining or solution features. If anomalous ground conditions are identified during construction works, it is recommended that the advice of a geotechnical engineer be obtained to assess the particular ground conditions. In such situations, localised zones of poor ground support may, on occasion, be mitigated by the inclusion of a grillage of ground beams in the building substructure that can span across areas of reduced support. It should be appreciated that any consideration of soakaway drainage will require an assessment of ground support risks.

5.4 Preliminary Geotechnical Assessment

It is understood that the proposed development comprises a three- to four storey apartment block. A proposed development plan is presented as Figure 4.

Based on the information currently available, the ground conditions are indicated to comprise medium to high strength clays and silts overlying chalk which may be suitable to support the proposed development on strip/trench fill and pad footings. However, until a suitable ground investigation has been completed across the site to demonstrate the competence of the near surface materials, it may be prudent to include an allowance be made for use of a deeper foundation solution, such as piles.

Due to the anticipated volume change potential clay/silt horizons at shallow depth, suitable foundation precautions within the influence zone of existing trees are likely to be required and a suspended ground floor slab with a suitable underfloor void is recommended.

5.5 Soakaway Drainage

Based on the available information, the shallow Head Deposits are likely to comprise low permeability clays and silts and the underlying chalk strata are likely to include a weathered upper horizon with a significant fines content which may preclude conventional shallow soakaway drainage. BGS borehole records from immediately north of the site indicate groundwater is present at approximately 5 m depth, such that a deep borehole soakaway drainage solution is also unlikely to be feasible for the development. At this stage, an alternative drainage solution is recommended for the proposed development.

6. RECOMMENDATIONS FOR GROUND INVESTIGATIONS

It is recommended that a ground investigation be undertaken at the site to obtain appropriate data to enable a more detailed environmental risk assessment to be undertaken and appropriate foundation solutions to be confirmed and data provided for design.

It is recommended that an initial phase of ground investigation utilising dynamic sampling be undertaken, as this will cause minimal disturbance to the existing property and exploratory holes may be readily reinstated. The investigation should extend through Made Ground to identify competent natural strata. Samples should be recovered for geotechnical and, where appropriate, analytical laboratory testing.

Subject to the findings of the initial phase of investigation, a supplementary phase of ground investigation may be necessary to confirm the ground conditions across the site when access is available. The scope of works will be dependent on the findings of the first phase of works and could include trial pits and/or boreholes as necessary to confirm ground conditions and obtain additional data for design purposes.

7. SUMMARY

A residential development is proposed at GRFC Bowls Club, Church Walk, Gravesend, Kent. The site is currently occupied by a bowls club, comprising a bowling green and a pavilion, and part of a sports ground. The proposed development comprises a three- to four storey block of apartments, together with car parking, and managed landscaping areas. Residents of the development will be of retirement age.

Ground conditions beneath the site are expected to include a thickness of Made Ground associated with the construction of the Bowls Club. Below the Made Ground and topsoil in undeveloped areas, superficial head deposits of clay, silt, sand, and gravel overlying chalk is anticipated. Shallow groundwater, less than 3 m depth, is not anticipated.

Based on the available information, the site does not appear to be associated with a significant source of potential contaminants. In the unlikely event that impacted soils are encountered beneath the site, to protect against the risks to end users, a barrier, in the form of a topsoil/subsoil capping layer in proposed landscaping areas is likely to be required. The ground conditions at the site are unlikely to be associated with a valid contaminant linkage in relation to Controlled Waters and the proposed development should not be constrained by issues relating to ground gases.

It may be possible to support the proposed development on strip or trench-fill footings, placed within the Head Deposits or chalk strata. Foundations should extend through Made Ground and any low strength strata. However, if the expected structural loads are high and/or the strength of shallow strata are lower than expected, it may then be necessary to consider a piled foundation. Allowance should be made for suspended floor slabs for the development.

Soakaway drainage may not be feasible due to the likely high fines content of the near-surface natural deposits. It is recommended that an alternative drainage solution be determined for the proposed development.

It is recommended that an investigation be carried out using dynamic sampling techniques to assess the potential pollutant linkages that have been identified and to confirm the most appropriate foundation solution. The investigation should extend through Made Ground to identify natural strata. Samples should be collected for geotechnical and analytical testing. Depending on the findings of the investigation and the confirmed ground-related development solutions, a supplementary ground investigation may be needed to provide additional data.

REFERENCES

BRE (2004) *BR465 – Cover Systems for Land Regeneration* Building Research Establishment

BRE (2016) *DG365 – Soakaway Design* IHS

BSI (2020) *BS EN ISO 21365:2020 Soil Quality – Conceptual Site Models for Potentially Contaminated Sites* British Standards Institution

BSI (2020) *BS 5930:2015+A1:2020 Code of Practice for Ground Investigations* British Standards Institution

BSI (2017) *BS 10175:2011+A2:2017 Code of Practice for Investigation of Potentially Contaminated Sites* British Standards Institution

CIRIA (2001) *CIRIA C552 – Contaminated Land Risk Assessment: A Guide to Good Practice* Construction Industry Research Association

DoE (1990) *The Environmental Protection Act* Department of The Environment HMSO

Environment Agency (October 2020, Updated April 2021) *Land Contamination Risk Management (LCRM)* EA

Environment Agency (2010) *Guiding Principles for Land Contamination – GPLC1 to 3* EA

Ministry of Housing, Communities and Local Government (2019) *National Planning Policy Framework*

NHBC and Environment Agency (2008) *Guidance for the Safe Development of Housing on Land Affected by Contamination R&D Publication 66: 2008*

NHBC (2022) *Standards* National House Building Council

UKWIR (2010) *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* Report Ref. No. 10/WM/03/21 UK Water Industry Research

GENERAL NOTES

1. The report is limited to the site boundaries and is specific to the development proposals as identified by the Client (or Client's advisor) and confirmed within this report. The report should not be used in a different context. Where the report is identified as a site appraisal, further geoenvironmental assessment, and detailed investigations, will be required prior to finalisation of ground related assessment and designs. Other reports may recommend additional investigation or other works that would be considered essential prior to the preparation of final assessments and associated designs.
2. This report has been prepared by Crossfield Consulting Limited with all reasonable skill, care and diligence within the terms of the Appointment/Proposal Terms and Conditions (as applicable) and with the resources agreed with the Client. Responsibility for any matters outside the agreed scope is not accepted.
3. Where any data supplied by the Client or by other external sources, including previous site investigation data, has been used it has been assumed that the information is correct unless otherwise stated. No responsibility can be accepted by Crossfield Consulting Limited for inaccuracies within the data supplied by others.
4. Any borehole data from the British Geological Survey sources are included on the following basis: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
5. Any assessments made in this report are based on the ground conditions indicated by the factual records included and/or referenced in the report, namely, trial pits and/or boreholes, together with the results of any field or laboratory testing undertaken and, where appropriate, other relevant site data/desk study information which may have been obtained for the site. Variations in ground conditions may occur between exploratory hole locations and there may be special conditions appertaining to the site that have not been revealed by the investigation and that have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.
6. Exploratory hole locations provided in the report are generally established by tape measurement (or similar measurement) from existing features or boundaries. Ground levels stated in the report are based on site survey plans as provided. Hole locations are not accurately surveyed and ground levels at these locations are not obtained unless specifically included in the agreed scope of services.
7. Unless stated otherwise, no consultations with regulatory authorities, funders or other third parties have been carried out; hence, definitive assurance that such third parties will accept the findings of this report cannot be provided.
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10. The Client cannot place reliance on the report until full payment has been made for the report and all associated works.
11. New information, improved methods, changes in published guidance, codes of practice, policies and legislation can occur at any time and may necessitate an alteration to the report in whole, or in part, after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Crossfield Consulting Limited for re-assessment and, if necessary, re-appraisal.

Gravesham Borough Council

TABLES

TABLE 1

CONCEPTUAL SITE MODEL

	Potential Contaminant Source	Potential Contaminants	Potential Pathway	Receptors and Assessed Contaminant Linkage
On-Site Solid	Made Ground	Toxic and phytotoxic metals PAHs Asbestos	Dermal and oral exposure pathways (including air-borne migration) are present during construction phase but will generally not be present following development due to building and hardstanding effective barriers. If limited landscaping areas are proposed, then after development such areas represent possible dust exposure pathways. Release into Liquid Phase Metal solubility generally low at typical soil temperature and pH. Polyaromatic hydrocarbons are typically of low solubility. Therefore, limited potential for release into liquid/aqueous phase. Release into Vapour Phase n/a – no source Release into Vapour Phase n/a – no source	Human Health <i>End Users:</i> Possible contaminant linkage <i>Groundworkers:</i> Possible contaminant linkage <i>Neighbouring Properties/General Public:</i> Possible contaminant linkage Buried Structures & Services <i>Buried concrete:</i> No contaminant linkage <i>Potable water pipes:</i> No contaminant linkage <i>Other buried structures:</i> No contaminant linkage Landscape and Garden Areas: No contaminant linkage
Off-Site Solid	No evidence of potential source	n/a		
On-Site Liquid	No evidence of potential source	n/a		
Off-Site Liquid	No evidence of potential source	n/a		
On Site Liquid	No evidence of potential source	n/a	n/a – no source	Controlled Waters <i>Groundwater:</i> No contaminant linkage Secondary undifferentiated and Secondary A superficial aquifer strata and Principal and Secondary A bedrock aquifer strata, no groundwater source protection zone: <i>Surface Water:</i> No contaminant linkage
Ground Gases	Graveyard The site is not within a radon affected area	n/a	n/a – no source	Human Health <i>End Users:</i> No contaminant linkage

NOTES

- The above conceptual model is based on CIRIA C552 (2001) and BS 10175:2011+A2:2017, BS EN ISO 21365:2020 and Environment Agency Land Contamination Risk Management (LCRM) (2020).

Gravesham Borough Council

FIGURES

FIGURE 1



SITE LOCATION PLAN

Scale 1: 50,000

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FIGURE 2

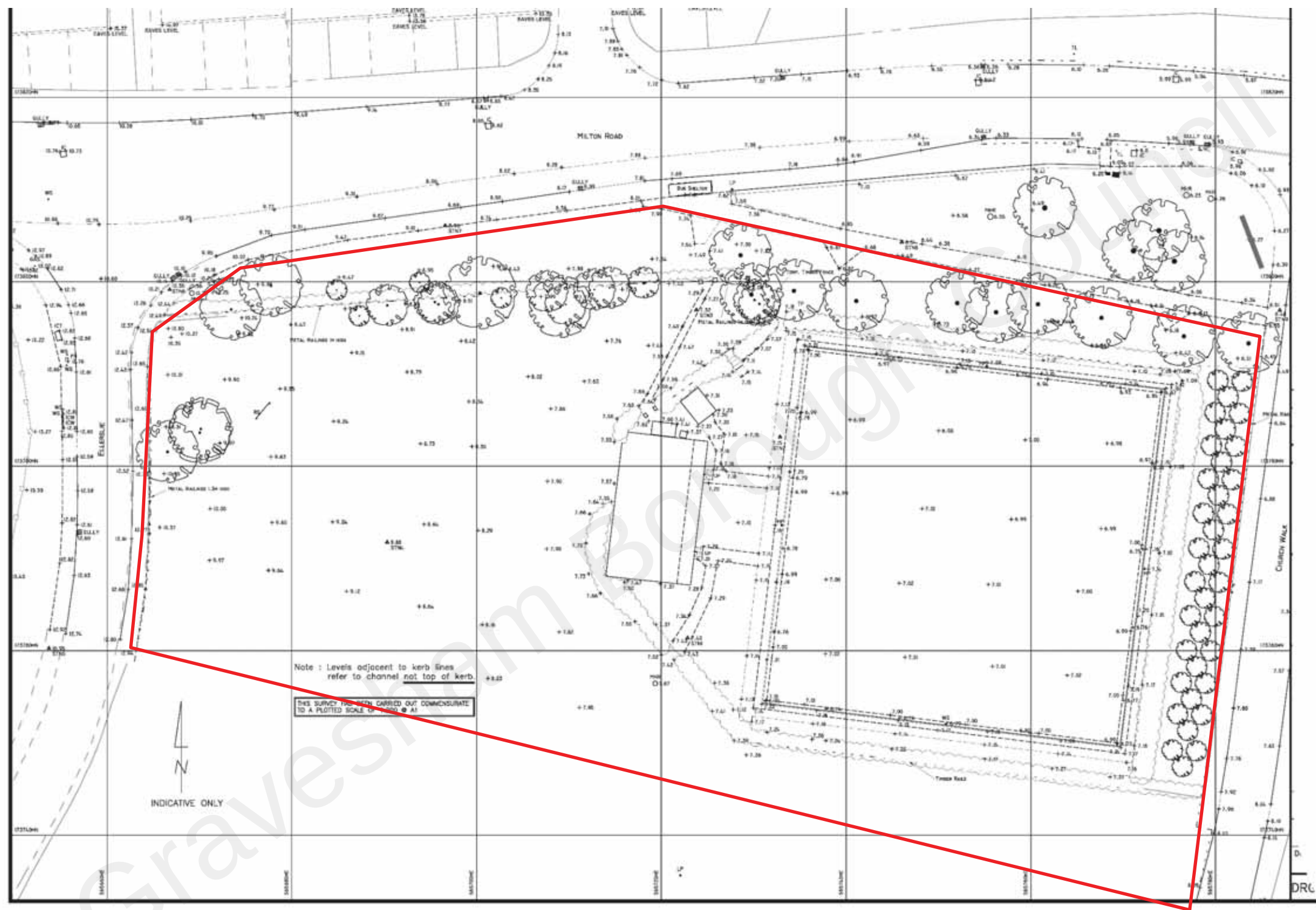


SITE PLAN

Scale 1: 1,250

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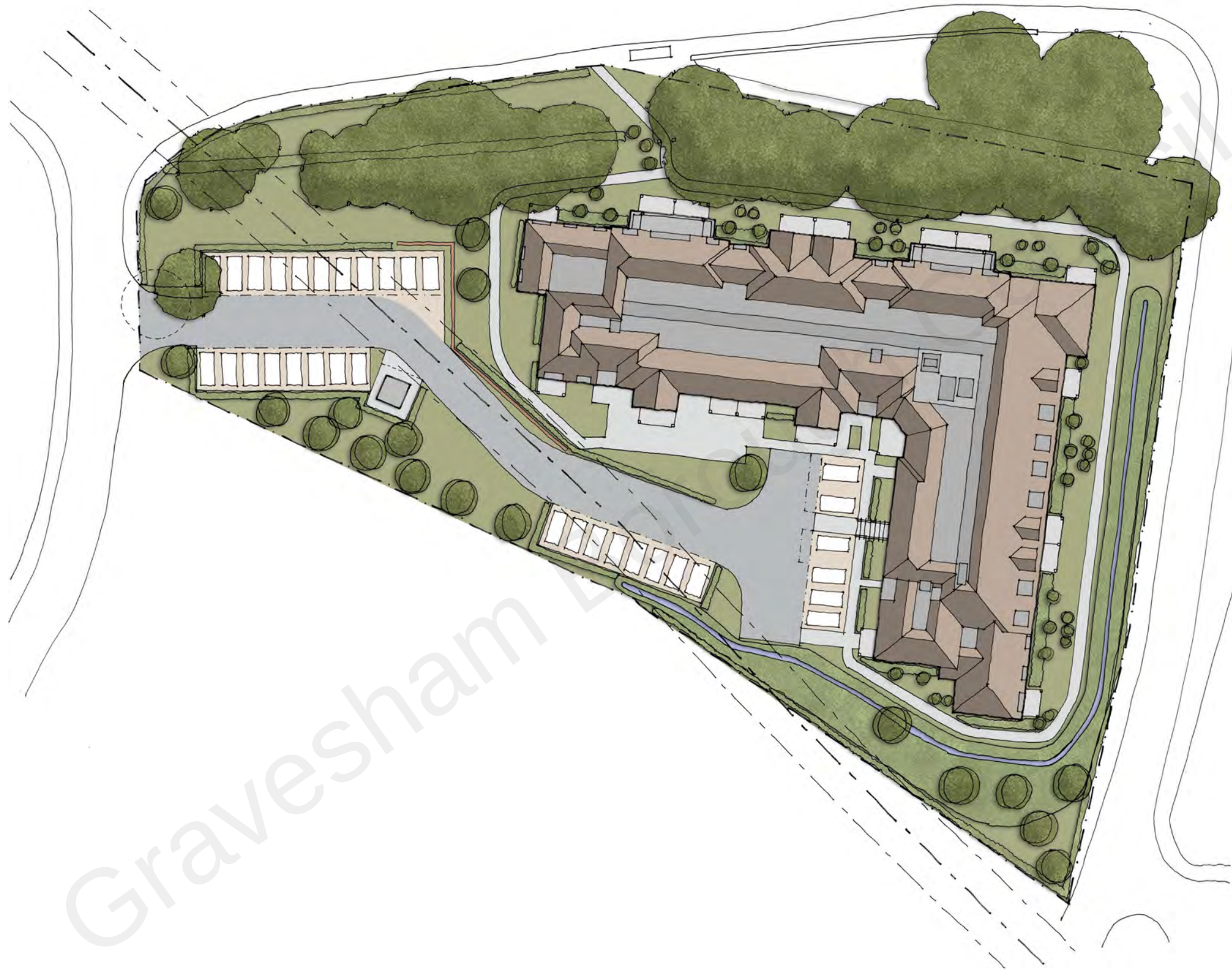
FIGURE 3



TOPOGRAPHICAL SURVEY
Scale 1: 500

Reproduced from Prospaplan Limited Drawing No. PP/4081/GRAVESEND/F1, dated December 2021

FIGURE 4



PROPOSED DEVELOPMENT PLAN
Scale 1: 500

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APPENDIX I

APPENDIX I – HISTORICAL INFORMATION

GroundSure MapInsight

Historical Ordnance Survey County Series and National Grid maps, as part of Groundsure's MapInsight package, have been obtained from Emapsite. Only map extracts that indicate relevant changes to the site and surrounding area are presented in this Appendix and discussed further in Section 2.3 of the report. A complete list of the maps received in the MapInsight package is given below in Table I-1. A full copy of the MapInsight package can be provided on request.

TABLE I-1

Large Scale Maps 25" County Series/1:2500 National Grid Series/1:1250 LandLine	Small Scale Maps 6" County Series/1:10,000 National Grid Series
1864	1863-1865
1866	1888
1897	1895
1909	1895-1899
1932	1907
1953	1916
1954	1923
1955-1958	1931-1932
1974-1978	1938
1980-1983	1946
1983-1986	1948
1992-1993	1955
1993	1966-1967
1994	1971-1973
2003	1977-1982
	2001
	2010
	2022

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Site Details:

Gravesend RFC Bowls
Club, Church
Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: County Series

Map date: 1866

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1866
Revised 1866
Edition N/A
Copyright N/A
Levelled N/A



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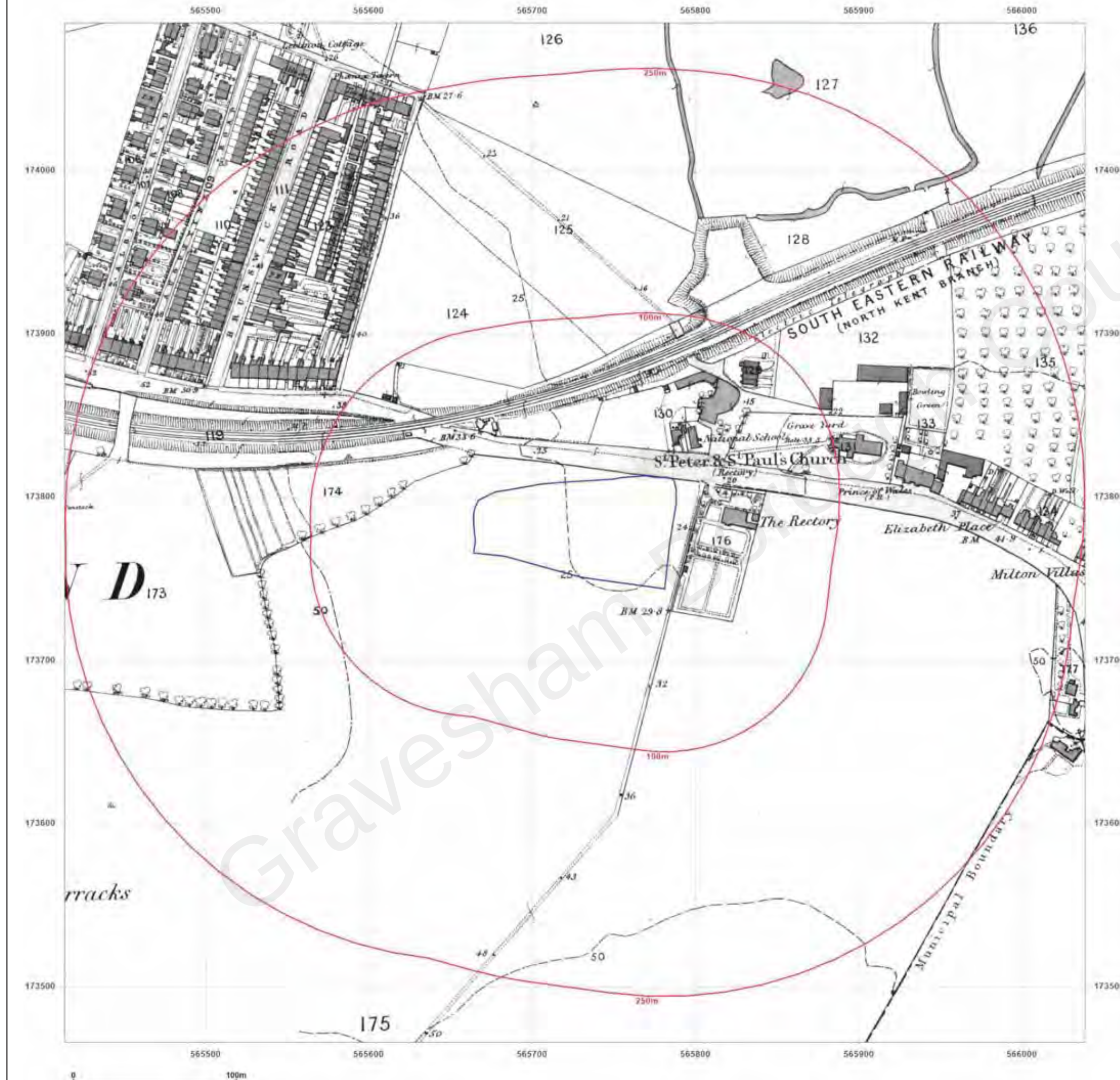


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Map legend available at:
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Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: County Series

Map date: 1897

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1897
Revised 1897
Edition N/A
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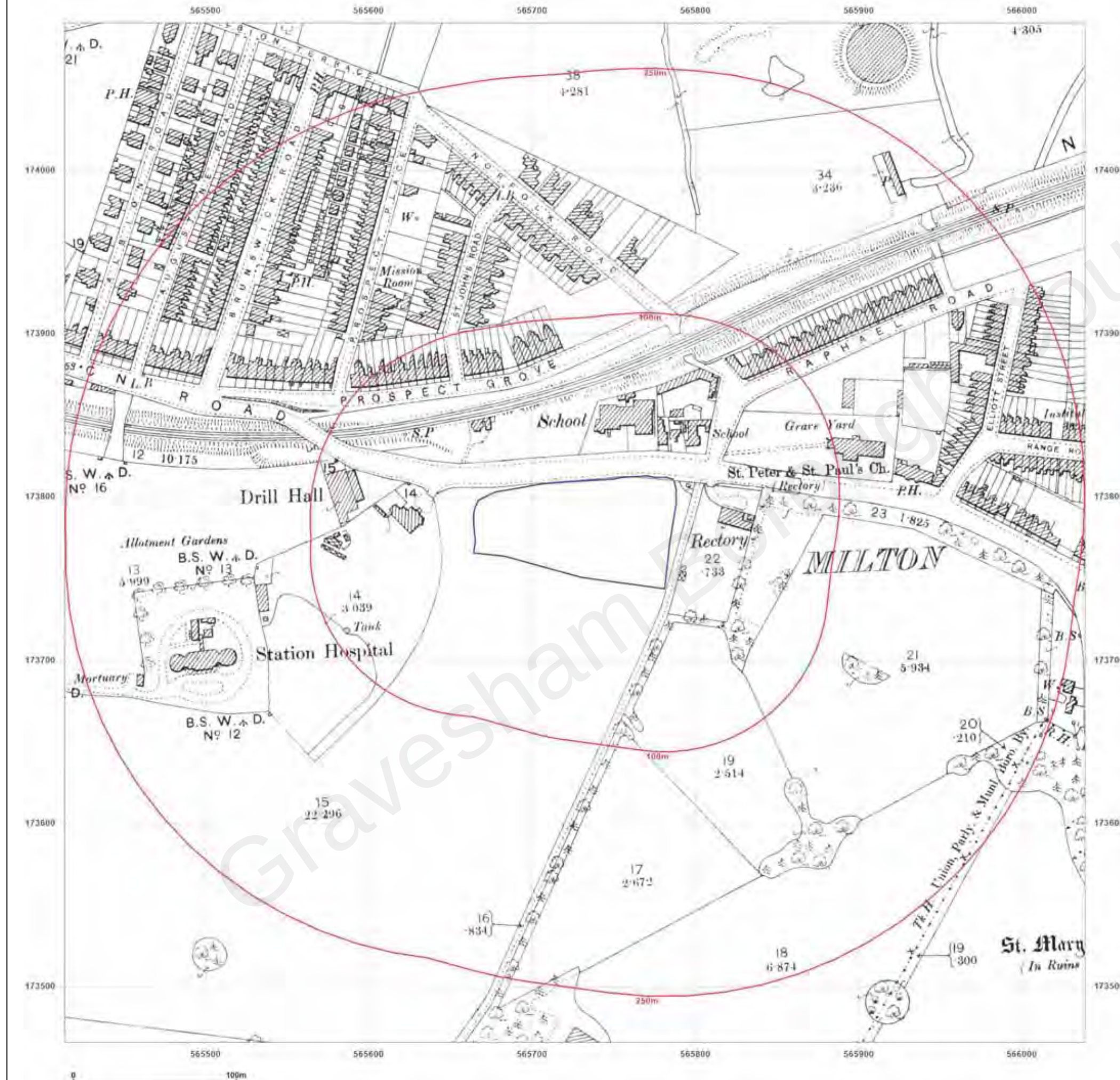


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Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: County Series

Map date: 1909

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1909
Revised 1909
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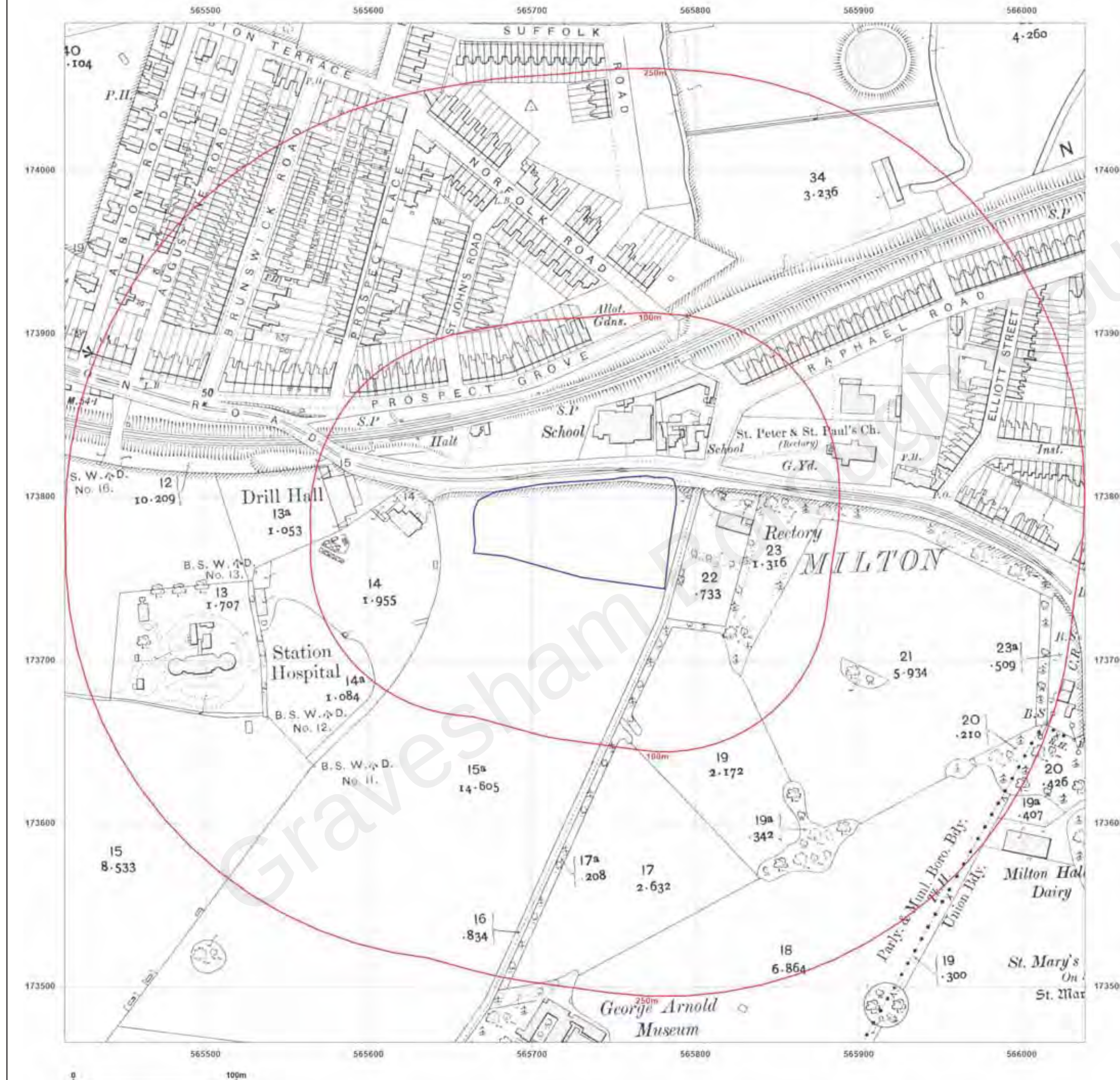


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Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: County Series

Map date: 1932

Scale: 1:2,500

Printed at: 1:2,500



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Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: National Grid

Map date: 1953

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1953
Revised 1953
Edition N/A
Copyright N/A
Levelled 1952

Surveyed 1953
Revised 1953
Edition N/A
Copyright N/A
Levelled 1952

Surveyed 1953
Revised 1953
Edition N/A
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Levelled 1952

Surveyed 1953
Revised 1953
Edition N/A
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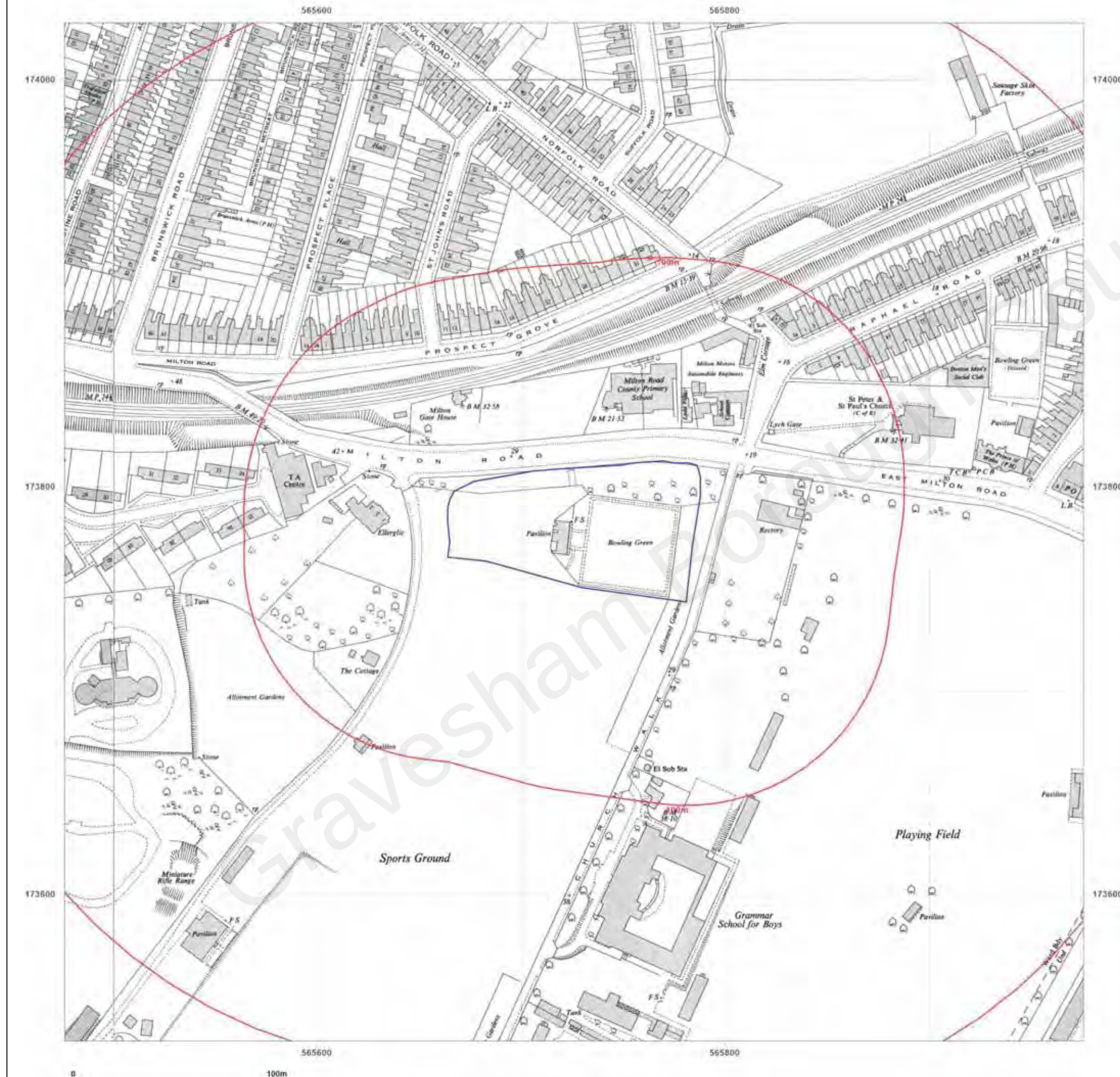


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Site Details:

Gravesend RFC Bowls
Club, Church
Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: National Grid

Map date: 1974-1978

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1953
Revised 1975
Edition N/A
Copyright 1976
Levelled 1952

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

Surveyed N/A
Revised N/A
Edition N/A
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Surveyed 1953
Revised 1975
Edition N/A
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Site Details:

Gravesend RFC Bowls
Club, Church
Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: National Grid

Map date: 1980-1983

Scale: 1:1,250

Printed at: 1:2,000



Surveyed N/A
Revised N/A
Edition N/A
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Surveyed 1953
Revised 1983
Edition N/A
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Surveyed 1980
Revised 1983
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Site Details:

Gravesend RFC Bowls
Club, Church
Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: National Grid

Map date: 1983-1986

Scale: 1:1,250

Printed at: 1:2,000



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Revised 1983
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Site Details:

Gravesend RFC Bowls
Club, Church
Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: National Grid

Map date: 1992-1993

Scale: 1:1,250

Printed at: 1:2,000



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Revised 1992
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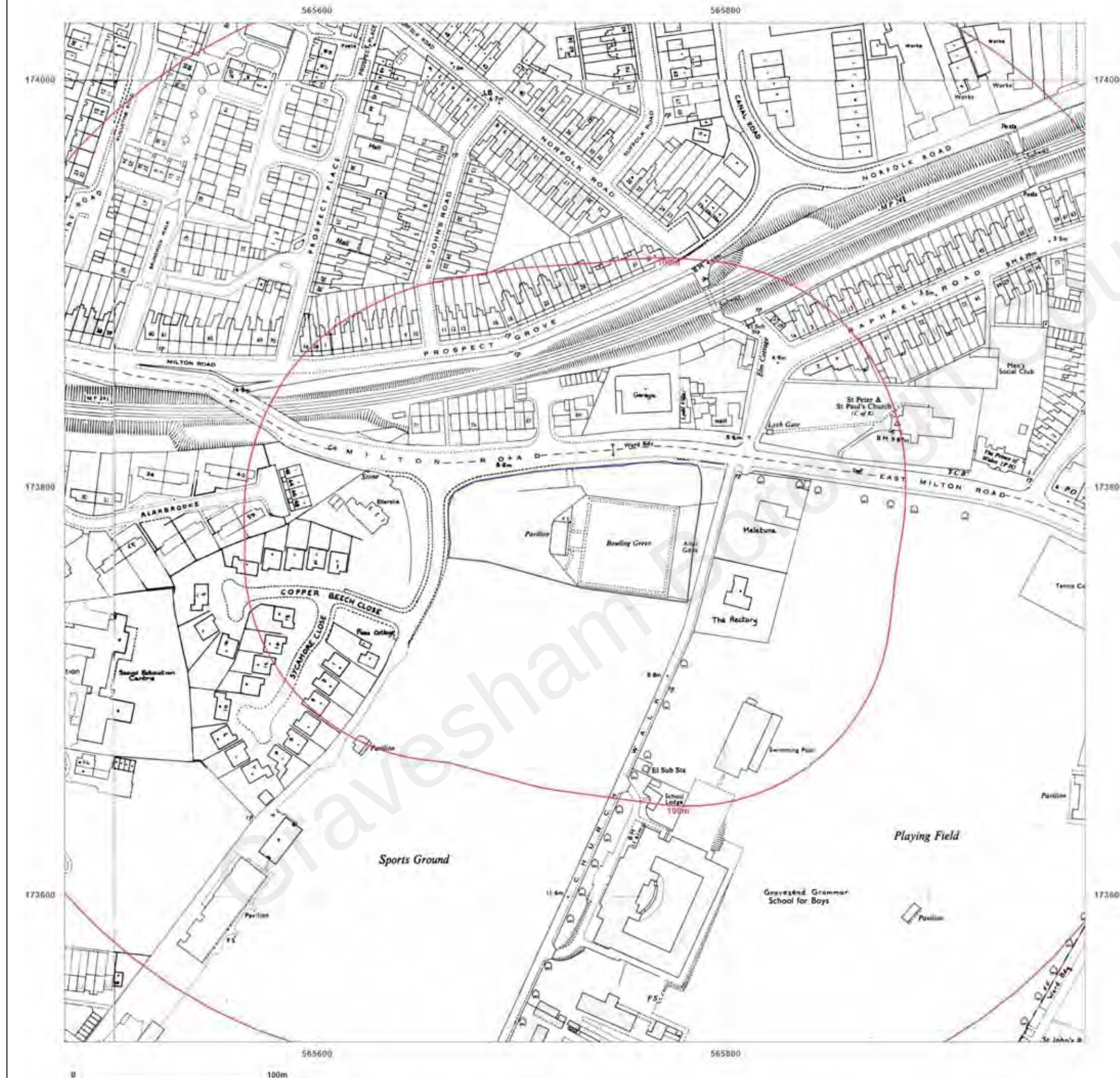


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Site Details:

Gravesend RFC Bowls
Club, Church
Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: National Grid

Map date: 1994

Scale: 1:1,250

Printed at: 1:2,000



Surveyed N/A
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Site Details:

Gravesend RFC Bowls
Club, Church
Walk, Gravesend, Kent, DA12 2TL

Client Ref: EMS_760478_984770
Report Ref: EMS-760478_984770
Grid Ref: 565726, 173778

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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Production date: 17 February 2022

Map legend available at:
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APPENDIX II

APPENDIX II – DESK STUDY INFORMATION

Groundsure Enviro+Geo Insight Databases

An Enviro+Geo Insight Report has been obtained from Groundsure for the site and surrounding area. The databases compile information from a variety of sources and includes entries that cover Environment Agency permits, waste sites, hazardous substances, geological data, industrial landuse, groundwater vulnerability, source protection zones and floodplains.

Also included is reference to databases that cover geological data, including information regarding mining/mineral extraction, natural cavities, landslips and other geohazards.

A report is included in this Appendix for a search radius of up to 1 km around the site and that report includes a summary table of the search results. Detailed information contained in the report has been included only if it is relevant to the geotechnical and environmental assessment. All other pages have been omitted. A full copy of the GroundSure Report can be provided on request. A higher resolution copy of the report can also be provided on request.

British Geological Survey

Records of Wells and Exploratory Holes close to the site, held by the British Geological Survey National Geological Records Centre, are presented in this Appendix. The locations of these holes are identified within the Groundsure Report provided in this Appendix. The records are reproduced under the Open Government Licence, available for viewing at <http://www.nationalarchives.gov.uk/doc/open-government-licence>.

Gravesend RFC Bowls Club, Church Walk, Gravesend, Kent, DA12 2TL

Order Details

Date: 17/02/2022
Your ref: EMS_760478_984771
Our Ref: EMS-760478_984771
Client: emapsite

Site Details

Location: 565731 173781
Area: 0.66 ha
Authority: [Gravesend Borough Council](#)



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Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.13

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	<u>Historical industrial land uses</u>	0	5	60	148	-
22	1.2	<u>Historical tanks</u>	0	0	17	57	-
25	1.3	<u>Historical energy features</u>	0	0	15	34	-
27	1.4	Historical petrol stations	0	0	0	0	-
28	1.5	<u>Historical garages</u>	0	2	1	6	-
28	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
29	2.1	<u>Historical industrial land uses</u>	0	5	86	207	-
40	2.2	<u>Historical tanks</u>	0	0	24	96	-
45	2.3	<u>Historical energy features</u>	0	0	28	60	-
48	2.4	Historical petrol stations	0	0	0	0	-
48	2.5	<u>Historical garages</u>	0	3	2	13	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
50	3.1	Active or recent landfill	0	0	0	0	-
50	3.2	Historical landfill (BGS records)	0	0	0	0	-
51	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
51	3.4	<u>Historical landfill (EA/NRW records)</u>	0	0	0	2	-
51	3.5	<u>Historical waste sites</u>	0	0	1	0	-
52	3.6	Licensed waste sites	0	0	0	0	-
52	3.7	<u>Waste exemptions</u>	0	0	0	4	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
53	4.1	<u>Recent industrial land uses</u>	0	1	16	-	-
55	4.2	Current or recent petrol stations	0	0	0	0	-
55	4.3	Electricity cables	0	0	0	0	-
55	4.4	Gas pipelines	0	0	0	0	-
55	4.5	Sites determined as Contaminated Land	0	0	0	0	-



55	4.6	<u>Control of Major Accident Hazards (COMAH)</u>	0	0	1	0	-
56	4.7	Regulated explosive sites	0	0	0	0	-
56	4.8	<u>Hazardous substance storage/usage</u>	0	0	0	2	-
56	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
57	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
57	4.11	<u>Licensed pollutant release (Part A(2)/B)</u>	0	0	0	2	-
57	4.12	<u>Radioactive Substance Authorisations</u>	0	0	0	2	-
58	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	6	0	-
59	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
59	4.15	Pollutant release to public sewer	0	0	0	0	-
59	4.16	List 1 Dangerous Substances	0	0	0	0	-
60	4.17	List 2 Dangerous Substances	0	0	0	0	-
60	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	1	0	7	-
61	4.19	Pollution inventory substances	0	0	0	0	-
61	4.20	Pollution inventory waste transfers	0	0	0	0	-
61	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
62	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
64	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
66	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
67	5.4	<u>Groundwater vulnerability- soluble rock risk</u>	Identified (within 0m)				
67	5.5	Groundwater vulnerability- local information	None (within 0m)				
68	5.6	<u>Groundwater abstractions</u>	0	0	0	0	5
70	5.7	<u>Surface water abstractions</u>	0	0	0	0	2
71	5.8	<u>Potable abstractions</u>	0	0	0	0	1
71	5.9	<u>Source Protection Zones</u>	0	0	0	1	-
71	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
72	6.1	Water Network (OS MasterMap)	0	0	0	-	-



72	6.2	Surface water features	0	0	0	-	-
73	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
73	6.4	WFD Surface water bodies	0	0	0	-	-
73	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
75	7.1	<u>Risk of flooding from rivers and the sea</u>	Low (within 50m)				
76	7.2	Historical Flood Events	0	0	0	-	-
76	7.3	Flood Defences	0	0	0	-	-
76	7.4	<u>Areas Benefiting from Flood Defences</u>	0	1	0	-	-
77	7.5	Flood Storage Areas	0	0	0	-	-
78	7.6	<u>Flood Zone 2</u>	Identified (within 50m)				
79	7.7	<u>Flood Zone 3</u>	Identified (within 50m)				
Page	Section	Surface water flooding					
80	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
82	9.1	<u>Groundwater flooding</u>	High (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
83	10.1	<u>Sites of Special Scientific Interest (SSSI)</u>	0	0	0	0	1
84	10.2	<u>Conserved wetland sites (Ramsar sites)</u>	0	0	0	0	1
84	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
84	10.4	Special Protection Areas (SPA)	0	0	0	0	0
85	10.5	National Nature Reserves (NNR)	0	0	0	0	0
85	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
85	10.7	Designated Ancient Woodland	0	0	0	0	0
85	10.8	Biosphere Reserves	0	0	0	0	0
86	10.9	Forest Parks	0	0	0	0	0
86	10.10	Marine Conservation Zones	0	0	0	0	0
86	10.11	<u>Green Belt</u>	0	0	0	0	2
86	10.12	Proposed Ramsar sites	0	0	0	0	0

87	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
87	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
87	10.15	Nitrate Sensitive Areas	0	0	0	0	0
87	10.16	<u>Nitrate Vulnerable Zones</u>	0	0	2	0	0
89	10.17	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
90	10.18	<u>SSSI Units</u>	0	0	0	0	1
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
92	11.1	World Heritage Sites	0	0	0	-	-
93	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
93	11.3	National Parks	0	0	0	-	-
93	11.4	<u>Listed Buildings</u>	0	1	2	-	-
94	11.5	Conservation Areas	0	0	0	-	-
94	11.6	Scheduled Ancient Monuments	0	0	0	-	-
94	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
95	12.1	<u>Agricultural Land Classification</u>	Urban (within 250m)				
96	12.2	Open Access Land	0	0	0	-	-
96	12.3	Tree Felling Licences	0	0	0	-	-
96	12.4	Environmental Stewardship Schemes	0	0	0	-	-
96	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
97	13.1	Priority Habitat Inventory	0	0	0	-	-
97	13.2	<u>Habitat Networks</u>	0	0	1	-	-
98	13.3	Open Mosaic Habitat	0	0	0	-	-
98	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
99	14.1	<u>10k Availability</u>	Identified (within 500m)				
100	14.2	<u>Artificial and made ground (10k)</u>	0	2	2	10	-
102	14.3	<u>Superficial geology (10k)</u>	1	1	2	0	-

103	14.4	Landslip (10k)	0	0	0	0	-
104	14.5	<u>Bedrock geology (10k)</u>	1	0	1	0	-
105	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
106	15.1	<u>50k Availability</u>	Identified (within 500m)				
107	15.2	<u>Artificial and made ground (50k)</u>	0	0	3	7	-
108	15.3	Artificial ground permeability (50k)	0	0	-	-	-
109	15.4	<u>Superficial geology (50k)</u>	1	0	3	1	-
110	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
110	15.6	Landslip (50k)	0	0	0	0	-
110	15.7	Landslip permeability (50k)	None (within 50m)				
111	15.8	<u>Bedrock geology (50k)</u>	1	0	1	0	-
112	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
112	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
113	16.1	<u>BGS Boreholes</u>	2	0	4	-	-
Page	Section	Natural ground subsidence					
115	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
116	17.2	<u>Running sands</u>	Very low (within 50m)				
118	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
119	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
120	17.5	<u>Landslides</u>	Very low (within 50m)				
122	17.6	<u>Ground dissolution of soluble rocks</u>	High (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
124	18.1	Natural cavities	0	0	0	0	-
125	18.2	<u>BritPits</u>	0	0	0	1	-
125	18.3	<u>Surface ground workings</u>	0	1	45	-	-
127	18.4	Underground workings	0	0	0	0	0
127	18.5	Historical Mineral Planning Areas	0	0	0	0	-



127	18.6	<u>Non-coal mining</u>	1	0	0	0	12
129	18.7	<u>Mining cavities</u>	0	0	0	1	1
129	18.8	JPB mining areas	None (within 0m)				
130	18.9	Coal mining	None (within 0m)				
130	18.10	Brine areas	None (within 0m)				
130	18.11	Gypsum areas	None (within 0m)				
130	18.12	Tin mining	None (within 0m)				
130	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
131	19.1	<u>Radon</u>	Between 1% and 3% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
132	20.1	<u>BGS Estimated Background Soil Chemistry</u>	1	1	-	-	-
132	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
132	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
133	21.1	Underground railways (London)	0	0	0	-	-
133	21.2	Underground railways (Non-London)	0	0	0	-	-
134	21.3	Railway tunnels	0	0	0	-	-
134	21.4	<u>Historical railway and tunnel features</u>	0	2	0	-	-
134	21.5	Royal Mail tunnels	0	0	0	-	-
134	21.6	Historical railways	0	0	0	-	-
135	21.7	<u>Railways</u>	0	3	7	-	-
135	21.8	Crossrail 1	0	0	0	0	-
135	21.9	Crossrail 2	0	0	0	0	-
136	21.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 01/09/2018

Site Area: 0.66ha



Recent site history - 2015 aerial photograph



Capture Date: 30/06/2015

Site Area: 0.66ha



Recent site history - 2012 aerial photograph



Capture Date: 25/05/2012

Site Area: 0.66ha



Recent site history - 2009 aerial photograph



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Capture Date: 27/09/2009

Site Area: 0.66ha



Recent site history - 1999 aerial photograph



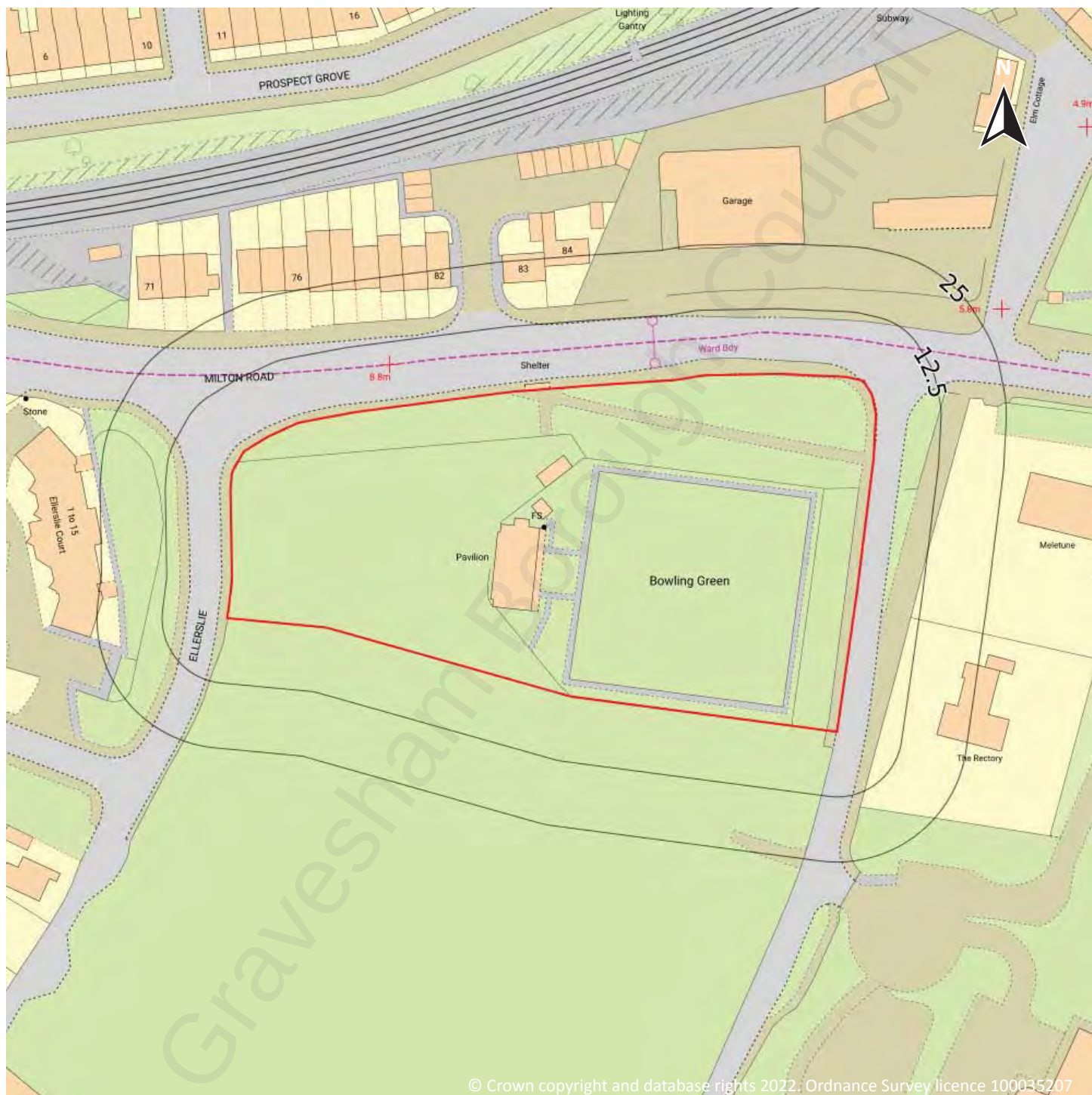
Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2022. All Rights Reserved.

Capture Date: 03/09/1999

Site Area: 0.66ha



OS MasterMap site plan

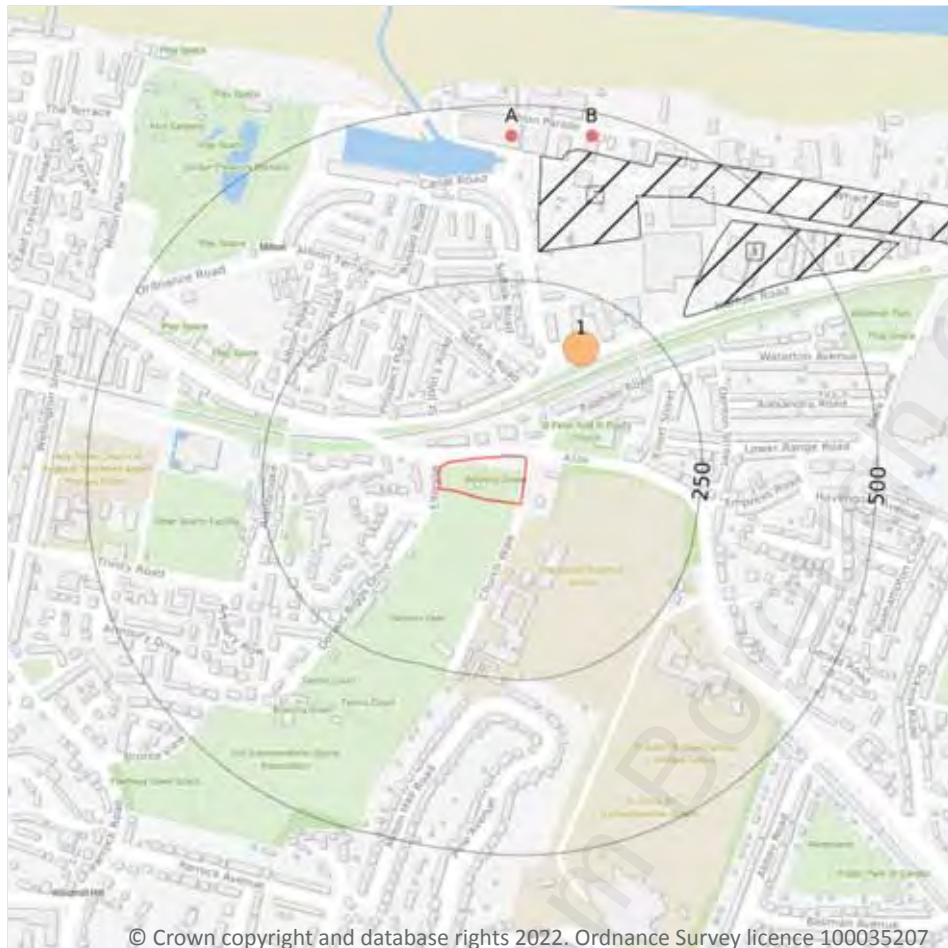


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Site Area: 0.66ha



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (EA/NRW)
- Historical waste sites
- 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

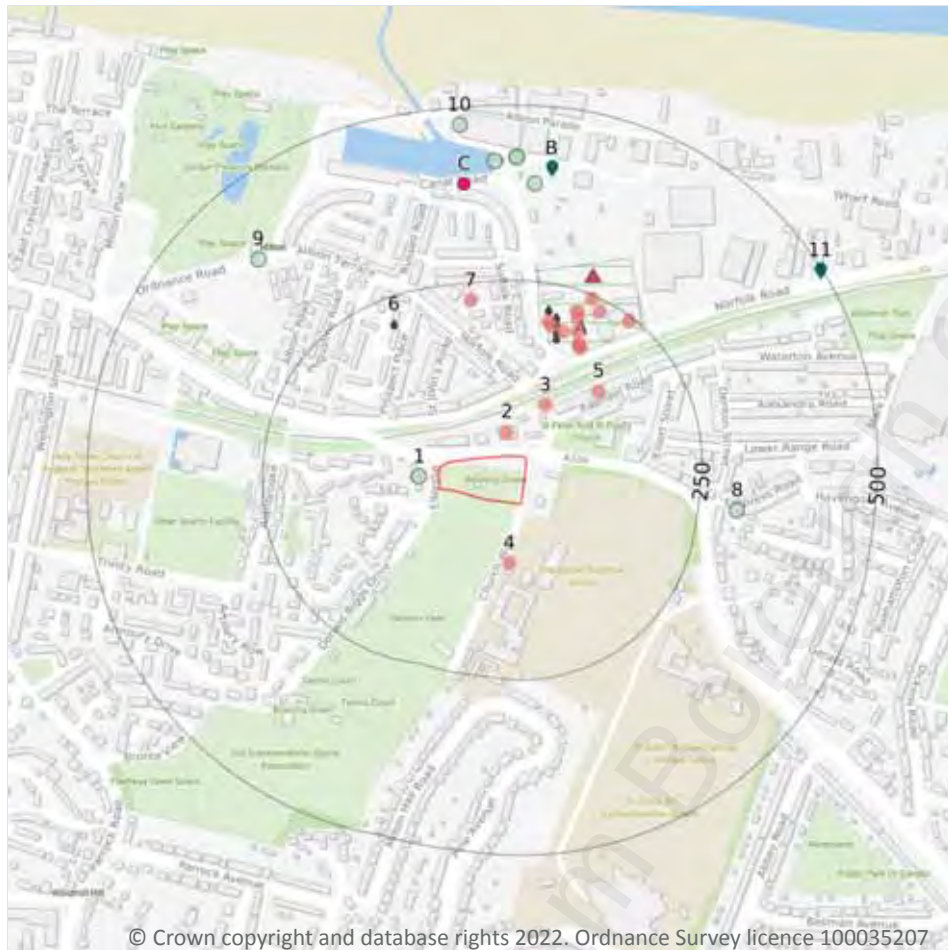
0

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.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Control of Major Accident Hazards
- ▲ Hazardous substance storage/usage
- Licensed pollutant release (Part A(2)/B)
- Radioactive Substance Authorisations
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

17

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 53**

ID	Location	Company	Address	Activity	Category
2	34m N	G & M Motors	85, Milton Road, Gravesend, Kent, DA12 2PP	New Vehicles	Motoring
3	79m N	Electricity Sub Station	Kent, DA12	Electrical Features	Infrastructure and Facilities
4	85m S	Electricity Sub Station	Kent, DA12	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
5	141m NE	Astra Cars Kent	29, Raphael Road, Gravesend, Kent, DA12 2PN	Airlines and Airline Services	Transport, Storage and Delivery
A	174m NE	Barrett Print	Unit 10 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Published Goods	Industrial Products
A	178m NE	T S Autos	Unit 9 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Vehicle Repair, Testing and Servicing	Repair and Servicing
A	178m NE	Recycling 4 Rehoming	Unit 9 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Clearance and Salvage Dealers	Recycling Services
A	187m N	Canal Road Industrial Park	Kent, DA12	Business Parks and Industrial Estates	Industrial Features
A	190m N	N B Tool Services	Unit 13 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Industrial Repairs and Servicing	Repair and Servicing
A	194m NE	Norfolk Road M O T Centre	Unit 6-8 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Vehicle Repair, Testing and Servicing	Repair and Servicing
A	196m N	Tecweld	Unit 12 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Tools Including Machine Shops	Industrial Products
A	212m N	Gravesend Sound & Lighting	Unit 3 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Lampshades and Lighting	Consumer Products
A	219m N	Thames Hose & Couplings Ltd	Unit 1-2 Canal Industrial Park, Canal Road, Gravesend, Kent, DA12 2PA	Industrial Repairs and Servicing	Repair and Servicing
7	225m N	Tank	Kent, DA12	Tanks (Generic)	Industrial Features
A	233m NE	Works	Kent, DA12	Unspecified Works Or Factories	Industrial Features
A	244m NE	Electricity Sub Station	Kent, DA12	Electrical Features	Infrastructure and Facilities
A	245m NE	Norfolk Road Industrial Estate	Kent, DA12	Business Parks and Industrial Estates	Industrial Features

This data is sourced from Ordnance Survey.



4.2 Current or recent petrol stations

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

Open, closed, under development and obsolete petrol stations.

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	1
----------------------------	----------

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.

Features are displayed on the Current industrial land use map on **page 53**

ID	Location	Company	Address	Operational status	Tier
A	158m N	British Gas	British Gas, Gravesend Holder Station, Suffolk Road, Gravesend	Historical NIHHS Site	-

This data is sourced from the Health and Safety Executive.

ID	Location	Address	Details	
C	391m N	Magnox Electric Ltd, Canal Road, Gravesend, Kent, DA12 2RS	Operator: Magnox Electric Ltd Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AD7605 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled

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

4.13 Licensed Discharges to controlled waters

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

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 53**

ID	Location	Address	Details	
A	174m N	CANAL ROAD IND. PARK, GRAVESEND, KENT	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: P03509 Permit Version: 1 Receiving Water: INTO LAND	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 19/03/1991 Effective Date: 19/03/1991 Revocation Date: 01/07/1991
A	184m N	CANAL ROAD IND. PARK, GRAVESEND, KENT	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: P03509 Permit Version: 1 Receiving Water: INTO LAND	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 19/03/1991 Effective Date: 19/03/1991 Revocation Date: 01/07/1991
A	193m N	CANAL ROAD IND. PARK, GRAVESEND, KENT	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: P03509 Permit Version: 1 Receiving Water: INTO LAND	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 19/03/1991 Effective Date: 19/03/1991 Revocation Date: 01/07/1991
A	203m N	CANAL ROAD IND. PARK, GRAVESEND, KENT	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: P03509 Permit Version: 1 Receiving Water: INTO LAND	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 19/03/1991 Effective Date: 19/03/1991 Revocation Date: 01/07/1991

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

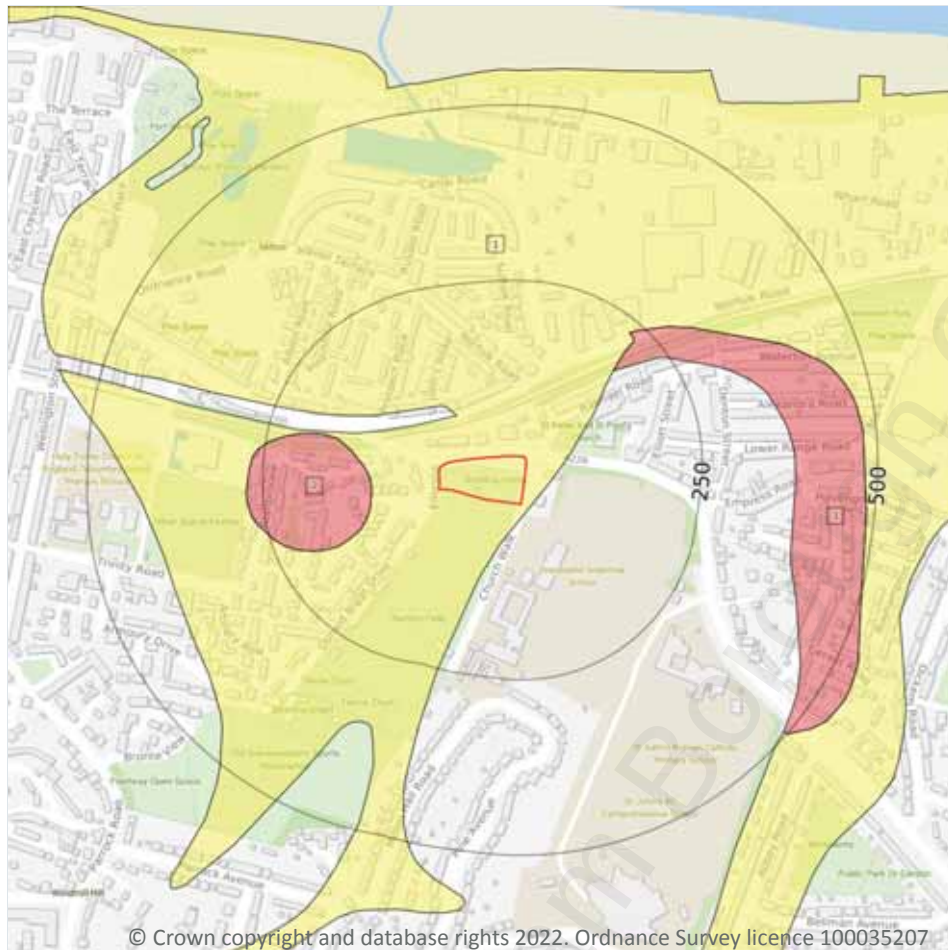
8

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 53**

ID	Location	Details	
1	28m W	Incident Date: 02/11/2003 Incident Identification: 199459 Pollutant: Oils and Fuel Pollutant Description: Petrol	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
8	305m E	Incident Date: 07/05/2003 Incident Identification: 156500 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	388m N	Incident Date: 06/04/2001 Incident Identification: 15205 Pollutant: Contaminated Water Pollutant Description: Other Contaminated Water	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
9	393m NW	Incident Date: 19/06/2002 Incident Identification: 85967 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	420m N	Incident Date: 13/07/2001 Incident Identification: 16232 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
B	425m N	Incident Date: 29/03/2003 Incident Identification: 147063 Pollutant: Specific Waste Materials Pollutant Description: Household Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

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

3

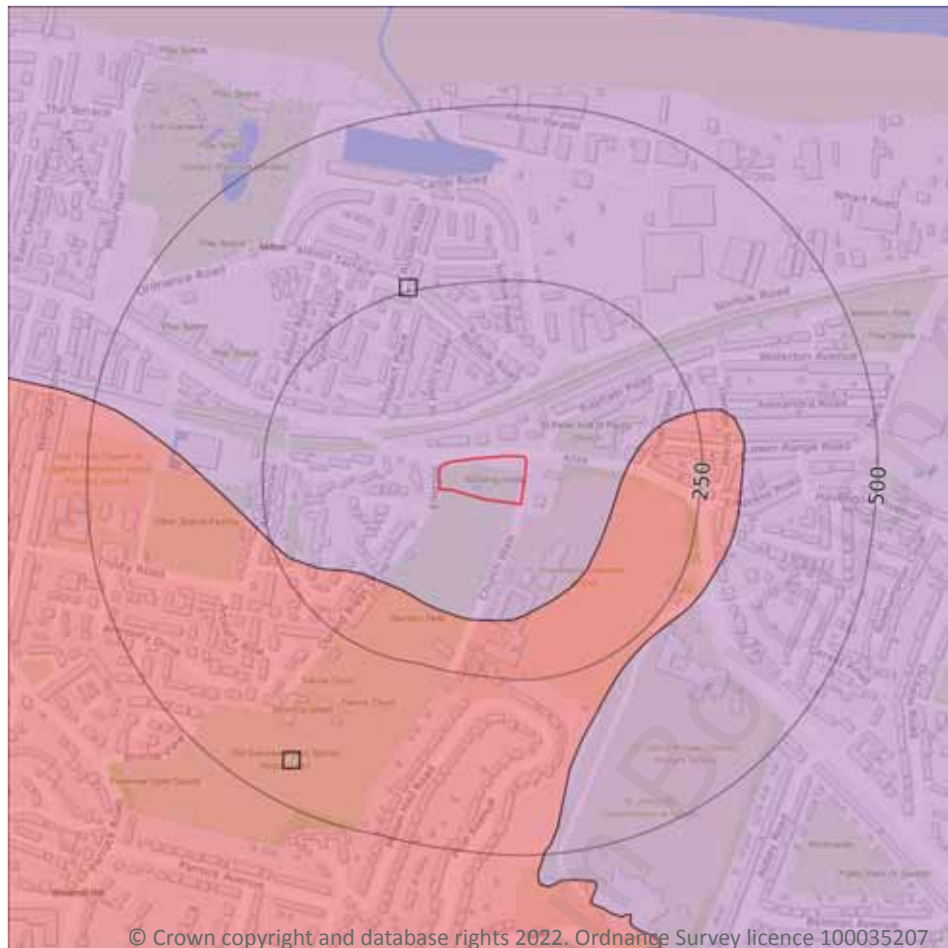
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 62**

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	95m W	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



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

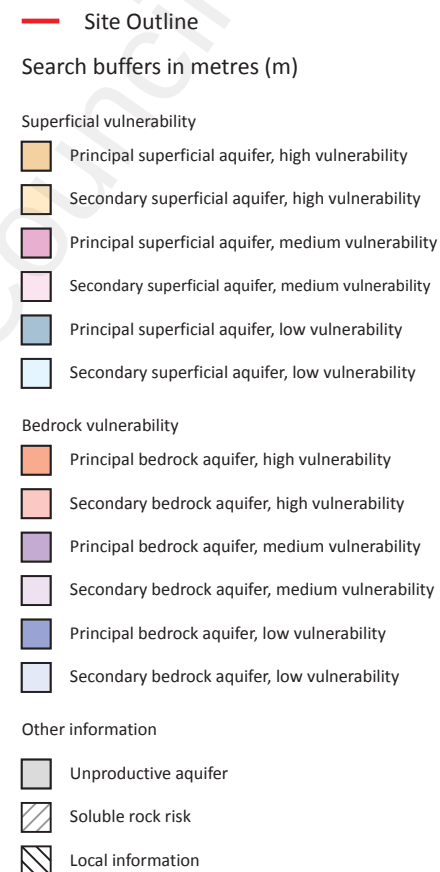
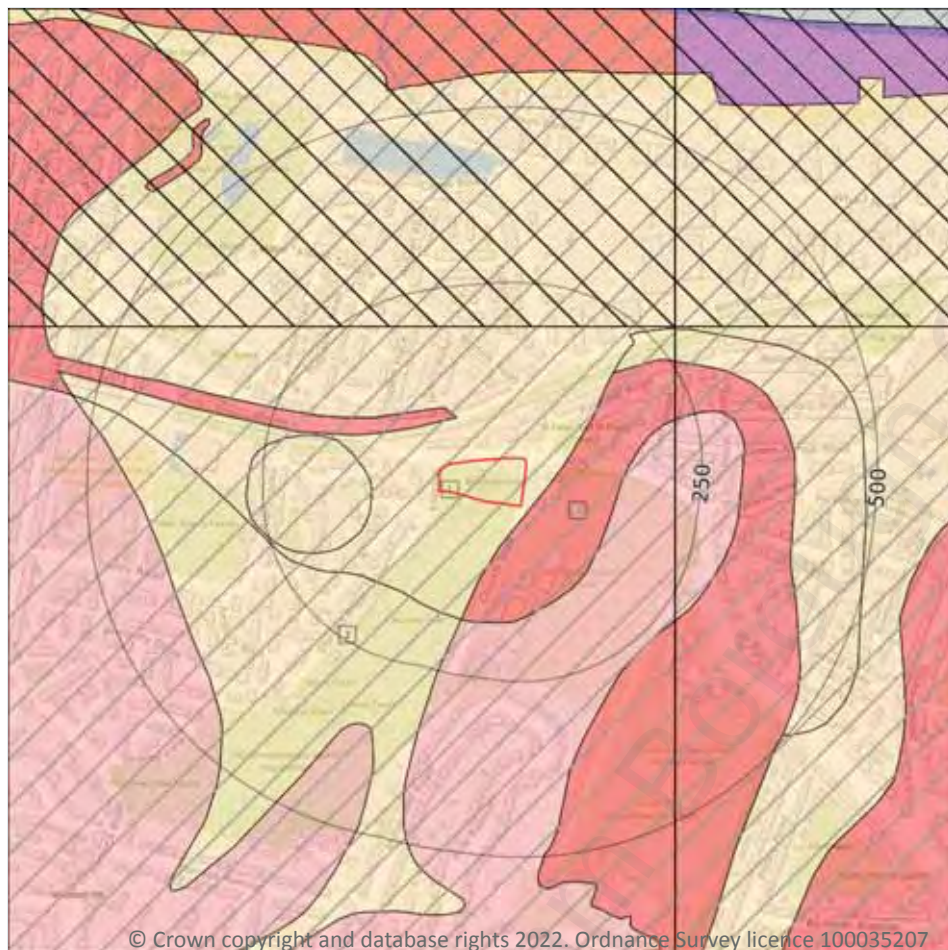
2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 64**

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	125m 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

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 66**

Abstractions and Source Protection Zones



- 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
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

5

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 68**

ID	Location	Details	
A	781m SW	Status: Active Licence No: 9/40/01/0511/G Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: BOREHOLES, ADITS AND CATCHPITS AT WINDMILL HILL PS Data Type: Poly4 Name: Southern Water Services Ltd Easting: 565060 Northing: 173270	Annual Volume (m ³): 17,700,000 Max Daily Volume (m ³): 92,000 Original Application No: - Original Start Date: 24/03/1986 Expiry Date: - Issue No: 100 Version Start Date: 27/11/2006 Version End Date: -
-	903m E	Status: Active Licence No: 9/40/01/0508/G Details: General Washing/Process Washing Direct Source: Southern Region Groundwater Point: POINT 1, BOREHOLE AT GRAVESEND SEWAGE WORKS IN KENT. Data Type: Point Name: Southern Water Services Ltd Easting: 566670 Northing: 174000	Annual Volume (m ³): 55,000 Max Daily Volume (m ³): 340 Original Application No: - Original Start Date: 23/03/1989 Expiry Date: - Issue No: 100 Version Start Date: 27/11/2006 Version End Date: -
-	1188m E	Status: Active Licence No: 9/40/01/0498/G Details: Mineral Washing Direct Source: Southern Region Groundwater Point: POINT A, S DRIFT, UNDERGROUND GRAVEL STRATA (THAMES BALLAST) Data Type: Point Name: J Clubb Ltd Easting: 566925 Northing: 174152	Annual Volume (m ³): 83,969 Max Daily Volume (m ³): 336 Original Application No: - Original Start Date: 03/05/1976 Expiry Date: - Issue No: 101 Version Start Date: 26/05/2016 Version End Date: -
-	1192m E	Status: Active Licence No: 9/40/01/0498/G Details: Mineral Washing Direct Source: Southern Region Groundwater Point: BOREHOLE B, UNDERGROUND STRATA RIVER TERRACE GRAVELS Data Type: Point Name: J Clubb Ltd Easting: 566929 Northing: 174152	Annual Volume (m ³): 83,969 Max Daily Volume (m ³): 336 Original Application No: - Original Start Date: 03/05/1976 Expiry Date: - Issue No: 101 Version Start Date: 26/05/2016 Version End Date: -

5.8 Potable abstractions

Records within 2000m

1

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.

Features are displayed on the Abstractions and Source Protection Zones map on **page 68**

ID	Location	Details	
A	781m SW	Status: Active Licence No: 9/40/01/0511/G Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: BOREHOLES, ADITS AND CATCHPITS AT WINDMILL HILL PS Data Type: Poly4 Name: Southern Water Services Ltd Easting: 565060 Northing: 173270	Annual Volume (m ³): 17,700,000 Max Daily Volume (m ³): 92,000 Original Application No: - Original Start Date: 24/03/1986 Expiry Date: - Issue No: 100 Version Start Date: 27/11/2006 Version End Date: -

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

5.9 Source Protection Zones

Records within 500m

1

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 68**

ID	Location	Type	Description
1	380m SW	1	Inner catchment

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

5.10 Source Protection Zones (confined aquifer)

Records within 500m

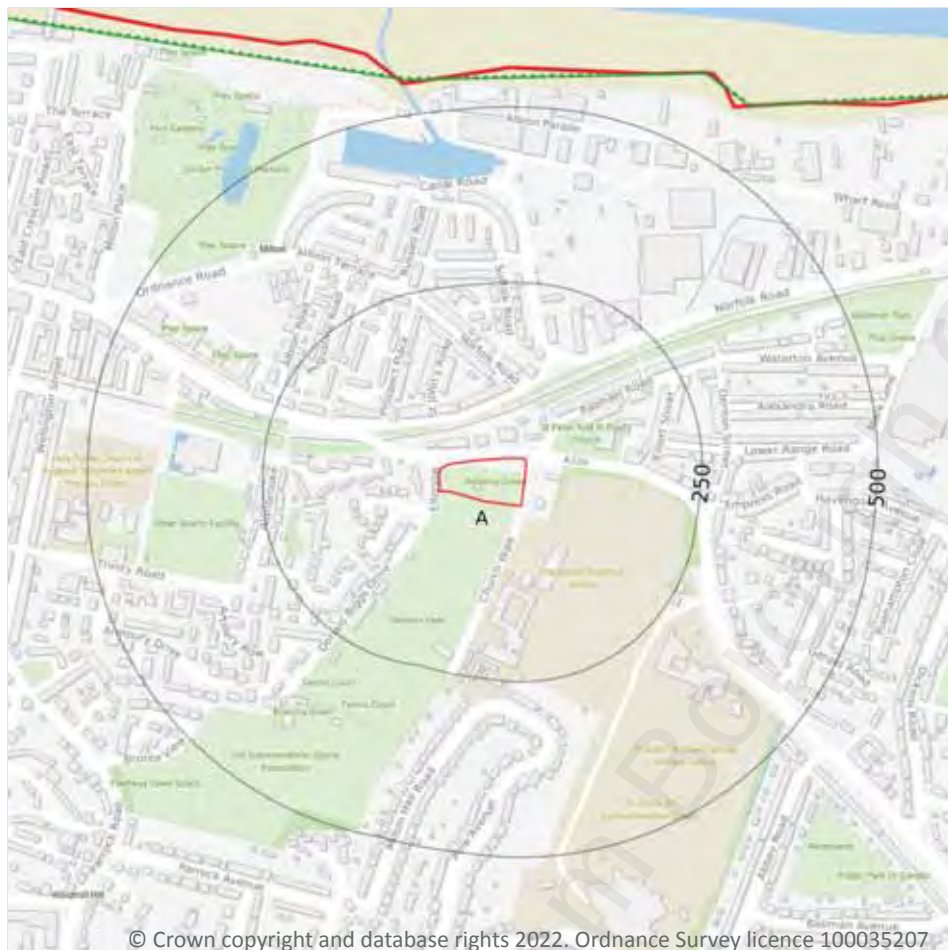
0

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



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

0

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

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

0

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.

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 75**

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.

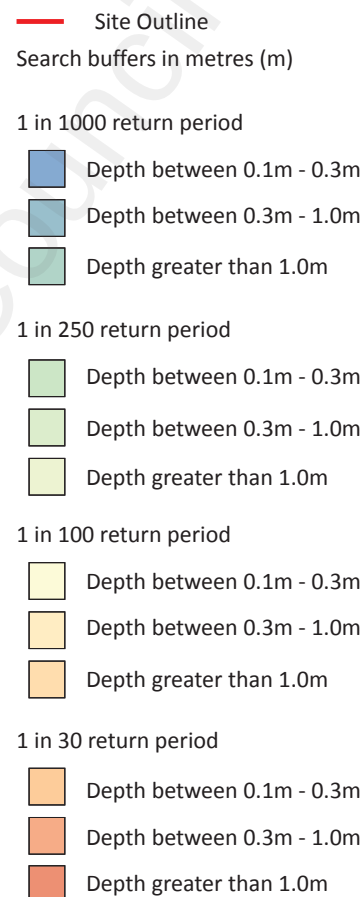
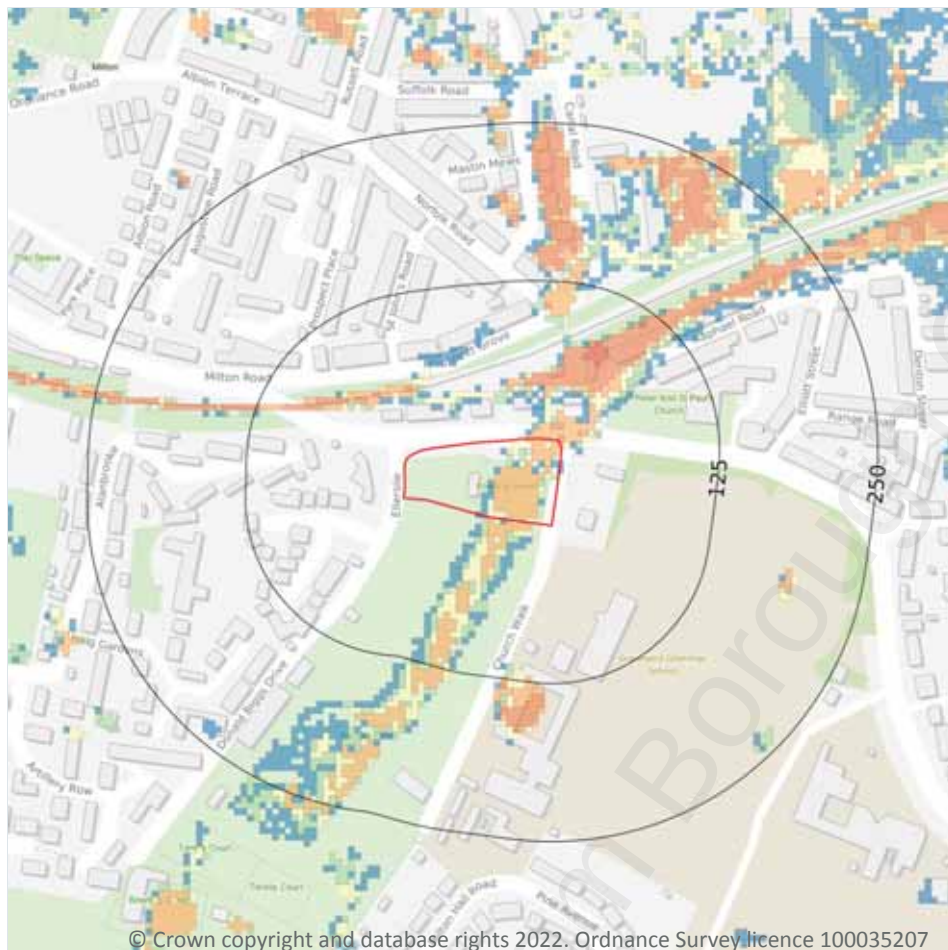
Features are displayed on the River and coastal flooding map on **page 75**

Location	Type
26m NE	Zone 2 - (Fluvial /Tidal Models)

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



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.3m - 1.0m

Highest risk within 50m

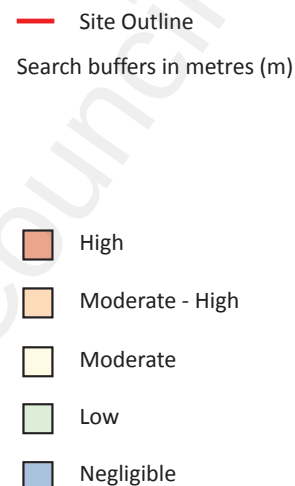
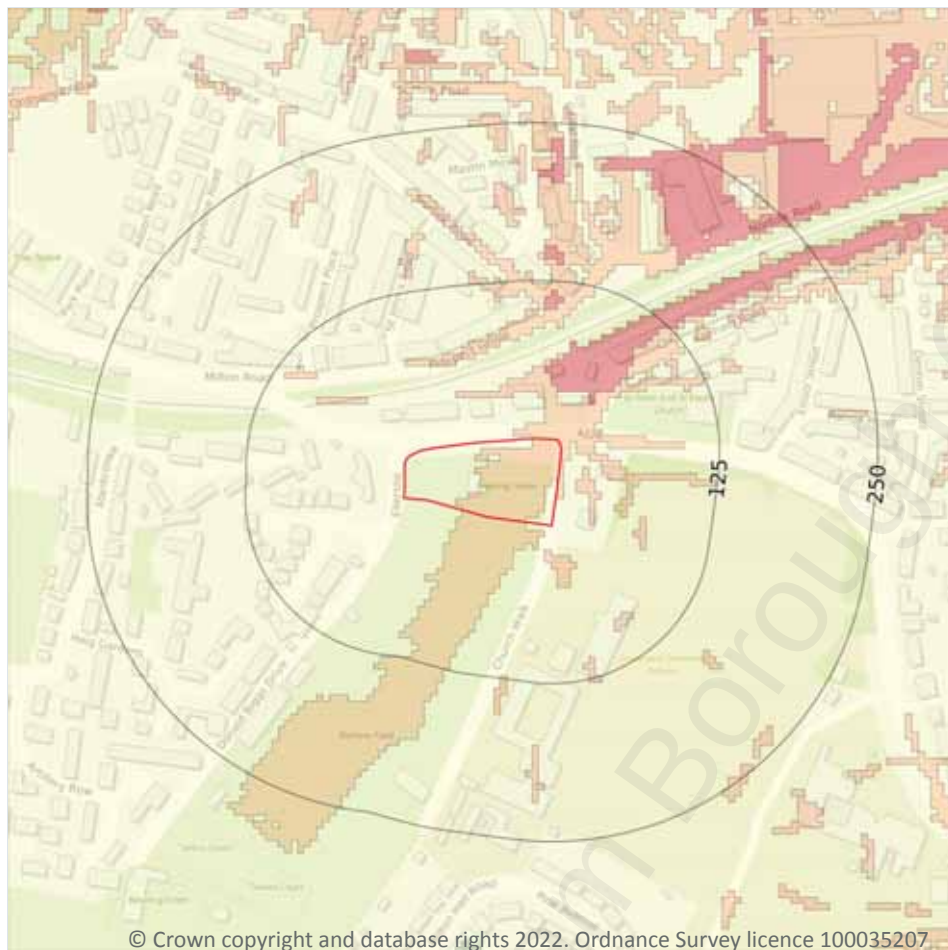
1 in 30 year, 0.3m - 1.0m

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 80**

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.

9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Moderate-High

Highest risk within 50m

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 82**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- X Conserved wetland sites (Ramsar sites)
- Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

1

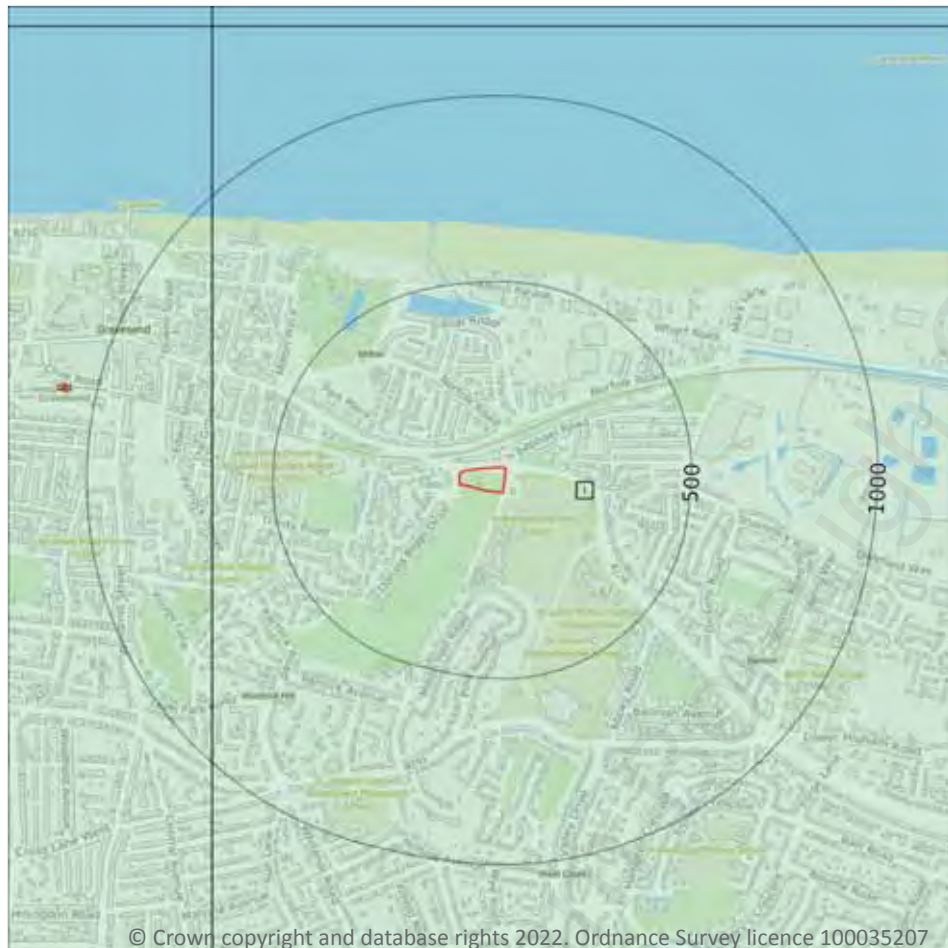
Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the 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 83**

ID	Location	Name	Data source
-	1235m E	South Thames Estuary and Marshes	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

1

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.

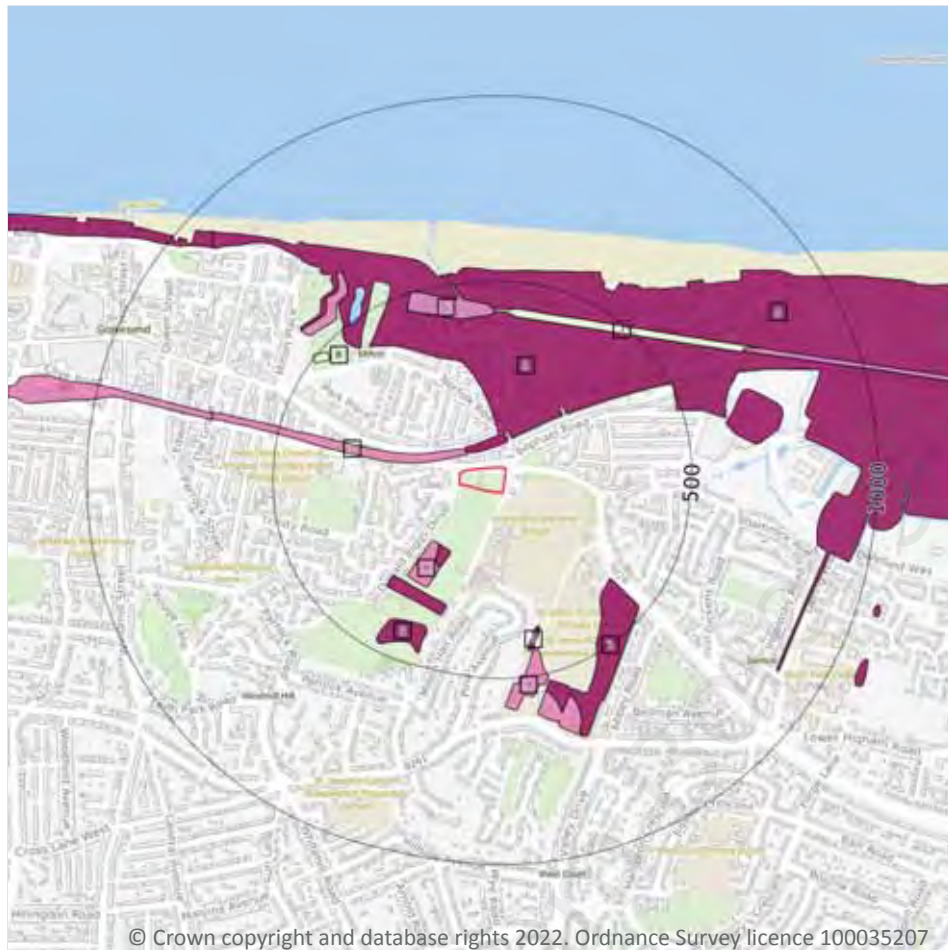
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 99**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	TQ67SE

This data is sourced from the British Geological Survey.



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



Site Outline
Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m

14

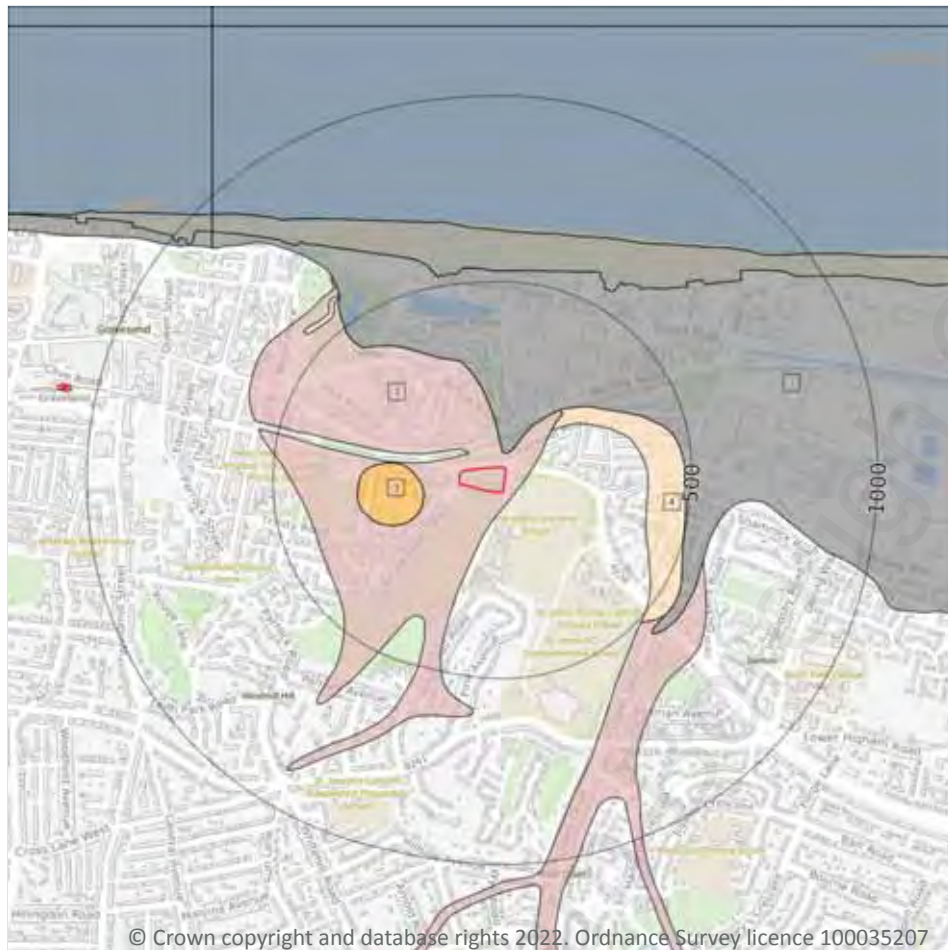
Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 100**

ID	Location	LEX Code	Description	Rock description
1	42m N	WGR-VOID	Worked Ground (Undivided)	Void
2	44m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	166m SW	WGR-VOID	Worked Ground (Undivided)	Void
A	168m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit



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

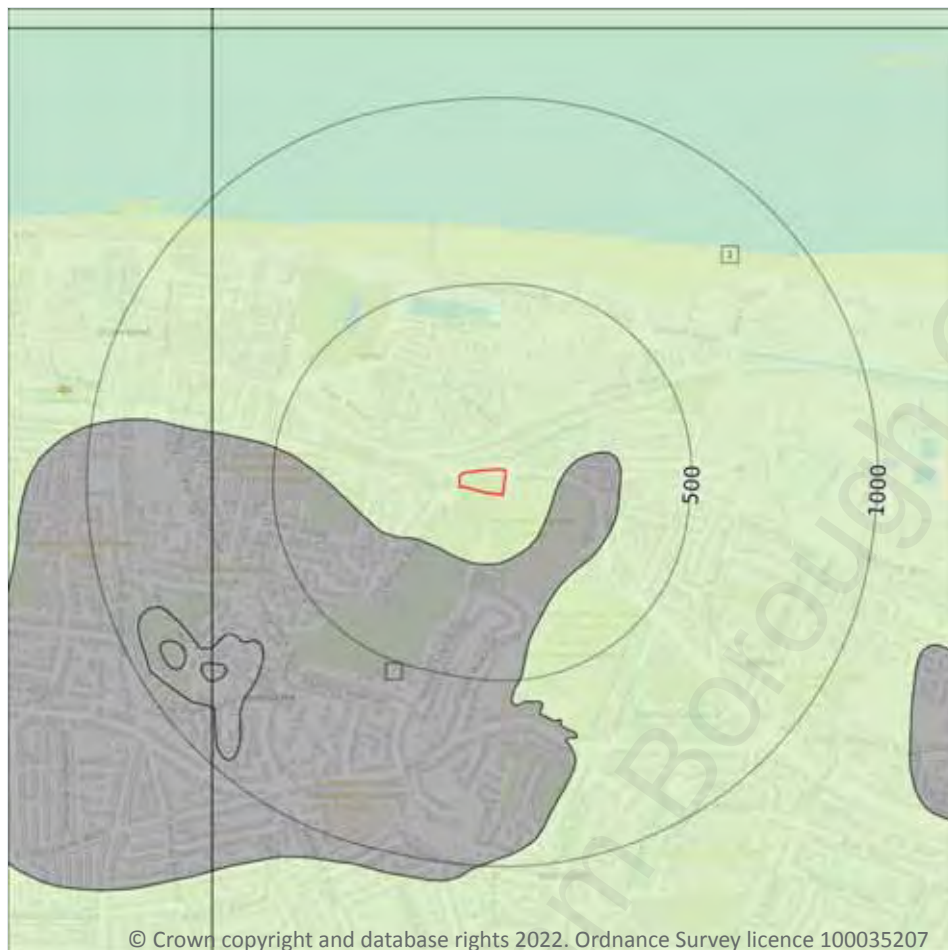
4

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 102**

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-DMTN	Head - Diamicton	Diamicton
2	39m N	ALV-Z	Alluvium - Silt (unlithified Deposits Coding Scheme)	Silt
3	98m W	LHGR-XSV	Lynch Hill Gravel Member - Sand And Gravel	Sand And Gravel

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 104**

ID	Location	LEX Code	Description	Rock age
1	On site	SECK-CHLK	Seaford Chalk Formation - Chalk	Santonian Age - Coniacian Age
2	132m E	TAB-SANDU	Thanet Sand Formation - Sand	Thanetian Age

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

6

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 113**

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	On site	565770 173800	A226 MILTON RD GRAVESEND S1	21.0	N	725602
A	On site	565750 173800	A226 MILTON RD GRAVESEND S4	2.0	N	725605
B	143m N	565820 173950	NORFOLD ROAD CANAL ROAD LINK TP 3	2.0	N	725697



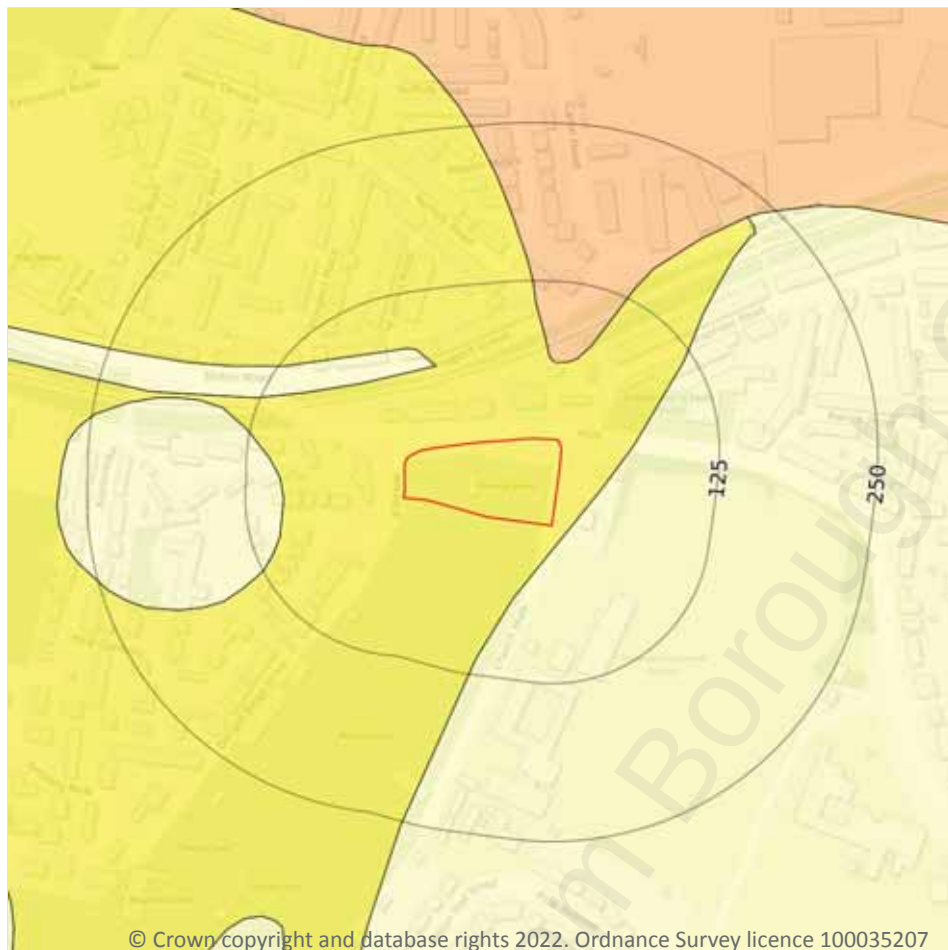
ID	Location	Grid reference	Name	Length	Confidential	Web link
B	158m N	565811 173967	NORFOLK-CANAL RD MILTON 1	5.0	N	725613
1	182m NW	565500 173870	A226 MILTON RD GRAVESEND S2	4.0	N	725603
2	210m N	565810 174020	NORFOLD ROAD CANAL ROAD LINK TP 4	2.5	N	725698

This data is sourced from the British Geological Survey.

Gravesend Borough Council



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

2

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).

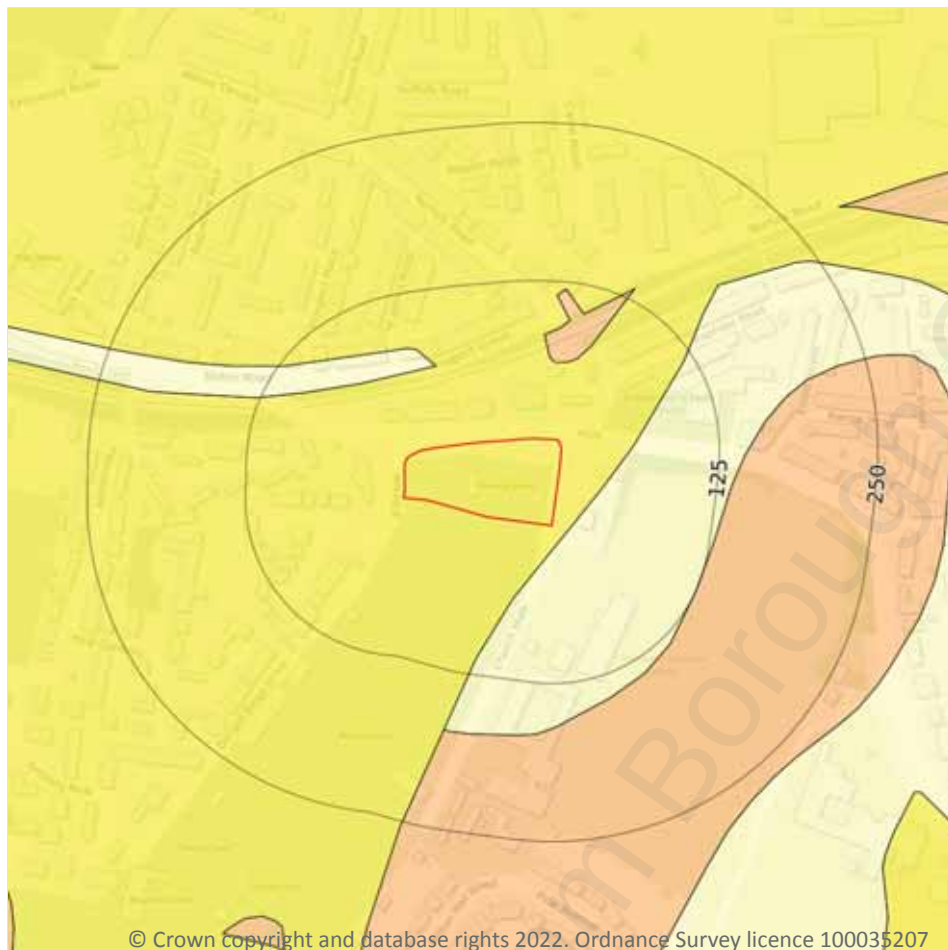
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 115**

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.
13m SE	Negligible	Ground conditions predominantly non-plastic.

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

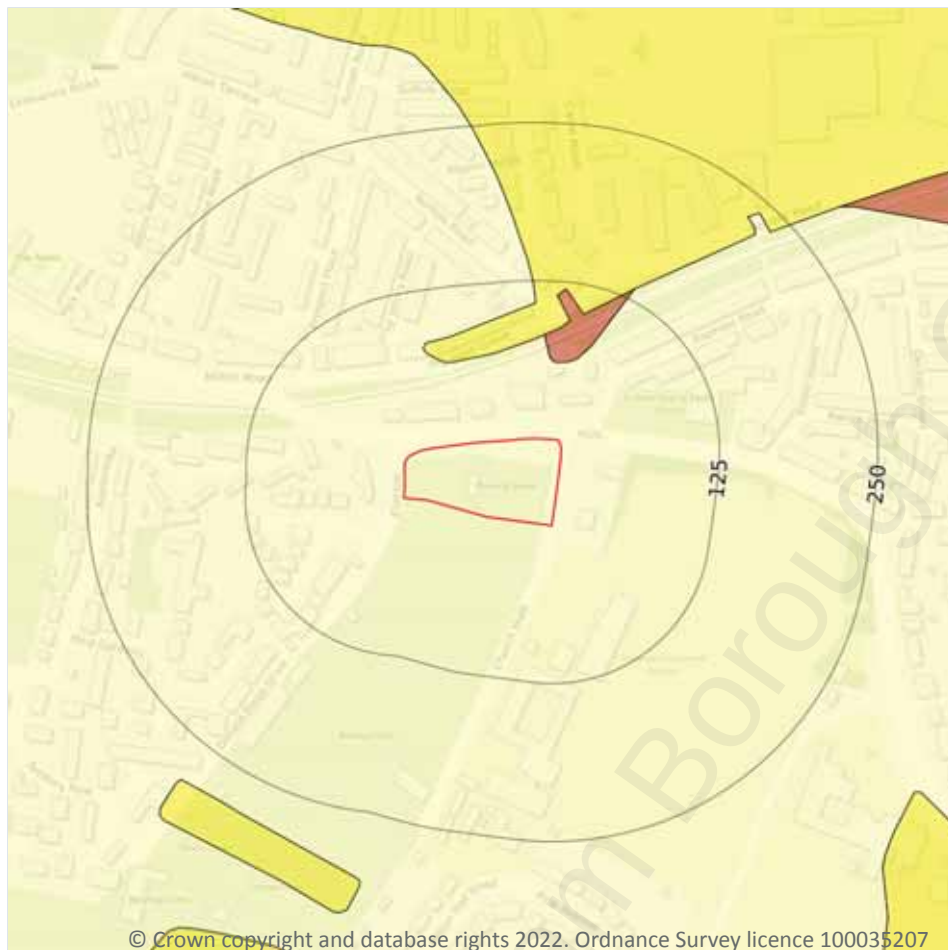
2

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 116**

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.

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.

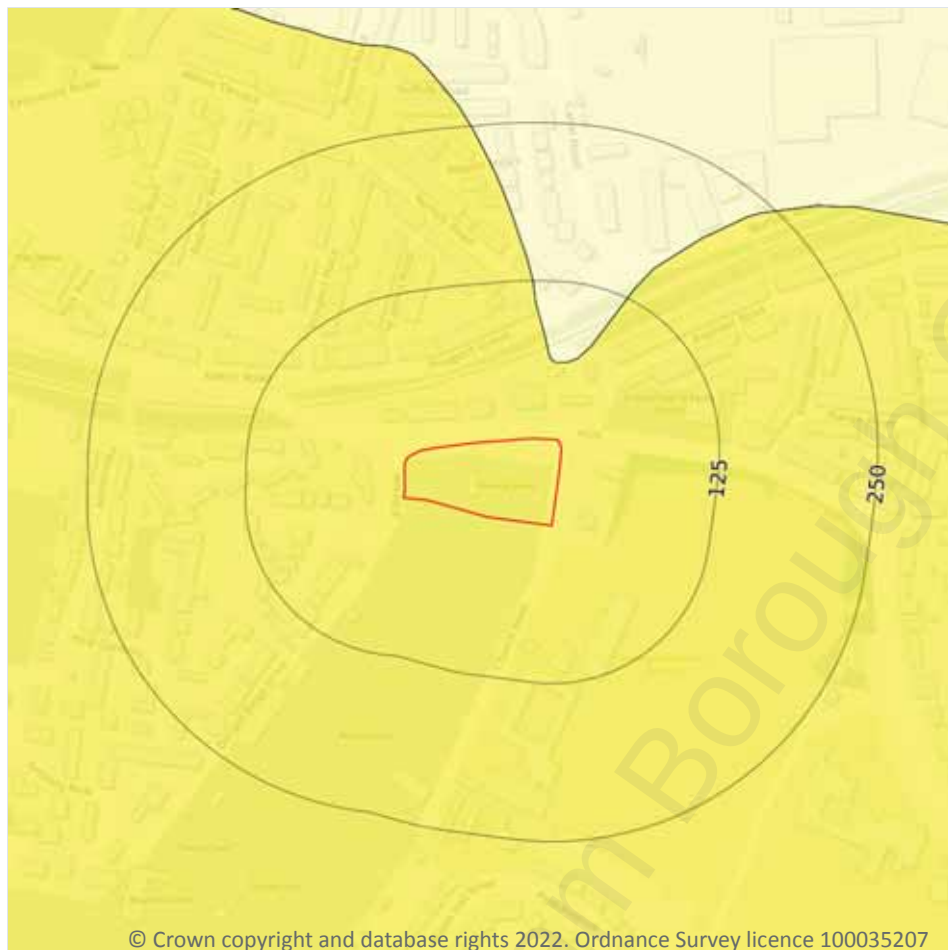
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 118**

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.

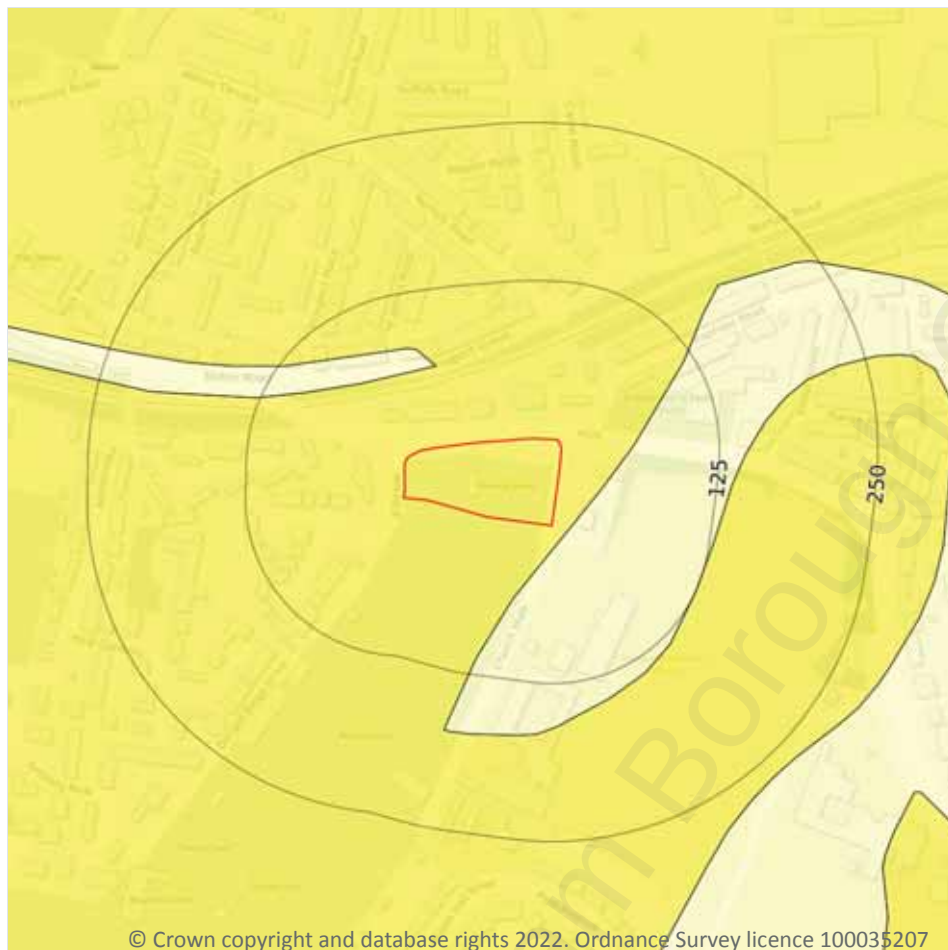
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 119**

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

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17.5 Landslides

Records within 50m

2

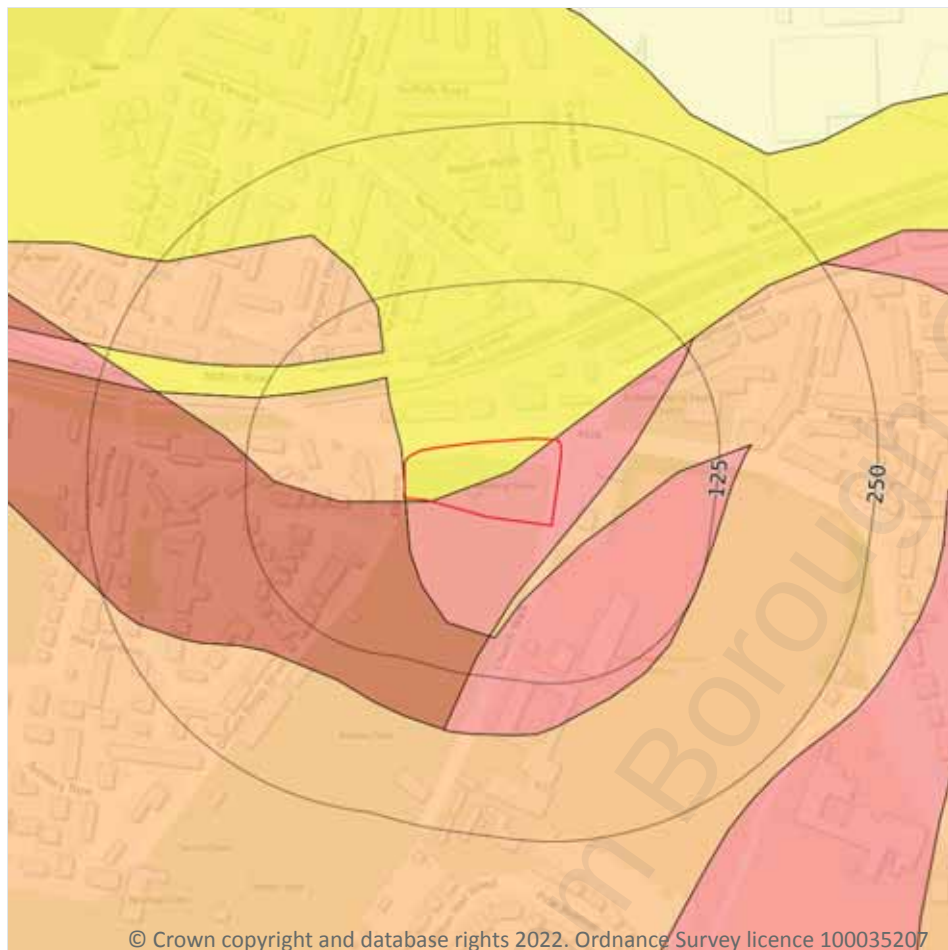
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 120**

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.



Natural ground subsidence - Ground dissolution of soluble rocks



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

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17.6 Ground dissolution of soluble rocks

Records within 50m

6

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 122**

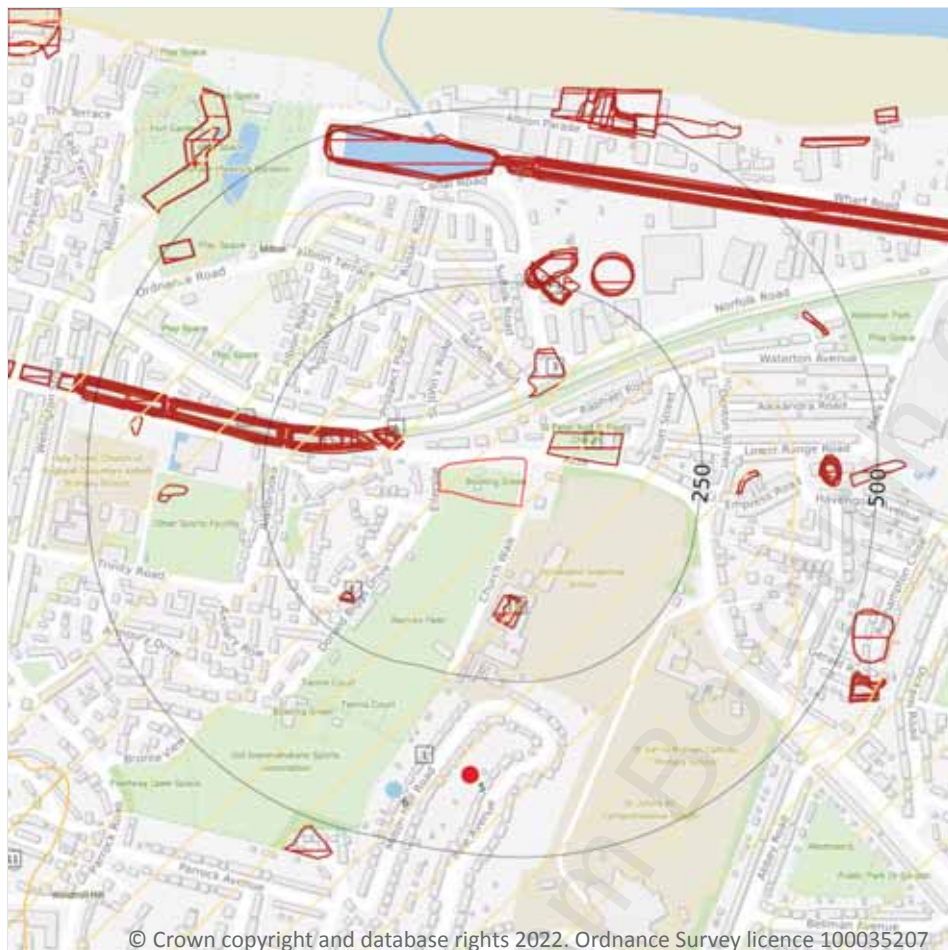
Location	Hazard rating	Details
On site	Very low	Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.

Location	Hazard rating	Details
On site	Low	Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.
On site	Moderate	Soluble rocks are present within the ground. Many dissolution features may be present. Potential for difficult ground conditions are at a level where they should be considered. Potential for subsidence is at a level where it may need to be considered.
3m S	High	Soluble rocks are present within the ground. Numerous dissolution features may be present. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered.
13m SE	Low	Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.
27m SE	Moderate	Soluble rocks are present within the ground. Many dissolution features may be present. Potential for difficult ground conditions are at a level where they should be considered. Potential for subsidence is at a level where it may need to be considered.

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



- 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

1

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 124**

ID	Location	Details	Description
5	389m S	Name: Milton Hall Road Denehole Address: GRAVESEND, Kent Commodity: Chalk Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

46

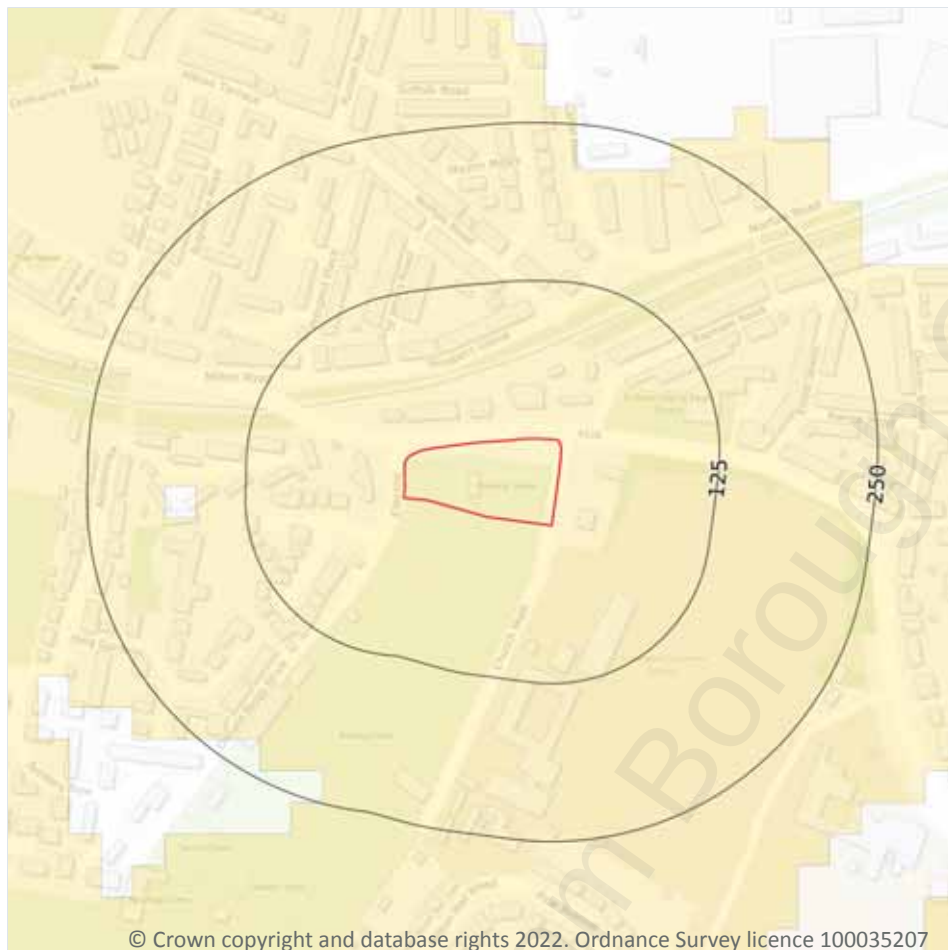
Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 124**

ID	Location	Land Use	Year of mapping	Mapping scale
2	33m E	Grave Yard	1865	1:10560
A	65m NW	Cuttings	1916	1:10560
A	66m NW	Cuttings	1938	1:10560
A	66m NW	Cuttings	1863	1:10560
A	66m NW	Cuttings	1907	1:10560
A	67m NW	Cuttings	1923	1:10560
A	68m NW	Cuttings	1938	1:10560
B	74m NW	Cuttings	1938	1:10560
3	89m N	Unspecified Heap	1865	1:10560
C	97m W	Cuttings	1923	1:10560



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 131**

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.



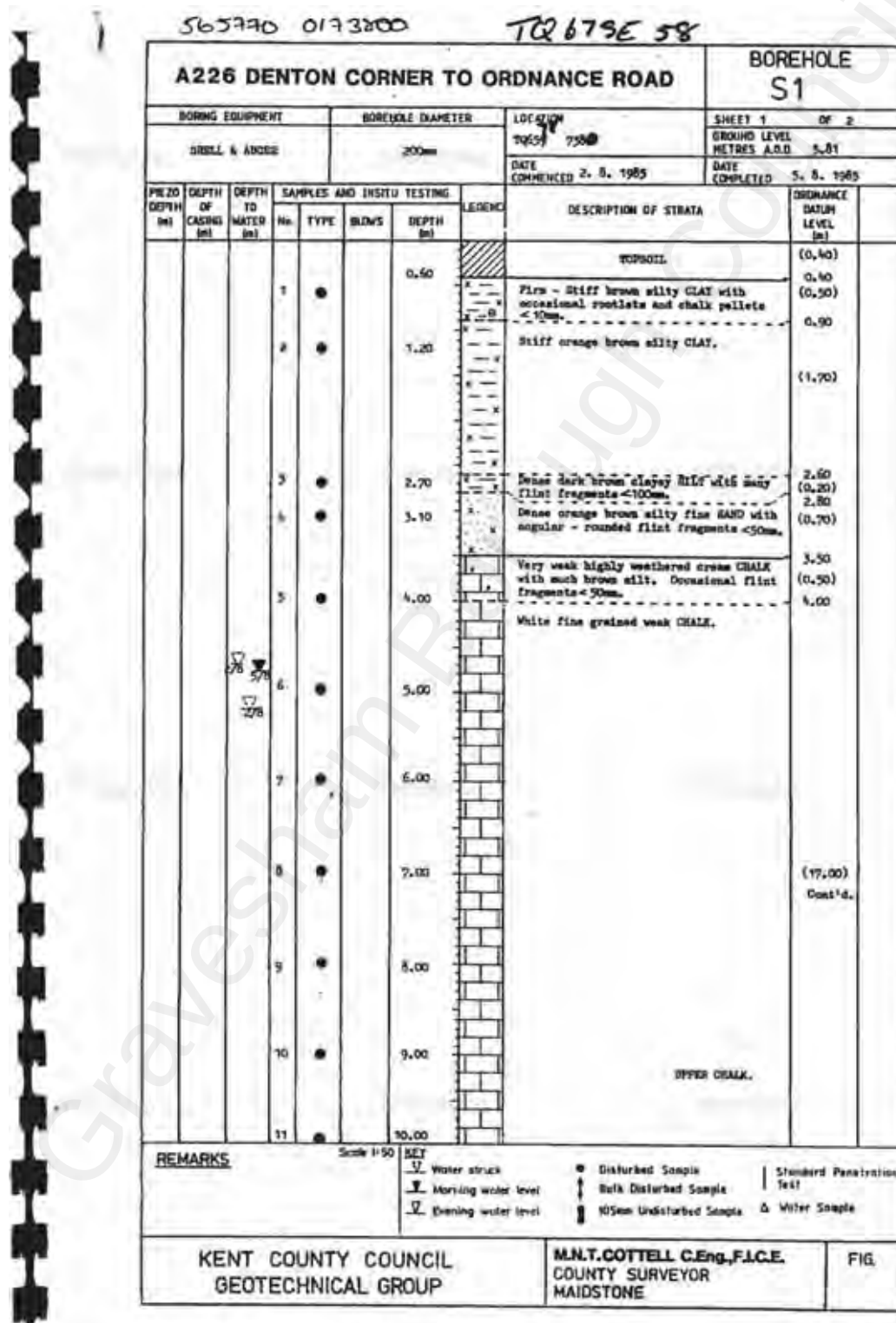


British
Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 725602 BGS Reference: TQ67SE58

British National Grid (27700): 565770,173800



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GRFC Bowls Club, Church Walk, Gravesend

CCL03525.CP31

February 2022



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 725605 BGS Reference: TQ67SE61

British National Grid (27700): 565750,173800

TQ67SE61

A226 DENTON CORNER TO ORDNANCE ROAD										BOREHOLE S4	
BORING EQUIPMENT			BOREHOLE DIAMETER			LOCATION			SHEET 1 OF 1		
HAND BORE			150mm.			TQ 658 7382			GROUND LEVEL METRES A.O.D. 6.33		
						DATE COMMENCED 5. 8. 1985			DATE COMPLETED 5. 8. 1985		
PIEZO DEPTH (m)	DEPTH OF CASING (m)	DEPTH TO WATER (m)	No.	TYPE	BLOWS	DEPTH (m)	LEGEND	DESCRIPTION OF STRATA	ORDNANCE DATUM LEVEL (m)		
								TOPSOIL	(0.40)		
			1	●		1.00	x x x x x x x	Dark orange brown clayey KILT. Occasional flint fragments <50mm and chalk pellets <20mm, becoming more frequent with depth.	0.40 (1.60)		
			2	●		2.00		HEAD	2.00		
BOREHOLE COMPLETED AT 2.00m. UPPER CHALK ENCOUNTERED AT 2.0.											
REMARKS											
NO WATER ENCOUNTERED DURING BORING.											
SCALE 1:50											
KEY											
V Water struck											
V Morning water level											
V Evening water level											
● Disturbed Sample											
↑ Bulk Disturbed Sample											
105mm Undisturbed Sample											
Standard Penetration Test											
Δ Water Sample											
KENT COUNTY COUNCIL GEOTECHNICAL GROUP							M.N.T.COTTELL C.Eng., F.I.C.E. COUNTY SURVEYOR MAIDSTONE			FIG.	

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