Appendix C

Extracts from Wilson Bailey Site Investigation Report

Desk Study and Phase 1 Ground Investigation Report

Arborfield Development Site
Parcel N
Arborfield Garrison
Wokingham
Berkshire

Client Crest Nicholson Operations Limited

J2426

September 2024

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

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EXECUTIVE SUMMARY

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

BRIEF

This report describes the findings of a desk study and initial phase of ground investigation carried out by the Wilson Bailey Partnership on the instructions of Crest Nicholson Operations Limited with respect to the residential development of this site. The purpose of the investigation has been to research the history and environmental setting of the site, to investigate the ground conditions and assess the implications of the findings with regards to geotechnical design and land contamination as part of the proposed residential development of this land parcel.

DESK STUDY SUMMARY

Desk study research has been carried out with reference to publicly available historical mapping and environmental database records together with information held by the Local Authority Contaminated Land Team, historical information held by the Garrison and a site walkover survey

Records indicate that this part of the Arborfield Garrison site was originally open agricultural land associated with Biggs Farm, the main agricultural buildings to which were located approximately 100m to the west of the site. Whilst this land parcel is currently undeveloped, historical mapping indicates that during the 1930s the main part of the site was occupied by a set of sewerage filter beds that formed part of a private sewerage treatment system associated with an early phase of military development at the Garrison. The western part of the site was also occupied by a series of divided paddocks associated with the Infirmary Stables to the west of the site that were used for the treatment and rehabilitation of army horses prior to the mechanization of the army.

The next available map dating from 1968 indicates that by that time the redevelopment and refurbishment of the Garrison had taken place as part of its transformation from a remount division to a mechanical engineering training school. By that time the former structures on the site are shown to have been demolished and cleared, since which time the site has remained unused and vacant, having more recently become overgrown with rough grass.

Desk study research has indicated the presence of potential off-site sources of ground contamination which include the former Whitehall Brickworks located approximately 560m to the west of the site. Whilst most of the former brickworks site has been subsequently redeveloped for housing, part of the former brickworks has been infilled with a range of wastes within an engineered landfill site. Subsequent monitoring of this site has indicated active processes and the presence of raised concentrations of soil gasses within the landfill, with perimeter monitoring indicating measureable, but not elevated, concentrations of soil gas directly outside of the landfill. This monitoring and evaluation carried out historically by others has indicated a flow direction from groundwater towards the east from this landfill site, towards this site.

GROUND CONDITIONS

The ground investigation indicates the presence of a generally nominal thickness of apparently natural topsoil and apparently localised made ground comprising reworked topsoil with brick and tile fragments to a depth of up to about 0.90 m below ground level but generally less than about 0.50 m. These soils have been found to be subsequently underlain by a medium strength orange-brown variably silty fissured clay with occasional orange-brown sand partings to the full depth of investigation. No visual indications of the effects of trees was noted as part of the ground investigation works and the results of the laboratory geotechnical testing have not indicated widespread desiccation of the clay, although clearly in the immediate vicinity of trees, precautions will be required.

A series of shallow trenches have been excavated through where the sewerage filter beds and other structures are shown to have been present and no residual structures have been encountered such that these are assessed as likely to have been above ground structures, with minimal foundations, that have been demolished and cleared historically.

Groundwater was not encountered, and subsequent monitoring of installed standpipes has not indicated consistent groundwater levels, although some indications of perched water within the upper levels of the clay and made ground has been noted. Gas monitoring has not indicated the presence of elevated concentrations of soil gasses.

Laboratory soil contamination testing of 10 soil samples has not indicated raised or elevated concentrations of a wide range of potential chemicals of concern with regards to a proposed Residential with Plant Uptake end use scenario.

GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

The near surface medium strength clay soils are considered suitable to support the light to moderate foundation loads anticipated to be associated with traditional two storey houses and to provide an assumed net allowable bearing capacity of 100 kPa. Floor slabs should be designed to be suspended over a naturally ventilated void and foundations in the vicinity of trees will require deepening in accordance with the NHBC guidelines for medium plasticity clay soils.

Elevated sulphates have not been identified and whilst localised groundwater inflows and excavation side instability may be expected within the sandier near surface soils, foundation excavation are anticipated to remain generally dry and stable.

On the basis of preliminary testing, road pavements may be designed on the basis of an assessed CBR of about 7%-15% within the near surface natural clay soils, although once the road levels have been designed, further testing should be carried out to determine the design CBR, particularly if the development scheme will involve raising of site levels.

Whilst soakage testing has not been carried out, soakaways are not considered to present a viable option for the disposal of surface waters due to the predominantly clayey nature of the near surface soils. Attenuated discharge to the local surface water drainage network of ditches, swales and basins should be explored further by the Civil Engineers as part of the detailed drainage design.

GEOENVIRONMENTAL CONCLUSIONS AND RECOMMENDATIONS

The historical use of the site as part of a private sewerage treatment facility may be considered to be potentially contaminative, although the more recent use as open grassland is not considered to be potentially contaminative. The ground investigation has not indicated the presence of elevated concentrations of a wide range of potential soil contamination. The desk study has identified an adjacent off site potential source of potentially mobile contaminants in the form of the adjacent landfill, although work carried out by others suggests that this landfill does not present an unacceptable risk to the wider environment. The ground investigation has indicated the presence of assumed low to negligible permeability clays soils and gas monitoring has not indicated the presence of soil gasses.

The results of soil contamination testing do not indicate a requirement for ground remediation on the basis of a Residential with Plant Uptake end use and the results of soil gas monitoring have not indicated a requirement for soil gas protection to be incorporated into the design of ground floor slabs. The proposed formation level to areas of private domestic garden are likely to be formed within natural soils, where they may locally be formed in made ground, additional inspection and verification will be required to confirm the suitability of soils that remain at garden formation level. Garden inspections will need to be documented and photographed, with further plot specific inspections and testing carried out as necessary.

Preliminary testing has suggested that site won topsoil may be chemically suitable for reuse on this site, although further testing should be carried out to confirm suitability once the topsoil strip has been completed and the topsoil is contained within stockpiles.

A requirement for soil and groundwater remediation, over and above a routine geo-environmental watching brief has not been identified as part of this ground investigation.

FURTHER WORK

In accordance with best practice for redevelopment of any brownfield site, a geo-environmental watching brief should be maintained during the course of the subsequent development in order that should any suspicious or contaminated soils be encountered, they may be investigated, assessed and remediated as necessary under the supervision of Wilson Bailey Partnership and in conjunction with the Local Authority.

As with any historically developed site there remains an albeit low potential for discarded, abandoned or deliberately buried materials to be present on site, although no indications of any such materials have been identified as part of the site works and these should be readily resolved as part of the above watching brief.

1.0 INTRODUCTION

The Wilson Bailey Partnership has been commissioned by Crest Nicholson Operations Limited to research the environmental setting and history of the site and to carry out a ground investigation of this land parcel that forms Parcel N of the Arborfield Garrison redevelopment.

1.1 Proposed Development

Consideration is currently being given to the development of the site through the construction of a residential housing development. Whilst details have not yet been formulated, it is anticipated that the development will comprise predominantly two storey houses with some garages, together with areas of private gardens, communal access soft landscaping, access roads and areas of hard standing for car parking.

New access routes into the development are to be formed by means of a culvert that will allow vehicles to cross over to the site from the adjoining development site to the south of the site.

A series of surface water attenuation basins have already been constructed directly to the south and southwest of this land parcel as part of development wide drainage infrastructure works.

This report is specific to the proposed development and the advice herein should be reviewed once the development proposals have been finalised.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows.

- to check the history of the site with respect to previous uses of the site and surroundings;
- to determine the prevailing near surface ground conditions;
- to investigate and test for the presence of contamination;
- to carry out an appropriate risk assessment with regards to any contamination; and
- to provide advice and recommendations with respect to geotechnical design.

1.3 Scope of Work

In order to meet the above objectives, a desk study was carried out, followed by a ground investigation. The desk study comprised:

- to provide advice and recommendations with respect to geotechnical design.
- a review of readily available geological maps and publicly available information provided by the Environment Agency;
- a review of information provided by the Health Protection Agency with regards to radon;
- a review of Ordnance Survey (OS) maps sourced from the Envirocheck database;
- a review of local Authority Planning records and details held by the Local Authority Environmental Quality Team; and
- a walkover survey of the site.

The physical ground investigation comprised, in summary, the following activities:

- a total of 14 small diameter boreholes drilled across the land parcel by means of a mini tracked open drive percussive soil sampling rig to allow an investigation of the shallow soils, recovery of soil samples and installation of groundwater monitoring standpipes;
- excavation of five shallow trenches through areas indicated to have been historically developed and subsequently demolished;
- the installation and monitoring of combined groundwater and soil gas monitoring standpipes in three of the boreholes;
- insitu CBR testing together with the recover of soil samples for laboratory equilibrium soaked CBR testing;
- laboratory testing of selected soil samples for geotechnical properties;
- laboratory testing of selected soil samples for the presence of contamination; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigation. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or groundwater samples tested; no liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by the Wilson Bailey Partnership.

2.0 THE SITE

2.1 Site Description

The site considered as part of this report comprises Parcel N, which forms an approximately triangular area of overgrown vacant grassland with approximate maximum dimensions of 250 m by 160 m. The northeastern boundary to the site is formed by a mature hedge with mature trees, beyond which are the rear gardens of military housing stock fronting onto Stephenson Road. The northwestern boundary of the site is formed by Tope Crescent, beyond which are further former military houses. The southern and western boundaries to the site are formed by further areas of open overgrown grassland, with a pair of attenuation basins located to the south, beyond which is an existing surface water drainage ditch.

To the west of the site are the recently refurbished former infirmary stables that are retained from the initial development of the Arborfield Garrison as a Remount Division trusted with the supply of trained horses to the army prior to mechanisation.

The site is sensibly level with a gentle slope downwards to the south and a change in level of less than about a metre, which is consistent with the variation of the local topography.

2.2 Site History

The site history has been researched by reference to historical Ordnance Survey (OS) maps sourced from the Envirocheck database and supplemented by information provided by the Local Authority environmental enquiry response and historical anecdotal information held by the garrison.

Records indicate that Arborfield Garrison has undergone three main phases of redevelopment during which various buildings have been demolished, cleared and constructed.

The garrison was originally three farms that were purchased by the army in order that the garrison could be established as a re-mount division providing replacement horses to the army prior to mechanization. The garrison subsequently became a training base for the army electrical and mechanical engineers teaching new recruits military skills as well as trade skills in engineering.

This part of the garrison is remote from any of the workshops and potentially contaminative activities carried out at the garrison but in the initial phase of military expansion during the interwar years, the site appears to have been occupied by parts of a private sewerage treatment facility including tanks and filter beds. With this system presumably cleaning site derived sewerage prior to discharge to the local ditch network to the south of the site. This system was subsequently abandoned and by the time of the next available map dating from 1968, by which time the Remount Division had been repurposed and refurbished to provide an Army training school, the sewerage related structures are shown to have been demolished and cleared from site.

The desk study has revealed that the area approximately 375m to the west of the site was previously occupied by a brick and tile works from at least 1938 until 1980 and was used for the manufacture of bricks and tiles using site won clay excavated from a pit located within the northwestern part of the brickworks site. The main works part of the brickworks was redeveloped in the 1980s through the construction of a housing estate, whilst the former clay extraction pit is understood to have been licensed as a landfill site

2.3 Other Information

Searches of information provided by the Environment Agency have confirmed the presence of an historical landfill site located within approximately 560 m west of the site.

Upon closure of the former brick and tile works to the west, the main works part of the site is understood to have been redeveloped for housing, with remediation works understood to have been carried out to the satisfaction of the Local Authority.

The former clay extraction pit was used as a landfill and was licensed to accept household, commercial and industrial wastes and following infilling was capped and engineered with a perimeter drainage trench and landfill gas management system. Subsequent gas monitoring is understood to not have indicated hazardous ground gas and groundwater conditions outside of the landfill with the soil gas and leachate monitoring within the landfill understood to be suggestive of ongoing maturation of the wastes within the landfill.

No other indications of potentially significant ground contamination have been identified in the vicinity of the site. No recorded incidents of fuel or oil leakage are known and it is understood that the whole of the Arborfield site has been screened for radioactive materials and has not indicated the presence of any issue of concern.

The searches have also indicated the site to be located in an area where less than 1% of homes may be affected by radon emissions, which is the lowest risk category such that radon protection measures are not required as part of the redevelopment of this site.

The Geological Survey map of the area indicates the site to be underlain by London Clay from the surface, with various tracts of alluvium present in the vicinity of the site

Information provided by the Environment Agency indicates the site to not be underlain by any class of productive strata and to not be located within any class of Source Protection Zone associated with any licensed groundwater abstraction points.

2.4 Preliminary Risk Assessment

The historical use of the site as part of a private sewerage treatment facility may be considered to be potentially contaminative, although the more recent use as open grassland is not considered to be potentially contaminative. The potential microbiological contaminants associated with sewerage would not be expected to have a long term consequence and the potential for a build up of metallic contamination that can be associated with sewerage works is not likely to have had sufficient time to build up due to the subsequent demolition and clearance of the site as part of the military refurbishment and expansion of the facilities on the wider garrison site.

The desk study has identified an adjacent off site potential source of potentially mobile contaminants in the form of the adjacent landfill, although work carried out by others suggests that this landfill does not present an unacceptable risk to the wider environment.

The presence of assumed low to negligible permeability London Clay soils is also likely to mitigate the potential for any off site sources of ground contamination, groundwater contamination or soil gasses to impact upon this site.

On the basis of the above information there is considered to be a low to moderate risk of potentially significant ground contamination at this site.

3.0 EXPLORATORY WORK SAMPLING STRATEGY

In order to meet the objectives described in Section 1.2 a series of 14 small diameter boreholes were drilled in locations across the site to investigate the soils to a depth of up to 4.00 m and enable groundwater and soil gas monitoring standpipes to be installed. The locations of boreholes and the installed monitoring standpipes were selected to obtain a general coverage and allow investigation of the prevailing ground conditions. The scope of ground investigation was limited by the presence of live services that have been identified across parts of the site.

Representative samples of the soils encountered were taken to the laboratory for geotechnical testing and contamination analyses. The analytical suite of soil contamination testing was selected to identify concentrations of a wide range of potential contaminants of concern for the purposes of general coverage. For this investigation the analytical suite included a range of metals, speciated total petroleum hydrocarbons (TPHCWG), speciated polycyclic aromatic hydrocarbons (PAH), and monohydric phenols together with routine analyses for pH and organic content. The contamination analyses were carried out at a MCERTs accredited laboratory and details of the MCERTs accreditation and test methods may be supplied on request.

The borehole records and results of the insitu soil testing and laboratory analyses are appended together with a site plan indicating the exploratory positions.

4.0 GROUND CONDITIONS

The investigation has broadly confirmed the expected ground conditions in that below a variable depth of made ground, predominantly clay Superficial Deposits were found to be underlain by firm rapidly becoming stiff dark bluish grey clay soils of the London Clay were encountered and proved to the full depth of investigation.

4.1 Made Ground and Reworked Topsoil

Across much of the site a generally nominal thickness of apparently natural topsoil was encountered to a depth of up to less than about 0.50 m below ground level and found to comprise a dark brown sandy clay, with made ground locally encountered to a maximum depth of 0.90m. The made ground was found to comprise reworked topsoil and clay with occasional brick and tile fragments.

No visual or olfactory indications of ground contamination were noted within the topsoil. Representative samples of the topsoil, made ground and underlying natural soils were recovered from a number of the boreholes from across the land parcels and analysed for a range of contaminants and the results are summarised in Section 4.5. Whilst not every soil sample has been tested it is considered that a suitable coverage of the site has been achieved.

4.2 London Clay Formation

The clay soils of the London Clay Formation, were encountered underlying the near surface made ground and proved to the maximum depth of investigation. These clay soils were found to be firm brown becoming grey with depth generally silty and locally sandy fissured clay soils with occasional partings of fine orange-brown silty sand.

No visual indications of the effects of trees was noted as part of the ground investigation works.

Laboratory geotechnical testing has indicated these clay soils to be of medium volume change potential and medium plasticity and the samples tested do not suggest the presence of desiccated soils, although clearly in the immediate vicinity of tress and at different times of year, the clay soils may well be at least locally desiccated.

4.3 Soil Contamination

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach. The use of a risk-based approach, which is presented in Part 2 of this report, means that it is not appropriate to determine the significance of contamination test results by simply comparing individual contaminant concentrations to a single "trigger" or "target" concentration.

The table below presents a summary of the results of the laboratory testing carried out as part of the supplementary ground investigation works and are based upon the analyses of 10 soil samples taken from across Parcel N;

Determinant	Maximum concentration recorded (mg/kg)	Minimum concentration recorded (mg/kg)	Number of samples below detection limit	Normalised upper bound US_{95}
Arsenic	12	5.0	None	7.0
Boron	<1.0	<1.0	All	--
Cadmium	<0.5	<0.5	All	--
Chromium	24	10	None	18
Hexavalent Chromium	<2.0	<2.0	All	--
Copper	20	5.0	None	14
Lead	55	9.0	None	33
Mercury	<1.0	<1.0	All	--
Nickel	10	4.0	None	8.2
Selenium	<3.0	<3.0	All	--
Zinc	105	21	None	69
Phenols	<2.0	<2.0	All	--
Benzo(a)pyrene	3.1	<0.1	7	1.5
Total Organic Carbon	5.4	0.4	None	2.5

Note: The use of the normalised upper bound for 95th percentile confidence aims to remove some of the uncertainty associated with calculation of an arithmetic sample mean of a relatively small number of samples. The US95 value is the upper bound of the range within which it can be stated with 95% confidence that the true mean concentration of the data set will fall.

In addition to the results presented above, all soil samples have been screened for the presence of detectable asbestos fibres and all results indicate that fibres have not been detected.

4.4 Groundwater

Groundwater seepages and inflows were encountered in a number of exploratory boreholes at depths of between about 2.00 m and 4.00 m below ground level.

Limited monitoring of the standpipes installed into the small diameter boreholes indicates boreholes to be generally dry but where groundwater has been detected it is present at inconsistent depths that are indicative of localised pockets of groundwater perched within the sandier layers, rather than being indicative of a single body of laterally consistent and hydraulic continuous groundwater.

4.5 Soil Gas

The results of a programme of soil gas monitoring are included within the appendix to this report.

The results of the monitoring carried out to date have not indicated elevated concentrations of soil gasses of concern and have not indicated any appreciable flow regime.

The programme of soil gas monitoring is currently ongoing and will be presented as an addendum to this report.

5.0 GROUND MODEL

On the basis of the fieldwork, the ground conditions at this site can be characterised as follows.

- Variably natural and reworked topsoil was generally encountered to depths of less than about 0.50m but locally up to depths of up to 1.10 m below ground level, which is considered to be consistent with the historical use of the site as part of a subsequently demolished and cleared private sewerage treatment facility and subsequent use as an area of amenity grassland within part of a military establishment;
- underlying the near surface topsoil and made ground firm brown becoming bluish grey silty locally sandy clay soils of the London Clay were encountered to the maximum depth of investigation at 4.00m;
- no visual or olfactory evidence of ground contamination was noted within the near surface soils other than the occasional presence of brick and tile fragments within the reworked topsoil made ground, with subsequent laboratory soil contamination testing not indicating the presence of elevated concentrations of a wide range of potential contaminants across the site;
- groundwater was encountered within the superficial deposits at a range of depths that suggest localised pockets of perched groundwater are present within the sandier layers of these soils rather than hydraulically continuous; and
- soil gas monitoring carried out to date has not indicated elevated concentrations of potentially hazardous soils gasses.

5.1 Contaminants of Concern

The results of comprehensive laboratory analyses carried out by an MCERTS accredited laboratory on a soil samples recovered from this site are enclosed. A total of 10 soil samples were submitted for routine contamination testing including testing for a wide range of metallic contaminants, speciated hydrocarbons, speciated poly-aromatic hydrocarbons and asbestos the results of which are presented in Part 1 of this report.

The significance of the measured concentrations of any chemicals of concern has therefore been assessed in relation to the available Environment Agency provided statutory C4SLs, supplemented with the available S4UL values that have been adopted by the Chartered Institute of Environmental Health (CIEH) for a residential with plant uptake end use and a soil organic matter representative of the results of the testing carried out (1%). These values are widely accepted as providing a suitable initial screening value against which measured concentrations of potential contaminants can be assessed to determine the requirement for site specific quantitative risk assessment. The acceptability criteria are presented as overleaf;

Determinant	Acceptability Criteria (residential with plant uptake) mg/kg	Number of exceedances	Location and value of exceedances
Asbestos	No asbestos	None	--
Arsenic (As)	37	None	--
Cadmium (Cd)	11	None	--
Chromium (hex)	6.0	None	--
Chromium (Cr)	910	None	--
Copper (Cu)	2400	None	--
Lead (Pb)	200	None	--
Mercury (Hg)	1.2	None	--
Nickel (Ni)	130	None	--
Selenium (Se)	250	None	--
Zinc (Zn)	3700	None	--
Benzo(a)pyrene	2.2	None	Borehole No 10 at 0.50m (3.07mg/kg)
Total Phenols (mono)	420	None	--
Speciated Fuel Related Hydrocarbons	Various species specific	None	--

The single elevated result of benzo(a)pyrene detected within a sample of the made ground recovered from Borehole No 10 at a depth of 0.50m is not considered to be statistically significant with the US95 value for the statistical population being less than the acceptability criterion for this determinand.

6.0 ADVICE AND RECOMMENDATIONS

The low strength predominantly clayey superficial deposits are considered suitable for the support of only lightly loaded spread foundations, whilst the underlying firm becoming stiff clay soils of the London Clay should be suitable for supporting more heavily loaded spread foundations.

6.1 Spread Foundations

Moderate width pad or strip foundations are considered to be viable for the development at this site. Foundations may be designed to found within the medium strength brown variably sandy clay soils of the London Clay at a minimum depth of 1.00 m below ground level and apply a net allowable bearing pressure of 100 kN/m2, with a minimum width of 0.60m.

This value includes an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits. In the unlikely event that heavily or eccentrically loaded foundations are required, a check should however be made on the magnitude of settlement once the base sizes are known, as the design bearing pressure is settlement dependent.

Foundations will need to be deepened in the vicinity of existing and proposed trees and National House Building Council (NHBC) guidelines with respect to Medium Volume Change Potential clay soils.

Due to the presence of abundant trees along the various site boundaries, there is a risk that should any plots be constructed within the immediate vicinity of trees or groups of trees that foundations could locally need to extend to a depth such that they are no longer viable and piled foundations may be required, for which further ground investigation would be necessary.

Where trees are to be removed the required founding depth should be determined on the basis of the existing tree height if it is less than 50% of the mature height and on the basis of full mature height if the current height is more than 50% of the mature height. Where a tree is to be retained the final mature height should be adopted and due allowance should be made for future growth of trees, with particular reference to the relatively dense additional planting that is proposed as part of the ecological mitigation measures. As part of the foundation assessment an allowance for the group effects of trees and dense vegetation should be considered, with further ground investigation and plot specific assessment carried out as deemed necessary by the structural engineers.

Notwithstanding NHBC guidelines, all foundations should extend beyond the zone of desiccation; in this respect it would be prudent to have all foundation excavations inspected by a suitably experienced engineer. The requirement for compressible material alongside foundations should be determined by reference to the NHBC guidelines. The results of laboratory geotechnical testing indicate the clay soils to be medium plasticity with a medium volume change potential.

6.2 Excavations

It is likely that across the majority of the site shallow excavations for services and foundations within the near surface soils are likely to remain dry and broadly stable in the short term.

Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

6.3 Ground Floor Slabs

In view of the presence of Medium Volume Change Potential clay soils and variable depth of made ground, it is anticipated that there will be a requirement for suspended ground floor slabs over a void in accordance with NHBC guidelines at this site.

6.4 Pavement Design

The formation level for hardstandings and access roads across the majority of the site is likely to be within the near surface clay soils.

The results of insitu CBR testing are enclosed and indicate values of between 7% and 15% have been measured.

The results of laboratory soaked CBR testing will be provided as an addendum once the results are available.

Due to the presence of clay soils, earthworks and road formations within winter months may be challenging and the formation level may be expected to degrade rapidly with site traffic and rain.

6.5 Buried Services

Precautions to ensure the protection of potentially sensitive underground services with regards to ground contamination are not envisaged as part of the development of this site, although discussions should be held with the statutory providers as they have a duty to ensure the appropriate protection of buried services from any deleterious ground conditions.

6.6 Effect of Sulphates

The results of laboratory geotechnical testing indicate low concentrations of soluble sulphate, corresponding to Class DS-1 AC-1s of Table 2 of BRE Special Digest 1: SD1 Part 1.

6.7 Surface Water Drainage

Soakage testing did not form part of the brief to this investigation, although it is considered that the assumed low permeability of the clay soils underlying the site would preclude the effective use of soakaways as part of the drainage solution for this site

6.8 Contamination Risk Assessment

The historical use of the site as part of a private sewerage treatment facility could present a source of potential contamination, however the biological contamination potentially associated with this use would be expected to be short lived and no longer pose a threat to this site. Furthermore, the duration of the presence of the sewerage treatment filter beds prior to removal and clearance as part of subsequent military upgrades is not likely to be sufficient to result in accumulations of potential metallic contaminants associated with sewerage. On this basis it is considered that this historical use of the site is not likely to present a realistic risk of ground contamination in view of the subsequent long term use as an area of open amenity grassland.

The results of the ground investigation have not identified widespread visual or olfactory indications of contamination, although localised brick and tile have been locally encountered within the made ground where present. A single elevated concentration of benzo(a)pyrene has been detected in a single sample of the made ground, although the statistical analysis of the results for this determinand indicate that this result is not considered to be of concern.

Trial trenching has not indicated the presence of any relic structures associated with the former sewerage filter beds, although localised obstructions may potentially remain within other parts of the site.

The monitoring carried out to date has also not indicated the presence of elevated concentrations of soil gasses potentially associated with the nearby historical landfill site.

One of the requirements of the Environment Act (1995) is that local authorities carry out inspections of their area with a view to identifying sites that may be contaminated. When assessing whether a site is contaminated the local authority will attempt to establish the presence of a 'pollution linkage'. A pollution linkage requires there to be a source of contamination, a sensitive receptor that can be adversely affected by the contamination and a pathway via which contamination can reach the target.

The proposed development of the site will introduce new sensitive receptors in the form of end users and construction workers, together with the formation of new pathways through the creation of areas of private domestic gardens.

With regards to the specific considerations required under the planning conditions, the risk to the following potentially sensitive receptors has been considered;

Human Health
Potential risks posed to human health have been considered and the results of soil contamination testing do not indicate a requirement for ground remediation on the basis of an assumed residential with plant uptake end use. The results of soil gas monitoring have not indicated a requirement for soil gas protection to be incorporated in to the design of ground floor slabs.

The proposed formation level to areas of private domestic garden are likely to be formed within natural soils, where they may locally be formed in made ground, additional inspection and verification will be required to confirm the suitability of soils that remain at garden formation level. Depending upon finalised designs and levels, garden inspections will need to be documented and photographed, with further plot specific inspections and testing carried out as necessary.

As with any site however there remains an albeit limited potential for localised ground contamination that should be managed as part of an overall site contaminated land watching brief.

Property (existing or proposed) including buildings, crops, livestock, pets, woodland and service lines and pipes,
The risk to these potential receptors has been considered and in view of the absence of significant and potentially mobile ground contamination, a significant risk warranting further action has not been identified.

The requirement for protected services such as drinking water has been considered and whilst the final decision rests with the providing utility company, a requirement for protection may be anticipated.

Adjoining land,
The risk to this potential receptor has been considered and in view of the absence of significant and potentially mobile ground contamination, a significant risk warranting further action has not been identified.

Groundwaters and surface waters
The risk to these potential receptors has been considered and in view of the absence of significant and potentially mobile ground contamination, a significant risk warranting further action has not been identified

Ecological systems
The risk to this potential receptor has been considered and in view of the absence of significant and potentially mobile ground contamination, a significant risk warranting further action has not been identified

Archaeological sites and ancient monuments
The risk to this potential receptor has been considered and in view of the absence of significant and potentially mobile ground contamination, a significant risk warranting further action has not been identified

Whilst the results of the contamination testing have not indicated the widespread presence of elevated concentrations of a wide range of potential contaminants, as with the development of any site, site workers should be made aware of the potential for contamination to be present. The

method of site working should be in accordance with guidelines set out by HSE[1] and CIRIA[2] and the requirements of the Local Authority Environmental Health Officer (EHO).

6.9 Waste Disposal and Materials Management

Any spoil arising from excavations or landscaping works will need to be disposed of to a licensed tip. Under the European Waste Directive landfills are classified as accepting Inert, Non-hazardous or Hazardous wastes in accordance with Waste Acceptance Criteria (WAC) which, for Non-hazardous and Inert wastes are based upon the results of CEN method bulk leaching tests or percolation tests.

Based upon the results of the analyses carried out and the technical guidance provided by the Environment Agency[3] it is considered likely that near surface topsoil and subsoil are likely to be classified as Non-Hazardous waste by virtue of the presence of organic matter, should they require off site disposal. It is also considered that segregated arisings from excavations into the underlying natural soils may be classified as Inert waste, subject to further confirmatory WAC testing.

It is considered likely that the topsoil present across the site could be effectively stripped and segregated and subject to additional confirmatory stockpile testing, site won topsoil could potentially be viable for reuse as part of the completed development. Any site won topsoil intended for reuse should be appropriately stockpiled and managed in accordance with the guidance provided by DEFRA until required.

In the unlikely event that during the course of the ground works soils are found to be stained or have any hydrocarbon odour, they should be stockpiled separately from other soils in order that they may be tested to determine a revised waste classification, as these soils may potentially require classification as Hazardous waste. Any such segregation, stockpiling or on site treatment to reduce or later the likely waste classification will need to be carried out in accordance with a Materials Management Plan that will need to be approved by the Environment Agency prior to commencement of work.

In any case, all waste classifications should be confirmed by the receiving landfill once the soils to be discarded have been identified. In order to finalise an Inert waste classification it will probably be necessary to carry out further analyses including WAC CEN method bulk leaching tests. Such tests should be carried out upon representative samples from the waste stream once the extent of the materials to be discarded has been established.

The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material and the scope of any additional testing that may be required.

1 HSE (1992) HS(G)66 *Protection of workers and the general public during the development of contaminated land* HMSO

2 CIRIA (1996) *A guide for safe working on contaminated sites* Report 132, Construction Industry Research and Information Association

3 Environment Agency 2003. *Hazardous Waste: Interpretation of the definition and classification of hazardous waste.* Technical Guidance WM2

8.0 REQUIREMENT FOR REMEDIATION

On the basis of the ground investigation works and subsequently soil gas and groundwater monitoring presented within this report the following requirement for remediation has been identified;

Requirement for Soil Contamination Remediation
Elevated concentration of a wide range of potential soil contaminants have not been identified across the site such that there is not a requirement for site wide soil remediation, over and above a routine geo-environmental watching brief and topsoil materials management.

The proposed formation level to areas of private domestic garden are likely to be formed within natural soils, where they may locally be formed in made ground, additional inspection and verification will be required to confirm the suitability of soils that remain at garden formation level.

Garden inspections will need to be documented and photographed, with further plot specific inspections and testing carried out as necessary.

Requirement for Groundwater Remediation
The ground investigation works have not indicated the potential for on-site contamination of the groundwater and previous monitoring of the effects of the landfill site to the north indicate that the local flow regime of any potentially mobile groundwater from this off site source is away from the site, such that a requirement for groundwater remediation is not envisaged.

Requirement for Soil Gas Remediation
The ground investigation has not identified the presence of elevated concentrations of soil gasses such that gas protection is not anticipated to be a requirement for the development at this site.

9.0 FURTHER WORK

The proposed formation level to areas of private domestic garden is likely to be formed within natural soils, where they may locally be formed in made ground, additional inspection and verification will be required to confirm the suitability of soils that remain at garden formation level.

Garden inspections will need to be documented and photographed, with further plot specific inspections and testing carried out as necessary.

As with the development of any site there is the risk of localised pockets of contamination being encountered as part of the proposed ground works. The development should therefore be carried out in accordance with the requirements of a routine geo-environmental watching brief, whereby should any contaminated or suspicious soils be encountered they may be appropriately tested, investigated and assessed by Wilson Bailey in consultation with the Regulatory Authorities before agreeing the scope of any remedial actions as necessary.

It is conceivable that further geotechnical focused ground investigation may be required to inform the detailed design of the proposed roads, structures and site drainage infrastructure, once the design, layout, scale and nature of the development has been finalised.

APPENDIX

Borehole Records

Geotechnical Laboratory Test Results (Soil)

Chemical Analyses (Soil)

Soil Gas and Groundwater Monitoring Results

Groundsure Geological and Environmental Data Summaries

Selected Historical Ordnance Survey Maps

Site Plan

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	TOPSOIL		
0.50	D1					Firm brown with orange-brown and pale grey mottled silty locally slightly sandy CLAY		
1.00-1.45	SPT N=6		1,1/1,2,1,2					
1.00	D2							
1.50	D3				(3.00)			
2.00-2.45	SPT N=8		1,2/2,2,2,2					
2.00	D4							
2.50	D5							
3.00-3.45	SPT N=12		2,3/3,3,3,3					
3.00	D6				3.20			
3.50	D7					Firm becoming stiff grey silty CLAY with occasional partings of pale grey silty fine sand		▽1
			Water strike(1) at 3.70m.		(1.25)			
4.00-4.45	SPT N=24		4,4/5,6,6,7					
4.00	D8							
					4.45			
4.45	D9					Complete at 4.45m		

Remarks
Groundwater seepage at 3.70m.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH1

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH10

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 28/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.10	MADE GROUND (rewroekd topsoil)		
					(0.50)	MADE GROUND (reworked brown sandy clay with topsoil and brick)		
0.50	D1				0.60	Firm brown silty locally slightly sandy CLAY		
1.00	D2							
1.50	D3							
					(2.60)			
2.00	D4							
2.50	D5							
3.00	D6							
					3.20	Stiff dark grey slightly silty CLAY		
3.50	D7				(0.80)			
4.00	D8				4.00	Complete at 4.00m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH10

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH11

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 28/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	MADE GROUND (reworked topsoil)		
					(0.20) 0.40	MADE GROUND (reworked clay with concrete)		
0.50	D1					Firm brown silty locally slightly sandy CLAY		
1.00	D2							
1.50	D3							
					(2.80)			
2.00	D4							
2.50	D5							
3.00	D6							
					3.20	Stiff dark grey slightly silty CLAY		
3.50	D7				(0.80)			
4.00	D8				4.00	Complete at 4.00m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH11

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH12

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 28/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	TOPSOIL		
						Firm brown silty locally sandy CLAY		
0.50	D1							
1.00	D2							
1.50	D3				(3.10)			
2.00	D4							
2.50	D5							
3.00	D6							
					3.30			
						Stiff dark grey slightly silty CLAY		
3.50	D7				(0.70)			
4.00	D8				4.00			
						Complete at 4.00m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH12

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH13

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 28/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	TOPSOIL		
						Firm brown silty slightly sandy CLAY		
0.50	D1							
1.00	D2							
1.50	D3				(2.80)			
2.00	D4							
2.50	D5							
3.00	D6				3.00	Complete at 3.00m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH13

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH14

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 28/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30) 0.30	MADE GROUND (reworked topsoil with brick)		
0.50	D1					Firm brown silty slightly sandy CLAY with occasional orange-brown and pale grey mottling		
1.00	D2							
1.50	D3							
					(3.10)			
2.00	D4							
2.50	D5							
3.00	D6							
					3.40			
3.50	D7					Stiff dark grey slightly silty CLAY		
					(0.60)			
4.00	D8				4.00	Complete at 4.00m		

Remarks
Groundwater not encountered, Standpipe installed with a resoponse zone from 1.00m to 4.00m.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH14

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH2

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	TOPSOIL		
						Firm brown with occasional orange-brown and pale grey mottled silty sandy CLAY		
0.50	D1							
1.00	D2							
1.50	D3				(2.60)			
2.00	D4							
2.50	D5							
					2.80			
3.00	D6				(0.40)	Stiff grey with brown mottled silty CLAY		
					3.20			
3.50	D7				(0.80)	Stiff grey slightly silty CLAY		
4.00	D8				4.00			
						Complete at 4.00m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH2

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH3

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.10	TOPSOIL		
0.50	D1				(1.00)	Firm brown, pale brown, pale grey and orange-brown mottled silty locally sandy CLAY with occasional fine flint gravel		
1.00-1.45	SPT N=4		1,1/1,1,1,1		1.10			
1.00	D2					Firm brown silty sandy locally very sandy CLAY with sand partings		
1.50	D3							
2.00-2.45	SPT N=7		1,1/1,2,2,2		(2.00)			
2.00	D4							
2.50	D5							▽1
			Water strike(1) at 2.80m.					
3.00-3.45	SPT N=9		2,2/2,2,2,3		3.10			
3.00	D6					Stiff dark grey CLAY		
3.50	D7				(1.35)			
4.00-4.45	SPT N=17		3,3/3,4,5,5					
4.00	D8							
					4.45			
4.45	D9					Complete at 4.45m		

Remarks
Groundwater seepage at 2.80m. Standpipe installed with a response zone from 1.00m to 3.00m.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH3

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	TOPSOIL		
0.50	D1					Firm brown slightly silty CLAY with occasional pale grey mottling and orange-brown silty sandy partings		
1.00	D2							
1.50	D3							
2.00	D4				(3.80)			
2.50	D5							
3.00	D6							
3.50	D7							
4.00	D8				4.00	Complete at 4.00m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH4

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH5

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.10	TOPSOIL		
						Firm brown with orange-brown and pale grey mottled silty slightly sandy CLAY		
0.50	D1							
1.00	D2							
1.50	D3							
					(3.50)			
2.00	D4							
2.50	D5							
3.00	D6							
3.50	D7				3.60	Stiff dark greyish brown slightly silty CLAY		
					(0.65)			
4.00	D8							
4.25	D9				4.25	Complete at 4.25m		

Remarks
Groundwater not encountered. Standpipe installed with a response zone form 1.00m to 4.00m.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH5

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH6

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	TOPSOIL		
					0.30	Pale yellowish brown silty sandy CLAY with abundant fine flint gravel		
0.50	D1					Firm brown silty slightly sandy CLAY with pale grey and orange-brown mottling and occasional partings of orange-brown silty sand		
1.00	D2							
1.50	D3				(2.90)			
2.00	D4							
2.50	D5							
3.00	D6				3.20	Stiff dark grey slightly silty CLAY		
3.50	D7				(0.80)			
4.00	D8				4.00	Complete at 4.00m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH6

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH7

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.35)	MADE GROUND (reworked topsoil with brick)		
0.25	D0				0.35			
0.50	D1				(0.35)	Firm pale brown silty sandy locally very sandy CLAY		
					0.70			
1.00-1.45	SPT N=4		1,1/1,1,1,1			Firm brown with occasional pale grey and orange-brown mottled silty locally slightly sandy CLAY		
1.00	D2							
1.50	D3							
					(2.30)			
2.00-2.45	SPT N=8		1,1/2,2,2,2					
2.00	D4							
2.50	D5							
					3.00			
3.00-3.45	SPT N=12		2,3/3,3,3,3			Stiff dark grey slightly silty CLAY		
3.00	D6							
3.50	D7				(1.00)			
					4.00			
4.00-4.45	SPT N=18		3,4/4,4,5,5			Complete at 4.00m		
4.00	D8							

Remarks
Groundwater not encountered. Standpipe installed with a response zone from 1.00m to 4.00m.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH7

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH8

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	MADE GROUND (reworked topsoil with concrete fragments)		
					0.40			
0.50	D1				(0.50)	MADE GROUND (reworked clay with occasional brick)		
					0.90			
1.00	D2					Firm brown silty lcoally slightly sandy CLAY		
1.50	D3							
2.00	D4				(2.20)			
2.50	D5							
3.00	D6				3.10			
						Firm becoming stiff dakr grey slightly silty CLAY		
3.50	D7				(0.90)			
4.00	D8				4.00			
						Complete at 4.00m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH8

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Number
Arborfield Parcel N	BH9

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Crest Nicholson	J202426
	Location	**Dates** 27/08/2024	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.70)	MADE GROUND (reworked topsoil)		
0.50	D1				0.70	Firm brown silty locally sandy and very sandy CLAY with occasional sand partings		
1.00	D2							
1.50	D3							
2.00	D4				(2.60)			
2.50	D5		Water strike(1) at 2.70m.					▽1
3.00	D6							
					3.30			
3.50	D7				(0.70)	Firm dark grey slightly silty CLAY		
4.00	D8				4.00	Complete at 4.00m		

Remarks
Groundwater encountered at 2.70m. Pocket of claystone and wet sand at 2.70m to 2.80m.

Scale (approx)	Logged By
1:50	

Figure No. J202426.BH9

	In Situ California Bearing Ratio (CBR)			Job Ref	35984
				CBR No.	CBR1
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	1

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

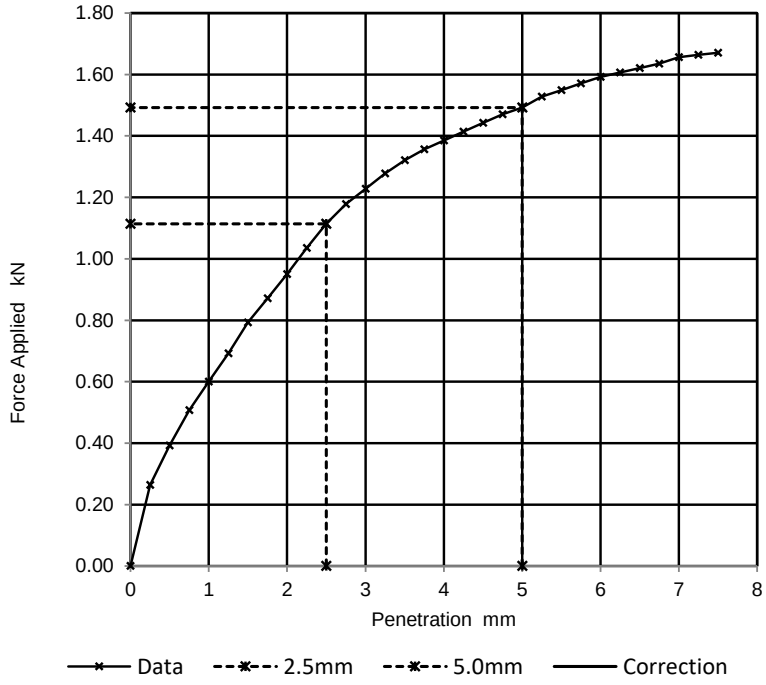
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	37	0.26
0.50	55	0.39
0.75	71	0.51
1.00	84	0.60
1.25	97	0.69
1.50	111	0.79
1.75	122	0.87
2.00	133	0.95
2.25	145	1.04
2.50	156	1.11
2.75	165	1.18
3.00	172	1.23
3.25	179	1.28
3.50	185	1.32
3.75	190	1.36
4.00	194	1.39
4.25	198	1.41
4.50	202	1.44
4.75	206	1.47
5.00	209	1.49
5.25	214	1.53
5.50	217	1.55
5.75	220	1.57
6.00	223	1.59
6.25	225	1.61
6.50	227	1.62
6.75	229	1.64
7.00	232	1.66
7.25	233	1.66
7.50	234	1.67

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	8.4	7.5	**8.4**	10

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials: **J.P**
Date: 16/09/2024

	In Situ California Bearing Ratio (CBR)			Job Ref	35984
				CBR No.	CBR2
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	2

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

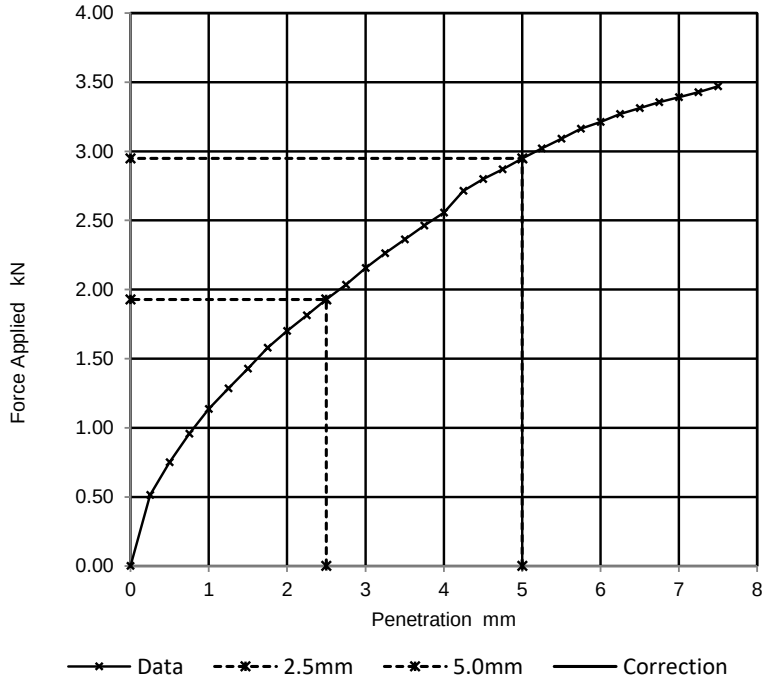
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	72	0.51
0.50	105	0.75
0.75	134	0.96
1.00	159	1.14
1.25	180	1.29
1.50	200	1.43
1.75	221	1.58
2.00	238	1.70
2.25	254	1.81
2.50	270	1.93
2.75	285	2.03
3.00	302	2.16
3.25	317	2.26
3.50	331	2.36
3.75	345	2.46
4.00	358	2.56
4.25	380	2.71
4.50	392	2.80
4.75	402	2.87
5.00	413	2.95
5.25	423	3.02
5.50	433	3.09
5.75	443	3.16
6.00	450	3.21
6.25	458	3.27
6.50	464	3.31
6.75	470	3.36
7.00	475	3.39
7.25	480	3.43
7.50	486	3.47

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	15	15	**15**	7.8

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials: **J.P**

Date: 16/09/2024

In Situ California Bearing Ratio (CBR)

				Job Ref	35984
				CBR No.	CBR3
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	3

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

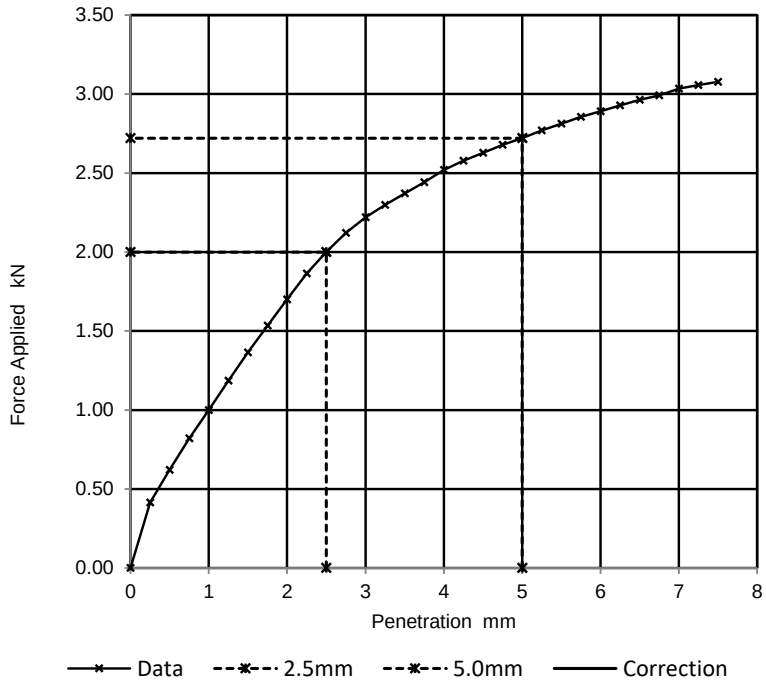
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	58	0.41
0.50	87	0.62
0.75	115	0.82
1.00	140	1.00
1.25	166	1.19
1.50	191	1.36
1.75	215	1.54
2.00	238	1.70
2.25	261	1.86
2.50	280	2.00
2.75	297	2.12
3.00	311	2.22
3.25	322	2.30
3.50	332	2.37
3.75	342	2.44
4.00	353	2.52
4.25	361	2.58
4.50	368	2.63
4.75	375	2.68
5.00	381	2.72
5.25	388	2.77
5.50	394	2.81
5.75	400	2.86
6.00	405	2.89
6.25	410	2.93
6.50	415	2.96
6.75	419	2.99
7.00	425	3.03
7.25	428	3.06
7.50	431	3.08

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	15	14	**15**	18

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Initials: **J.P**
Date: 16/09/2024

	In Situ California Bearing Ratio (CBR)			Job Ref	35984
				CBR No.	CBR4
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	4

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

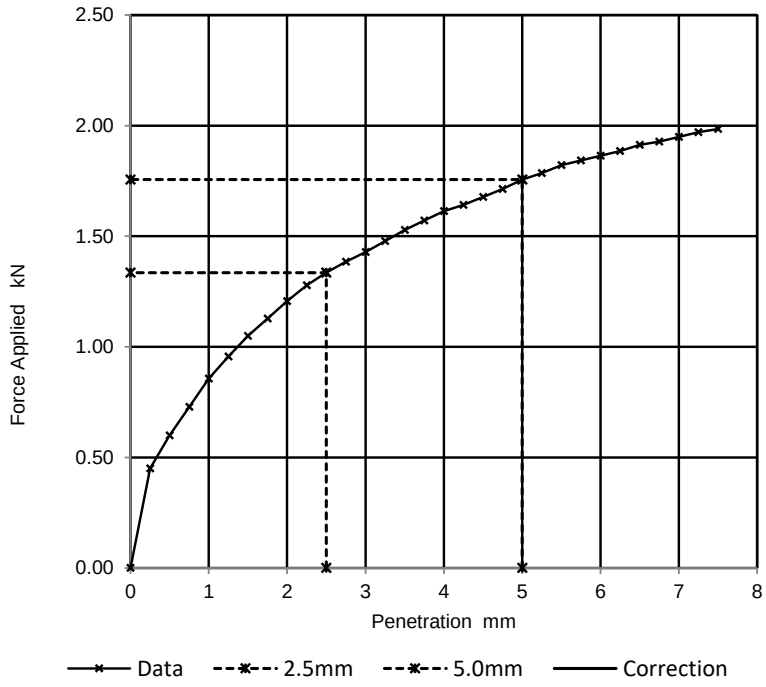
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	63	0.45
0.50	84	0.60
0.75	102	0.73
1.00	120	0.86
1.25	134	0.96
1.50	147	1.05
1.75	158	1.13
2.00	169	1.21
2.25	179	1.28
2.50	187	1.34
2.75	194	1.39
3.00	200	1.43
3.25	207	1.48
3.50	214	1.53
3.75	220	1.57
4.00	226	1.61
4.25	230	1.64
4.50	235	1.68
4.75	240	1.71
5.00	246	1.76
5.25	250	1.79
5.50	255	1.82
5.75	258	1.84
6.00	261	1.86
6.25	264	1.88
6.50	268	1.91
6.75	270	1.93
7.00	273	1.95
7.25	276	1.97
7.50	278	1.98

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	10	8.8	**10**	13

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Checked and Approved

Initials: **J.P**

Date: 16/09/2024

In Situ California Bearing Ratio (CBR)

				Job Ref	35984
				CBR No.	CBR5
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	5

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

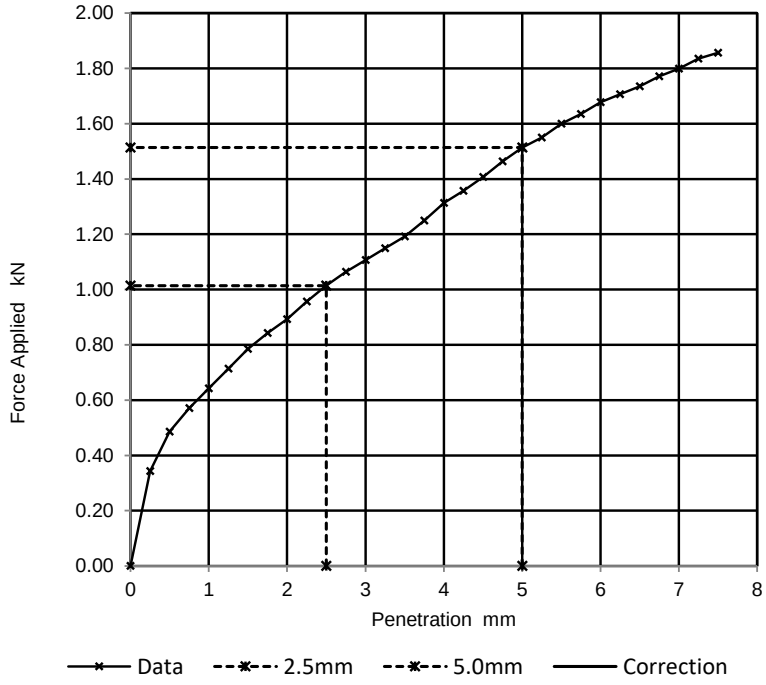
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	48	0.34
0.50	68	0.49
0.75	80	0.57
1.00	90	0.64
1.25	100	0.71
1.50	110	0.79
1.75	118	0.84
2.00	125	0.89
2.25	134	0.96
2.50	142	1.01
2.75	149	1.06
3.00	155	1.11
3.25	161	1.15
3.50	167	1.19
3.75	175	1.25
4.00	184	1.31
4.25	190	1.36
4.50	197	1.41
4.75	205	1.46
5.00	212	1.51
5.25	217	1.55
5.50	224	1.60
5.75	229	1.64
6.00	235	1.68
6.25	239	1.71
6.50	243	1.74
6.75	248	1.77
7.00	252	1.80
7.25	257	1.83
7.50	260	1.86

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	7.7	7.6	**7.7**	11

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Checked and Approved
Initials: **J.P**
Date: 16/09/2024

	In Situ California Bearing Ratio (CBR)			Job Ref	35984
				CBR No.	CBR6
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	6

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

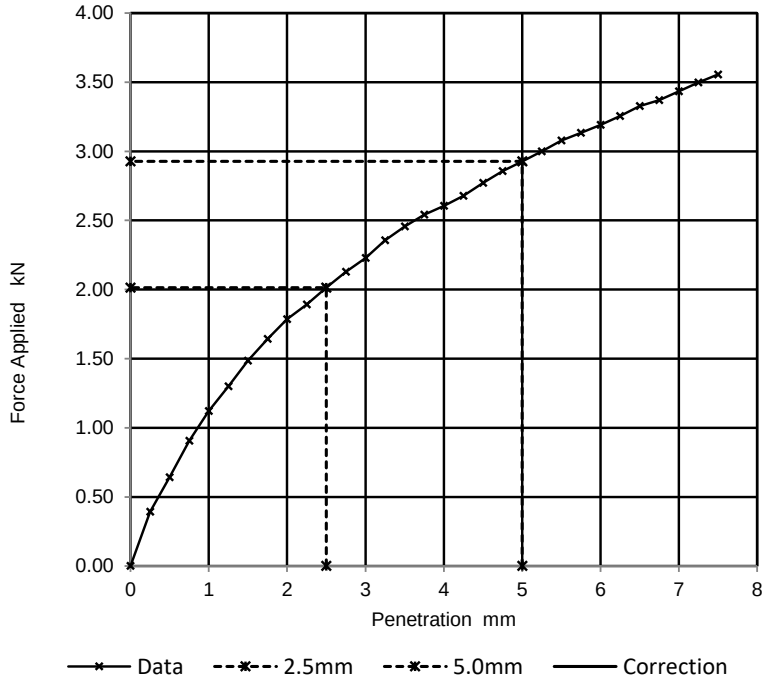
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	55	0.39
0.50	90	0.64
0.75	127	0.91
1.00	157	1.12
1.25	182	1.30
1.50	208	1.49
1.75	230	1.64
2.00	250	1.79
2.25	265	1.89
2.50	282	2.01
2.75	298	2.13
3.00	312	2.23
3.25	330	2.36
3.50	344	2.46
3.75	356	2.54
4.00	365	2.61
4.25	375	2.68
4.50	388	2.77
4.75	400	2.86
5.00	410	2.93
5.25	420	3.00
5.50	431	3.08
5.75	439	3.13
6.00	447	3.19
6.25	456	3.26
6.50	466	3.33
6.75	472	3.37
7.00	481	3.43
7.25	490	3.50
7.50	498	3.56

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	15	15	**15**	8.8

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Date: 16/09/2024

	In Situ California Bearing Ratio (CBR)			Job Ref	35984
				CBR No.	CBR7
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	7

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

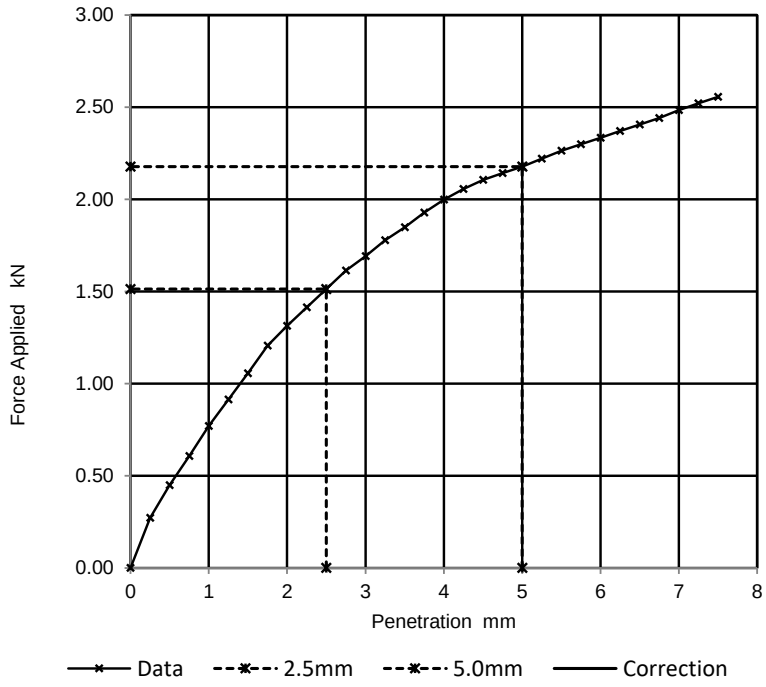
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	38	0.27
0.50	63	0.45
0.75	85	0.61
1.00	108	0.77
1.25	128	0.91
1.50	148	1.06
1.75	169	1.21
2.00	184	1.31
2.25	198	1.41
2.50	212	1.51
2.75	226	1.61
3.00	237	1.69
3.25	249	1.78
3.50	259	1.85
3.75	270	1.93
4.00	280	2.00
4.25	288	2.06
4.50	295	2.11
4.75	300	2.14
5.00	305	2.18
5.25	311	2.22
5.50	317	2.26
5.75	322	2.30
6.00	327	2.33
6.25	332	2.37
6.50	337	2.41
6.75	342	2.44
7.00	348	2.48
7.25	353	2.52
7.50	358	2.56

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	11	11	**11**	10

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials: **J.P**
Date: 16/09/2024

	In Situ California Bearing Ratio (CBR)			Job Ref	35984
				CBR No.	CBR8
Site Name	Arborfield			Depth m	0.50
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Dark brown sandy gravelly silty CLAY (gravel is fmc and sub-angular to rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	8

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

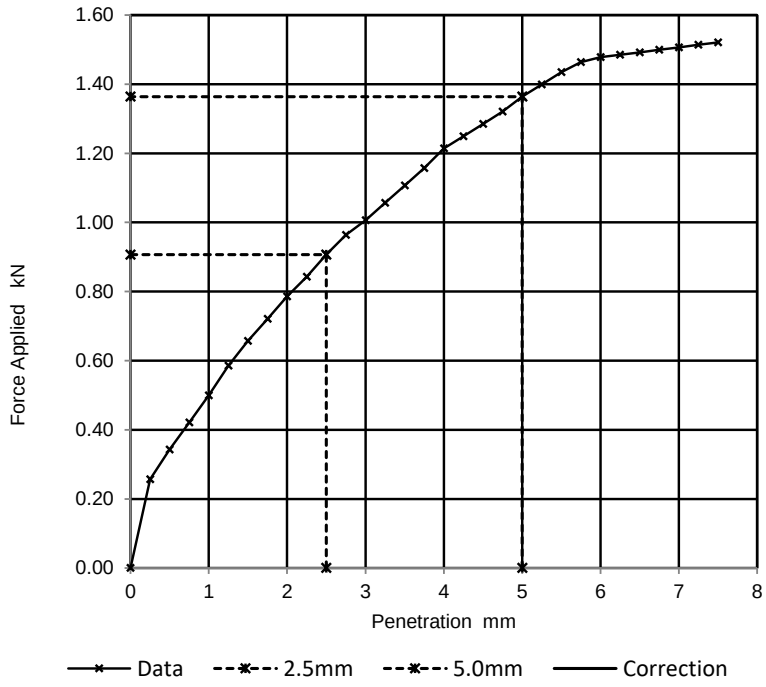
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	36	0.26
0.50	48	0.34
0.75	59	0.42
1.00	70	0.50
1.25	82	0.59
1.50	92	0.66
1.75	101	0.72
2.00	110	0.79
2.25	118	0.84
2.50	127	0.91
2.75	135	0.96
3.00	141	1.01
3.25	148	1.06
3.50	155	1.11
3.75	162	1.16
4.00	170	1.21
4.25	175	1.25
4.50	180	1.29
4.75	185	1.32
5.00	191	1.36
5.25	196	1.40
5.50	201	1.44
5.75	205	1.46
6.00	207	1.48
6.25	208	1.49
6.50	209	1.49
6.75	210	1.50
7.00	211	1.51
7.25	212	1.51
7.50	213	1.52

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	6.9	6.8	**6.9**	11

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
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Checked and Approved
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Date: 16/09/2024

	In Situ California Bearing Ratio (CBR)			Job Ref	35984
				CBR No.	CBR9
Site Name	Arborfield			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	04/09/2024
Soil Description	Brown sandy silty CLAY with occasional roots and rootlets				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	9

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

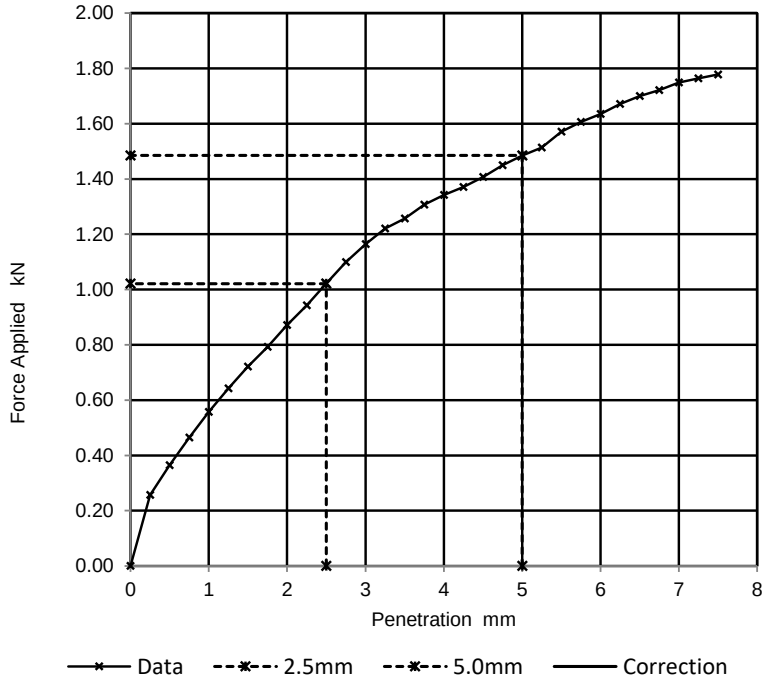
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.5	kg
Proving Ring Factor	7.14	N/div

Temperature	23	0C
Environmental Conditions	Slightly cloudy	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	36	0.26
0.50	51	0.36
0.75	65	0.46
1.00	78	0.56
1.25	90	0.64
1.50	101	0.72
1.75	111	0.79
2.00	122	0.87
2.25	132	0.94
2.50	143	1.02
2.75	154	1.10
3.00	163	1.16
3.25	171	1.22
3.50	176	1.26
3.75	183	1.31
4.00	188	1.34
4.25	192	1.37
4.50	197	1.41
4.75	203	1.45
5.00	208	1.49
5.25	212	1.51
5.50	220	1.57
5.75	225	1.61
6.00	229	1.64
6.25	234	1.67
6.50	238	1.70
6.75	241	1.72
7.00	245	1.75
7.25	247	1.76
7.50	249	1.78

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	7.7	7.4	**7.7**	15

Test Report by K4 SOILS LABORATORY
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Date: 16/09/2024

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
36006	Arborfield Parcel N	Samples received	06/09/2024
		Schedule received	10/09/2024
Project No.	Client	Project started	11/09/2024
-	Wilson Bailey	Testing Started	18/09/2024

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top m	Base m	Type		%	%	%	%	%	
BH3	-	1.00	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	20					
BH3	-	2.00	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	24	100	42	20	22	
BH5	-	1.50	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	24					
BH6	-	1.50	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	24	100	43	20	23	
BH6	-	3.00	-	D	Dark grey slightly mottled orangish brown slightly sandy silty CLAY	22					
BH7	-	1.00	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	27	100	47	21	26	
BH7	-	2.00	-	D	Dark grey slightly mottled orangish brown slightly sandy silty CLAY	26					
BH10	-	1.50	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	23	100	39	19	20	
BH13	-	1.00	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	20					
BH13	-	2.50	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	24	100	36	20	16	

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3 and 5.0
These results only apply to the items tested

Test Report by K4 SOILS LABORATORY
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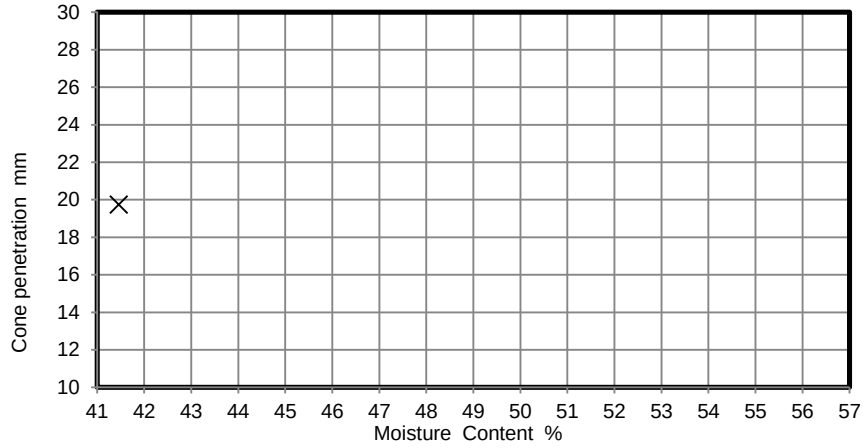
Checked and Approved
Initials J.P
Date: 19/09/2024

2519 Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

				Job No.	36006
				Borehole/Pit No.	BH3
Site Name	Arborfield Parcel N			Sample No.	-
Project No.	-	Client	Wilson Bailey	Depth Top m	2.00
Soil Description	Orangish brown slightly mottled grey slightly sandy silty CLAY			Depth Base m	-
				Sample Type	D
				Samples received	06/09/2024
				Schedules received	10/09/2024
				Project Started	11/09/2024
				Date Tested	18/09/2024

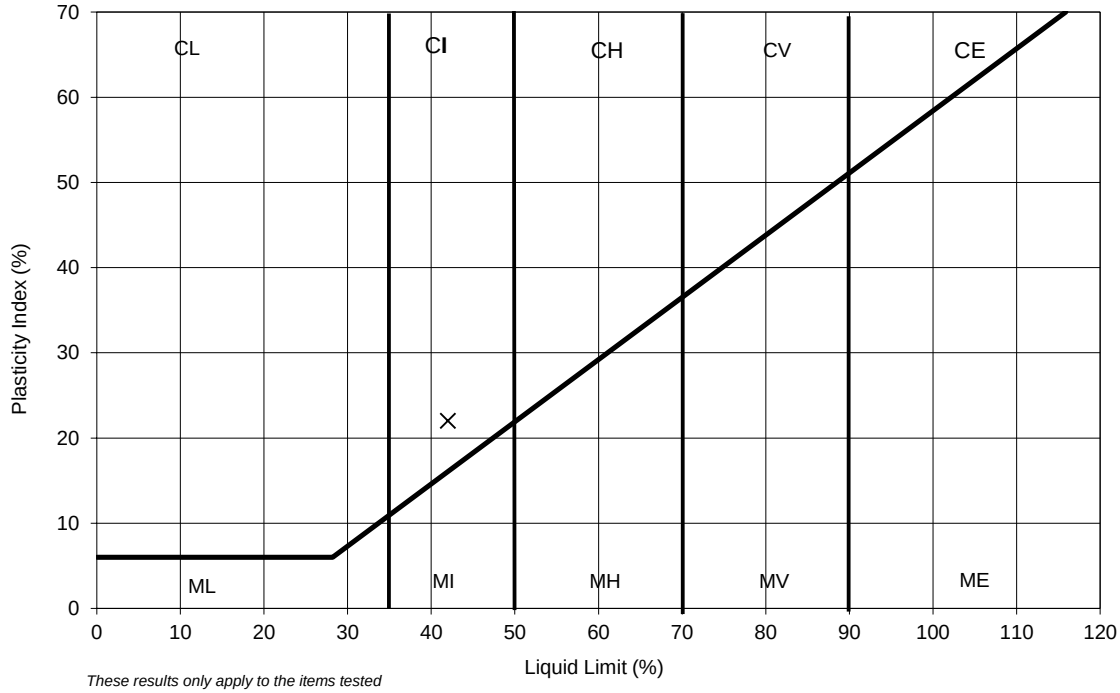


NATURAL MOISTURE CONTENT	**24**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**42**	**%**
PLASTIC LIMIT	**20**	**%**
PLASTICITY INDEX	**22**	**%**

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method
BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Checked and Approved

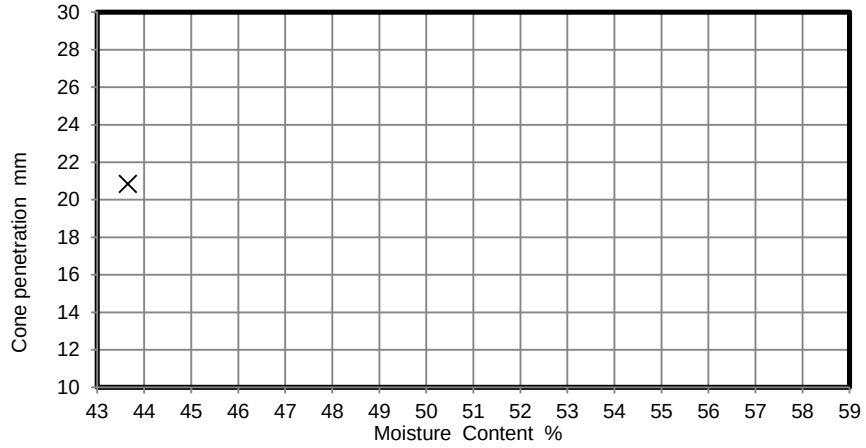
Initials: J.P
Date: 19/09/2024

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	36006
				Borehole/Pit No.	BH6
Site Name	Arborfield Parcel N			Sample No.	-
Project No.	-	Client	Wilson Bailey	Depth Top m	1.50
Soil Description	Orangish brown slightly mottled grey slightly sandy silty CLAY			Depth Base m	-
				Sample Type	D
				Samples received	06/09/2024
				Schedules received	10/09/2024
				Project Started	11/09/2024
				Date Tested	18/09/2024

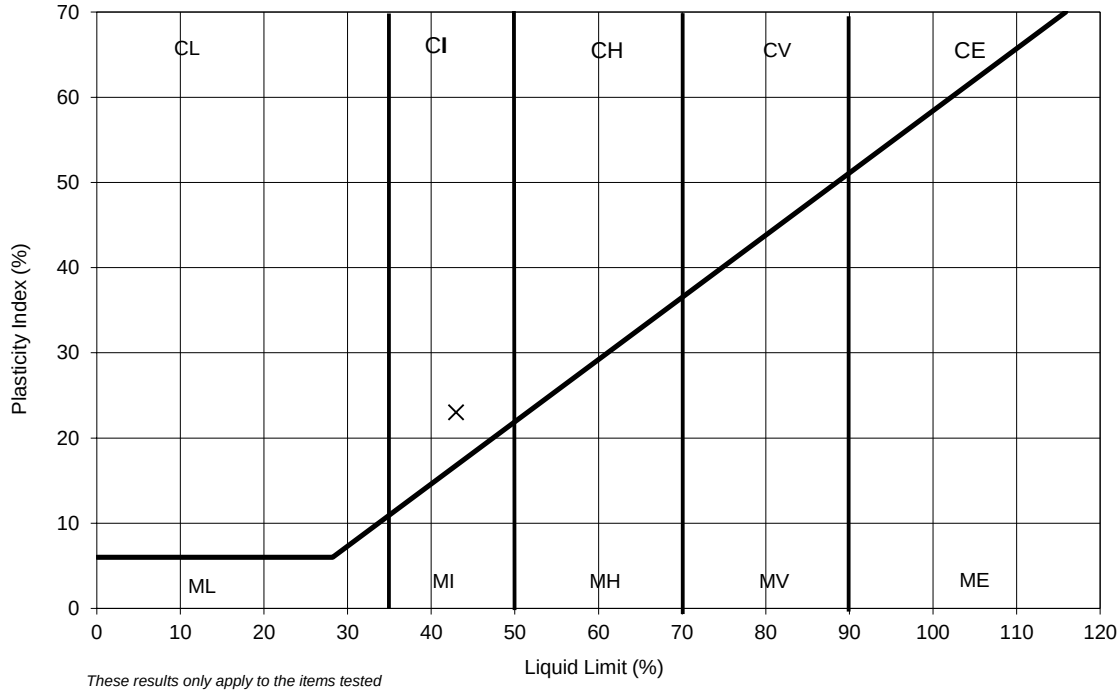


NATURAL MOISTURE CONTENT	**24**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**43**	**%**
PLASTIC LIMIT	**20**	**%**
PLASTICITY INDEX	**23**	**%**

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method
BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Checked and Approved

Initials: J.P
Date: 19/09/2024

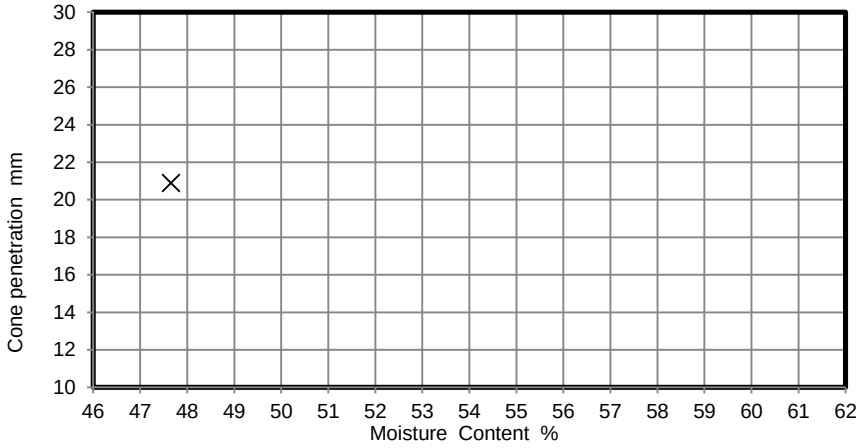
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

				Job No.	36006
				Borehole/Pit No.	BH7
Site Name	Arborfield Parcel N			Sample No.	-
Project No.	-	Client	Wilson Bailey	Depth Top m	1.00
Soil Description	Orangish brown slightly mottled grey slightly sandy silty CLAY			Depth Base m	-
				Sample Type	D
				Samples received	06/09/2024
				Schedules received	10/09/2024
				Project Started	11/09/2024
				Date Tested	18/09/2024

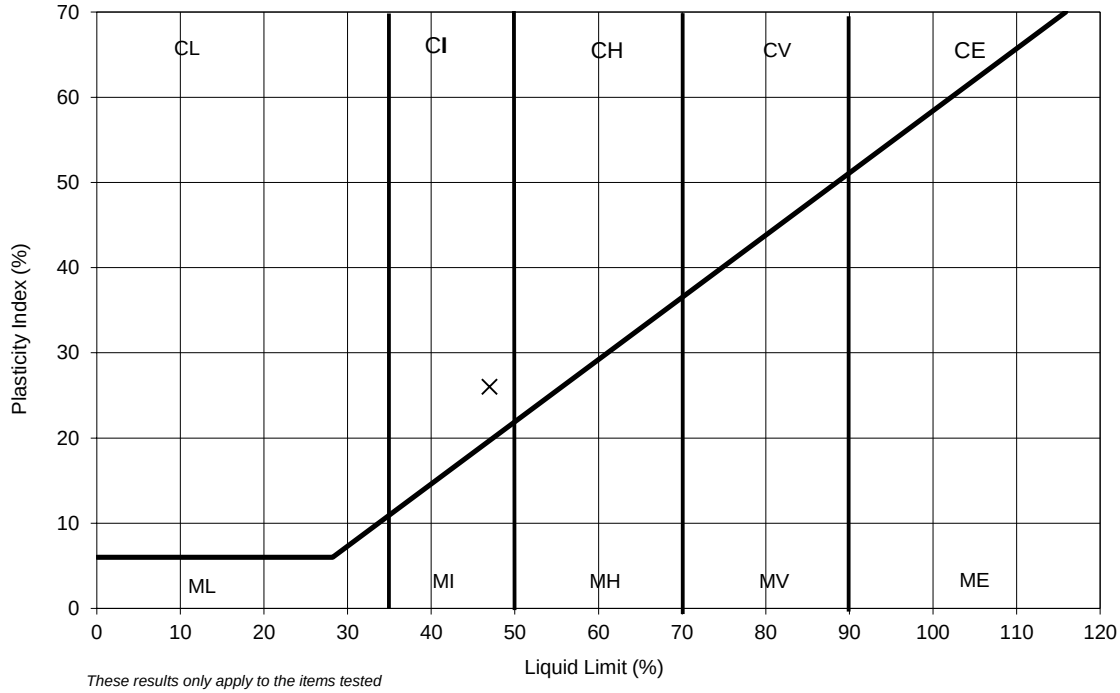


NATURAL MOISTURE CONTENT	**27**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**47**	**%**
PLASTIC LIMIT	**21**	**%**
PLASTICITY INDEX	**26**	**%**

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method
BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Checked and Approved

Initials: J.P
Date: 19/09/2024

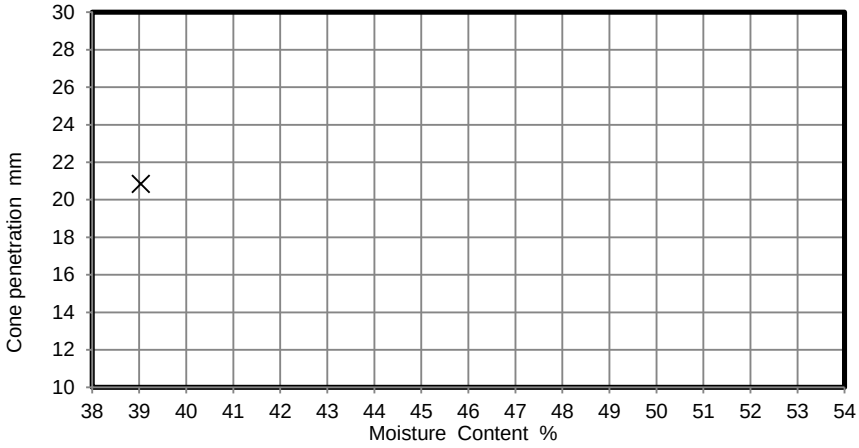
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	36006
				Borehole/Pit No.	BH10
Site Name	Arborfield Parcel N			Sample No.	-
Project No.	-	Client	Wilson Bailey	Depth Top m	1.50
Soil Description	Orangish brown slightly mottled grey slightly sandy silty CLAY			Depth Base m	-
				Sample Type	D
				Samples received	06/09/2024
				Schedules received	10/09/2024
				Project Started	11/09/2024
				Date Tested	18/09/2024

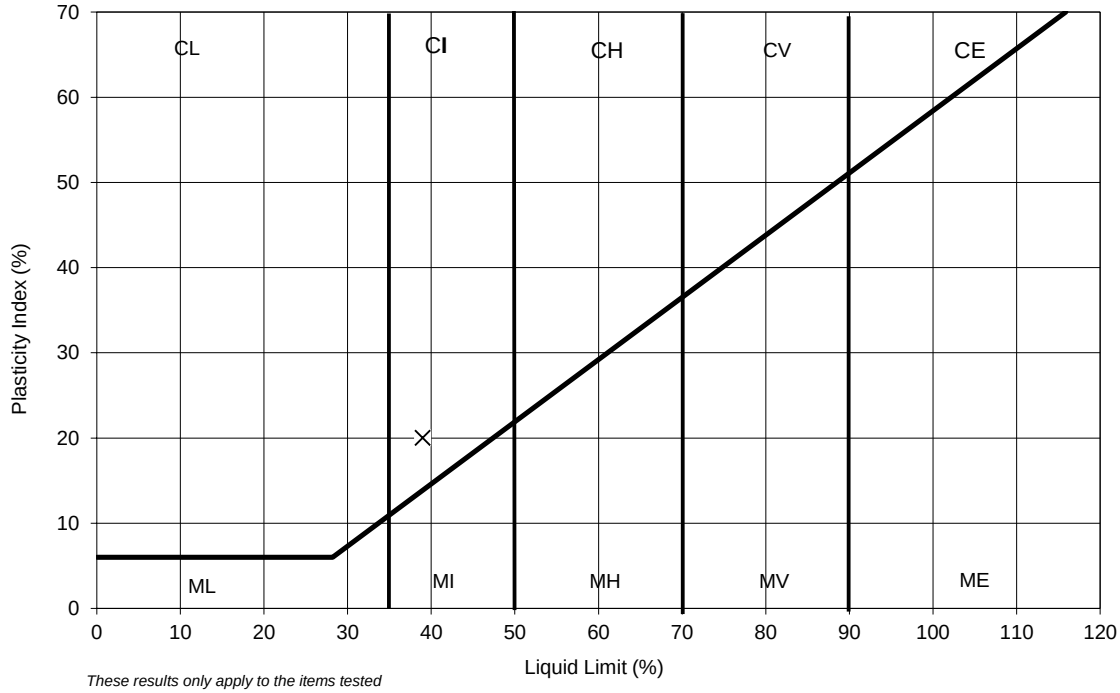


NATURAL MOISTURE CONTENT	**23**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**39**	**%**
PLASTIC LIMIT	**19**	**%**
PLASTICITY INDEX	**20**	**%**

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method
BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Checked and Approved

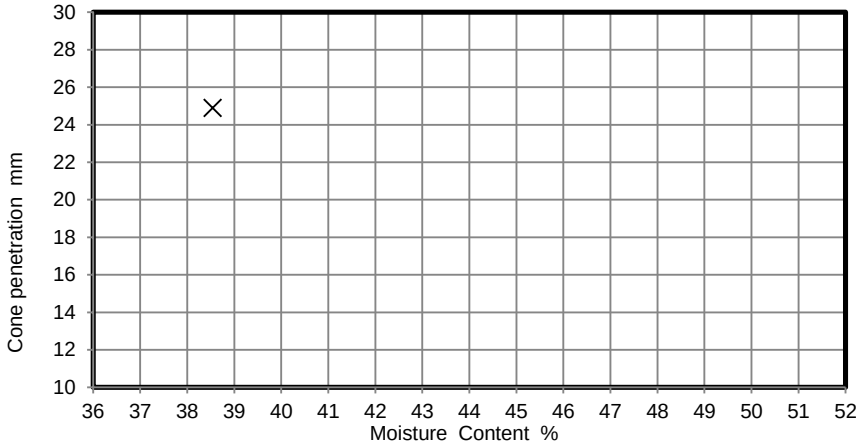
Initials: J.P
Date: 19/09/2024

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	36006
				Borehole/Pit No.	BH13
Site Name	Arborfield Parcel N			Sample No.	-
Project No.	-	Client	Wilson Bailey	Depth Top m	2.50
Soil Description	Orangish brown slightly mottled grey slightly sandy silty CLAY			Depth Base m	-
				Sample Type	D
				Samples received	06/09/2024
				Schedules received	10/09/2024
				Project Started	11/09/2024
				Date Tested	18/09/2024

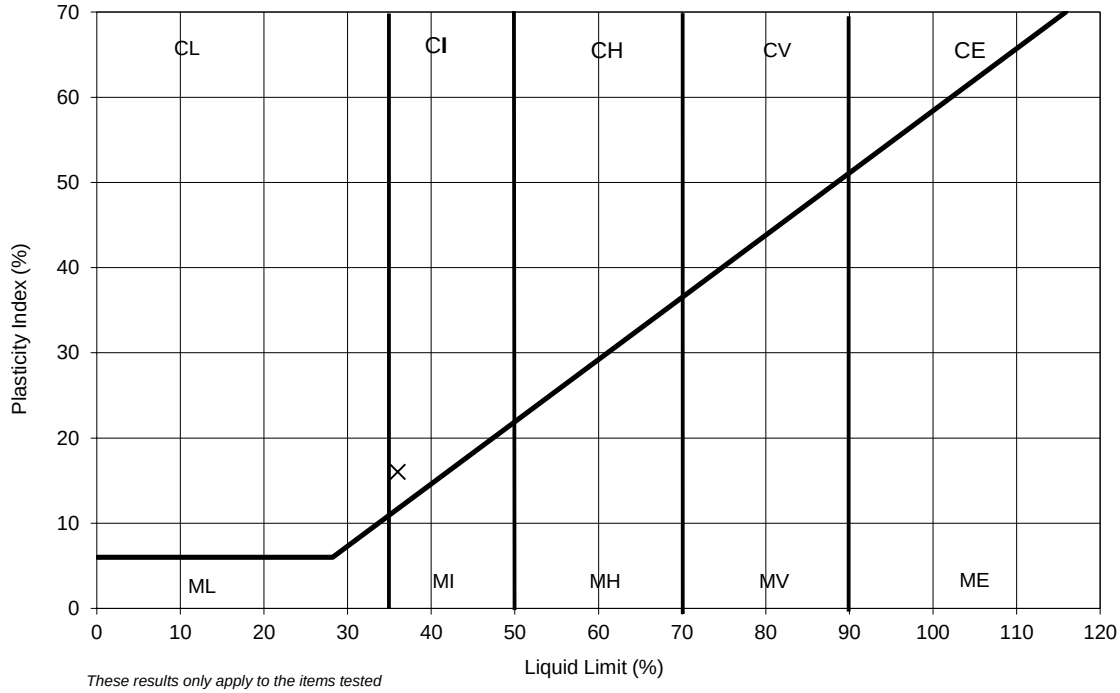


NATURAL MOISTURE CONTENT	**24**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**36**	**%**
PLASTIC LIMIT	**20**	**%**
PLASTICITY INDEX	**16**	**%**

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method
BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Checked and Approved

Initials: J.P
Date: 19/09/2024

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results

Tested in accordance with BS1377 : Part 3 : 2018, Clause 7.6 & Clause 12

Job No.	Project Name	Programme	
36006	Arborfield Parcel N	Samples received	06/09/2024
		Schedule received	10/09/2024
Project No.	Client	Project started	11/09/2024
-	Wilson Bailey	Testing Started	13/09/2024

Hole No.	Sample				Soil description	Dry Mass passing 2mm	SO4 Content	pH	Remarks
	Ref	Top m	Base m	Type		%	mg/l		
BH3	-	1.00	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	100	130	6.6	
BH5	-	1.50	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	100	100	6.6	
BH6	-	3.00	-	D	Dark grey slightly mottled orangish brown slightly sandy silty CLAY	100	110	6.6	
BH7	-	2.00	-	D	Dark grey slightly mottled orangish brown slightly sandy silty CLAY	100	90	6.7	
BH13	-	1.00	-	D	Orangish brown slightly mottled grey slightly sandy silty CLAY	100	40	6.7	

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

These results only apply to the items tested

Checked and Approved

Initials J.P

Date: 19/09/2024

Client: Wilson Bailey
Site: Arborfield Parcel N
Date: 07/09/2024

Quote No:
Visit No: 1 of 3 (fortnightly)
Operator: P Philpott
Project Manager:

	GAS CONCENTRATIONS												VOLATILES		FLOW DATA			WELL AND WATER DATA		Comments
Monitoring	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady			Peak	Steady					
BH14	0	0	0	0	4.3	1	0	0	0	0	19.8	18.3	NR	NR	0	0	0	0	2.1	3.67	
BH7	0	0	0	0	1.1	0.6	0	0	0	0	20.1	19.4	NR	NR	0	0	0	0	1.73	3.72	Bung off on arrival
BH5	0	0	0	0	0.8	0.6	0	0	0	0	20.5	19.7	NR	NR	0	0	0	0	2.115	3.715	
Pond East	0	0	0	0	2.1	0.8	0	0	0	0	19.7	19.1	NR	NR	0	0	0	0	1.67	4.06	
Max	0	0	0	0	4.3	1	0	0	0	0	20.5	19.7	NR	NR	0	0	0				
Min	0	0	0	0	0.8	0.3	0	0	0	0	19.7	16.7	NR	NR	0	0	0				

ND - Not detected
NR - Not recorded
NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground:		Dry	X	Moist		Wet		Snow	Frozen
Wind:	X	Calm		Light		Moderate		Strong	
Cloud cover:		None		Slight	X	Cloudy		Overcast	
Precipitation:	X	None		Slight		Moderate		Heavy	
Time monitoring performed:			8.41	Start			10.05	End	
Barometric pressure (mbar):			1003	Start			1003	End	
Pressure trend (Daily):				Falling	X	Steady		Rising	
Air Temperature (Deg. C):			14	Before			14	After	

Date of last calibration:
Date of next calibration: 27/04/2024

Dominic Brightman
Wilson Bailey Geotechnical & Environmental Ltd
Northdown Farmhouse
Donhead St Mary
Wiltshire
SP7 9DD

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 24-10496

Site Reference:	ARB Parcel N
Project / Job Ref:	None Supplied
Order No:	None Supplied
Sample Receipt Date:	03/09/2024
Sample Scheduled Date:	06/09/2024
Report Issue Number:	1
Reporting Date:	12/09/2024

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH1	BH3	BH4	BH6	BH7
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.25	0.50	0.50	0.25
Reporting Date: 12/09/2024	**DETS Sample No**	736755	736756	736757	736758	736759

Determinand	**Unit**	**RL**	**Accreditation**					
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	**MCERTS**	7.1	5.6	7.3	7.1	6.7
TOC (Total Organic Carbon)	%	< 0.1	**MCERTS**	0.4	2	0.8	0.8	2.4
Arsenic (As)	mg/kg	< 2	**MCERTS**	10	5	12	8	7
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	**MCERTS**	24	12	21	18	14
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	**MCERTS**	10	5	7	5	12
Lead (Pb)	mg/kg	< 3	**MCERTS**	9	16	9	10	55
Mercury (Hg)	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	**MCERTS**	10	5	6	5	8
Selenium (Se)	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	**MCERTS**	30	36	30	29	104
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH8	BH10	BH11	BH13	Topsoil
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.50	0.50	0.25	None Supplied
Reporting Date: 12/09/2024	**DETS Sample No**	736760	736761	736762	736763	736764

Determinand	**Unit**	**RL**	**Accreditation**					
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	**MCERTS**	7.0	6.9	6.6	6.7	6.3
TOC (Total Organic Carbon)	%	< 0.1	**MCERTS**	0.8	2.5	0.7	1	5.4
Arsenic (As)	mg/kg	< 2	**MCERTS**	7	8	5	6	9
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	**MCERTS**	17	13	10	12	13
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	**MCERTS**	8	16	< 4	14	20
Lead (Pb)	mg/kg	< 3	**MCERTS**	11	51	9	17	41
Mercury (Hg)	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	**MCERTS**	7	9	4	5	10
Selenium (Se)	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	**MCERTS**	29	105	21	28	85
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH1	BH3	BH4	BH6	BH7
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.25	0.50	0.50	0.25
Reporting Date: 12/09/2024	**DETS Sample No**	736755	736756	736757	736758	736759

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.19
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.19
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	2.01
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.27
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.15	< 0.1	< 0.1	2.54
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.11	< 0.1	< 0.1	2.14
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.99
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	1.19
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.15	< 0.1	< 0.1	1.34
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.42
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	1.04
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.71
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.16
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.62
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	13.8

~Sample details provided by customer and can affect the validity of results

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH8	BH10	BH11	BH13	Topsoil
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.50	0.50	0.25	None Supplied
Reporting Date: 12/09/2024	**DETS Sample No**	736760	736761	736762	736763	736764

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	0.26	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	0.32	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	0.12	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	1.72	< 0.1	< 0.1	0.49
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.41	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.16	3.99	< 0.1	0.11	1.05
Pyrene	mg/kg	< 0.1	MCERTS	0.14	3.62	< 0.1	< 0.1	0.98
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	2.31	< 0.1	< 0.1	0.56
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	2.28	< 0.1	< 0.1	0.78
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.15	3.65	< 0.1	0.12	1.08
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.93	< 0.1	< 0.1	0.21
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	3.07	< 0.1	< 0.1	0.64
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	2.30	< 0.1	< 0.1	0.52
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.54	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	2.16	< 0.1	< 0.1	0.49
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	27.7	< 1.6	< 1.6	6.8

~Sample details provided by customer and can affect the validity of results

Normec DETS Limited
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Rose Lane
Lenham Heath
Maidstone
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Tel : 01622 850410

Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH1	BH3	BH4	BH6	BH7
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.25	0.50	0.50	0.25
Reporting Date: 12/09/2024	**DETS Sample No**	736755	736756	736757	736758	736759

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	9
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	11
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

~Sample details provided by customer and can affect the validity of results

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Maidstone
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Tel : 01622 850410

Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH8	BH10	BH11	BH13	Topsoil
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.50	0.50	0.25	None Supplied
Reporting Date: 12/09/2024	**DETS Sample No**	736760	736761	736762	736763	736764

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	16	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	49	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	65	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	65	< 42	< 42	< 42

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH1	BH3	BH4	BH6	BH7
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.25	0.50	0.50	0.25
Reporting Date: 12/09/2024	**DETS Sample No**	736755	736756	736757	736758	736759

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-10496	**~Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: ARB Parcel N	**~TP / BH No**	BH8	BH10	BH11	BH13	Topsoil
~Project / Job Ref: None Supplied	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: None Supplied	**~Depth (m)**	0.50	0.50	0.50	0.25	None Supplied
Reporting Date: 12/09/2024	**DETS Sample No**	736760	736761	736762	736763	736764

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

~Sample details provided by customer and can affect the validity of results

Normec DETS Limited
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Maidstone
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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-10496	
Wilson Bailey Geotechnical & Environmental Ltd	
~Site Reference: ARB Parcel N	
~Project / Job Ref: None Supplied	
~Order No: None Supplied	
Reporting Date: 12/09/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 736755	BH1	None Supplied	0.50	17.2	Light brown clay
^ 736756	BH3	None Supplied	0.25	12.7	Light brown sandy clay
^ 736757	BH4	None Supplied	0.50	15	Light brown sandy clay
^ 736758	BH6	None Supplied	0.50	13.8	Light brown sandy clay
^ 736759	BH7	None Supplied	0.25	11.8	Brown sandy clay with stones and vegetation
^ 736760	BH8	None Supplied	0.50	11.8	Brown sandy clay
^ 736761	BH10	None Supplied	0.50	7.5	Brown sandy clay with stones and fibrous material
^ 736762	BH11	None Supplied	0.50	6.5	Light brown sandy clay
^ 736763	BH13	None Supplied	0.25	7.1	Brown sandy clay
^ 736764	Topsoil	None Supplied	None Supplied	13.6	Brown sandy clay with vegetation

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S
~Sample details provided by customer and can affect the validity of results
^ no sampling date provided; unable to confirm if samples are within acceptable holding times

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 24-10496
Wilson Bailey Geotechnical & Environmental Ltd
~Site Reference: ARB Parcel N
~Project / Job Ref: None Supplied
~Order No: None Supplied
Reporting Date: 12/09/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

~Sample details provided by customer and can affect the validity of results

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo Insight

PARCEL N - ARBORFIELD GARRISON, ARBORFIELD, WOKINGHAM

Order Details

Date: 13/09/2024

Your ref: Crest

Our Ref: GS-BQT-7EQ-Q2B-34P

Site Details

Location: 477050 165383

Area: 2.37 ha

Authority: Wokingham Borough Council ↗

Contact us with any questions at:
info@groundsure.com ↗
01273 257 755

Certified B Corporation

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	6	0	2	12	-
16 >	1.2 >	Historical tanks >	1	0	9	13	-
18 >	1.3 >	Historical energy features >	0	0	3	4	-
18	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	Historical garages	0	0	0	0	-
19	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
20 >	2.1 >	Historical industrial land uses >	9	0	4	15	-
22 >	2.2 >	Historical tanks >	1	0	16	24	-
23 >	2.3 >	Historical energy features >	0	0	5	6	-
24	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
25	3.1	Active or recent landfill	0	0	0	0	-
25	3.2	Historical landfill (BGS records)	0	0	0	0	-
26	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
26 >	3.4 >	Historical landfill (EA/NRW records) >	0	0	0	1	-
26	3.5	Historical waste sites	0	0	0	0	-
26	3.6	Licensed waste sites	0	0	0	0	-
27 >	3.7 >	Waste exemptions >	0	0	3	2	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
28 >	4.1 >	Recent industrial land uses >	0	0	4	-	-
29	4.2	Current or recent petrol stations	0	0	0	0	-
29	4.3	Electricity cables	0	0	0	0	-
29	4.4	Gas pipelines	0	0	0	0	-
29	4.5	Sites determined as Contaminated Land	0	0	0	0	-

29	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
30	4.7	Regulated explosive sites	0	0	0	0	-
30	4.8	Hazardous substance storage/usage	0	0	0	0	-
30	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
30	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
30	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
31	4.12	Radioactive Substance Authorisations	0	0	0	0	-
31 >	4.13 >	Licensed Discharges to controlled waters >	0	0	0	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	-
32	4.16	List 1 Dangerous Substances	0	0	0	0	-
32	4.17	List 2 Dangerous Substances	0	0	0	0	-
32	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
32	4.19	Pollution inventory substances	0	0	0	0	-
32	4.20	Pollution inventory waste transfers	0	0	0	0	-
33	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
34 >	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	None (within 0m)				
38	5.5	Groundwater vulnerability- local information	None (within 0m)				
39	5.6	Groundwater abstractions	0	0	0	0	0
39	5.7	Surface water abstractions	0	0	0	0	0
39	5.8	Potable abstractions	0	0	0	0	0
39	5.9	Source Protection Zones	0	0	0	0	-
40	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
41 >	6.1 >	Water Network (OS MasterMap) >	1	7	16	-	-

43 >	6.2 >	Surface water features >	1	4	8	-	-
44 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
44 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
44	6.5	WFD Groundwater bodies	0	-	-	-	-
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	None (within 50m)				
46	7.2	Historical Flood Events	0	0	0	-	-
46	7.3	Flood Defences	0	0	0	-	-
47	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
47	7.5	Flood Storage Areas	0	0	0	-	-
48	7.6	Flood Zone 2	None (within 50m)				
48	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
49 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
51 >	9.1 >	Groundwater flooding >	Moderate (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
52 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	0	0	1
53	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
53	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
53	10.4	Special Protection Areas (SPA)	0	0	0	0	0
53	10.5	National Nature Reserves (NNR)	0	0	0	0	0
54 >	10.6 >	Local Nature Reserves (LNR) >	0	0	0	0	1
54 >	10.7 >	Designated Ancient Woodland >	0	0	0	4	53
57	10.8	Biosphere Reserves	0	0	0	0	0
58	10.9	Forest Parks	0	0	0	0	0
58	10.10	Marine Conservation Zones	0	0	0	0	0
58	10.11	Green Belt	0	0	0	0	0
58	10.12	Proposed Ramsar sites	0	0	0	0	0

58	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
59	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
59	10.15	Nitrate Sensitive Areas	0	0	0	0	0
59 >	10.16 >	Nitrate Vulnerable Zones >	1	0	0	0	1
60 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
61 >	10.18 >	SSSI Units >	0	0	0	0	2
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
63	11.1	World Heritage Sites	0	0	0	-	-
64	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
64	11.3	National Parks	0	0	0	-	-
64	11.4	Listed Buildings	0	0	0	-	-
64	11.5	Conservation Areas	0	0	0	-	-
65 >	11.6 >	Scheduled Ancient Monuments >	0	1	1	-	-
65	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
66 >	12.1 >	Agricultural Land Classification >	Grade 4 (within 250m)				
67	12.2	Open Access Land	0	0	0	-	-
67	12.3	Tree Felling Licences	0	0	0	-	-
67	12.4	Environmental Stewardship Schemes	0	0	0	-	-
67	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
68 >	13.1 >	Priority Habitat Inventory >	0	0	8	-	-
69	13.2	Habitat Networks	0	0	0	-	-
69	13.3	Open Mosaic Habitat	0	0	0	-	-
69	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
70 >	14.1 >	10k Availability >	Identified (within 500m)				
71 >	14.2 >	Artificial and made ground (10k) >	0	0	0	6	-
73 >	14.3 >	Superficial geology (10k) >	0	1	0	0	-

74	14.4	Landslip (10k)	0	0	0	0	-
75 >	14.5 >	Bedrock geology (10k) >	1	0	0	2	-
76	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
77 >	15.1 >	50k Availability >	Identified (within 500m)				
78 >	15.2 >	Artificial and made ground (50k) >	0	0	1	0	-
79	15.3	Artificial ground permeability (50k)	0	0	-	-	-
80 >	15.4 >	Superficial geology (50k) >	0	1	0	0	-
81 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
81	15.6	Landslip (50k)	0	0	0	0	-
81	15.7	Landslip permeability (50k)	None (within 50m)				
82 >	15.8 >	Bedrock geology (50k) >	1	0	0	1	-
83 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
83	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
84 >	16.1 >	BGS Boreholes >	0	0	13	-	-
Page	Section	Natural ground subsidence >					
86 >	17.1 >	Shrink swell clays >	Low (within 50m)				
87 >	17.2 >	Running sands >	Low (within 50m)				
89 >	17.3 >	Compressible deposits >	Moderate (within 50m)				
91 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
92 >	17.5 >	Landslides >	Very low (within 50m)				
93 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
95	18.1	BritPits	0	0	0	0	-
96 >	18.2 >	Surface ground workings >	8	0	0	-	-
96	18.3	Underground workings	0	0	0	0	0
96	18.4	Underground mining extents	0	0	0	0	-
97 >	18.5 >	Historical Mineral Planning Areas >	0	0	0	1	-

97	18.6	Non-coal mining	0	0	0	0	0
97	18.7	JPB mining areas	None (within 0m)				
97	18.8	The Coal Authority non-coal mining	0	0	0	0	-
98 >	**18.9 >**	**Researched mining >**	0	0	0	1	-
98	18.10	Mining record office plans	0	0	0	0	-
98	18.11	BGS mine plans	0	0	0	0	-
98	18.12	Coal mining	None (within 0m)				
99	18.13	Brine areas	None (within 0m)				
99	18.14	Gypsum areas	None (within 0m)				
99	18.15	Tin mining	None (within 0m)				
99	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
100	19.1	Natural cavities	0	0	0	0	-
100	19.2	Mining cavities	0	0	0	0	0
100	19.3	Reported recent incidents	0	0	0	0	-
100	19.4	Historical incidents	0	0	0	0	-
101	19.5	National karst database	0	0	0	0	-
Page	Section	**Radon >**					
102 >	**20.1 >**	**Radon >**	Less than 1% (within 0m)				
Page	Section	**Soil chemistry >**	On site	0-50m	50-250m	250-500m	500-2000m
104 >	**21.1 >**	**BGS Estimated Background Soil Chemistry >**	3	4	-	-	-
104	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
105	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
106	22.1	Underground railways (London)	0	0	0	-	-
106	22.2	Underground railways (Non-London)	0	0	0	-	-
106	22.3	Railway tunnels	0	0	0	-	-
106	22.4	Historical railway and tunnel features	0	0	0	-	-
106	22.5	Royal Mail tunnels	0	0	0	-	-

107	22.6	Historical railways	0	0	0	-	-
107	22.7	Railways	0	0	0	-	-
107	22.8	Crossrail 1	0	0	0	0	-
107	22.9	Crossrail 2	0	0	0	0	-
107	22.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 30/04/2022

Site Area: 2.37ha

Recent site history - 2019 aerial photograph

Capture Date: 29/06/2019

Site Area: 2.37ha

Recent site history - 2010 aerial photograph

Capture Date: 25/09/2010

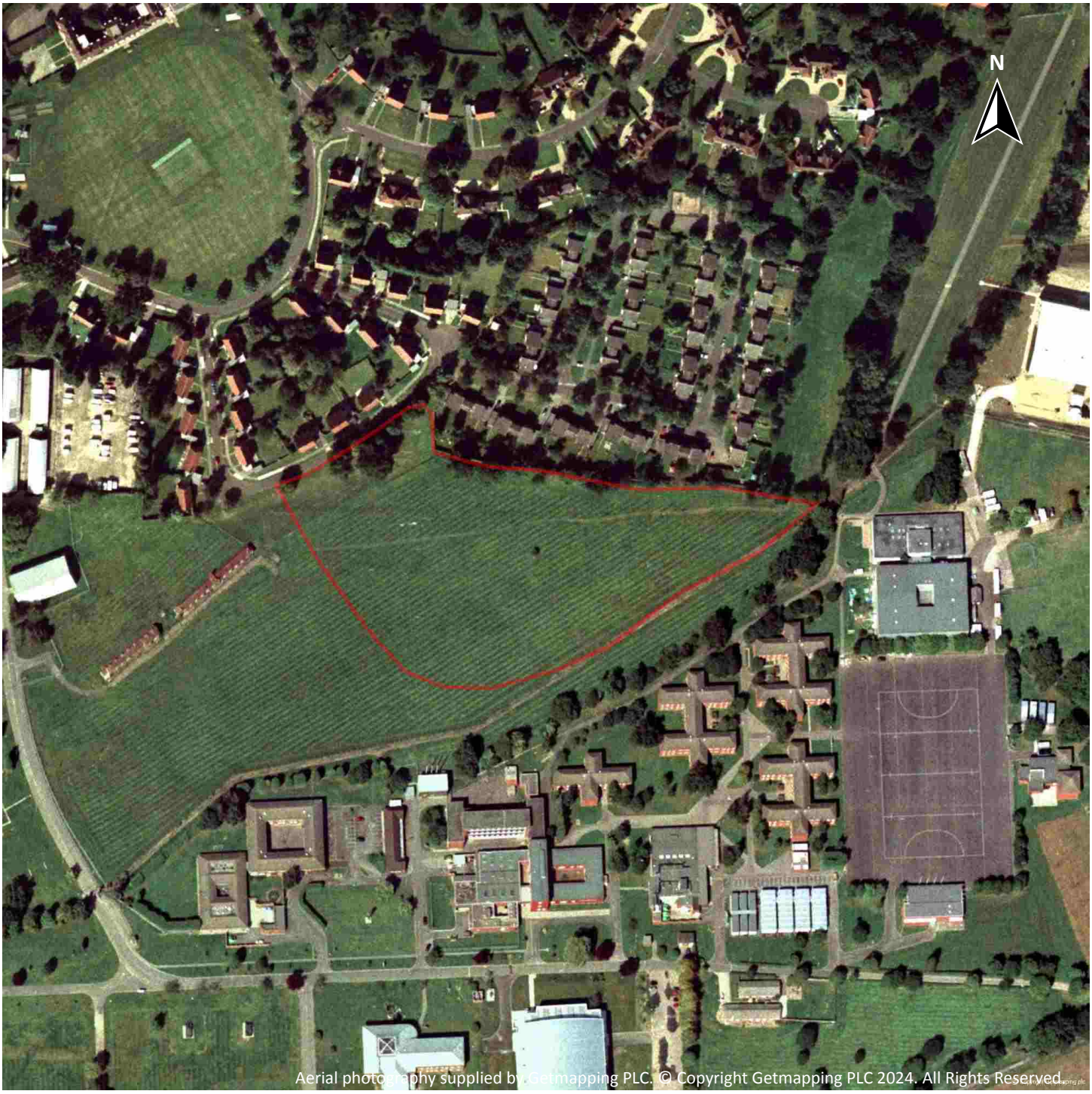
Site Area: 2.37ha

Recent site history - 2005 aerial photograph

Capture Date: 19/06/2005

Site Area: 2.37ha

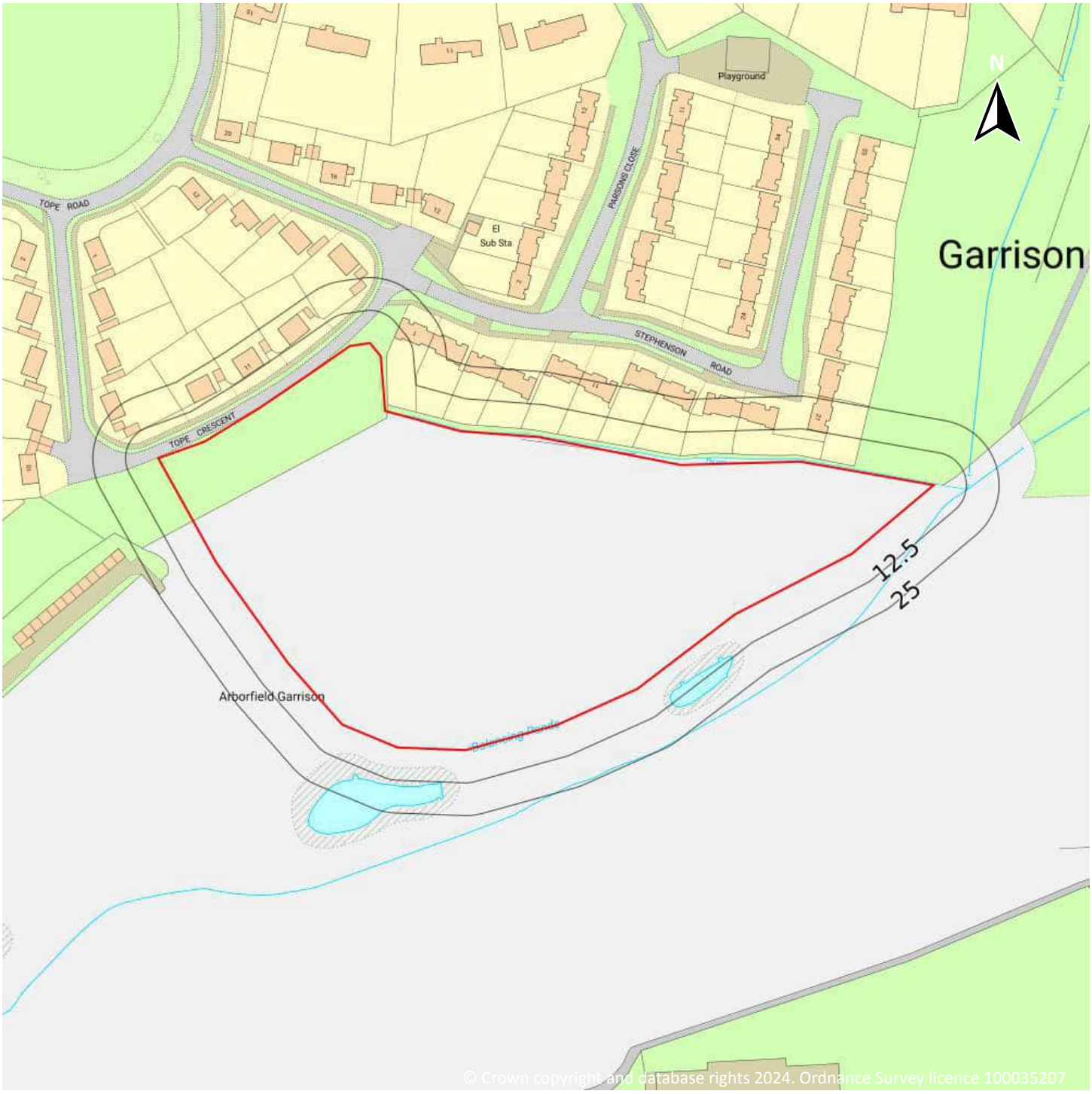
Recent site history - 1999 aerial photograph



Capture Date: 04/09/1999

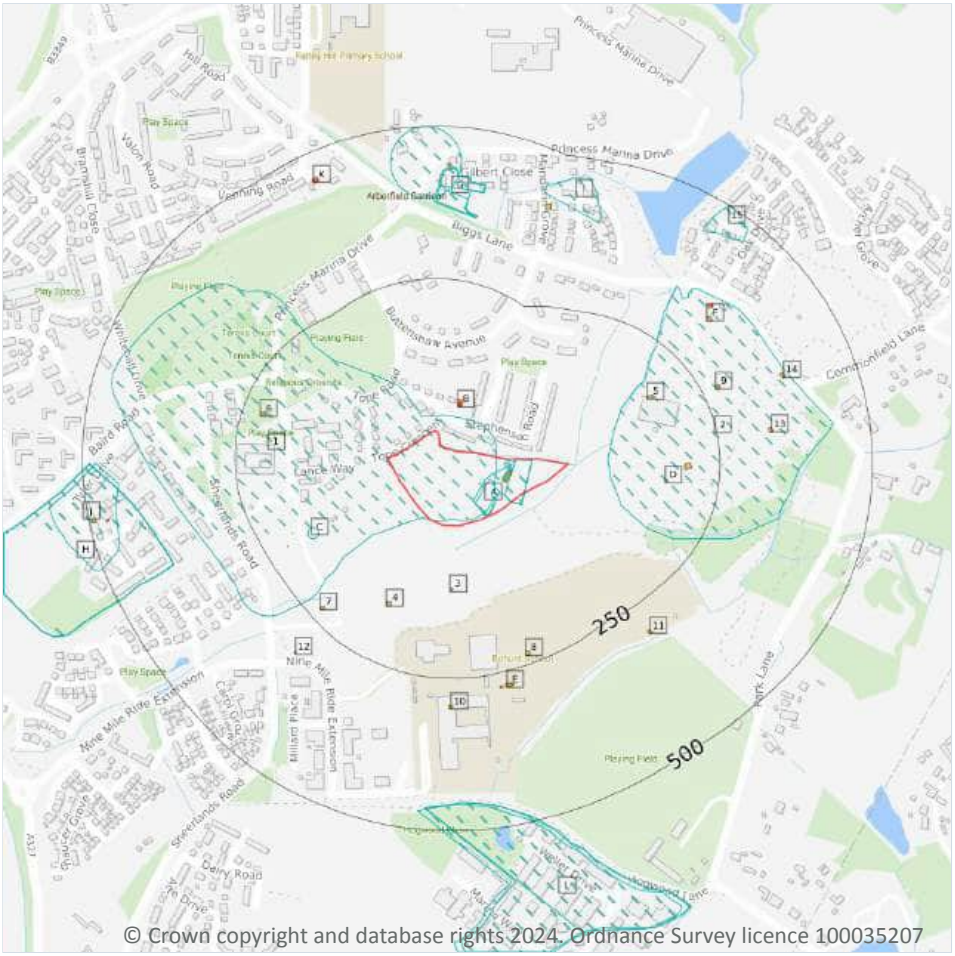
Site Area: 2.37ha

OS MasterMap site plan



Site Area: 2.37ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

1.1 Historical industrial land uses

Records within 500m	20

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 15 >**

ID	Location	Land use	Dates present	Group ID
1	**On site**	**Unspecified Depot**	**1932 - 1938**	**1979943**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Filter Beds**	**1932**	**1931701**
A	**On site**	**Filter Beds**	**1938**	**1942418**
A	**On site**	**Filter Beds**	**1932**	**1947370**
A	**On site**	**Sewage Tanks**	**1938**	**1991780**
A	**On site**	**Sewage Tanks**	**1932**	**1999451**
2	67m E	Barracks	1969 - 1979	1923535
C	157m W	Unspecified Tank	1910	1892362
G	355m N	Filter Beds	1938	1985818
G	357m N	Filter Beds	1932	1982276
G	383m N	Unspecified Tank	1932 - 1938	1962213
H	392m W	Unspecified Works	1961	1890888
H	392m W	Brick and Tile Works	1988	1951560
H	392m W	Brick and Tile Works	1969 - 1979	1996714
I	400m NE	Unspecified Heap	1988	1895046
15	442m NE	Unspecified Heap	1988	1895047
J	442m W	Brick Works	1938	1897455
L	453m S	Brick Works	1938	1897456
L	456m S	Unspecified Works	1978	1940103
L	456m S	Unspecified Works	1960	1958628

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**23**

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 15 >**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Sewage Tanks**	**1933**	**319108**
3	103m S	Unspecified Tank	1968	326671
4	148m SW	Unspecified Tank	1968 - 1976	336405
D	162m E	Unspecified Tank	1968	326670
5	169m NE	Unspecified Tank	1968 - 1976	333884
D	192m E	Unspecified Tank	1976 - 1993	339413
6	211m W	Unspecified Tank	1968	326667
C	212m W	Unspecified Tank	1911	326660
7	223m SW	Unspecified Tank	1968 - 1976	330675
8	227m S	Unspecified Tank	1968 - 1976	339743
E	270m S	Tanks	1987	328105
E	270m S	Tanks	1968 - 1976	327531
E	271m S	Unspecified Tank	1976	326666
9	274m E	Unspecified Tank	1968 - 1976	329266
10	295m S	Unspecified Tank	1968 - 1976	337645
11	295m SE	Unspecified Tank	1968	326672
12	309m SW	Unspecified Tank	1968 - 1976	336943
F	329m NE	Unspecified Tank	1968 - 1976	328128
13	334m E	Unspecified Tank	1968 - 1976	328843
14	378m E	Unspecified Tank	1968 - 1976	340984
I	406m N	Unspecified Tank	1968 - 1993	339835
G	434m N	Unspecified Tank	1933	326662
J	488m W	Unspecified Tank	1968	326669

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	7

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 15 >**

ID	Location	Land use	Dates present	Group ID
B	55m N	Electricity Substation	1987	223459
B	56m N	Electricity Substation	1993	212006
B	57m N	Electricity Substation	1968 - 1976	227384
F	345m NE	Electricity Substation	1976	210013
K	451m NW	Electricity Substation	1976 - 1999	218101
K	452m NW	Electricity Substation	-	206885
J	468m W	Electricity Substation	1999	210007

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	0

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'.

This data is sourced from Ordnance Survey / Groundsure.

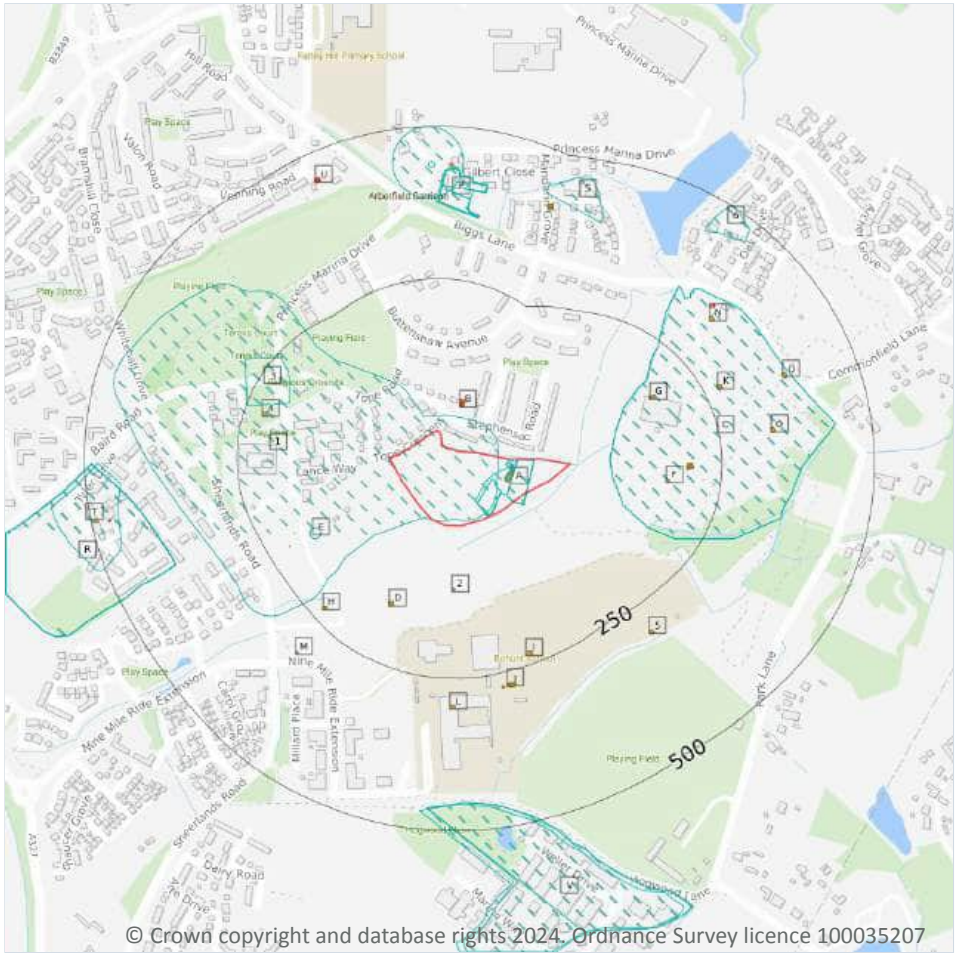
1.6 Historical military land

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



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

2.1 Historical industrial land uses

Records within 500m	28

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 20 >**

ID	Location	Land Use	Date	Group ID
1	**On site**	**Unspecified Depot**	**1938**	**1979943**
A	**On site**	**Filter Beds**	**1938**	**1942418**
A	**On site**	**Sewage Tanks**	**1938**	**1991780**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Filter Beds**	**1932**	**1931701**
A	**On site**	**Filter Beds**	**1932**	**1947370**
A	**On site**	**Sewage Tanks**	**1932**	**1999451**
A	**On site**	**Filter Beds**	**1932**	**1931701**
A	**On site**	**Filter Beds**	**1932**	**1947370**
A	**On site**	**Sewage Tanks**	**1932**	**1999451**
C	67m E	Barracks	1969	1923535
C	67m E	Barracks	1979	1923535
E	157m W	Unspecified Tank	1910	1892362
3	187m NW	Unspecified Depot	1932	1979943
P	355m N	Filter Beds	1938	1985818
P	357m N	Filter Beds	1932	1982276
P	357m N	Filter Beds	1932	1982276
P	383m N	Unspecified Tank	1938	1962213
R	392m W	Brick and Tile Works	1988	1951560
R	392m W	Brick and Tile Works	1969	1996714
R	392m W	Brick and Tile Works	1979	1996714
R	392m W	Unspecified Works	1961	1890888
S	400m NE	Unspecified Heap	1988	1895046
P	433m N	Unspecified Tank	1932	1962213
6	442m NE	Unspecified Heap	1988	1895047
T	442m W	Brick Works	1938	1897455
V	453m S	Brick Works	1938	1897456
V	456m S	Unspecified Works	1978	1940103
V	456m S	Unspecified Works	1960	1958628

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	41

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 20 >**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Sewage Tanks**	**1933**	**319108**
2	103m S	Unspecified Tank	1968	326671
D	148m SW	Unspecified Tank	1976	336405
D	148m SW	Unspecified Tank	1968	336405
F	162m E	Unspecified Tank	1968	326670
G	169m NE	Unspecified Tank	1968	333884
G	172m NE	Unspecified Tank	1976	333884
F	192m E	Unspecified Tank	1987	339413
F	193m E	Unspecified Tank	1993	339413
F	193m E	Unspecified Tank	1993	339413
F	195m E	Unspecified Tank	1976	339413
4	211m W	Unspecified Tank	1968	326667
E	212m W	Unspecified Tank	1911	326660
H	223m SW	Unspecified Tank	1976	330675
H	223m SW	Unspecified Tank	1968	330675
I	227m S	Unspecified Tank	1976	339743
I	227m S	Unspecified Tank	1968	339743
J	270m S	Tanks	1987	328105
J	270m S	Tanks	1976	327531
J	270m S	Tanks	1968	327531
J	271m S	Unspecified Tank	1976	326666
K	274m E	Unspecified Tank	1976	329266
K	274m E	Unspecified Tank	1968	329266

ID	Location	Land Use	Date	Group ID
L	295m S	Unspecified Tank	1976	337645
L	295m S	Unspecified Tank	1968	337645
5	295m SE	Unspecified Tank	1968	326672
M	309m SW	Unspecified Tank	1976	336943
M	309m SW	Unspecified Tank	1968	336943
N	329m NE	Unspecified Tank	1976	328128
N	329m NE	Unspecified Tank	1968	328128
O	334m E	Unspecified Tank	1976	328843
O	334m E	Unspecified Tank	1968	328843
Q	378m E	Unspecified Tank	1976	340984
Q	378m E	Unspecified Tank	1968	340984
S	406m N	Unspecified Tank	1987	339835
S	406m N	Unspecified Tank	1976	339835
S	406m N	Unspecified Tank	1968	339835
S	409m N	Unspecified Tank	1993	339835
S	409m N	Unspecified Tank	1993	339835
P	434m N	Unspecified Tank	1933	326662
T	488m W	Unspecified Tank	1968	326669

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**11**

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 20 >**

ID	Location	Land Use	Date	Group ID
B	55m N	Electricity Substation	1987	223459
B	56m N	Electricity Substation	1993	212006

ID	Location	Land Use	Date	Group ID
B	56m N	Electricity Substation	1993	212006
B	57m N	Electricity Substation	1976	227384
B	57m N	Electricity Substation	1968	227384
N	345m NE	Electricity Substation	1976	210013
U	451m NW	Electricity Substation	1999	218101
U	451m NW	Electricity Substation	1976	218101
U	452m NW	Electricity Substation	1987	218101
U	452m NW	Electricity Substation	-	206885
T	468m W	Electricity Substation	1999	210007

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.

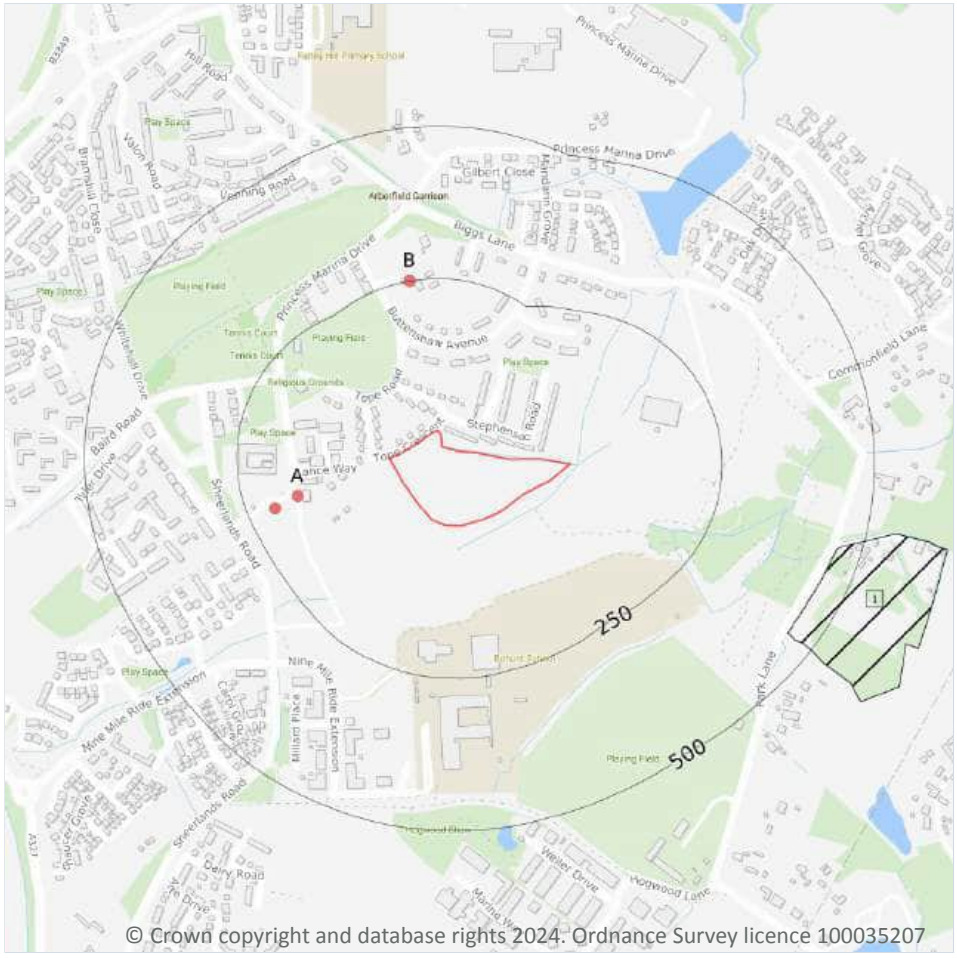
2.5 Historical garages

Records within 500m	**0**

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'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



Site Outline

Search buffers in metres (m)

Historical landfill (EA/NRW)

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	1

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.

Features are displayed on the Waste and landfill map on **page 25 >**

ID	Location	Details		
1	451m E	Site Address: Moor Farm, Finchampstead Licence Holder Address: -	Waste Licence: Yes Site Reference: 54/12/4/230, WOK27 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 31/03/1988 Licence Surrender: 25/04/1994	Operator: - Licence Holder: T N Chivers Esquire First Recorded 31/12/1987 Last Recorded: 25/04/1994

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	5

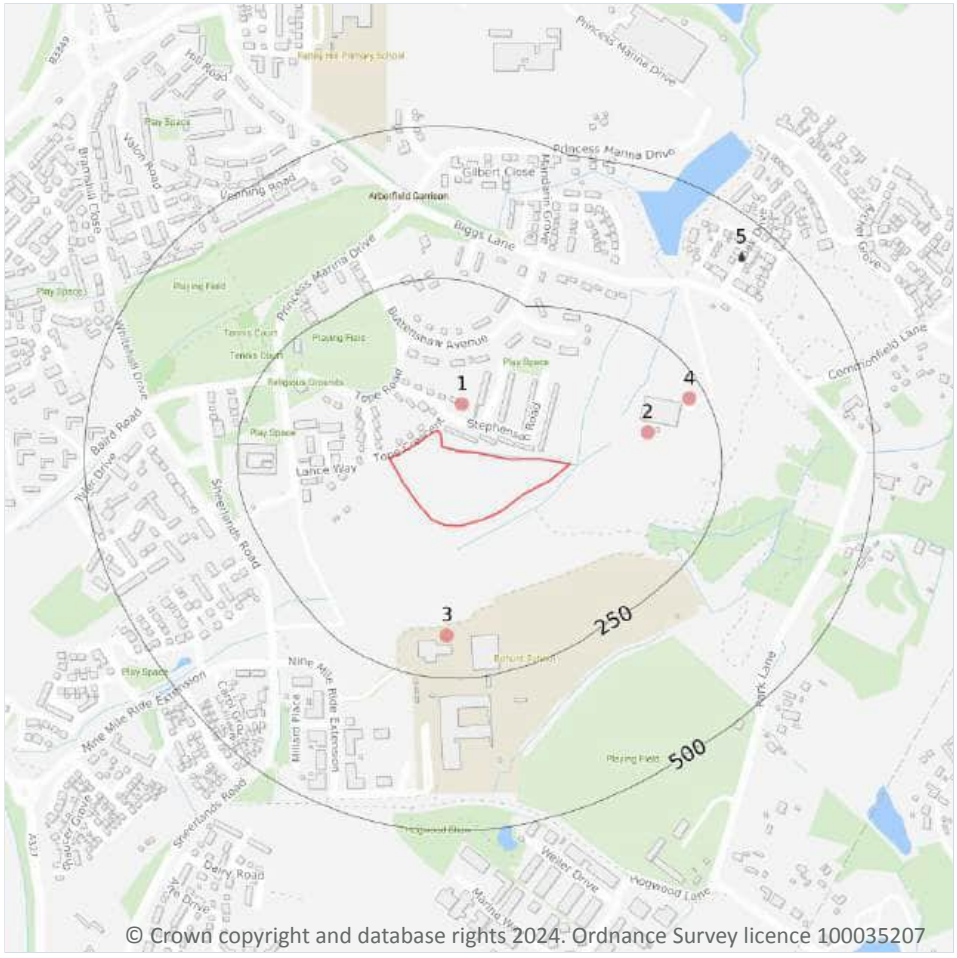
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 25 >**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	164m W	-	WEX156500	Treating waste exemption	Not on a farm	Screening and blending of waste
A	164m W	-	WEX156500	Using waste exemption	Not on a farm	Use of waste in construction
A	205m W	-	WEX369917	Using waste exemption	Not on a farm	Use of waste in construction
B	251m N	Natta Building Company, Biggs Lane, Arborfield, Rg29ln	WEX152659	Treating waste exemption	Not on a farm	Screening and blending of waste
B	251m N	Natta Building Company, Biggs Lane, Arborfield, Rg29ln	WEX136429	Using waste exemption	Not on a farm	Use of waste in construction

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

4 Current industrial land use



Site Outline

Search buffers in metres (m)

Recent industrial land uses

Licensed Discharges to controlled waters

4.1 Recent industrial land uses

Records within 250m	4

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 28 >**

ID	Location	Company	Address	Activity	Category
1	59m N	Electricity Sub Station	Berkshire, RG2	Electrical Features	Infrastructure and Facilities
2	138m E	Tank	Berkshire, RG2	Tanks (Generic)	Industrial Features
3	180m S	Electricity Sub Station	Berkshire, RG2	Electrical Features	Infrastructure and Facilities

ID	Location	Company	Address	Activity	Category
4	224m E	Electricity Sub Station	Berkshire, RG2	Electrical Features	Infrastructure and Facilities

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	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	1

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 28 >**

ID	Location	Address	Details	
5	441m NE	ARBORFIELD GARRISON, ARBORFIELD NEAR READING, BERKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE Permit Number: CATM.2572 Permit Version: 1 Receiving Water: TRIBUTARY OFTHE BARKHAMBROOK	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 19/12/1996 Effective Date: 19/12/1996 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	0

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

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.

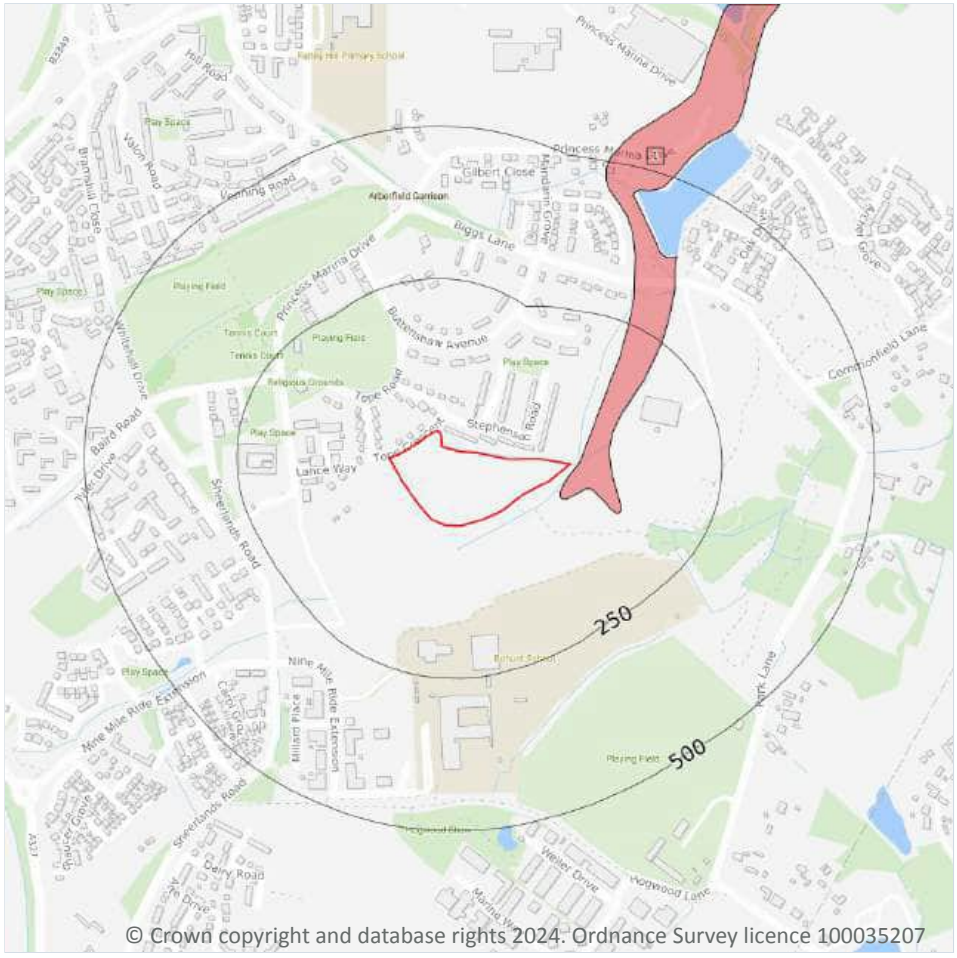
4.21 Pollution inventory radioactive waste

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	1

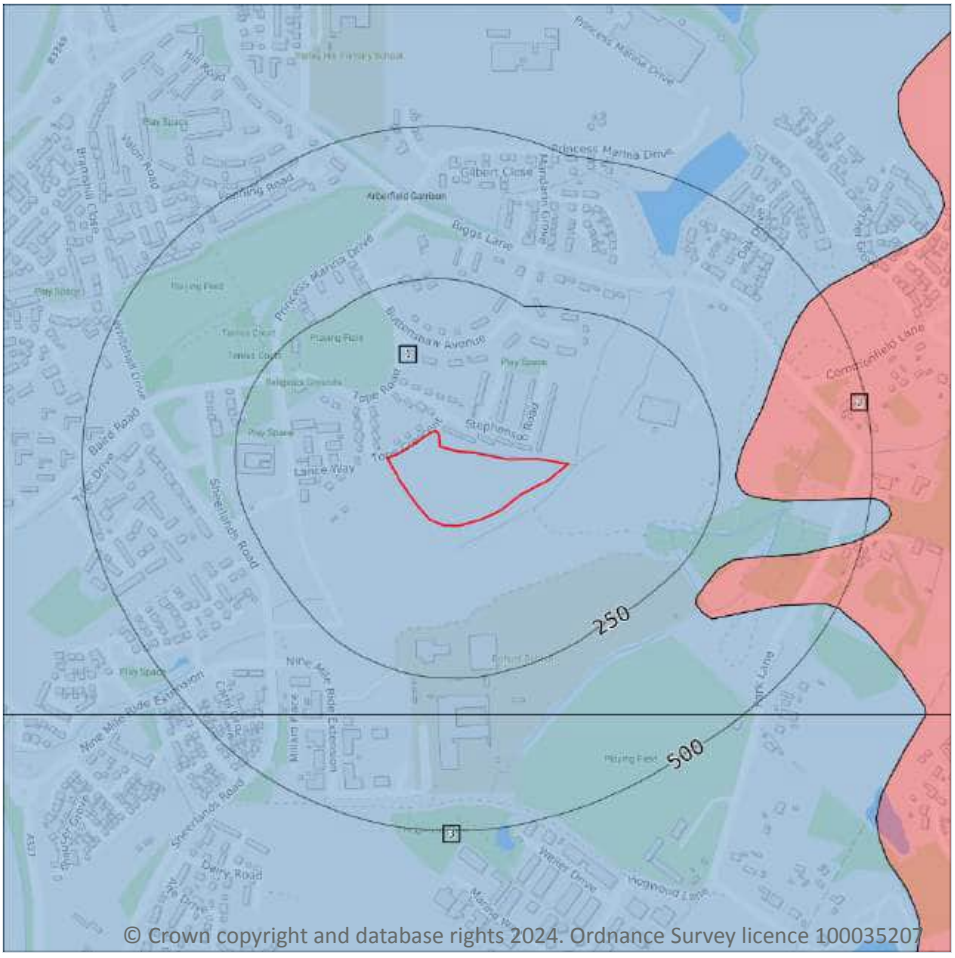
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 34 >**

ID	Location	Designation	Description
1	11m 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	3

Aquifer status of groundwater held within bedrock geology.

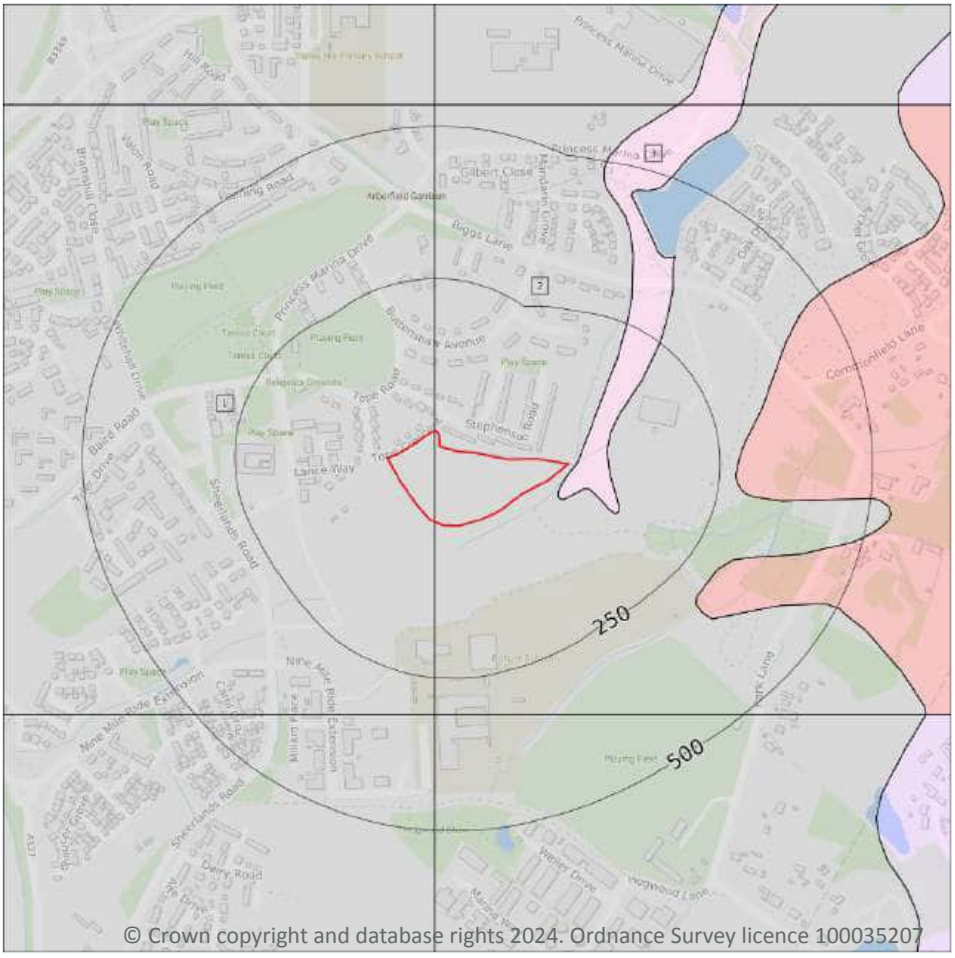
Features are displayed on the Bedrock aquifer map on **page 35 >**

ID	Location	Designation	Description
1	**On site**	**Unproductive**	**These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow**
2	276m 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

ID	Location	Designation	Description
3	309m S	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

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

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability
- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability
- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information
- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	3

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: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Low Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed**
2	**On site**	**Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Low Infiltration value: >70% Dilution value: <300mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed**
3	11m E	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed

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	0

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

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

5.6 Groundwater abstractions

Records within 2000m	0

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.

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

5.7 Surface water abstractions

Records within 2000m	0

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.

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.

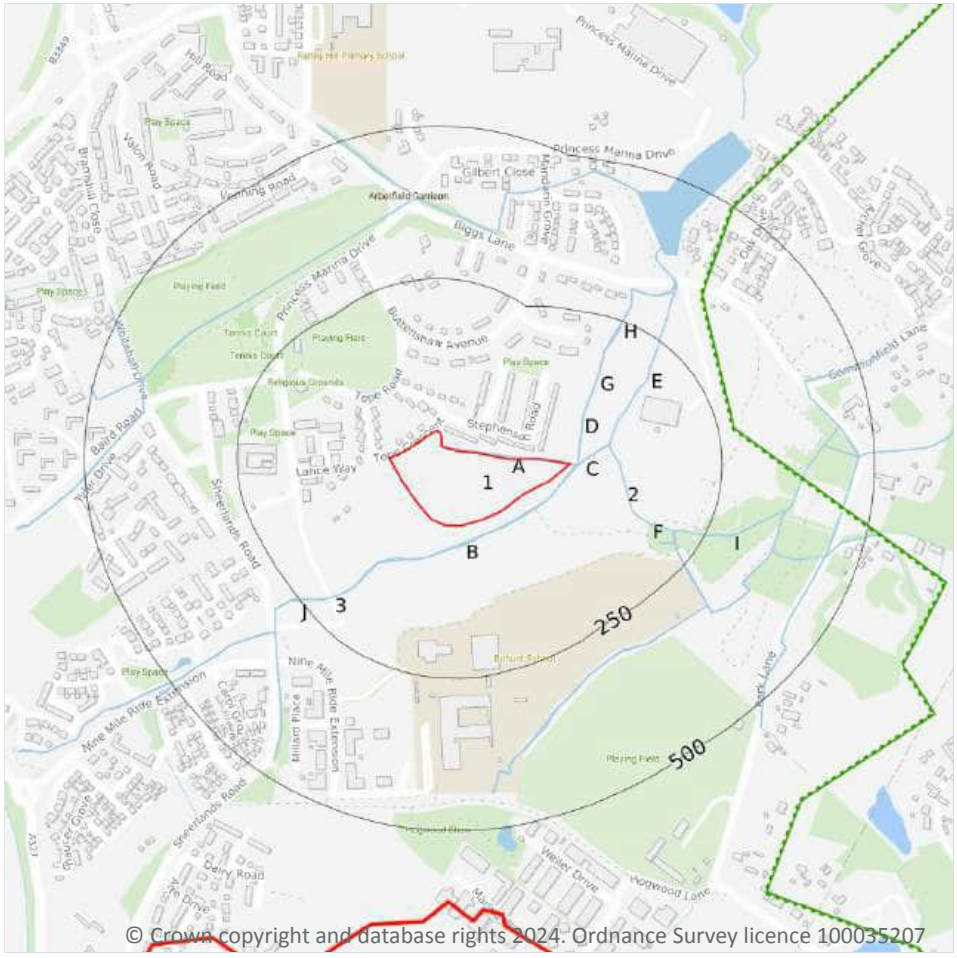
5.10 Source Protection Zones (confined aquifer)

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



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	24

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 41 >**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	**On site**	**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	9m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	13m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	13m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	13m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
D	14m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	37m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
C	42m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	71m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	74m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
2	82m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
F	126m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
G	151m NE	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
G	155m NE	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
G	159m NE	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
H	162m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	195m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
3	197m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
F	202m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
I	203m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	214m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	216m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	225m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
I	229m 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	**13**

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 41 >**

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 41 >**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River**	**Barkham Brook**	**GB106039017400**	**Loddon**	**Loddon and Trib**

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

6.4 WFD Surface water bodies

Records identified	1

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.

Features are displayed on the Hydrology map on **page 41 >**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	1323m NE	River	Barkham Brook	GB106039017400 ↗	Moderate	Fail	Moderate	2019

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

6.5 WFD Groundwater bodies

Records on site	0

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.

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

7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m	0

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).

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

7.2 Historical Flood Events

Records within 250m	0

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.

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

7.6 Flood Zone 2

Records within 50m	0

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.

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

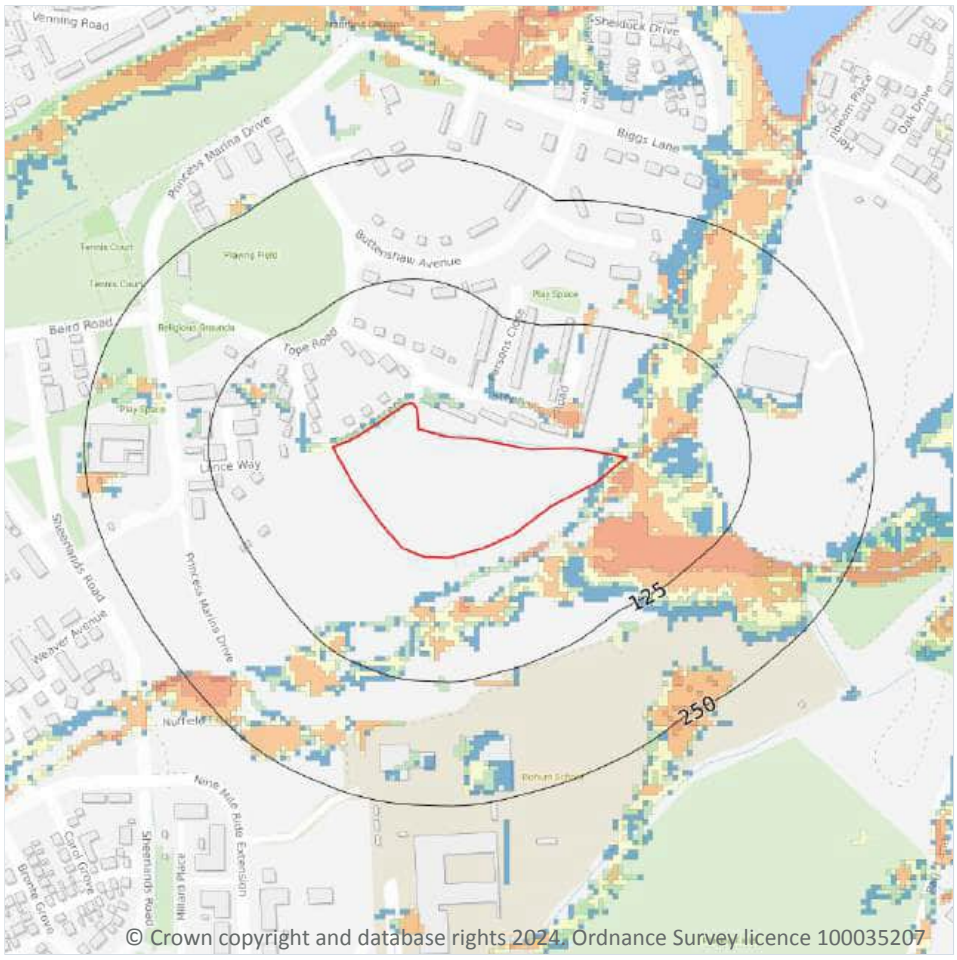
7.7 Flood Zone 3

Records within 50m	0

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.

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 100 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 49 >**

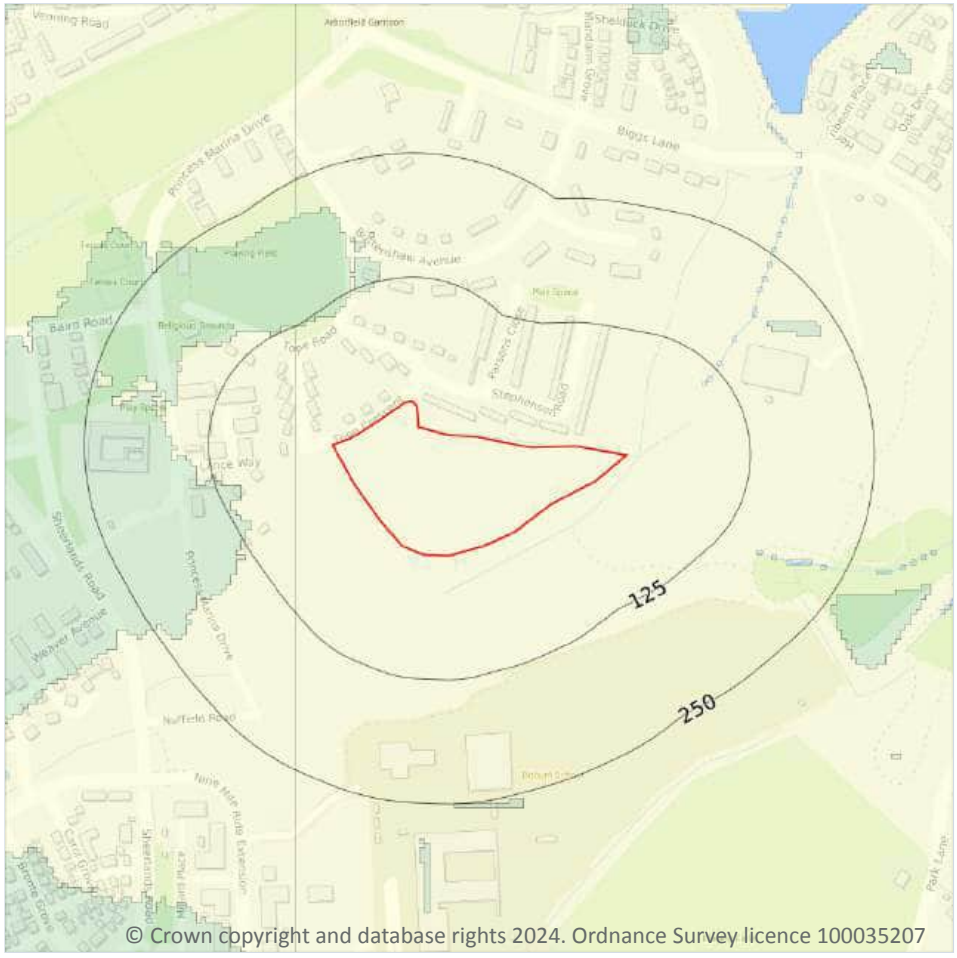
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

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	Between 0.3m and 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

9.1 Groundwater flooding

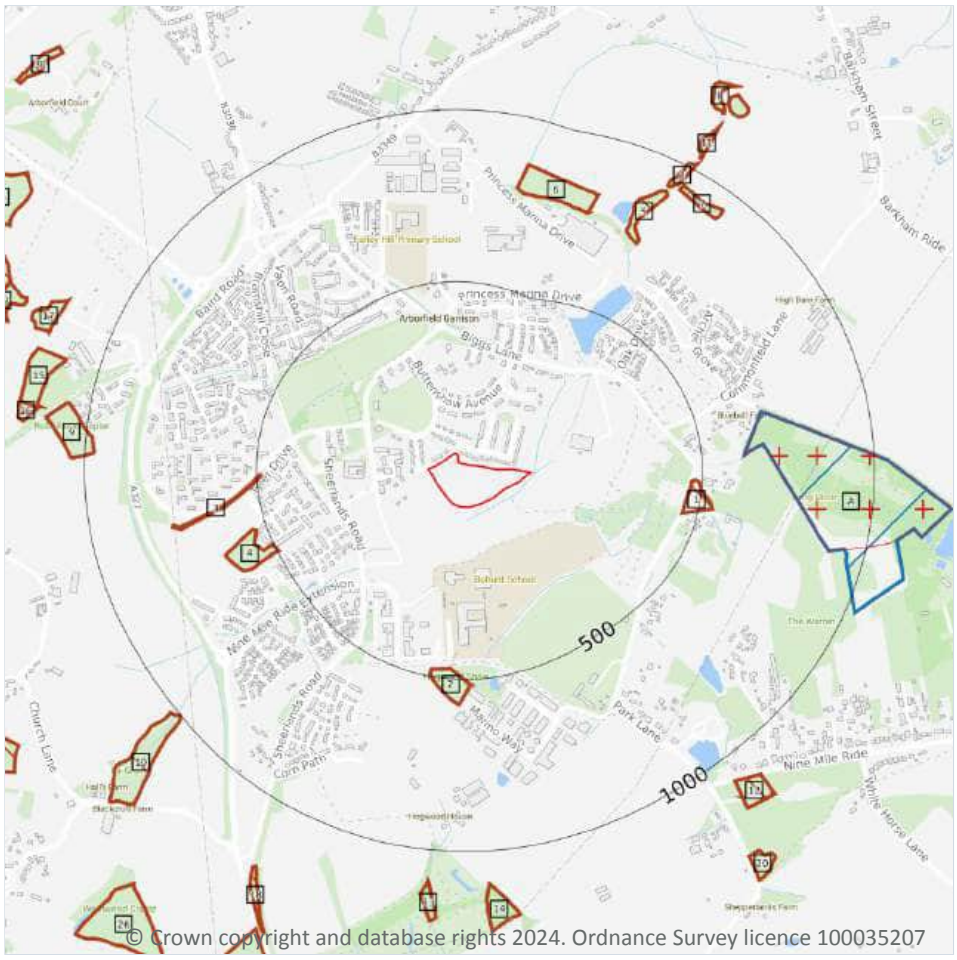
Highest risk on site	**Moderate**
Highest risk within 50m	**Moderate**

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 51 >**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Local Nature Reserves (LNR)

Designated Ancient Woodland

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 52 >**

ID	Location	Name	Data source
A	623m E	Longmoor Bog	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	1

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 52 >**

ID	Location	Name	Data source
A	625m E	Longmoor Bog	Natural England

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

10.7 Designated Ancient Woodland

Records within 2000m	57

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.

Features are displayed on the Environmental designations map on **page 52 >**

ID	Location	Name	Woodland Type
1	456m E	(Tithe=411=the Clumps; Osd=long Moor)	Ancient & Semi-Natural Woodland
2	470m S	Hogwood Shaw(tithe: Hogwood Shaw)	Ancient & Semi-Natural Woodland
3	487m W	Whitehall Copse (Tithe Map: White Hall Coppice)(tithe:white Hall Coppice)	Ancient & Semi-Natural Woodland
4	496m W	Whitehall Copse (Tithe Map: White Hall Coppice)(tithe:white Hall Coppice)	Ancient & Semi-Natural Woodland
5	734m NE	Kidgem Copse (Tithe:kitchem Coppice)(tithe:kitchen Coppice)(osd=kidghans (?) Coppice)	Ancient & Semi-Natural Woodland
6	772m NE	Kidgem Copse (Tithe:kitchem Coppice)(tithe:kitchen Coppice)(osd=kidghans (?) Coppice)	Ancient & Semi-Natural Woodland
7	912m NE	Kidgem Copse (Tithe:kitchem Coppice)(tithe:kitchen Coppice)(osd=kidghans (?) Coppice)	Ancient & Semi-Natural Woodland
8	924m NE	Kidgem Copse (Tithe:kitchem Coppice)(tithe:kitchen Coppice)(osd=kidghans (?) Coppice)	Ancient & Semi-Natural Woodland

ID	Location	Name	Woodland Type
9	973m W	Robinhood Copse (Tithe Map: Robin Hood's Coppice)(tithe:robin Wood Coppice)	Ancient & Semi-Natural Woodland
10	1002m SW	(Epoch2:fir Grove)(tithe: Yew Tree Copse)	Ancient & Semi-Natural Woodland
11	1039m NE	Kidgem Copse (Tithe:kitchem Coppice)(tithe:kitchen Coppice)(osd=kidghans (?) Coppice)	Ancient & Semi-Natural Woodland
12	1072m SE	Unknown	Ancient & Semi-Natural Woodland
13	1090m S	(Tithe: Redgates Shaw)	Ancient & Semi-Natural Woodland
14	1096m S	(Tithe: Garden Shaw)	Ancient & Semi-Natural Woodland
15	1100m W	(Tithe Map: Hurdle Coppice)(tithe:long Coppice Hurdle Coppice)	Ancient & Semi-Natural Woodland
16	1151m W	Unknown	Ancient & Semi-Natural Woodland
17	1155m NW	Long Copse (Tithe Map: The Long Coppice)(tithe:long Coppice Hurdle Coppice)	Ancient & Semi-Natural Woodland
B	1185m NE	Kidgem Copse (Tithe:kitchem Coppice)(tithe:kitchen Coppice)(osd=kidghans (?) Coppice)	Ancient & Semi-Natural Woodland
B	1197m NE	Kidgem Copse (Tithe:kitchem Coppice)(tithe:kitchen Coppice)(osd=kidghans (?) Coppice)	Ancient & Semi-Natural Woodland
18	1198m SW	Unknown	Ancient & Semi-Natural Woodland
19	1266m W	Long Copse (Tithe Map: The Long Coppice)(tithe:long Coppice Hurdle Coppice)	Ancient & Semi-Natural Woodland
20	1277m SE	(Tithe: Sandpit Copse)	Ancient & Semi-Natural Woodland
21	1331m NW	Long Copse (Tithe Map: The Long Coppice)(tithe:long Coppice Hurdle Coppice)	Ancient & Semi-Natural Woodland
22	1362m SW	Claypits(tithe: Clay Pit)	Ancient & Semi-Natural Woodland
-	1378m W	(Tithe Map: Coppice)	Ancient & Semi-Natural Woodland
24	1405m NW	(Epo2:spring Copse. Tithe Map: Spring Coppice)(tithe:spring Coppice)	Ancient & Semi-Natural Woodland

ID	Location	Name	Woodland Type
25	1434m SW	Pink's Copse(tithe:pinks Coppice)	Ancient & Semi-Natural Woodland
26	1441m SW	Westwood Copse(tithe: Westwood Copse)	Ancient & Semi-Natural Woodland
-	1519m W	Churchland Copse(tithe:burchetts Coppice)	Ancient & Semi-Natural Woodland
-	1537m W	Castle Copse (Tithe Map: Castle Coppice)	Ancient & Semi-Natural Woodland
-	1588m S	Lea Copse(tithe: Lea Copse)	Ancient & Semi-Natural Woodland
-	1592m SW	Pink's Copse(tithe:pinks Coppice)	Ancient & Semi-Natural Woodland
-	1597m W	Castle Copse (Tithe Map: Castle Coppice)	Ancient & Semi-Natural Woodland
30	1611m NW	Unknown	Ancient & Semi-Natural Woodland
-	1667m SW	Lea Copse(tithe: Lea Copse)	Ancient & Semi-Natural Woodland
-	1670m W	Castle Copse (Tithe Map: Castle Coppice)	Ancient & Semi-Natural Woodland
-	1681m W	Castle Copse (Tithe Map: Castle Coppice)	Ancient & Semi-Natural Woodland
-	1705m W	Castle Copse (Tithe Map: Castle Coppice)	Ancient & Semi-Natural Woodland
-	1719m W	(Tithe Map: Castle Coppice)	Ancient & Semi-Natural Woodland
-	1727m NE	(Tithe:little Coppice)	Ancient & Semi-Natural Woodland
-	1741m SW	(Tithe Map: Farley Hill Common)	Ancient & Semi-Natural Woodland
-	1780m S	Lea Copse(tithe: Lea Copse)	Ancient & Semi-Natural Woodland
-	1801m N	Bignell's Copse(tithe:bignolds Coppice)	Ancient & Semi-Natural Woodland
-	1812m N	The Coombes	Ancient & Semi-Natural Woodland

ID	Location	Name	Woodland Type
-	1812m SW	Unknown	Ancient & Semi-Natural Woodland
-	1822m SW	(Tithe Map: Farley Hill Common)	Ancient Replanted Woodland
-	1835m W	Great Copse (Tithe Map: Horns Coppice)(tithe:horns Coppice)	Ancient & Semi-Natural Woodland
-	1851m S	Lea Copse(tithe: Lea Copse)	Ancient & Semi-Natural Woodland
-	1885m W	Great Copse (Tithe Map: Horns Coppice)(tithe:horns Coppice)	Ancient & Semi-Natural Woodland
-	1894m N	(Epo2: Hazeltons Copse; Tithe:hazletons Copse)	Ancient & Semi-Natural Woodland
-	1898m SW	(Tithe Map: Farley Hill Common)	Ancient & Semi-Natural Woodland
-	1902m SW	(Tithe Map: Farley Hill Common)	Ancient & Semi-Natural Woodland
-	1918m SW	(Tithe:little Coppice Late Hornes)	Ancient & Semi-Natural Woodland
-	1944m SW	Wyvols Copse (Tithe Map: Wyfold Coppice)(tithe:wyfold Copse)	Ancient Replanted Woodland
-	1952m S	Banisters Copse(tithe: Banisters Copse)	Ancient & Semi-Natural Woodland
-	1957m SW	Pickets Copse (Tithe Map: Piggots Coppice)(tithe:piggots Or Picketts Coppice)	Ancient Replanted Woodland
-	1990m SW	Hornes Copse	Ancient & Semi-Natural Woodland

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

10.8 Biosphere Reserves

Records within 2000m	**0**

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.

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

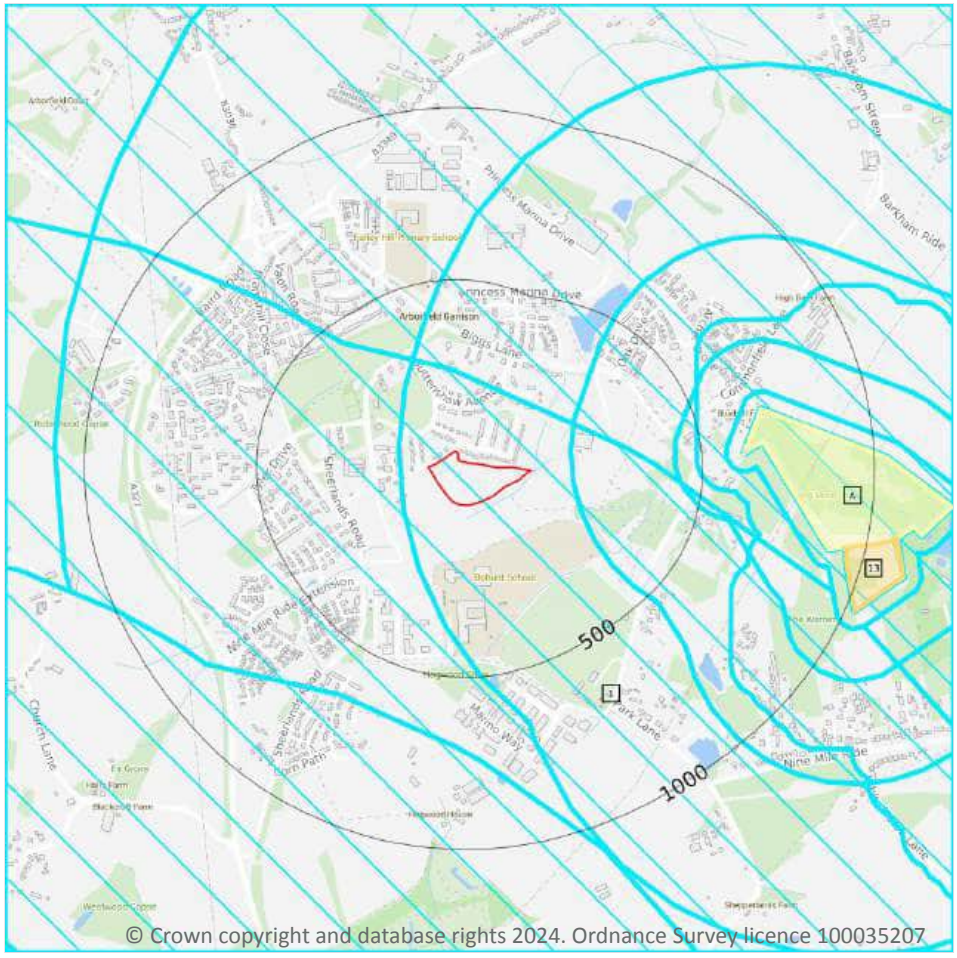
Records within 2000m	2

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	**Barkham Brook NVZ**	**Surface Water**	**449**	**Existing**
517m N	Barkham Brook NVZ	Surface Water	449	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 60 >**

ID	Location	Type of developments requiring consultation
1	On site	**Infrastructure - Pipelines and underground cables, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Wind and Solar - Wind turbines. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Residential - Residential development of 100 units or more. Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas. Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t). Combustion - General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Composting - Any composting proposal with more than 500 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply . Notes: Strategic solutions for recreational impacts are in place. Please contact your Local Planning Authority as they have the information to advise on specific requirements.**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	**2**

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 60 >**

ID:	A
Location:	623m E
SSSI name:	Longmoor Bog
Unit name:	Wdc
Broad habitat:	Fen, Marsh And Swamp - Lowland
Condition:	Unfavourable - Recovering
Reportable features:	

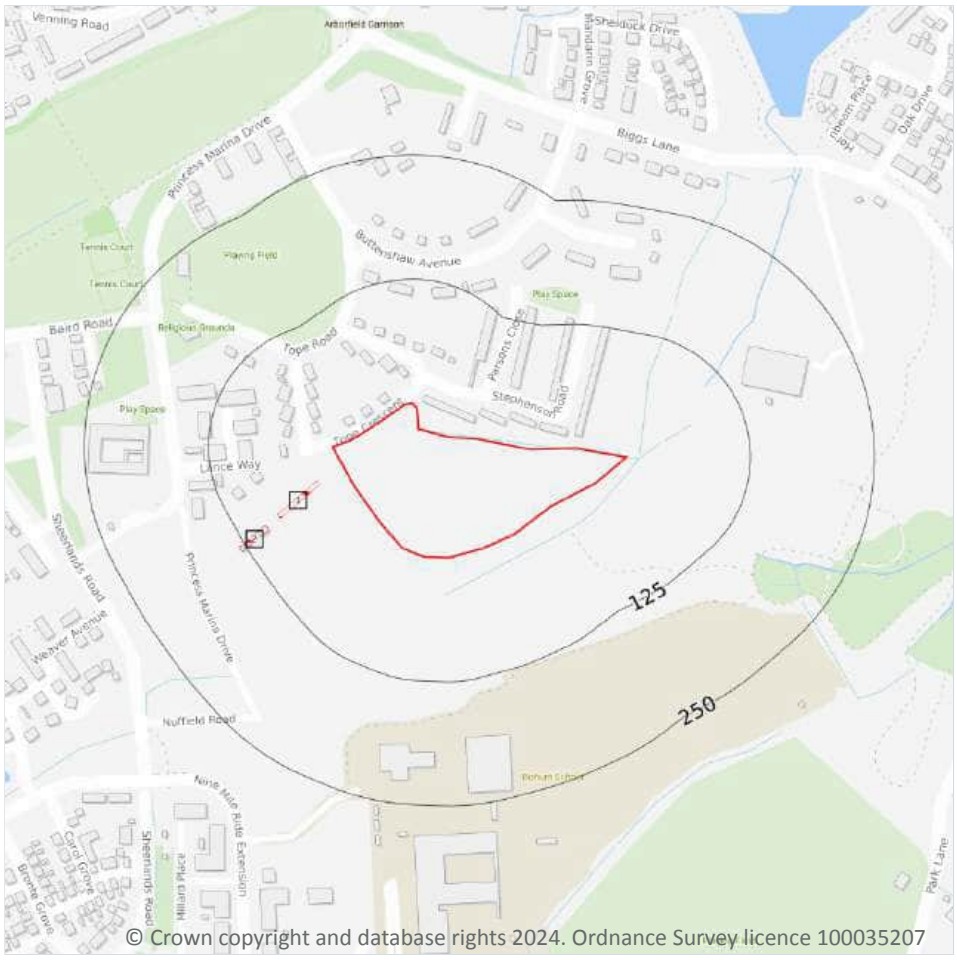
Feature name	Feature condition	Date of assessment
Lowland fens, including basin, flood-plain, open water transition and valley fens	Unfavourable - Recovering	22/07/2013
Lowland wet heath	Unfavourable - Recovering	22/07/2013
Wet woodland	Favourable	22/07/2013

ID: 13
Location: 939m E
SSSI name: Longmoor Bog
Unit name: California
Broad habitat: Fen, Marsh And Swamp - Lowland
Condition: Unfavourable - No change
Reportable features:

Feature name	Feature condition	Date of assessment
Lowland wet heath	Unfavourable - No change	22/07/2013

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	2

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.

Features are displayed on the Visual and cultural designations map on **page 63 >**

ID	Location	Ancient monument name	Reference number
1	29m W	Infirmary Stables, Arborfield	1006949
2	96m W	Infirmary Stables, Arborfield	1006949

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

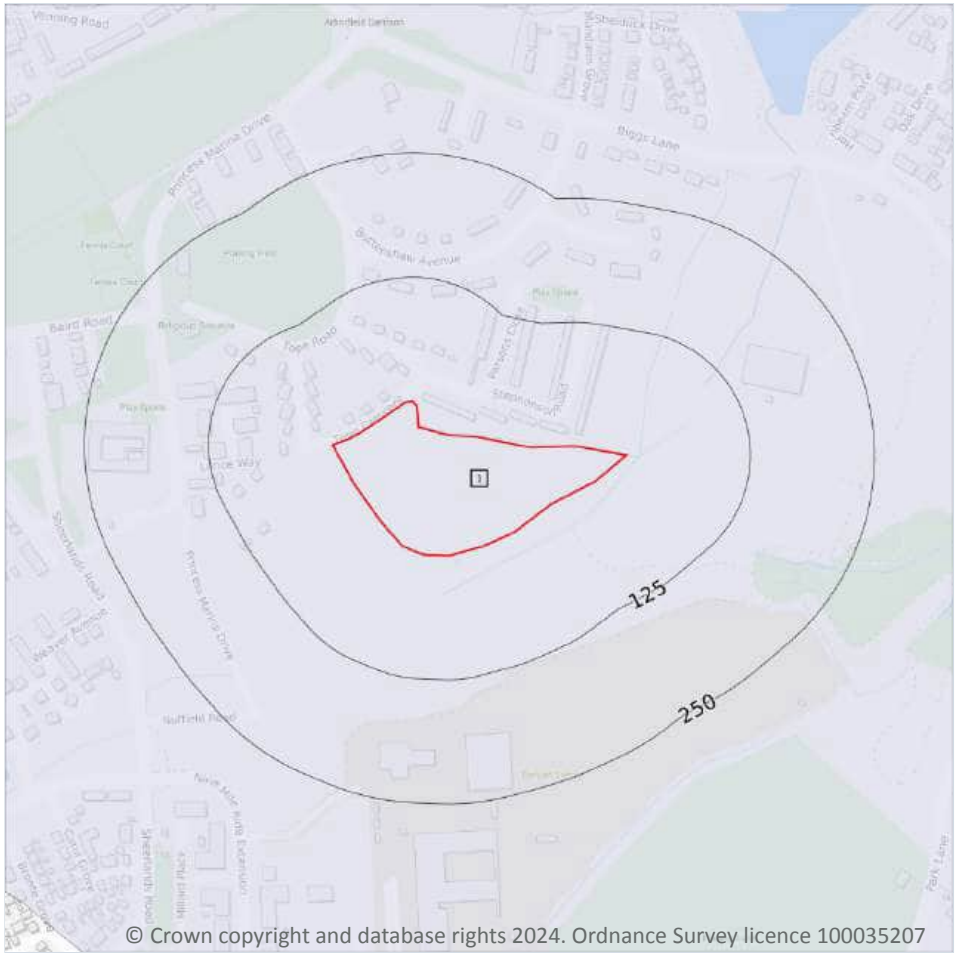
11.7 Registered Parks and Gardens

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	1

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 66 >**

ID	Location	Classification	Description
1	On site	Grade 4	**Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.**

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.

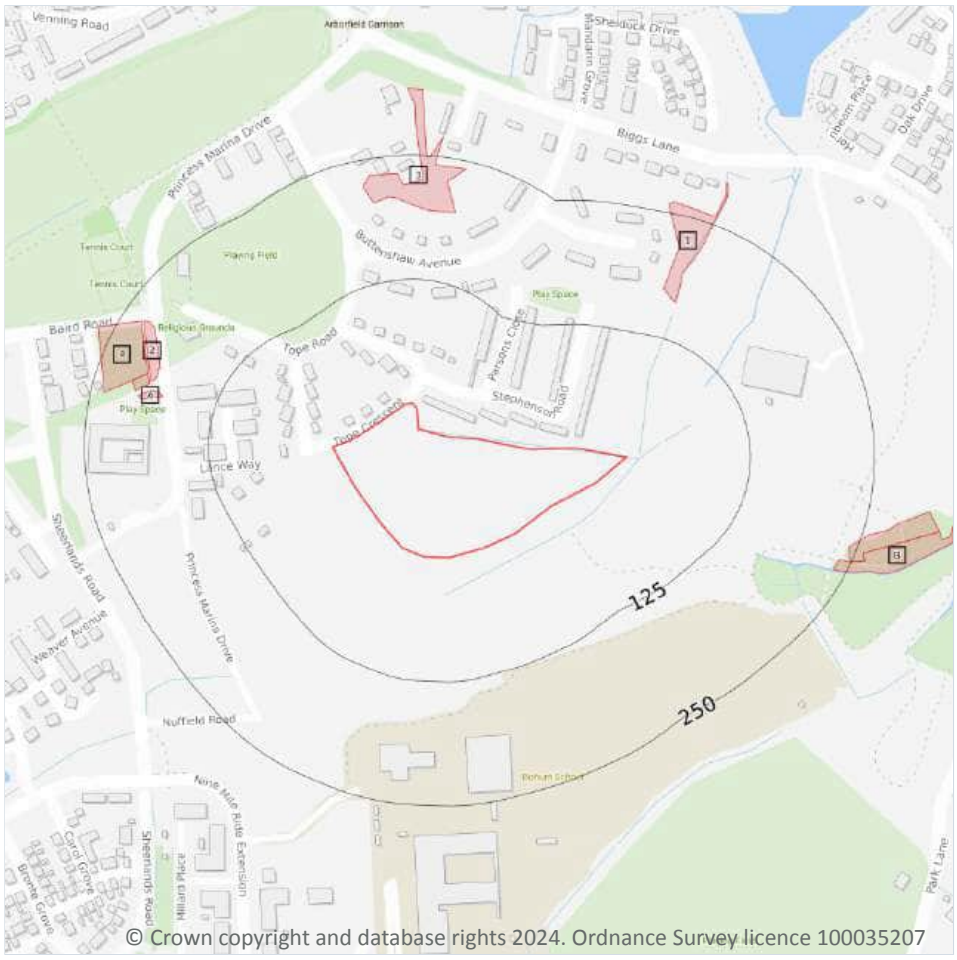
12.5 Countryside Stewardship Schemes

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



13.1 Priority Habitat Inventory

Records within 250m	8

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

Features are displayed on the Habitat designations map on **page 68 >**

ID	Location	Main Habitat	Other habitats
1	163m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	179m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	190m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	195m N	No main habitat but additional habitats present	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
A	195m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	200m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	237m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	242m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	**0**

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.

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.

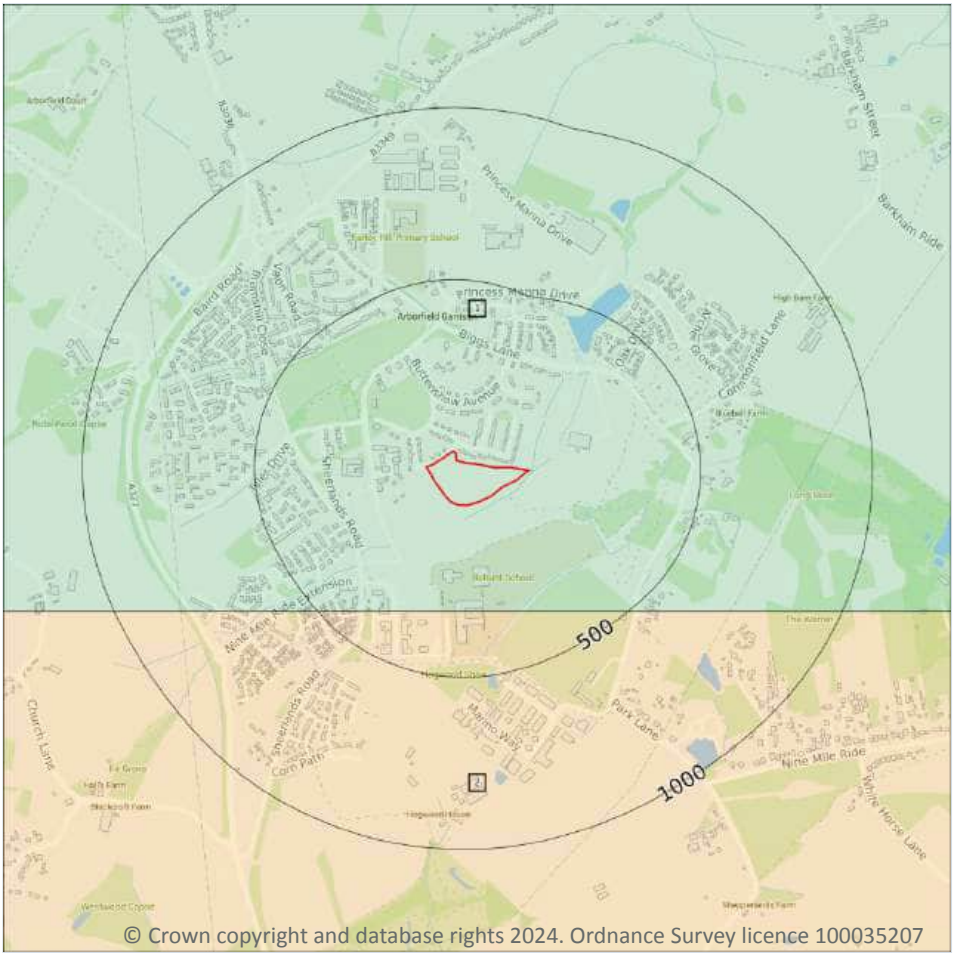
13.4 Limestone Pavement Orders

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

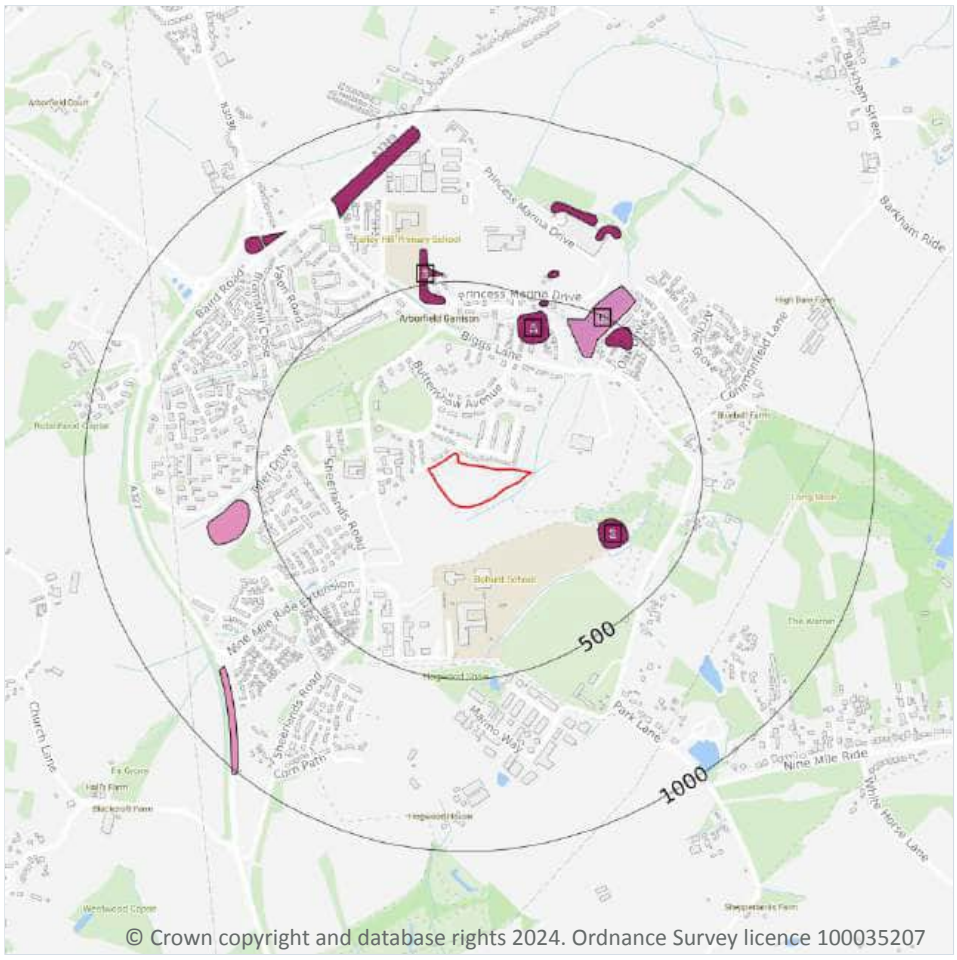
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 70 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**SU76NE**
2	309m S	Full	Partial	Partial	No coverage	SU76SE

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	6

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.

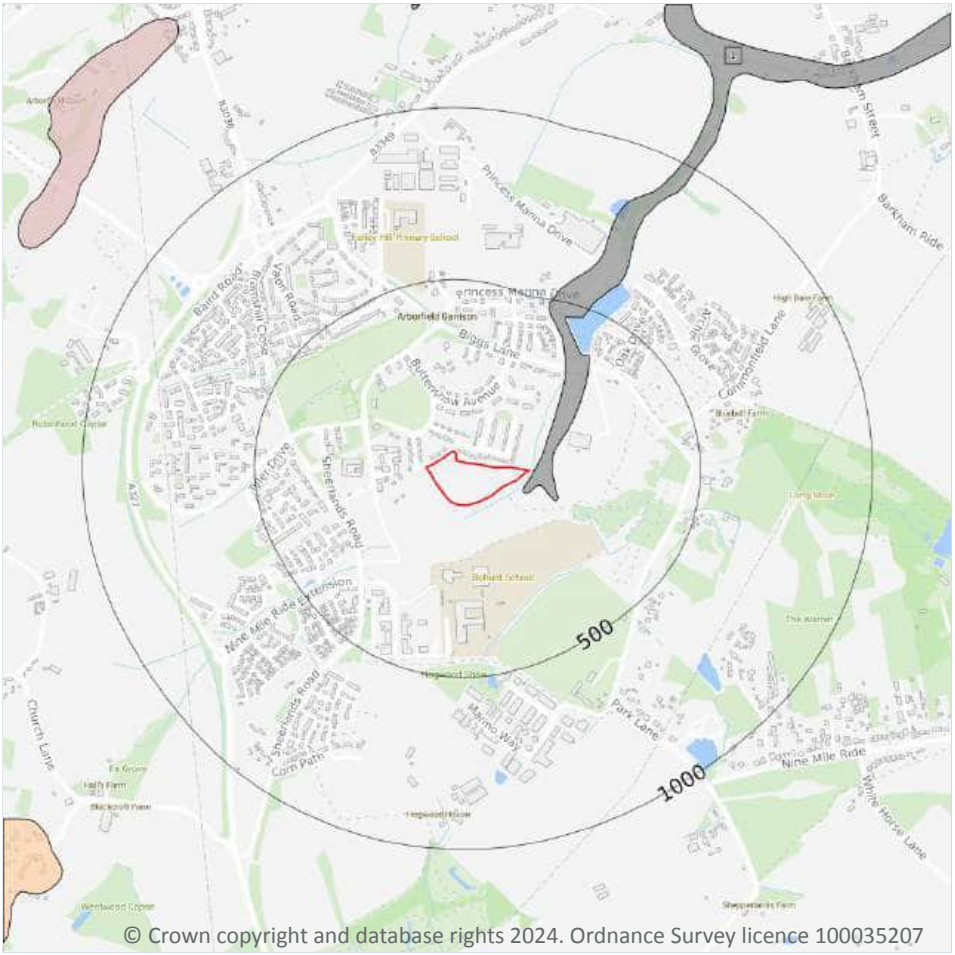
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 71 >**

ID	Location	LEX Code	Description	Rock description
1	251m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	368m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
B	370m NE	WGR-VOID	Worked Ground (Undivided)	Void
B	431m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
2	436m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	481m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

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	1

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 73 >**

ID	Location	LEX Code	Description	Rock description
1	16m E	ALV-Z	Alluvium - Silt (unlithified Deposits Coding Scheme)	Silt

This data is sourced from the British Geological Survey.

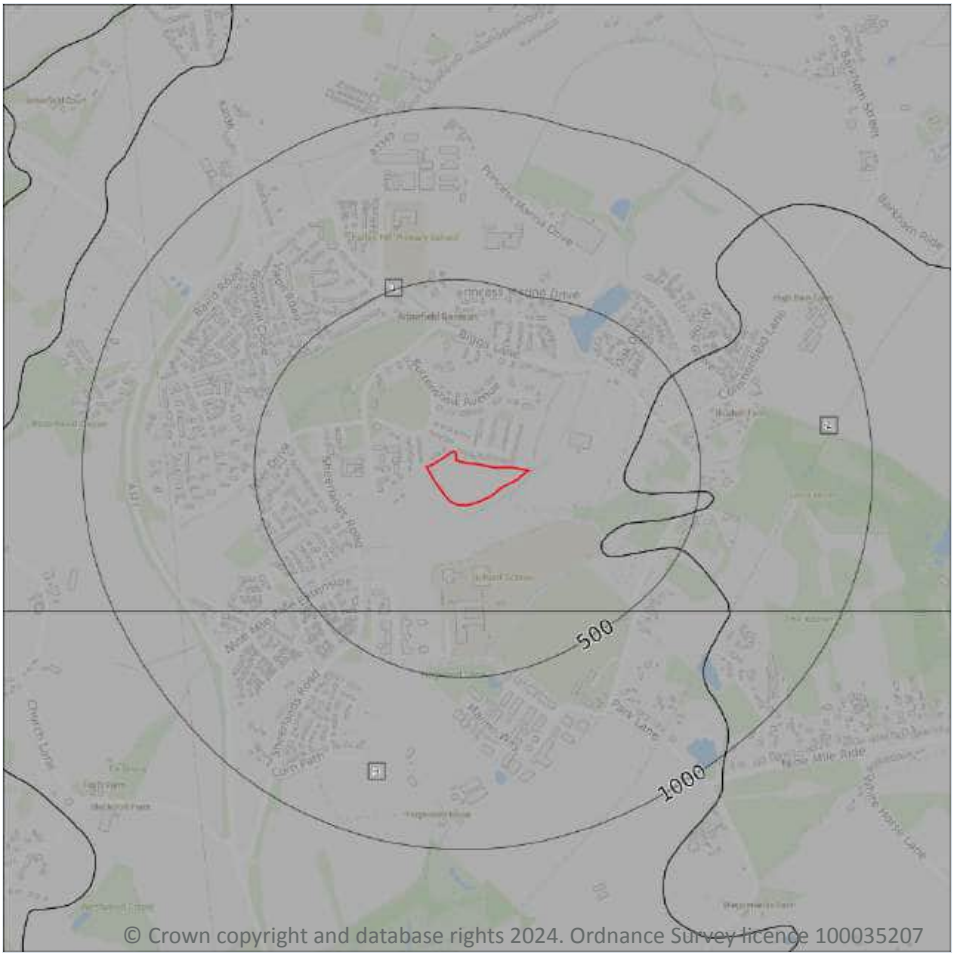
14.4 Landslip (10k)

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	3

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 75 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**LC-CLSISA**	**London Clay Formation - Clay, Silt And Sand**	**Eocene Epoch**
2	279m E	BGS-SANDU	Bagshot Formation - Sand	Eocene Epoch
3	309m S	LC-CLSISA	London Clay Formation - Clay, Silt And Sand	Eocene Epoch

This data is sourced from the British Geological Survey.

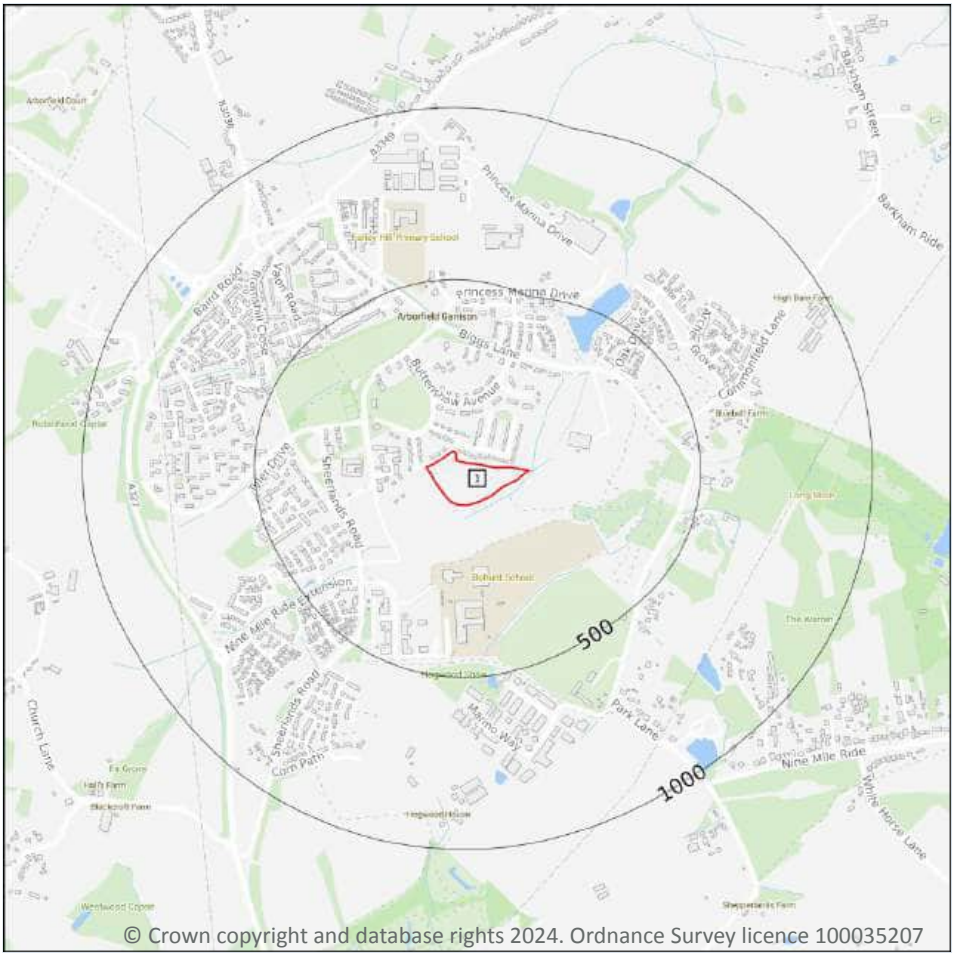
14.6 Bedrock faults and other linear features (10k)

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

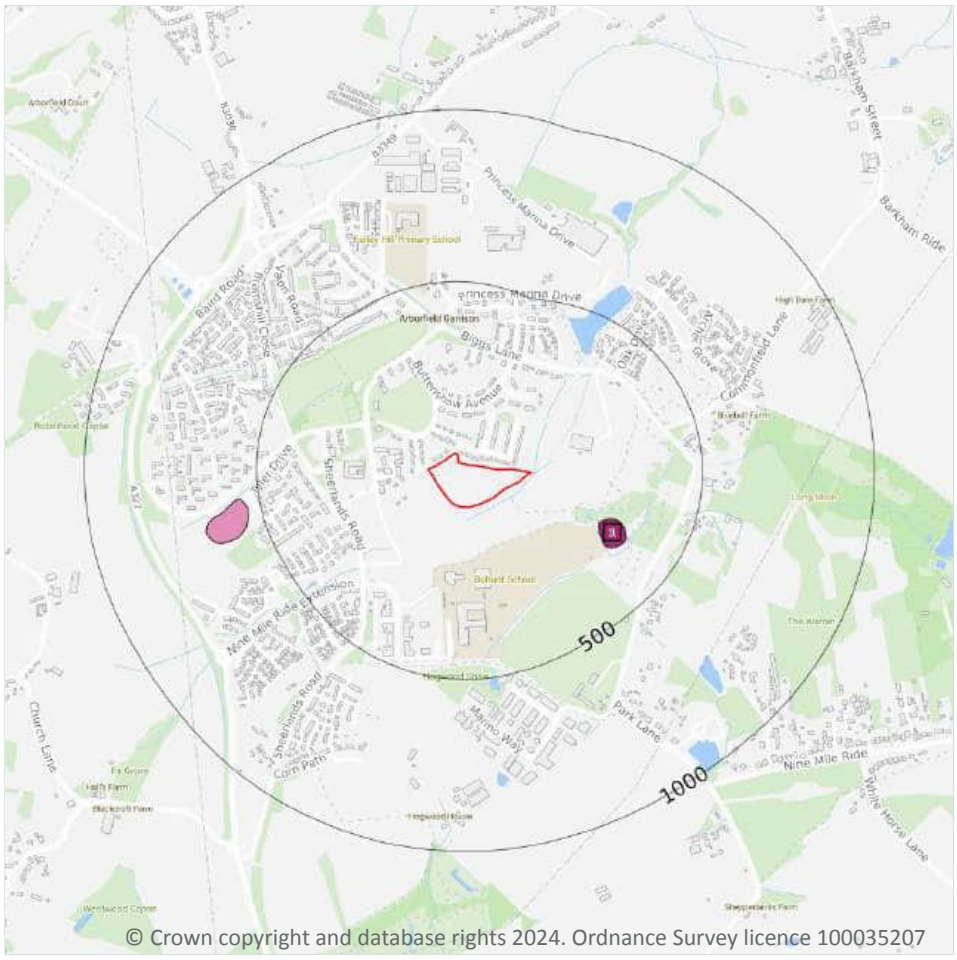
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

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

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**EW268_reading_v4**

This data is sourced from the British Geological Survey.

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



Site Outline

Search buffers in metres (m)

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

15.2 Artificial and made ground (50k)

Records within 500m	1

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.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 78 >**

ID	Location	LEX Code	Description	Rock description
1	249m E	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

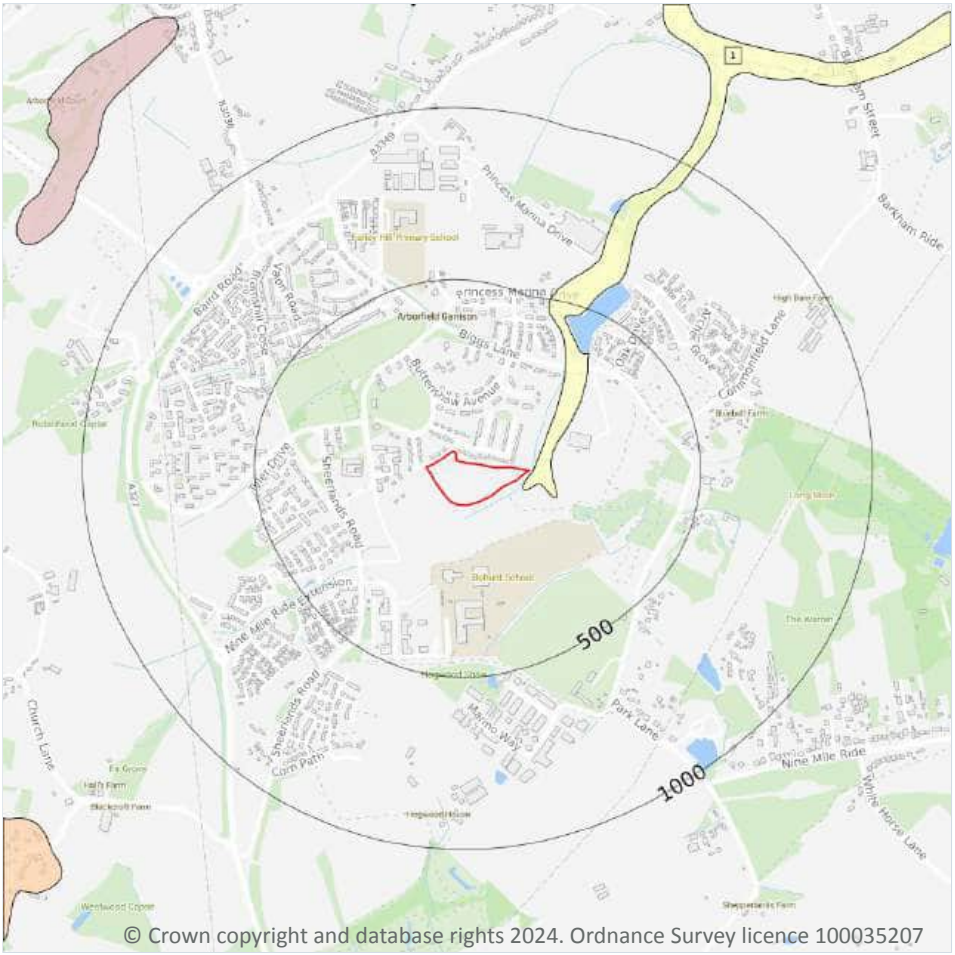
15.3 Artificial ground permeability (50k)

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	1

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 80 >**

ID	Location	LEX Code	Description	Rock description
1	11m E	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1

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
11m E	Intergranular	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.

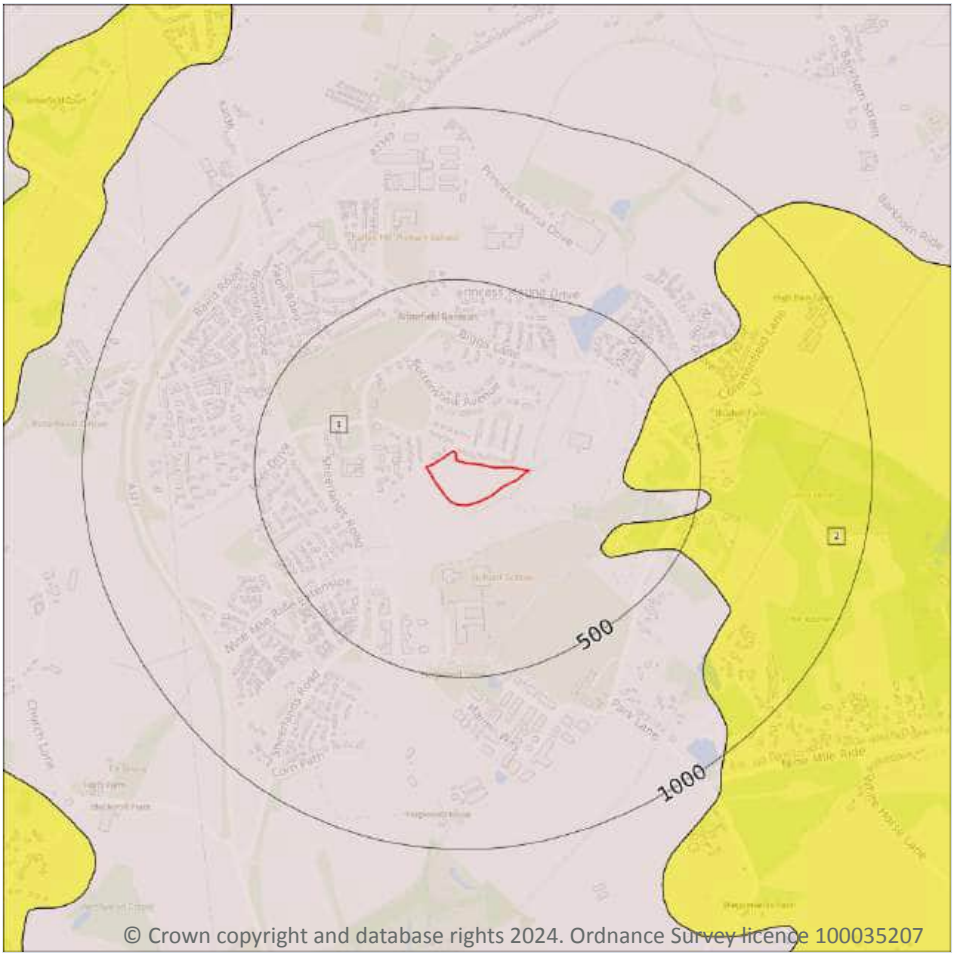
15.7 Landslip permeability (50k)

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	2

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 82 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**LC-XCZS**	**LONDON CLAY FORMATION - CLAY, SILT AND SAND**	**YPRESIAN**
2	276m E	BGS-S	BAGSHOT FORMATION - SAND	YPRESIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	1

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	**Mixed**	**Moderate**	**Very Low**

This data is sourced from the British Geological Survey.

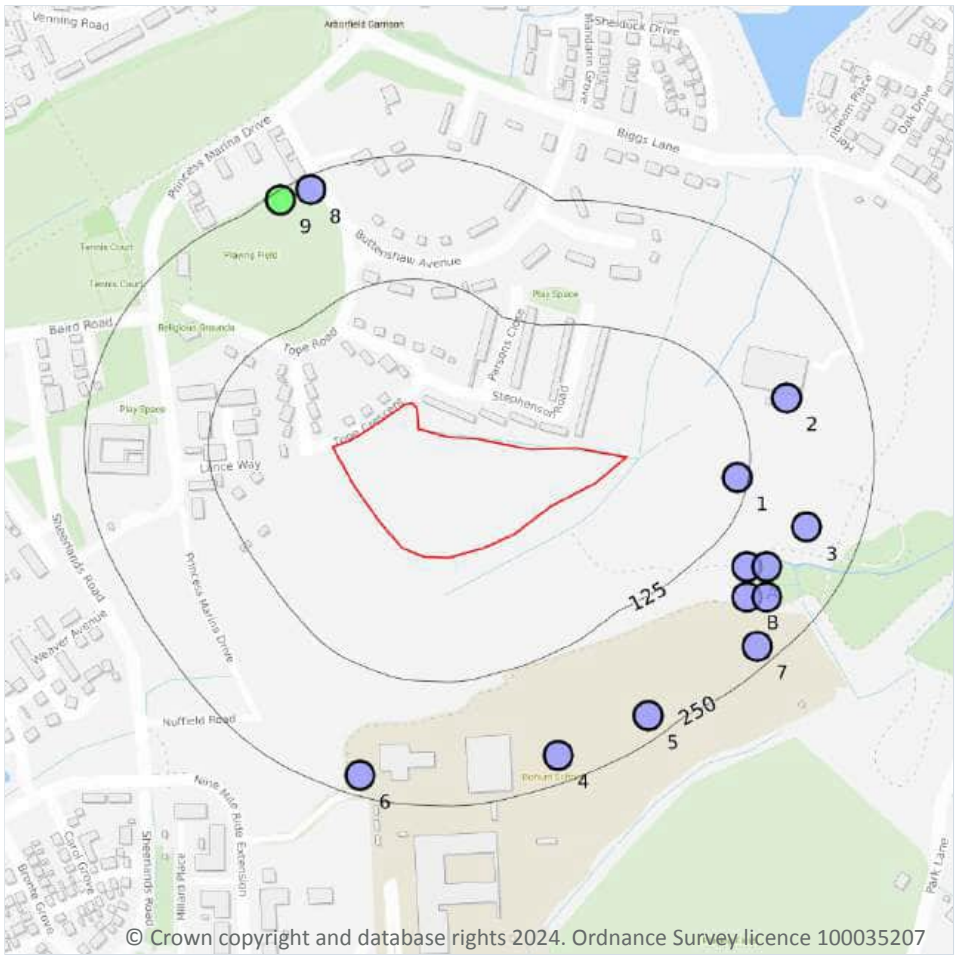
15.10 Bedrock faults and other linear features (50k)

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



16.1 BGS Boreholes

Records within 250m	13

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.

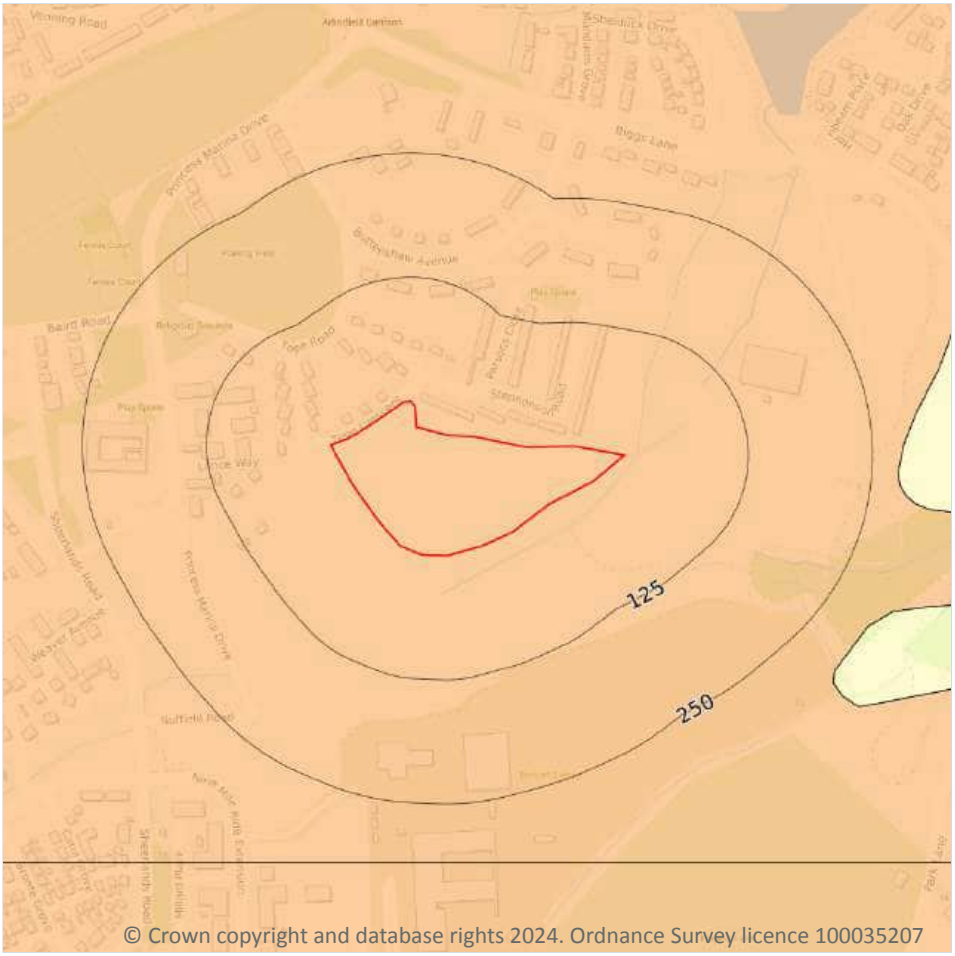
Features are displayed on the Boreholes map on **page 84 >**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	114m E	477330 165390	ARBORFIELD GARRISON 90	3.0	N	427078 ↗
A	164m E	477340 165300	ARBORFIELD GARRISON 50	10.0	N	427038 ↗
2	172m E	477380 165470	ARBORFIELD GARRISON 87	3.0	N	427075 ↗

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	180m E	477360 165300	ARBORFIELD GARRISON 51	6.0	N	427039 ↗
B	186m E	477340 165270	ARBORFIELD GARRISON 52	6.0	N	427040 ↗
3	195m E	477400 165340	ARBORFIELD GARRISON 91	3.0	N	427079 ↗
B	200m E	477360 165270	ARBORFIELD GARRISON 53	6.0	N	427041 ↗
4	222m S	477150 165110	ARBORFIELD GARRISON 98	3.0	N	427085 ↗
5	227m SE	477240 165150	ARBORFIELD GARRISON 99	3.0	N	427086 ↗
6	229m S	476950 165090	ARBORFIELD GARRISON 97	3.0	N	427084 ↗
7	231m SE	477350 165220	ARBORFIELD GARRISON 94	3.0	N	427081 ↗
8	236m NW	476900 165680	ARBORFIELD GARRISON 42	10.0	N	427030 ↗
9	241m NW	476870 165670	ARBORFIELD GARRISON 43	15.0	N	427031 ↗

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

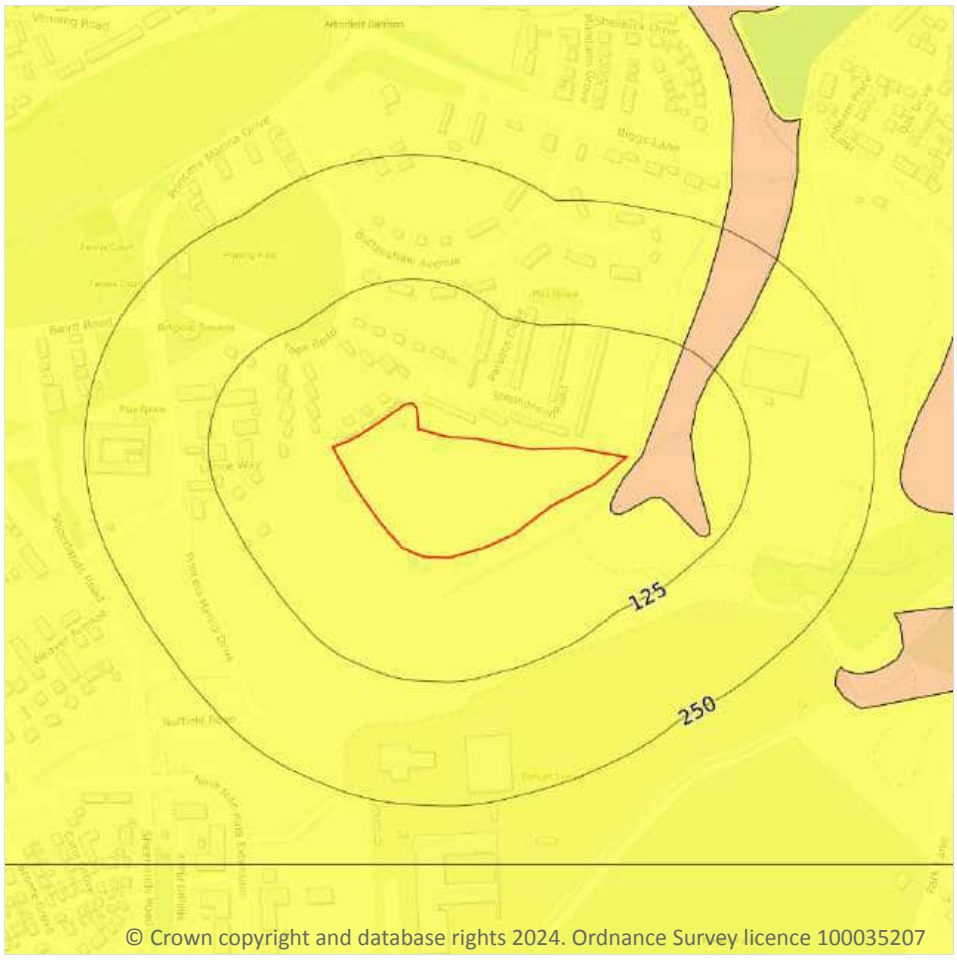
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 86 >**

Location	Hazard rating	Details
On site	**Low**	**Ground conditions predominantly medium 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	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.

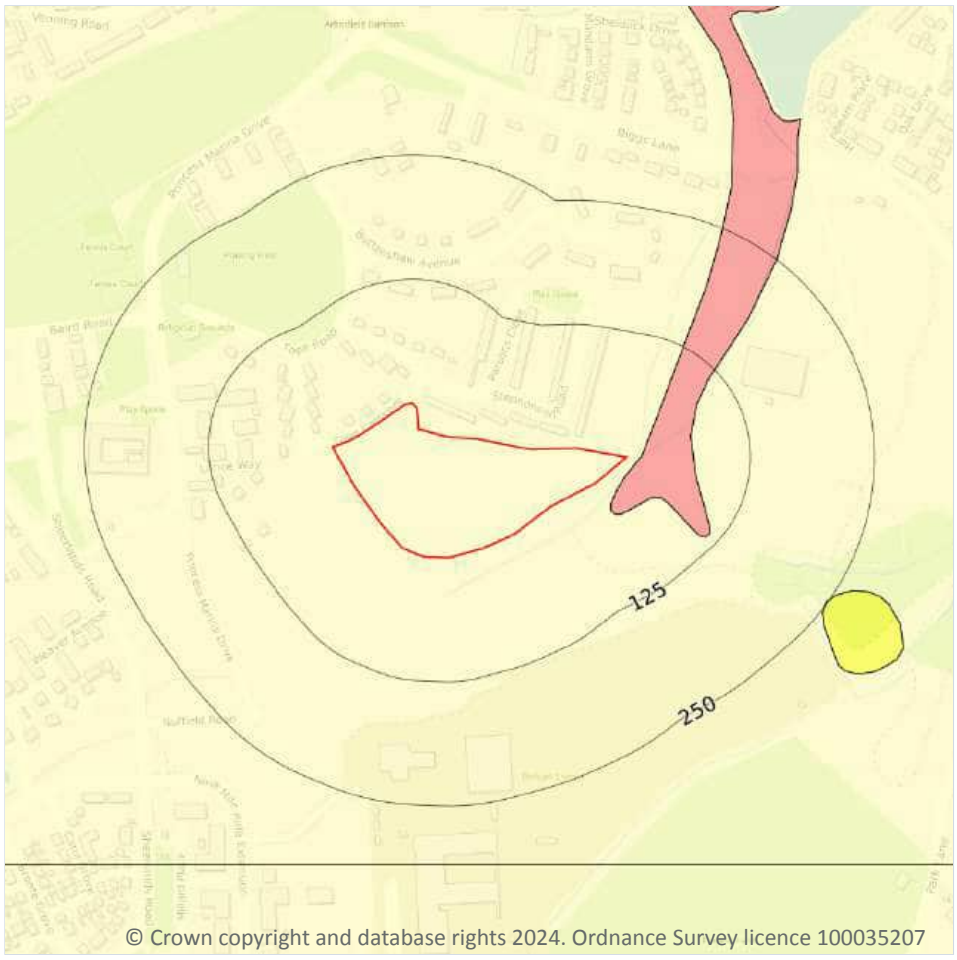
Features are displayed on the Natural ground subsidence - Running sands map on **page 87 >**

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.**

Location	Hazard rating	Details
11m E	Low	Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.

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	2

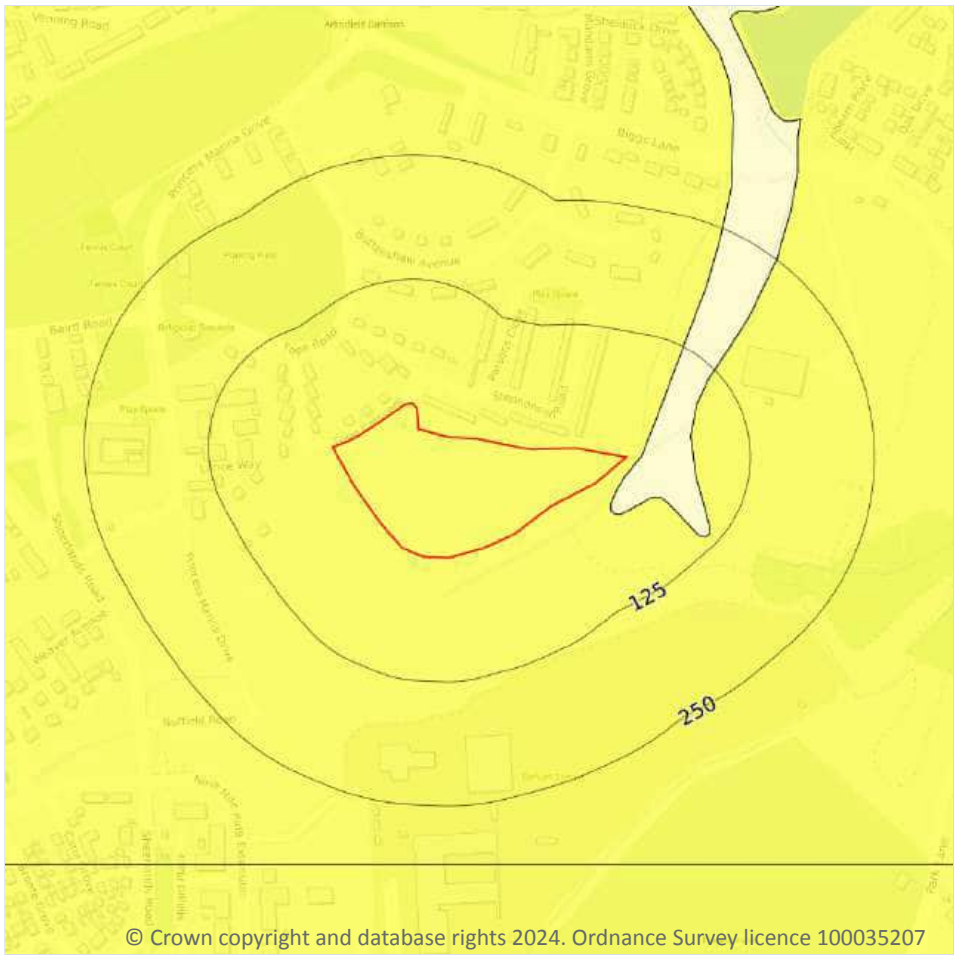
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 89 >**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**
11m E	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

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	2

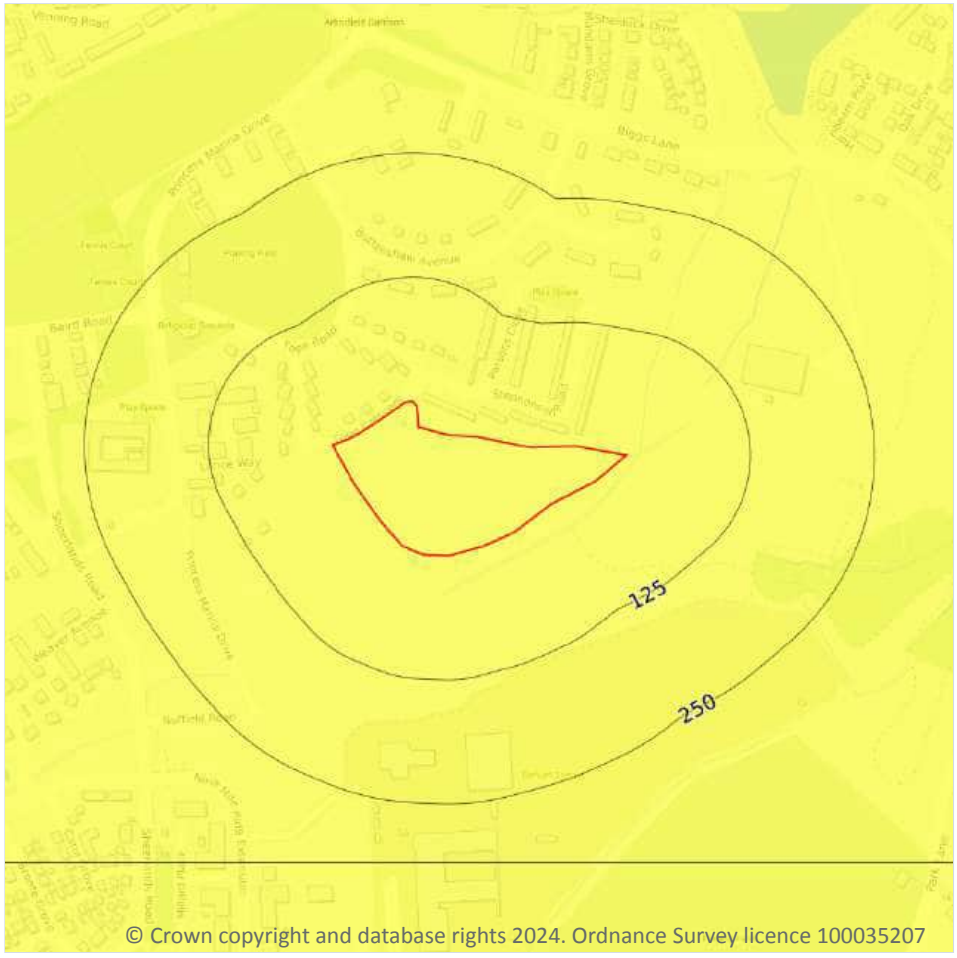
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 91 >**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**
11m E	Negligible	Deposits with potential to collapse when loaded and saturated are believed not 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

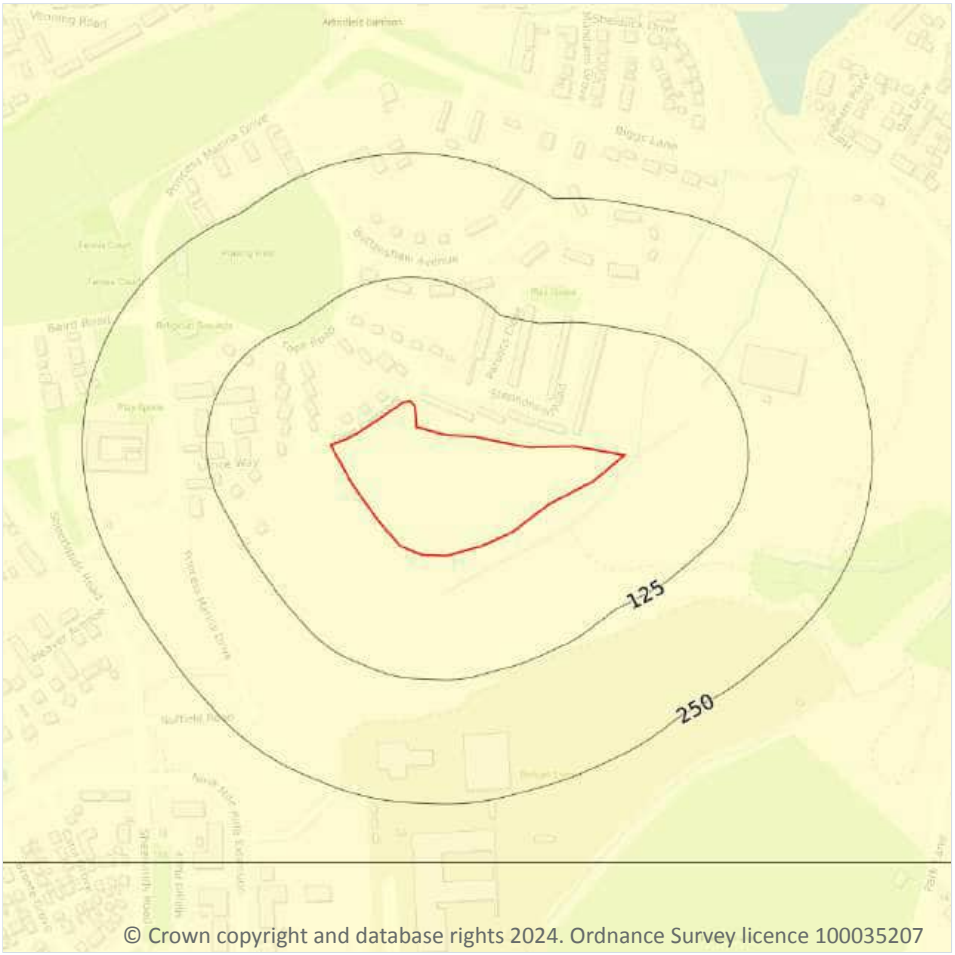
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 92 >**

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

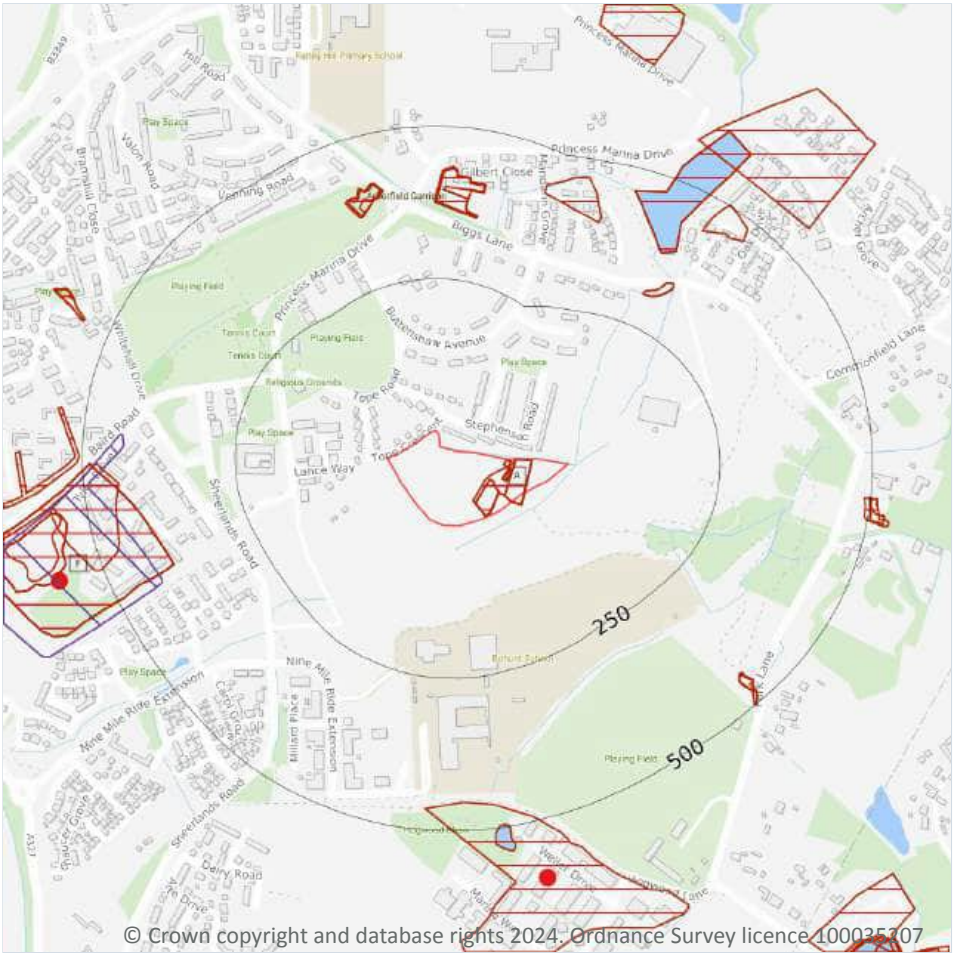
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 93 >**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

This data is sourced from the British Geological Survey.

18 Mining and ground workings



Site Outline

Search buffers in metres (m)

- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining

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 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.

18.2 Surface ground workings

Records within 250m	8

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 and ground workings map on **page 95 >**

ID	Location	Land Use	Year of mapping	Mapping scale
A	**On site**	**Filter Beds**	**1938**	**1:10560**
A	**On site**	**Sewage Tanks**	**1938**	**1:10560**
A	**On site**	**Filter Beds**	**1932**	**1:10560**
A	**On site**	**Filter Beds**	**1932**	**1:10560**
A	**On site**	**Sewage Tanks**	**1932**	**1:10560**
A	**On site**	**Filter Beds**	**1932**	**1:10560**
A	**On site**	**Filter Beds**	**1932**	**1:10560**
A	**On site**	**Sewage Tanks**	**1932**	**1:10560**

This is data is sourced from Ordnance Survey/Groundsure.

18.3 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.

18.4 Underground mining extents

Records within 500m	0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	1

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.

Features are displayed on the Mining and ground workings map on **page 95 >**

ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
F	420m W	Whitehall	Clay, bricks	Surface mineral working	Valid	06/47

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	0

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).

This data is sourced from the British Geological Survey.

18.7 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.

18.8 The Coal Authority non-coal mining

Records within 500m	0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m	1

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

Location	Mineral type
370m NE	Stone

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m	0

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m	0

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 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.

18.13 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.

18.14 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 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 Ground cavities and sinkholes

19.1 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.

19.2 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.

19.3 Reported recent incidents

Records within 500m	0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m	0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.

This data is sourced from Groundsure.

19.5 National karst database

Records within 500m	0

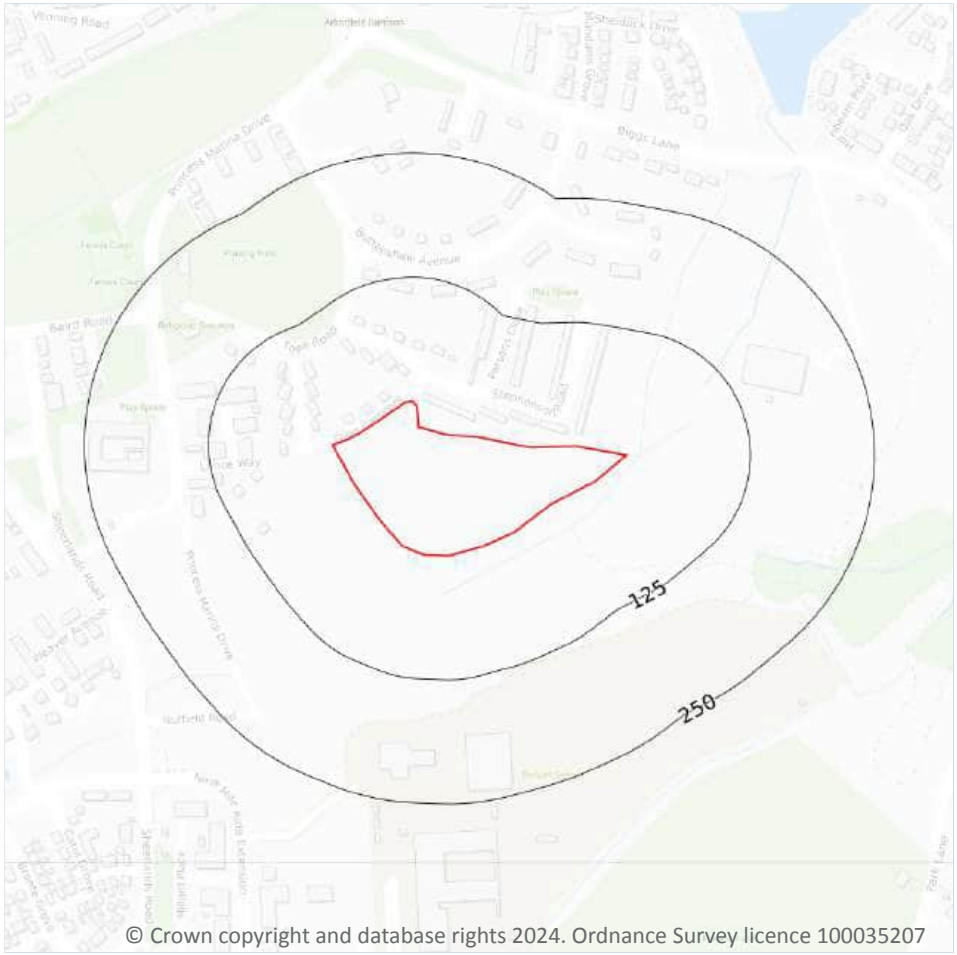
This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.

20 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%

20.1 Radon

Records on site	1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 102 >**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None**

This data is sourced from the British Geological Survey and UK Health Security Agency.

21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m	7

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**
11m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
35m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
35m NW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
35m NW	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.

21.2 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.

21.3 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.

22 Railway infrastructure and projects

22.1 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.

22.2 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.

22.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 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.

22.5 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.

22.6 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.

22.7 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.

22.8 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.

22.9 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.

22.10 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.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference ↗.

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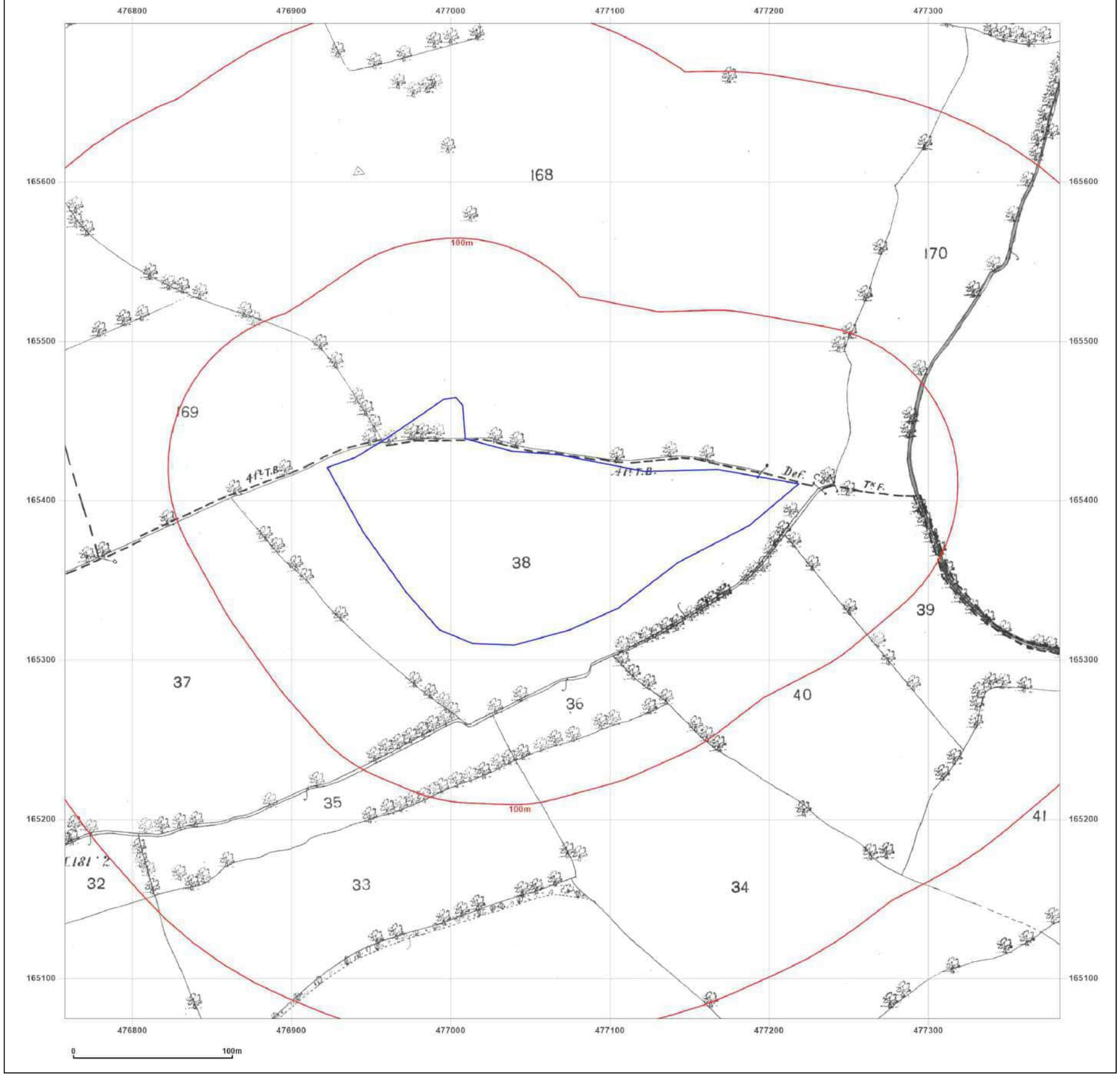

Groundsure INSIGHTS

Site Details:

PARCEL N - ARBORFIELD
GARRISON, ARBORFIELD,
WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: County Series
Map date: **1871**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1871
Revised 1871
Edition N/A
Copyright N/A
Levelled N/A

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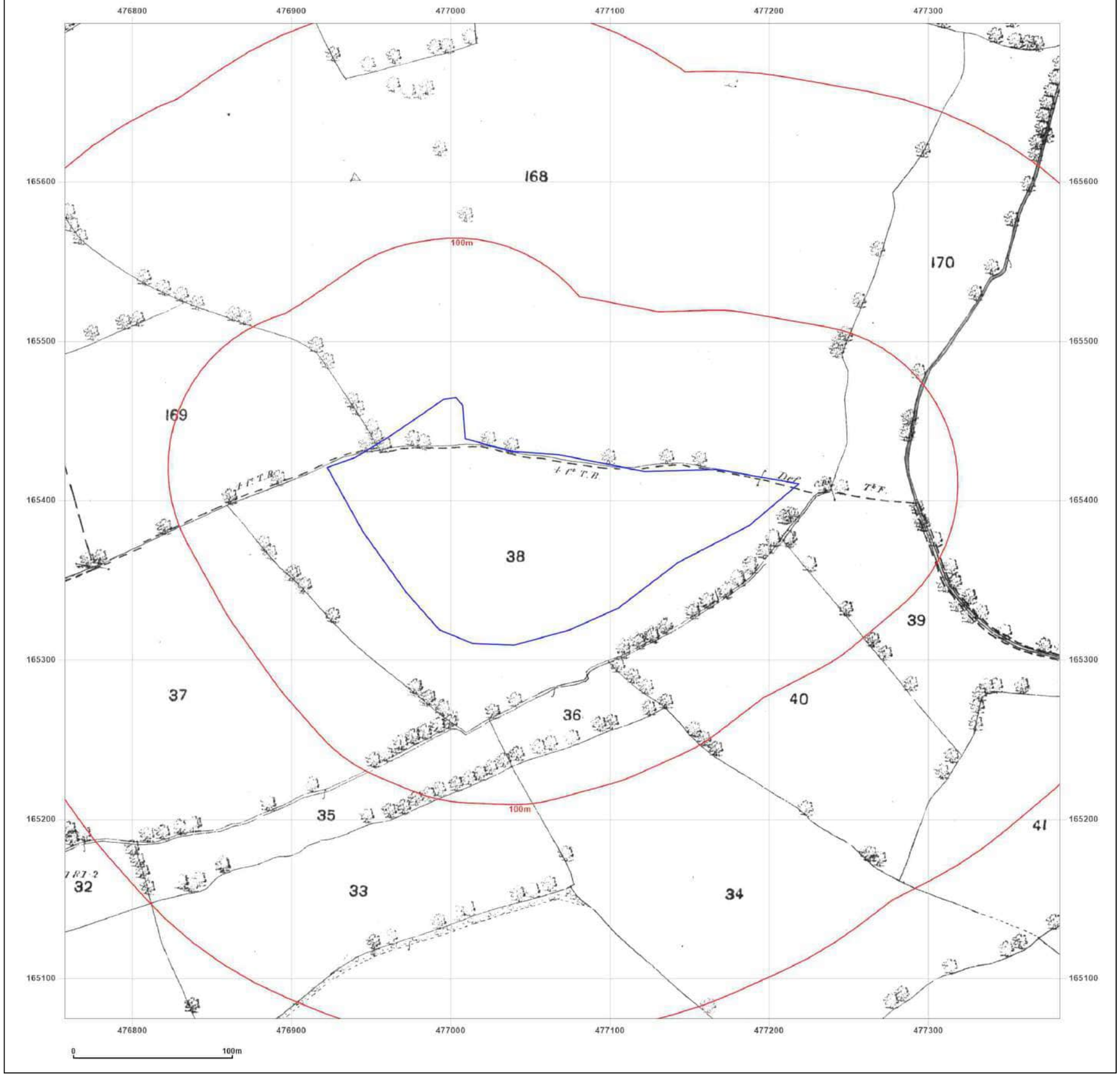

Groundsure INSIGHTS

Site Details:

PARCEL N - ARBORFIELD
GARRISON, ARBORFIELD,
WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: County Series
Map date: **1872**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1872
Revised 1872
Edition N/A
Copyright N/A
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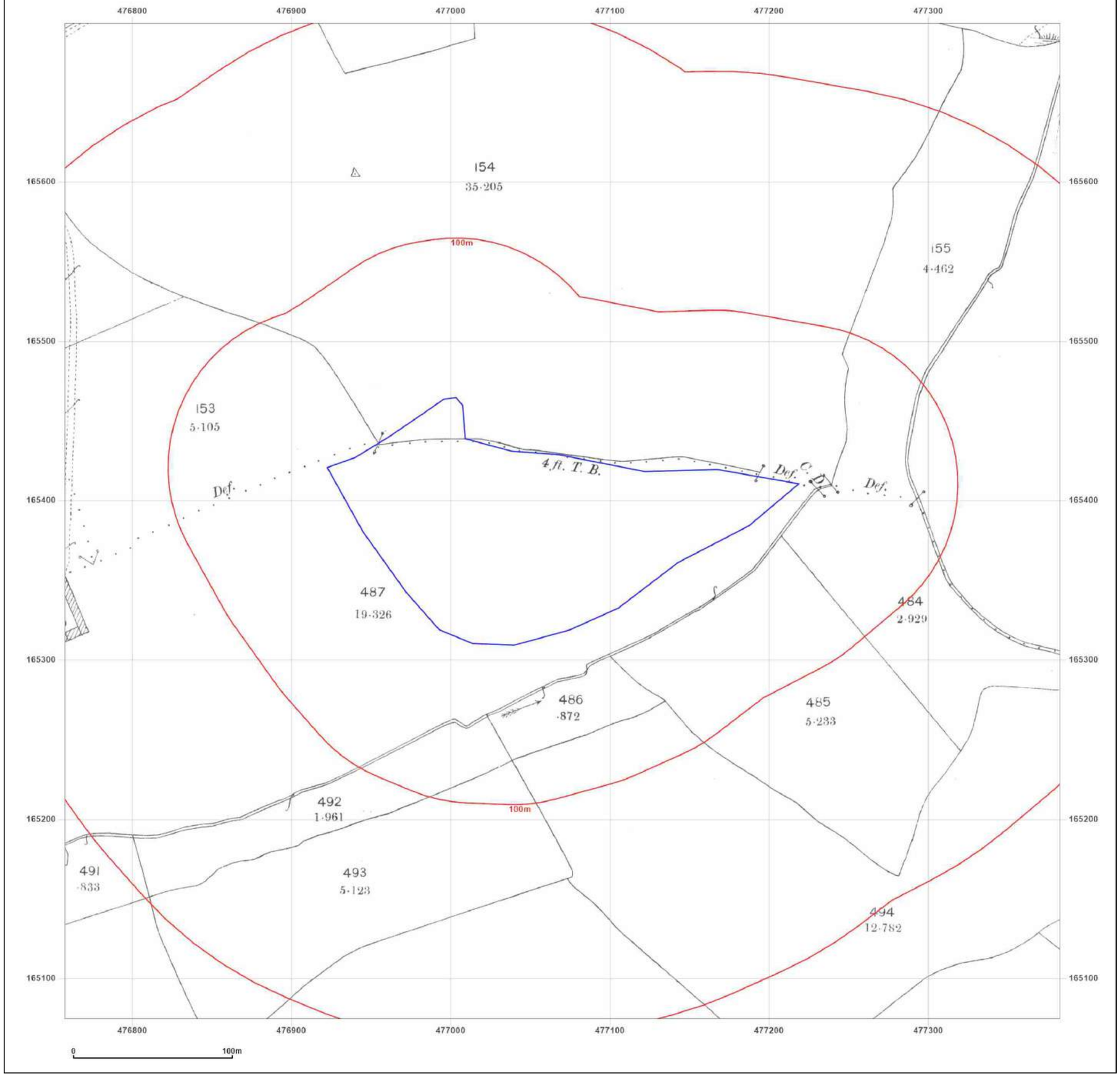

Groundsure INSIGHTS

Site Details:

PARCEL N - ARBORFIELD
GARRISON, ARBORFIELD,
WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: County Series
Map date: **1899**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1899
Revised 1899
Edition N/A
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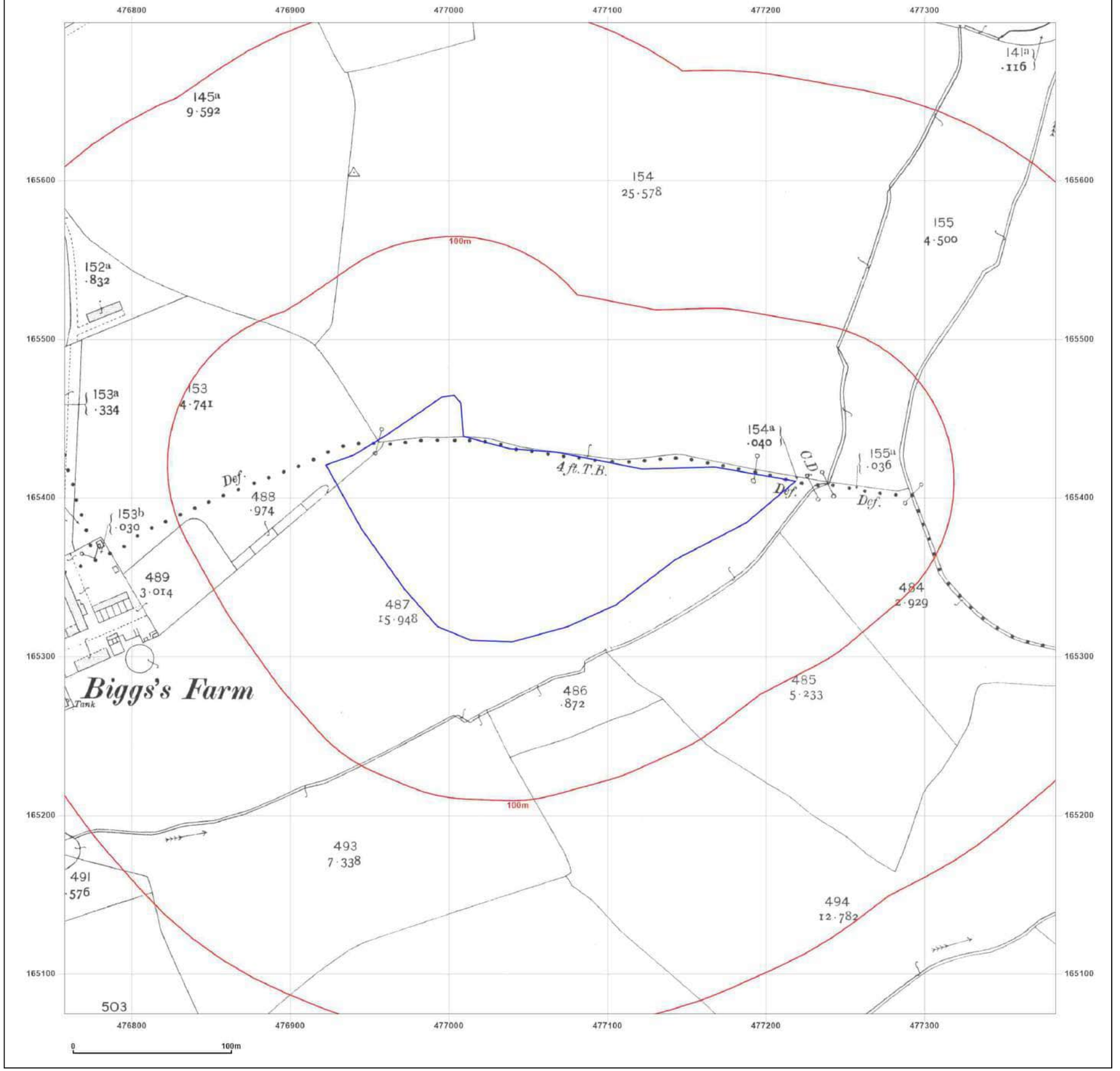

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Site Details:

PARCEL N - ARBORFIELD
GARRISON, ARBORFIELD,
WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: County Series
Map date: **1911**
Scale: 1:2,500
Printed at: 1:2,500

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Revised 1911
Edition N/A
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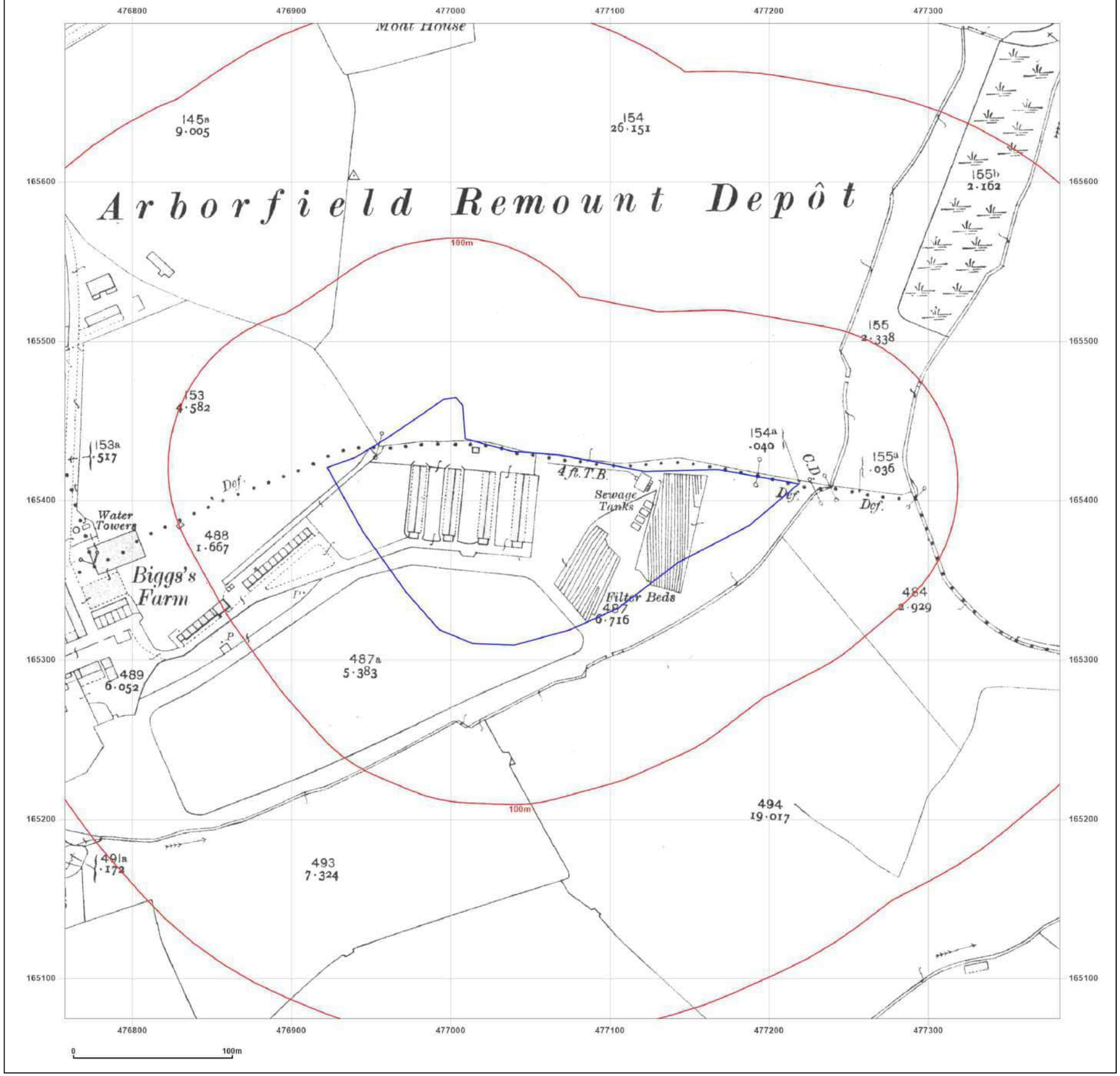

Groundsure INSIGHTS

Site Details:

PARCEL N - ARBORFIELD
GARRISON, ARBORFIELD,
WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: County Series
Map date: **1933**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1933
Revised 1933
Edition N/A
Copyright N/A
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Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: National Grid

Map date: **1968**

Scale: 1:2,500

Printed at: 1:2,500

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Revised N/A
Edition N/A
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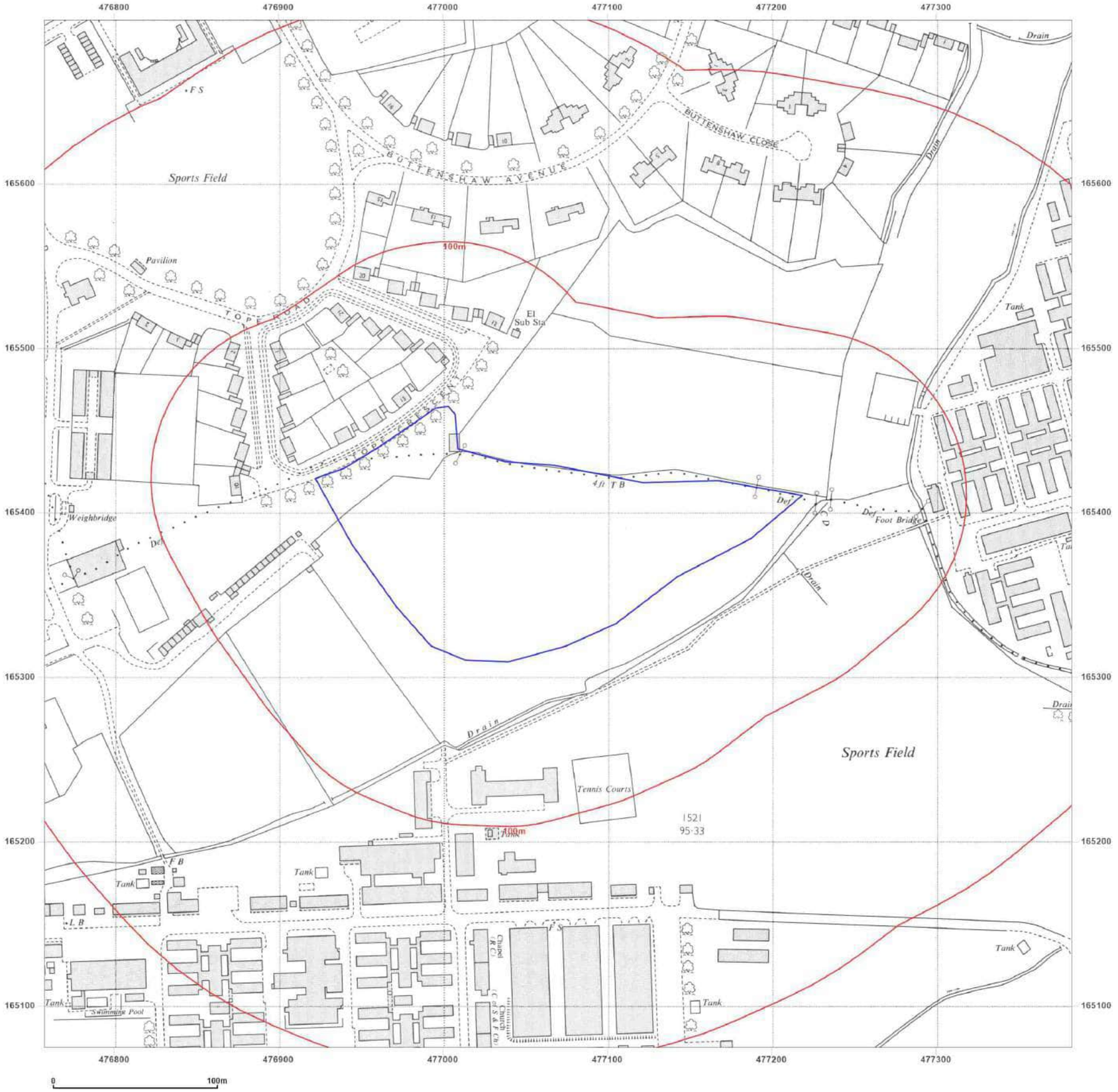

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Site Details:

PARCEL N - ARBORFIELD GARRISON, ARBORFIELD, WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: National Grid

Map date: **1968**

Scale: 1:2,500

Printed at: 1:2,500

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Edition N/A
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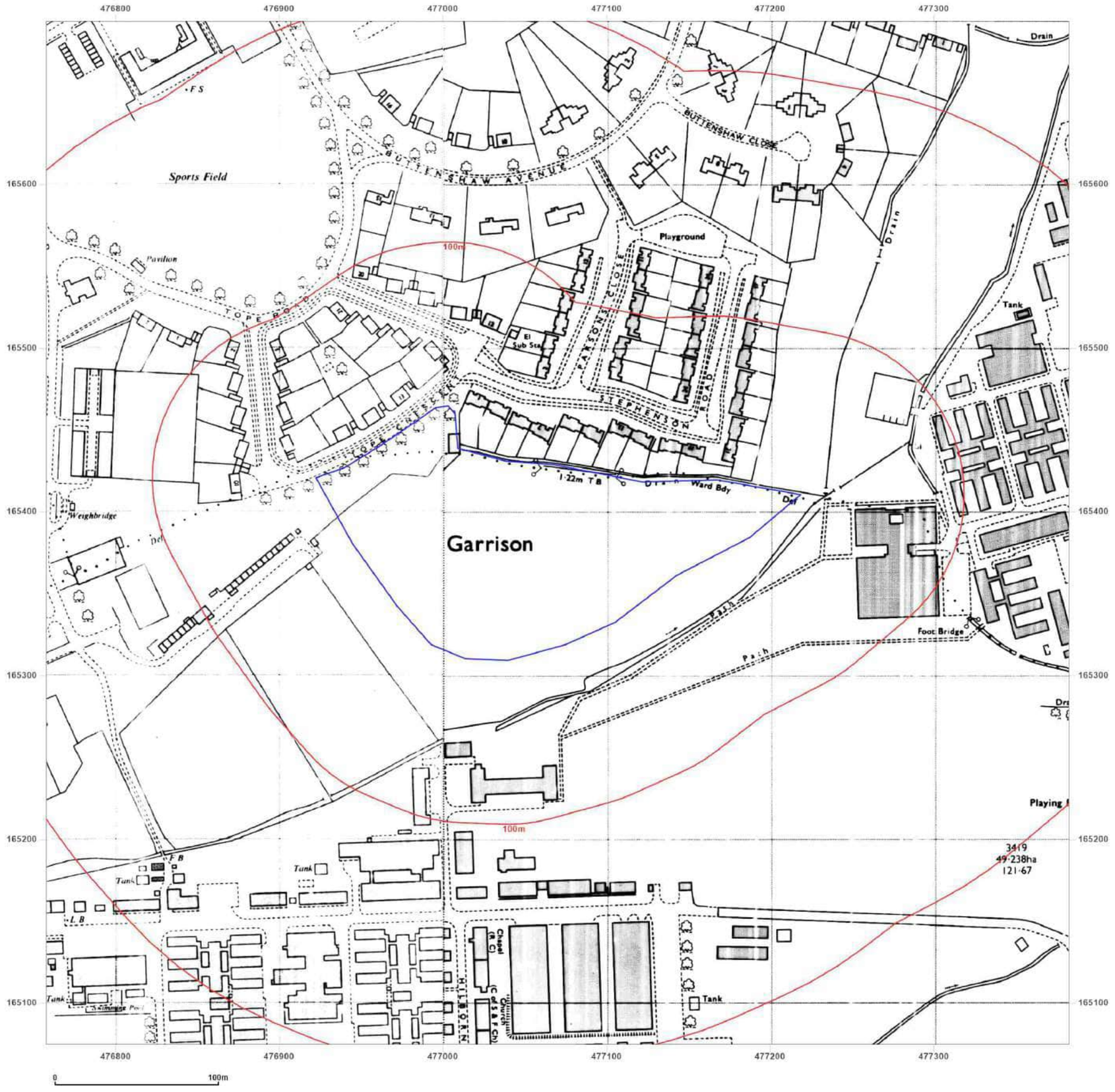

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Site Details:

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Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: National Grid

Map date: **1972-1976**

Scale: 1:2,500

Printed at: 1:2,500

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Edition N/A
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Levelled N/A

Surveyed N/A
Revised N/A
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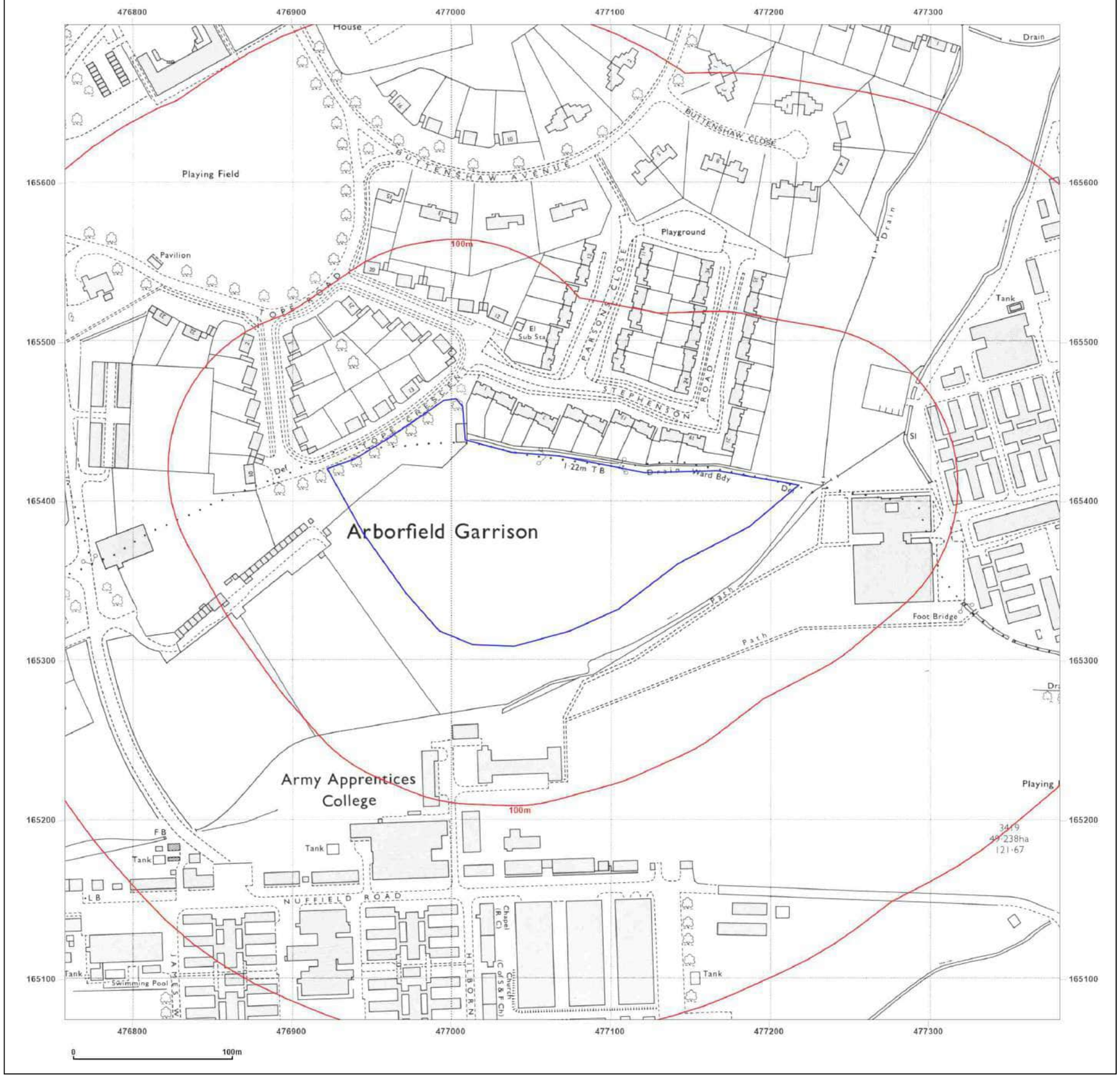

Groundsure INSIGHTS

Site Details:

PARCEL N - ARBORFIELD GARRISON, ARBORFIELD, WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: National Grid

Map date: **1976**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1975
Edition N/A
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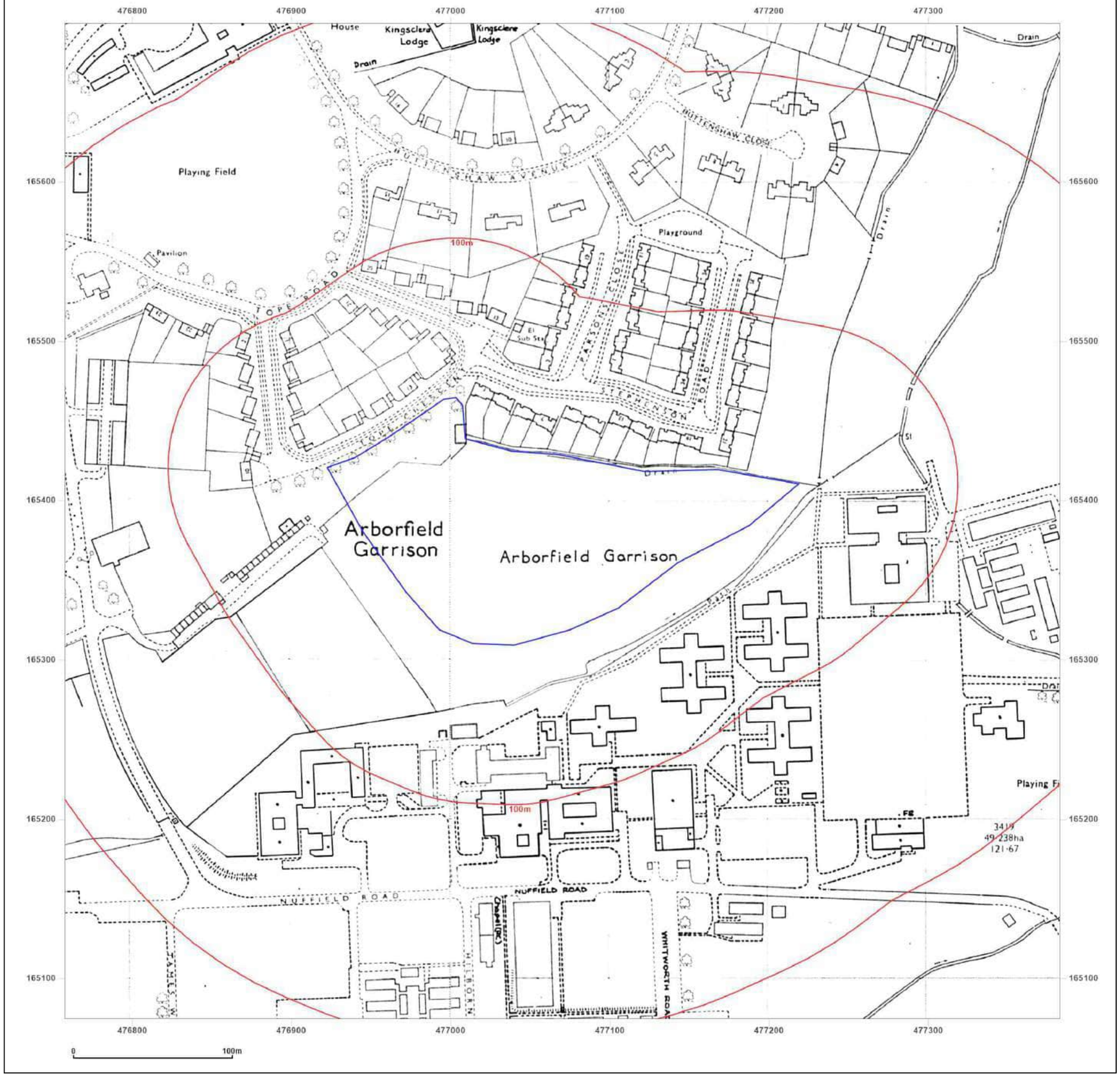

Site Details:

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Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: National Grid

Map date: **1987**

Scale: 1:2,500

Printed at: 1:2,500

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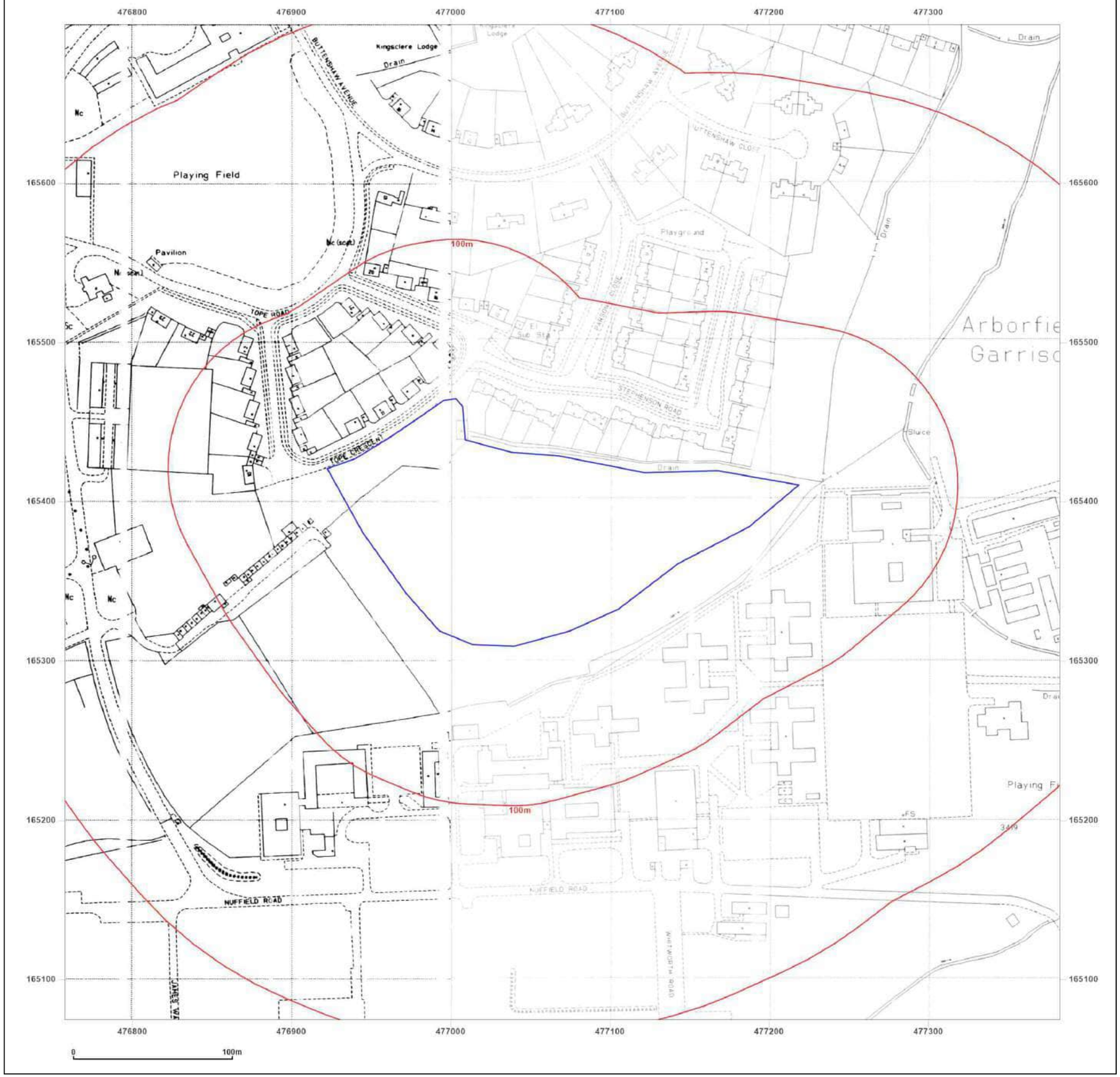

Groundsure INSIGHTS

Site Details:

PARCEL N - ARBORFIELD GARRISON, ARBORFIELD, WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

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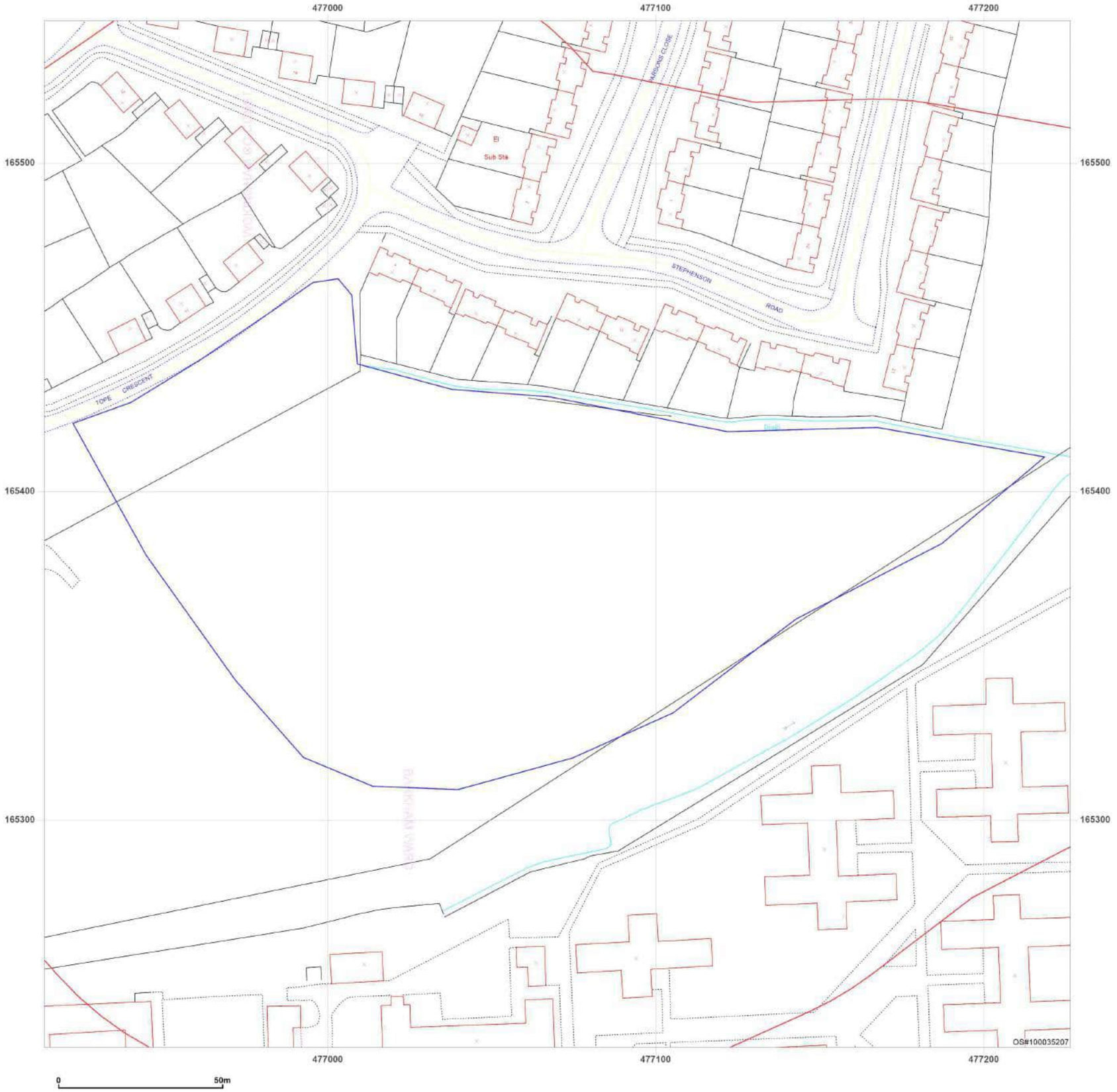

Groundsure INSIGHTS

Site Details:

PARCEL N - ARBORFIELD GARRISON, ARBORFIELD, WOKINGHAM

Client Ref: Crest
Report Ref: GS-N1L-6KV-871-ZPM
Grid Ref: 477070, 165387

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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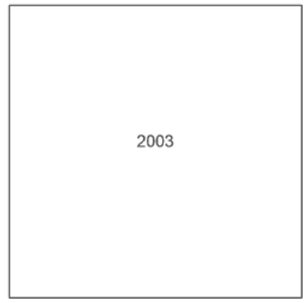

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Production date: 16 September 2024

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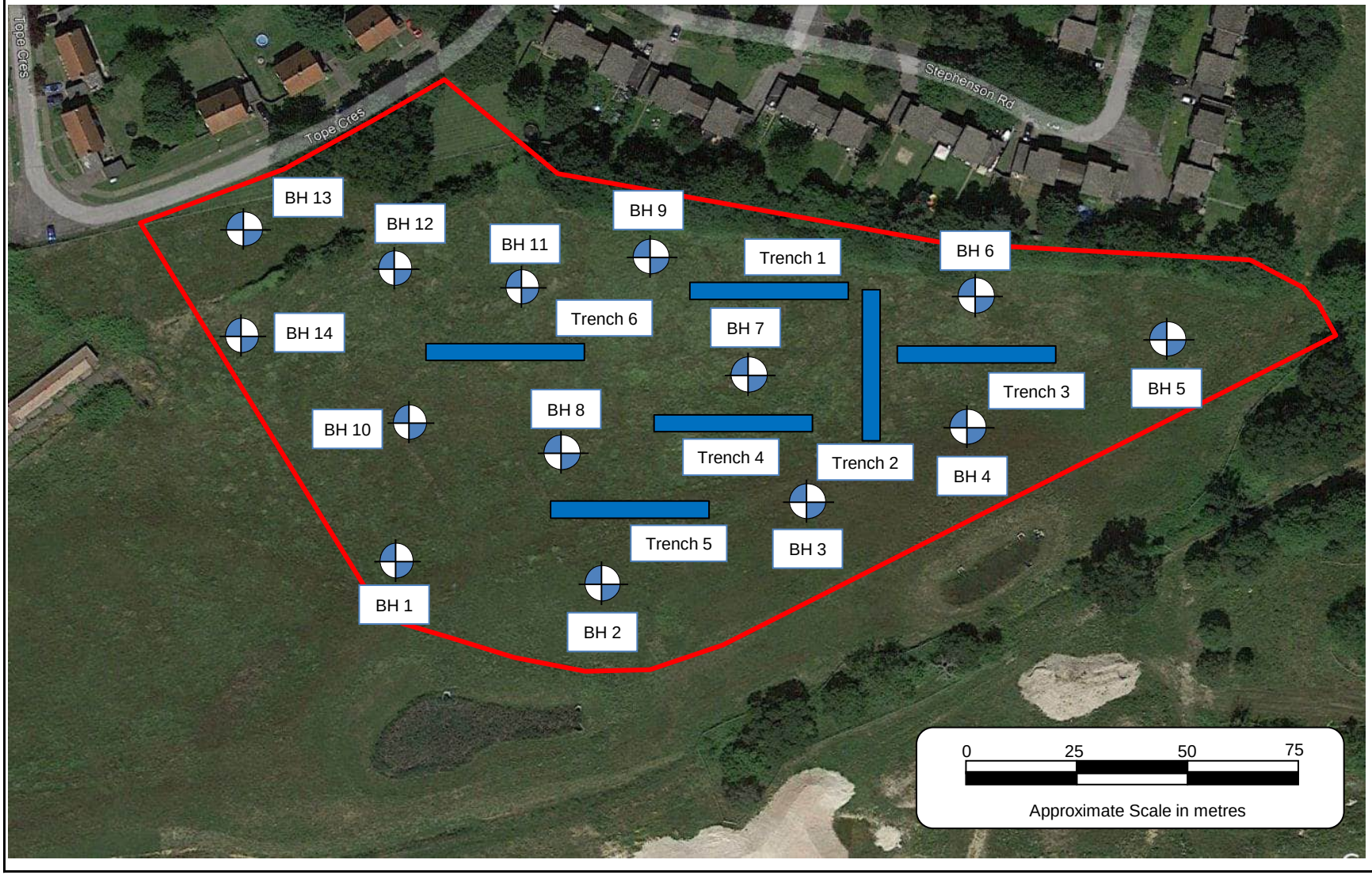
WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Northdown Farmhouse
Donhead St Mary
Wiltshire
SP7 9DD

Site Plan

Site Arborfield Green Development - Parcel N

Client Crest Nicholson Operations

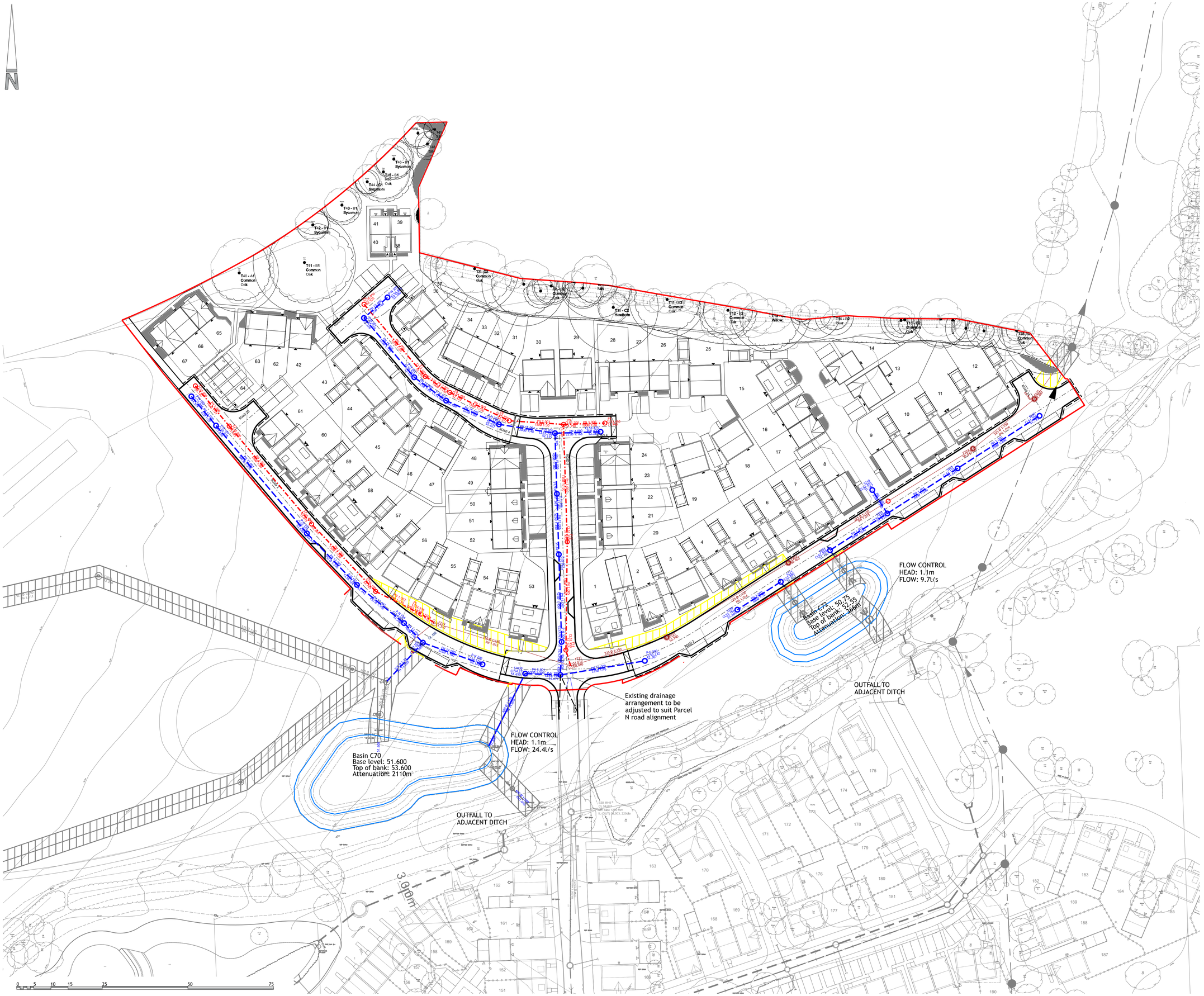


Appendix D

Proposed Drainage Strategy Drawings

Woods Hardwick

Architecture | Engineering | Planning | Surveying



NOTES

1. Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding.

2. This drawing is for planning purposes only and must not be read as a construction issue. It indicates design intent only and is subject to amendment during final design development

3. All plans and drawings are drawn true to stated scales and can be used for the purpose of planning only. Responsibility is not accepted for errors made by others in scaling from this drawing.

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6. All adoptable highway works to be undertaken in accordance with Wokingham Borough Council's 'Living Streets - A Highways Guide for Developers in Wokingham' 2019, under the direction of the Borough Council's engineers.

7. Drainage is indicative and subject to detailed design.

SAFETY, HEALTH AND ENVIRONMENTAL

In addition to the hazards, risks normally associated with the type of work detailed on this drawing, note the following significant risks and information.

Construction:

1. The contractor should make all necessary enquiries and take all necessary measures to identify the location of existing utilities and take appropriate precautions.

For information relating to end use, maintenance, demolition, see the health and safety file.

It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

KEY

- Existing FW sewer & manhole
- Proposed FW sewer & manhole
- Existing SW sewer & manhole
- Proposed SW sewer & manhole
- Attenuation pond
- Sewer easement
- Headwall
- Red line boundary

Details of the existing foul and surface water sewers are as per AECOM Drainage General Arrangement drawings 60312043/LP2/002 and 60312043/LP2/003 and Hydraulic Calculations reference: Network-70 231019-SWS Rev M SIM Results_1.5.10.30.100yr

Details of Basin C70 and Basin C72 are as per AECOM Drainage General Arrangement drawings 60312043/LP2/002 and 60312043/LP2/003 and Hydraulic Calculations reference: Network-70 231019-SWS Rev M SIM Results_1.5.10.30.100yr

REV	DESCRIPTION	DRN	CHD	DATE
B	Revised to latest layout	ShD	SD	29.09.25
A	Revised layout	ShD	SD	30.07.25

☐ PRELIMINARY ☐ INFORMATION ☐ TENDER

☐ CONSTRUCTION ☐ AS BUILT

SCALE	1:500 @ A1	DATE	JULY 2025
DRAWN	SW	CHK	ShD
DRAWING NO.	19632-ARB-100-006	REV	B

TITLE: PARCEL N, ARBORFIELD GREEN
WOKINGHAM

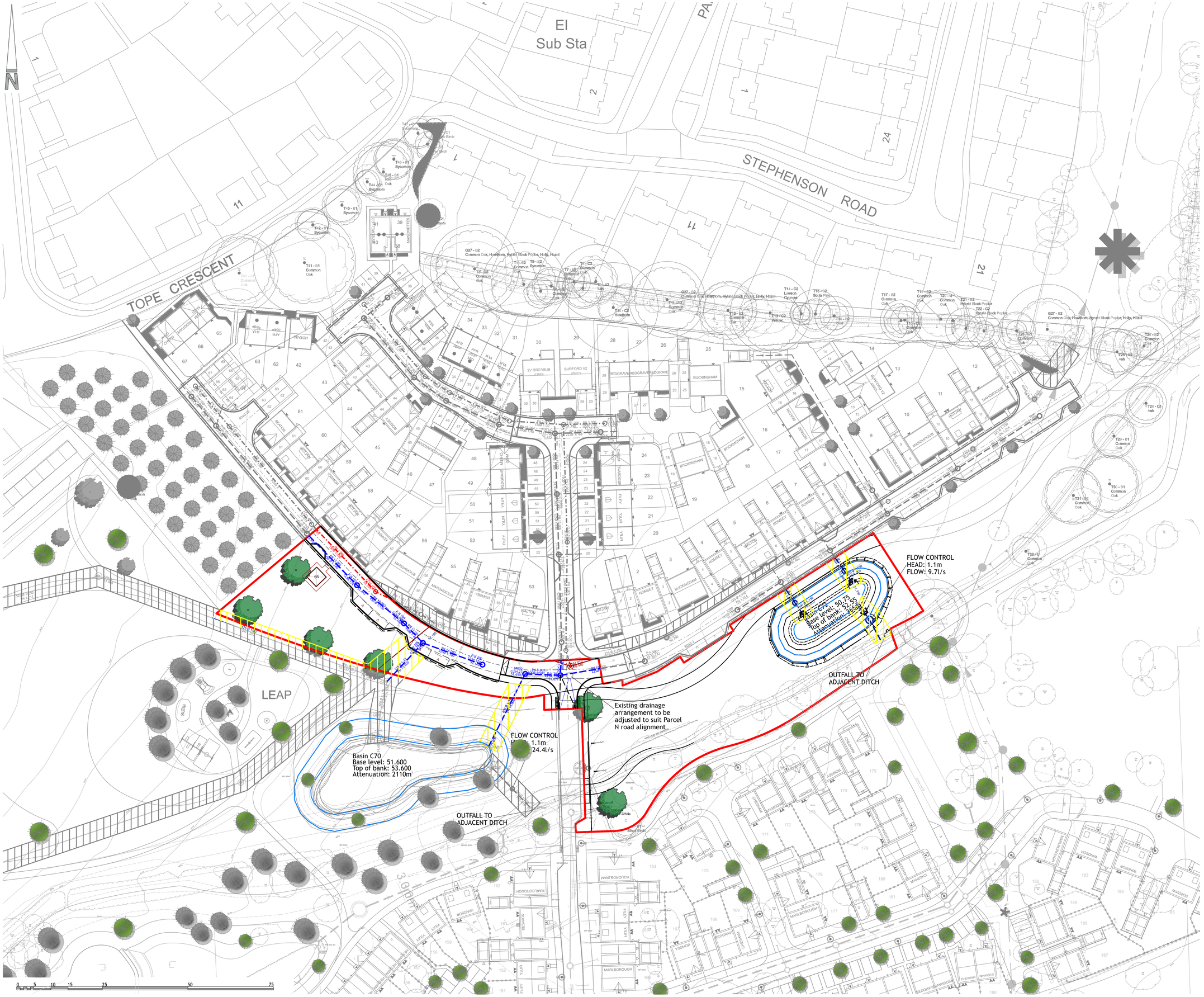
DETAILS: DRAINAGE STRATEGY PLAN

Woods Hardwick
Architecture Engineering Planning Surveying

BEDFORD : HEAD OFFICE
15-17 Goldington Road
Bedford MK40 3NH
T: +44 (0) 1234 268862

BIRMINGHAM
Fort Dunlop, Fort Parkway
Birmingham B24 9FE
T: +44 (0) 121 6297784

ONLINE: mail@woodshardwick.com | woodshardwick.com



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- Existing FW sewer & manhole
- Proposed FW sewer & manhole
- Existing SW sewer & manhole
- Proposed SW sewer & manhole
- Attenuation pond
- Sewer easement
- Headwall
- Red line boundary

Details of the existing foul and surface water sewers are as per AECOM Drainage General Arrangement drawings 60312043/LP2/002 and 60312043/LP2/003 and Hydraulic Calculations reference: Network-70 231019-SWS Rev M SIM Results_1.5.10.30.100yr

Details of Basin C70 and Basin C72 are as per AECOM Drainage General Arrangement drawings 60312043/LP2/002 and 60312043/LP2/003 and Hydraulic Calculations reference: Network-70 231019-SWS Rev M SIM Results_1.5.10.30.100yr

REV	DESCRIPTION	DRN	CHD	DATE
C	Parcel N layout updated	ShD	SD	29.09.25
B	Outlet location revised	ShD	SD	07.08.25
A	Flow rates amended	ShD	SD	29.07.25

☐ PRELIMINARY ☐ INFORMATION ☐ TENDER

☐ CONSTRUCTION ☐ AS BUILT

SCALE	1:500 @ A1	DATE	JULY 2025
DRAWN	SW	CHK	ShD
DRAWING NO.	19632-ARB-100-014	REV	C

TITLE: LINEAR PARK, ARBORFIELD GREEN WOKINGHAM

DETAILS: DRAINAGE STRATEGY PLAN

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Appendix E

Surface Water Drainage Calculations

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S8001	0.076	5.00	57.846	1200	476745.809	165540.634	2.296
SSTUB 1	0.087	5.00	57.400	1200	476767.315	165458.009	2.340
S8002	0.002	5.00	57.293	1200	476758.024	165456.813	2.469
S4	0.018	5.00	57.307	1350	476753.572	165453.360	2.501
SPARCEL-L S4 S1	0.091	5.00	57.000	1350	476745.971	165444.962	1.700
SSTUB2	0.010	5.00	57.606	1350	476751.127	165423.634	2.662
S8003	0.020	5.00	57.321	1350	476757.771	165424.274	2.585
SPARCEL-M S1 S1	0.192	5.00	56.900	1200	476839.979	165478.064	1.610
SPARCEL-M S3 S1	0.083	5.00	57.140	1200	476848.540	165386.583	2.010
SPARCEL-M S1 S2	0.068	5.00	57.140	1200	476841.636	165414.376	2.140
SSTUB3	0.230	5.00	57.220	1200	476778.561	165397.719	2.725
S8004	0.061	5.00	57.569	1500	476761.541	165395.239	3.269
S13	0.025	5.00	57.912	1500	476766.484	165365.779	3.673
SPARCEL L NET L-1 S1	0.040	5.00	58.010	1200	476651.637	165433.827	2.110
S16	0.034	5.00	58.100	1350	476700.519	165454.592	2.400
SPARCEL L NET L-1 S2	0.094	5.00	58.150	1200	476679.923	165446.879	2.650
SPARCEL L NET L-1 S3	0.068	5.00	58.040	1200	476694.021	165412.131	2.790
SPARCEL L NET L-1 S4	0.042	5.00	58.130	1200	476692.608	165398.143	2.980
SPARCEL L NET L-1 S5	0.000		57.860	1200	476680.993	165389.679	2.910
SPARCEL L NET L-1 S6	0.000		58.320	1200	476691.139	165366.734	3.460
SPARCEL L NET L-1 S7	0.026	5.00	58.100	1200	476709.735	165373.173	3.390
SPARCEL L NET L-3 S1	0.047	5.00	58.000	1200	476718.371	165389.412	3.100
SPARCEL L NET L-3 S2	0.034	5.00	58.000	1200	476723.444	165374.204	3.210
SPARCEL L NET L-1 S8	0.005	5.00	58.160	1200	476716.903	165371.673	3.550
SPARCEL P (NET)	0.071	5.00	59.190	1200	476693.284	165297.159	3.760
SSTUB5	0.050	5.00	58.980	1200	476707.158	165307.697	3.800
S29	0.131	5.00	59.000	1350	476672.196	165374.951	2.835
SSTUB9	0.000		58.882	1350	476690.128	165337.711	3.382
S8011	0.019	5.00	59.155	1200	476667.779	165300.255	1.425
S8010	0.045	5.00	59.198	1200	476663.693	165313.183	1.548
S8009	0.025	5.00	59.310	1200	476691.912	165335.278	4.310
S8008	0.020	5.00	58.778	1500	476724.718	165351.262	4.298
S8007	0.000		58.286	1500	476749.235	165363.164	3.867
S8006	0.008	5.00	58.099	1500	476756.957	165361.136	3.699
S8005	0.043	5.00	57.880	1500	476771.257	165354.262	3.667
S7012	0.000	5.00	58.264	1500	476776.271	165322.795	4.116
S36	0.000	5.00	58.347	1500	476784.150	165324.238	4.558
STABLE STUB 1	0.000	5.00	58.450	1200	476803.655	165335.744	4.450
S7013	0.000		58.430	1500	476802.784	165327.921	4.801
S7014	0.000		57.570	1500	476832.071	165304.379	4.091
S7015	0.000		57.230	1500	476872.990	165334.710	3.960
S7016	0.000		56.310	1500	476916.091	165346.906	3.220

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S7017	0.000		54.130	1500	476990.206	165319.672	2.100
P-N 100	0.170	5.00	55.944	1350	476943.186	165399.326	1.425
P-N 101	0.049	5.00	55.818	1350	476950.384	165390.787	1.932
P-N 102	0.060	5.00	55.352	1350	476976.922	165359.310	1.822
P-N 103	0.028	5.00	55.124	1350	476991.555	165344.271	1.681
P-N 104	0.052	5.00	54.925	1350	477005.296	165333.114	1.659
P-N 200	0.065	5.00	54.574	1350	477028.217	165321.076	1.425
P-N 105	0.000		54.784	1350	477010.811	165327.408	2.119
S7018	0.000		53.870	1500	477000.292	165316.129	1.950
DUMMY PIPE	0.000		53.760	1500	476998.301	165307.428	1.890
P-N 300	0.048	5.00	54.805	1200	477000.469	165428.229	1.425
P-N 301	0.021	5.00	54.919	1200	476993.583	165422.218	1.593
P-N 302	0.047	5.00	54.561	1200	477008.280	165404.900	1.433
P-N 303	0.017	5.00	54.422	1200	477017.608	165398.077	1.438
P-N 304	0.070	5.00	54.172	1200	477033.024	165391.163	1.545
P-N 400	0.118	5.00	53.475	1200	477062.705	165388.988	1.186
P-N 305	0.032	5.00	53.742	1350	477049.391	165388.564	1.757
P-N 306	0.118	5.00	53.493	1500	477049.953	165370.877	1.630
P-N 307	0.020	5.00	53.597	1500	477050.515	165353.189	1.773
P-N 308	0.010	5.00	53.922	1500	477051.328	165327.644	2.155
P-N 500	0.056	5.00	53.732	1200	477075.632	165322.098	1.425
P-N 309	0.074	5.00	54.139	1500	477050.965	165317.985	2.468
S7030	0.000	5.00	54.270	1350	477040.684	165318.371	2.620
POND C70	0.000		53.650	2100	477030.330	165297.400	2.050
S			53.650	1500	477032.782	165283.600	2.100

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S8001	S8002	84.706	0.600	55.550	55.049	0.501	169.1	225	6.41	49.2
2.000	SSTUB 1	S8002	9.368	0.600	55.060	54.824	0.236	39.7	450	5.05	50.0
1.001	S8002	S4	5.634	0.600	54.824	54.806	0.018	313.0	450	6.49	48.9
1.002	S4	S8003	29.388	0.600	54.806	54.736	0.070	419.8	450	6.99	47.1
3.000	SPARCEL-L S4 S1	SSTUB2	21.942	0.600	55.300	54.944	0.356	61.6	450	5.14	50.0
3.001	SSTUB2	S8003	6.675	0.600	54.944	54.736	0.208	32.1	450	5.17	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.002	39.9	10.1	2.071	2.019	0.076	0.0	77	0.839
2.000	3.234	514.3	11.8	1.890	2.019	0.087	0.0	46	1.362
1.001	1.143	181.9	21.9	2.019	2.051	0.165	0.0	104	0.779
1.002	0.986	156.8	23.4	2.051	2.135	0.183	0.0	116	0.714
3.000	2.593	412.4	12.3	1.250	2.212	0.091	0.0	52	1.179
3.001	3.598	572.3	13.7	2.212	2.135	0.101	0.0	47	1.534

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.003	S8003	S8004	29.279	0.600	54.736	54.375	0.361	81.1	450	7.20	46.5
4.000	SPARCEL-M S1 S1	SPARCEL-M S1 S2	63.710	0.600	55.290	55.000	0.290	219.7	375	5.87	50.0
5.000	SPARCEL-M S3 S1	SPARCEL-M S1 S2	28.638	0.600	55.130	55.075	0.055	520.7	300	5.70	50.0
4.001	SPARCEL-M S1 S2	SSTUB3	65.237	0.600	55.000	54.495	0.505	129.2	375	6.55	48.7
4.002	SSTUB3	S8004	17.200	0.600	54.495	54.450	0.045	382.2	375	6.87	47.6
1.004	S8004	S13	29.872	0.600	54.300	54.239	0.061	489.7	525	7.70	45.0
1.005	S13	S8005	12.467	0.600	54.239	54.213	0.026	479.5	525	7.90	44.3
6.000	SPARCEL L NET L-1 S1	SPARCEL L NET L-1 S2	31.152	0.600	55.900	55.500	0.400	77.9	525	5.20	50.0
7.000	S16	SPARCEL L NET L-1 S2	21.993	0.600	55.700	55.500	0.200	110.0	375	5.21	50.0
6.001	SPARCEL L NET L-1 S2	SPARCEL L NET L-1 S3	37.499	0.600	55.500	55.250	0.250	150.0	525	5.55	50.0
6.002	SPARCEL L NET L-1 S3	SPARCEL L NET L-1 S4	14.059	0.600	55.250	55.150	0.100	140.6	525	5.68	50.0
6.003	SPARCEL L NET L-1 S4	SPARCEL L NET L-1 S5	14.372	0.600	55.150	54.950	0.200	71.9	525	5.77	50.0
6.004	SPARCEL L NET L-1 S5	SPARCEL L NET L-1 S6	25.088	0.600	54.950	54.860	0.090	278.8	525	6.08	50.0
6.005	SPARCEL L NET L-1 S6	SPARCEL L NET L-1 S7	19.679	0.600	54.860	54.710	0.150	131.2	525	6.25	49.8
6.006	SPARCEL L NET L-1 S7	SPARCEL L NET L-1 S8	7.323	0.600	54.710	54.610	0.100	73.2	525	6.30	49.6
8.000	SPARCEL L NET L-3 S1	SPARCEL L NET L-3 S2	16.032	0.600	54.900	54.790	0.110	145.7	450	5.16	50.0
8.001	SPARCEL L NET L-3 S2	SPARCEL L NET L-1 S8	7.014	0.600	54.790	54.685	0.105	66.8	450	5.21	50.0
6.007	SPARCEL L NET L-1 S8	S8008	21.856	0.600	54.610	54.480	0.130	168.1	525	6.51	48.9
9.000	SPARCEL P (NET)	SSTUB5	17.422	0.600	55.430	55.255	0.175	99.6	300	5.18	50.0
9.001	SSTUB5	S8009	31.514	0.600	55.180	55.000	0.180	175.1	375	5.57	50.0
10.000	S29	SSTUB9	41.332	0.600	56.165	56.000	0.165	250.5	375	5.60	50.0
10.001	SSTUB9	S8009	3.017	0.600	55.500	55.000	0.500	6.0	375	5.61	50.0
11.000	S8011	S8010	13.558	0.600	57.730	57.650	0.080	169.5	225	5.23	50.0
11.001	S8010	S8009	35.840	0.600	57.650	55.150	2.500	14.3	225	5.40	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.003	2.259	359.2	38.3	2.135	2.744	0.304	0.0	98	1.490
4.000	1.218	134.5	26.0	1.235	1.765	0.192	0.0	111	0.948
5.000	0.682	48.2	11.2	1.710	1.765	0.083	0.0	98	0.558
4.001	1.592	175.9	45.3	1.765	2.350	0.343	0.0	129	1.342
4.002	0.921	101.7	73.9	2.350	2.744	0.573	0.0	238	1.001
1.004	1.005	217.6	114.4	2.744	3.148	0.938	0.0	270	1.017
1.005	1.016	219.9	115.7	3.148	3.142	0.963	0.0	270	1.028
6.000	2.540	549.7	5.4	1.585	2.125	0.040	0.0	36	0.833
7.000	1.727	190.7	4.6	2.025	2.275	0.034	0.0	40	0.738
6.001	1.826	395.3	22.8	2.125	2.265	0.168	0.0	84	1.011
6.002	1.887	408.4	32.0	2.265	2.455	0.236	0.0	98	1.142
6.003	2.644	572.4	37.7	2.455	2.385	0.278	0.0	90	1.524
6.004	1.336	289.3	37.7	2.385	2.935	0.278	0.0	127	0.935
6.005	1.954	422.9	37.5	2.935	2.865	0.278	0.0	104	1.225
6.006	2.619	567.0	40.9	2.865	3.025	0.304	0.0	94	1.549
8.000	1.682	267.4	6.4	2.650	2.760	0.047	0.0	47	0.713
8.001	2.490	396.0	11.0	2.760	3.025	0.081	0.0	51	1.108
6.007	1.724	373.3	51.7	3.025	3.773	0.390	0.0	131	1.228
9.000	1.575	111.4	9.6	3.460	3.425	0.071	0.0	59	0.973
9.001	1.366	150.9	16.4	3.425	3.935	0.121	0.0	83	0.907
10.000	1.140	125.9	17.8	2.460	2.507	0.131	0.0	95	0.815
10.001	7.415	818.9	17.8	3.007	3.935	0.131	0.0	38	3.080
11.000	1.001	39.8	2.6	1.200	1.323	0.019	0.0	38	0.563
11.001	3.473	138.1	8.7	1.323	3.935	0.064	0.0	38	1.965

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
9.002	S8009	S8008	36.493	0.600	55.000	54.630	0.370	98.6	375	5.94	50.0
6.008	S8008	S8007	27.253	0.600	54.480	54.419	0.061	446.8	525	6.94	47.3
6.009	S8007	S8006	7.984	0.600	54.419	54.400	0.019	420.2	525	7.06	46.9
6.010	S8006	S8005	15.866	0.600	54.400	54.213	0.187	84.8	525	7.17	46.6
1.006	S8005	S7012	31.864	0.600	54.213	54.149	0.064	497.9	525	8.44	42.9
1.007	S7012	S36	8.010	0.600	54.148	53.789	0.359	22.3	525	8.46	0.0
12.000	STABLE STUB 1	S7013	7.871	0.600	54.000	53.930	0.070	112.4	225	5.11	0.0
1.008	S36	S7013	18.994	0.600	53.789	53.629	0.160	118.7	525	8.62	0.0
1.009	S7013	S7014	37.576	0.600	53.629	53.479	0.150	250.5	525	9.06	0.0
1.010	S7014	S7015	50.935	0.600	53.479	53.270	0.209	243.7	525	9.66	0.0
1.011	S7015	S7016	44.793	0.600	53.270	53.090	0.180	248.9	525	10.18	0.0
1.012	S7016	S7017	78.960	0.600	53.090	52.105	0.985	80.2	525	10.71	0.0
1.013	S7017	S7018	10.690	0.600	52.030	51.920	0.110	97.2	600	10.78	37.4
13.000	P-N 100	P-N 101	11.168	0.600	54.519	53.961	0.558	20.0	225	5.06	50.0
13.001	P-N 101	P-N 102	41.171	0.600	53.886	53.680	0.206	200.0	300	5.68	50.0
13.002	P-N 102	P-N 103	20.983	0.600	53.530	53.443	0.087	240.0	450	5.95	50.0
13.003	P-N 103	P-N 104	17.700	0.600	53.443	53.266	0.177	100.0	450	6.10	50.0
13.004	P-N 104	P-N 105	7.936	0.600	53.266	53.094	0.172	46.1	450	6.14	50.0
14.000	P-N 200	P-N 105	18.522	0.600	53.149	52.965	0.184	100.7	225	5.24	50.0
13.005	P-N 105	S7018	15.423	0.600	52.665	51.995	0.670	23.0	525	6.19	50.0
1.014	S7018	DUMMY PIPE	8.926	0.600	51.920	51.870	0.050	178.5	600	10.86	37.3
1.015	DUMMY PIPE	POND C70	33.562	0.600	51.870	51.600	0.270	124.3	600	11.12	36.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
9.002	1.824	201.5	46.2	3.935	3.773	0.341	0.0	121	1.488
6.008	1.053	227.9	96.3	3.773	3.342	0.751	0.0	238	1.010
6.009	1.086	235.1	95.5	3.342	3.174	0.751	0.0	233	1.032
6.010	2.433	526.6	95.9	3.174	3.142	0.759	0.0	150	1.869
1.006	0.997	215.8	205.2	3.142	3.590	1.765	0.0	412	1.127
1.007	4.756	1029.5	0.0	3.591	4.033	1.765	0.0	0	0.000
12.000	1.232	49.0	0.0	4.225	4.275	0.000	0.0	0	0.000
1.008	2.054	444.7	0.0	4.033	4.276	1.765	0.0	0	0.000
1.009	1.410	305.3	0.0	4.276	3.566	1.765	0.0	0	0.000
1.010	1.430	309.6	0.0	3.566	3.435	1.765	0.0	0	0.000
1.011	1.415	306.3	0.0	3.435	2.695	1.765	0.0	0	0.000
1.012	2.503	541.8	0.0	2.695	1.500	1.765	0.0	0	0.000
1.013	2.470	698.4	178.9	1.500	1.350	1.765	0.0	206	2.083
13.000	2.939	116.8	23.0	1.200	1.632	0.170	0.0	67	2.295
13.001	1.108	78.3	29.7	1.632	1.372	0.219	0.0	128	1.034
13.002	1.308	208.0	37.8	1.372	1.231	0.279	0.0	129	1.001
13.003	2.033	323.3	41.6	1.231	1.209	0.307	0.0	108	1.414
13.004	2.999	476.9	48.7	1.209	1.240	0.359	0.0	96	1.960
14.000	1.303	51.8	8.8	1.200	1.594	0.065	0.0	63	0.979
13.005	4.682	1013.6	57.4	1.594	1.350	0.424	0.0	84	2.592
1.014	1.819	514.4	221.3	1.350	1.290	2.189	0.0	275	1.753
1.015	2.183	617.1	218.3	1.290	1.450	2.189	0.0	246	2.003

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.016	POND C70	S	14.016	0.600	51.600	51.550	0.050	280.3	600	11.28	0.0
15.000	P-N 300	P-N 301	9.141	0.600	53.380	53.326	0.054	168.0	225	5.15	50.0
15.001	P-N 301	P-N 302	22.714	0.600	53.326	53.128	0.198	115.0	225	5.46	50.0
15.002	P-N 302	P-N 303	11.557	0.600	53.128	52.984	0.144	80.0	225	5.59	50.0
15.003	P-N 303	P-N 304	16.895	0.600	52.984	52.702	0.282	60.0	225	5.76	50.0
15.004	P-N 304	P-N 305	16.572	0.600	52.627	52.135	0.492	33.7	300	5.86	50.0
16.000	P-N 400	P-N 305	13.321	0.600	52.289	52.210	0.079	168.0	225	5.22	50.0
15.005	P-N 305	P-N 306	17.696	0.600	51.985	51.938	0.047	380.0	450	6.15	50.0
15.006	P-N 306	P-N 307	17.697	0.600	51.863	51.824	0.039	450.0	525	6.43	49.1
15.007	P-N 307	P-N 308	25.558	0.600	51.824	51.767	0.057	450.0	525	6.83	47.7
15.008	P-N 308	P-N 309	9.666	0.600	51.767	51.746	0.021	450.0	525	6.99	47.1
17.000	P-N 500	P-N 309	25.008	0.600	52.307	52.046	0.261	95.8	225	5.31	50.0
15.009	P-N 309	S7030	10.288	0.600	51.671	51.650	0.021	500.0	600	7.15	46.7
14.005	S7030	POND C70	27.342	0.600	51.650	51.600	0.050	546.8	600	7.59	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.016	1.449	409.7	0.0	1.450	1.500	2.820	0.0	0	0.000
15.000	1.006	40.0	6.5	1.200	1.368	0.048	0.0	61	0.743
15.001	1.218	48.4	9.4	1.368	1.208	0.069	0.0	66	0.943
15.002	1.463	58.2	15.7	1.208	1.213	0.116	0.0	80	1.246
15.003	1.691	67.2	18.0	1.213	1.245	0.133	0.0	80	1.441
15.004	2.718	192.1	27.5	1.245	1.307	0.203	0.0	76	1.951
16.000	1.006	40.0	16.0	0.961	1.307	0.118	0.0	99	0.951
15.005	1.037	164.9	47.8	1.307	1.105	0.353	0.0	166	0.903
15.006	1.049	227.1	62.7	1.105	1.248	0.471	0.0	188	0.902
15.007	1.049	227.1	63.5	1.248	1.630	0.491	0.0	189	0.904
15.008	1.049	227.1	64.0	1.630	1.868	0.501	0.0	190	0.907
17.000	1.336	53.1	7.6	1.200	1.868	0.056	0.0	58	0.956
15.009	1.082	305.9	79.8	1.868	2.020	0.631	0.0	208	0.917
14.005	1.034	292.4	85.5	2.020	1.450	0.631	0.0	221	0.902

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	84.706	169.1	225	Circular_Default Sewer Type	57.846	55.550	2.071	57.293	55.049	2.019
2.000	9.368	39.7	450	Circular_Default Sewer Type	57.400	55.060	1.890	57.293	54.824	2.019
1.001	5.634	313.0	450	Circular_Default Sewer Type	57.293	54.824	2.019	57.307	54.806	2.051
1.002	29.388	419.8	450	Circular_Default Sewer Type	57.307	54.806	2.051	57.321	54.736	2.135

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S8001	1200	Manhole	Adoptable	S8002	1200	Manhole	Adoptable
2.000	SSTUB 1	1200	Manhole	Adoptable	S8002	1200	Manhole	Adoptable
1.001	S8002	1200	Manhole	Adoptable	S4	1350	Manhole	Adoptable
1.002	S4	1350	Manhole	Adoptable	S8003	1350	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.000	21.942	61.6	450	Circular_Default Sewer Type	57.000	55.300	1.250	57.606	54.944	2.212
3.001	6.675	32.1	450	Circular_Default Sewer Type	57.606	54.944	2.212	57.321	54.736	2.135
1.003	29.279	81.1	450	Circular_Default Sewer Type	57.321	54.736	2.135	57.569	54.375	2.744
4.000	63.710	219.7	375	Circular_Default Sewer Type	56.900	55.290	1.235	57.140	55.000	1.765
5.000	28.638	520.7	300	Circular_Default Sewer Type	57.140	55.130	1.710	57.140	55.075	1.765
4.001	65.237	129.2	375	Circular_Default Sewer Type	57.140	55.000	1.765	57.220	54.495	2.350
4.002	17.200	382.2	375	Circular_Default Sewer Type	57.220	54.495	2.350	57.569	54.450	2.744
1.004	29.872	489.7	525	Circular_Default Sewer Type	57.569	54.300	2.744	57.912	54.239	3.148
1.005	12.467	479.5	525	Circular_Default Sewer Type	57.912	54.239	3.148	57.880	54.213	3.142
6.000	31.152	77.9	525	Circular_Default Sewer Type	58.010	55.900	1.585	58.150	55.500	2.125
7.000	21.993	110.0	375	Circular_Default Sewer Type	58.100	55.700	2.025	58.150	55.500	2.275
6.001	37.499	150.0	525	Circular_Default Sewer Type	58.150	55.500	2.125	58.040	55.250	2.265
6.002	14.059	140.6	525	Circular_Default Sewer Type	58.040	55.250	2.265	58.130	55.150	2.455
6.003	14.372	71.9	525	Circular_Default Sewer Type	58.130	55.150	2.455	57.860	54.950	2.385
6.004	25.088	278.8	525	Circular_Default Sewer Type	57.860	54.950	2.385	58.320	54.860	2.935
6.005	19.679	131.2	525	Circular_Default Sewer Type	58.320	54.860	2.935	58.100	54.710	2.865
6.006	7.323	73.2	525	Circular_Default Sewer Type	58.100	54.710	2.865	58.160	54.610	3.025
8.000	16.032	145.7	450	Circular_Default Sewer Type	58.000	54.900	2.650	58.000	54.790	2.760
8.001	7.014	66.8	450	Circular_Default Sewer Type	58.000	54.790	2.760	58.160	54.685	3.025
6.007	21.856	168.1	525	Circular_Default Sewer Type	58.160	54.610	3.025	58.778	54.480	3.773
9.000	17.422	99.6	300	Circular_Default Sewer Type	59.190	55.430	3.460	58.980	55.255	3.425
9.001	31.514	175.1	375	Circular_Default Sewer Type	58.980	55.180	3.425	59.310	55.000	3.935
10.000	41.332	250.5	375	Circular_Default Sewer Type	59.000	56.165	2.460	58.882	56.000	2.507
10.001	3.017	6.0	375	Circular_Default Sewer Type	58.882	55.500	3.007	59.310	55.000	3.935
11.000	13.558	169.5	225	Circular_Default Sewer Type	59.155	57.730	1.200	59.198	57.650	1.323

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.000	SPARCEL-L S4 S1	1350	Manhole	Adoptable	SSTUB2	1350	Manhole	Adoptable
3.001	SSTUB2	1350	Manhole	Adoptable	S8003	1350	Manhole	Adoptable
1.003	S8003	1350	Manhole	Adoptable	S8004	1500	Manhole	Adoptable
4.000	SPARCEL-M S1 S1	1200	Manhole	Adoptable	SPARCEL-M S1 S2	1200	Manhole	Adoptable
5.000	SPARCEL-M S3 S1	1200	Manhole	Adoptable	SPARCEL-M S1 S2	1200	Manhole	Adoptable
4.001	SPARCEL-M S1 S2	1200	Manhole	Adoptable	SSTUB3	1200	Manhole	Adoptable
4.002	SSTUB3	1200	Manhole	Adoptable	S8004	1500	Manhole	Adoptable
1.004	S8004	1500	Manhole	Adoptable	S13	1500	Manhole	Adoptable
1.005	S13	1500	Manhole	Adoptable	S8005	1500	Manhole	Adoptable
6.000	SPARCEL L NET L-1 S1	1200	Manhole	Adoptable	SPARCEL L NET L-1 S2	1200	Manhole	Adoptable
7.000	S16	1350	Manhole	Adoptable	SPARCEL L NET L-1 S2	1200	Manhole	Adoptable
6.001	SPARCEL L NET L-1 S2	1200	Manhole	Adoptable	SPARCEL L NET L-1 S3	1200	Manhole	Adoptable
6.002	SPARCEL L NET L-1 S3	1200	Manhole	Adoptable	SPARCEL L NET L-1 S4	1200	Manhole	Adoptable
6.003	SPARCEL L NET L-1 S4	1200	Manhole	Adoptable	SPARCEL L NET L-1 S5	1200	Manhole	Adoptable
6.004	SPARCEL L NET L-1 S5	1200	Manhole	Adoptable	SPARCEL L NET L-1 S6	1200	Manhole	Adoptable
6.005	SPARCEL L NET L-1 S6	1200	Manhole	Adoptable	SPARCEL L NET L-1 S7	1200	Manhole	Adoptable
6.006	SPARCEL L NET L-1 S7	1200	Manhole	Adoptable	SPARCEL L NET L-1 S8	1200	Manhole	Adoptable
8.000	SPARCEL L NET L-3 S1	1200	Manhole	Adoptable	SPARCEL L NET L-3 S2	1200	Manhole	Adoptable
8.001	SPARCEL L NET L-3 S2	1200	Manhole	Adoptable	SPARCEL L NET L-1 S8	1200	Manhole	Adoptable
6.007	SPARCEL L NET L-1 S8	1200	Manhole	Adoptable	S8008	1500	Manhole	Adoptable
9.000	SPARCEL P (NET)	1200	Manhole	Adoptable	SSTUB5	1200	Manhole	Adoptable
9.001	SSTUB5	1200	Manhole	Adoptable	S8009	1200	Manhole	Adoptable
10.000	S29	1350	Manhole	Adoptable	SSTUB9	1350	Manhole	Adoptable
10.001	SSTUB9	1350	Manhole	Adoptable	S8009	1200	Manhole	Adoptable
11.000	S8011	1200	Manhole	Adoptable	S8010	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
11.001	35.840	14.3	225	Circular_Default Sewer Type	59.198	57.650	1.323	59.310	55.150	3.935
9.002	36.493	98.6	375	Circular_Default Sewer Type	59.310	55.000	3.935	58.778	54.630	3.773
6.008	27.253	446.8	525	Circular_Default Sewer Type	58.778	54.480	3.773	58.286	54.419	3.342
6.009	7.984	420.2	525	Circular_Default Sewer Type	58.286	54.419	3.342	58.099	54.400	3.174
6.010	15.866	84.8	525	Circular_Default Sewer Type	58.099	54.400	3.174	57.880	54.213	3.142
1.006	31.864	497.9	525	Circular_Default Sewer Type	57.880	54.213	3.142	58.264	54.149	3.590
1.007	8.010	22.3	525	Circular_Default Sewer Type	58.264	54.148	3.591	58.347	53.789	4.033
12.000	7.871	112.4	225	Circular_Default Sewer Type	58.450	54.000	4.225	58.430	53.930	4.275
1.008	18.994	118.7	525	Circular_Default Sewer Type	58.347	53.789	4.033	58.430	53.629	4.276
1.009	37.576	250.5	525	Circular_Default Sewer Type	58.430	53.629	4.276	57.570	53.479	3.566
1.010	50.935	243.7	525	Circular_Default Sewer Type	57.570	53.479	3.566	57.230	53.270	3.435
1.011	44.793	248.9	525	Circular_Default Sewer Type	57.230	53.270	3.435	56.310	53.090	2.695
1.012	78.960	80.2	525	Circular_Default Sewer Type	56.310	53.090	2.695	54.130	52.105	1.500
1.013	10.690	97.2	600	Circular_Default Sewer Type	54.130	52.030	1.500	53.870	51.920	1.350
13.000	11.168	20.0	225	Circular_Default Sewer Type	55.944	54.519	1.200	55.818	53.961	1.632
13.001	41.171	200.0	300	Circular_Default Sewer Type	55.818	53.886	1.632	55.352	53.680	1.372
13.002	20.983	240.0	450	Circular_Default Sewer Type	55.352	53.530	1.372	55.124	53.443	1.231
13.003	17.700	100.0	450	Circular_Default Sewer Type	55.124	53.443	1.231	54.925	53.266	1.209
13.004	7.936	46.1	450	Circular_Default Sewer Type	54.925	53.266	1.209	54.784	53.094	1.240
14.000	18.522	100.7	225	Circular_Default Sewer Type	54.574	53.149	1.200	54.784	52.965	1.594
13.005	15.423	23.0	525	Circular_Default Sewer Type	54.784	52.665	1.594	53.870	51.995	1.350
1.014	8.926	178.5	600	Circular_Default Sewer Type	53.870	51.920	1.350	53.760	51.870	1.290
1.015	33.562	124.3	600	Circular_Default Sewer Type	53.760	51.870	1.290	53.650	51.600	1.450

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
11.001	S8010	1200	Manhole	Adoptable	S8009	1200	Manhole	Adoptable
9.002	S8009	1200	Manhole	Adoptable	S8008	1500	Manhole	Adoptable
6.008	S8008	1500	Manhole	Adoptable	S8007	1500	Manhole	Adoptable
6.009	S8007	1500	Manhole	Adoptable	S8006	1500	Manhole	Adoptable
6.010	S8006	1500	Manhole	Adoptable	S8005	1500	Manhole	Adoptable
1.006	S8005	1500	Manhole	Adoptable	S7012	1500	Manhole	Adoptable
1.007	S7012	1500	Manhole	Adoptable	S36	1500	Manhole	Adoptable
12.000	STABLE STUB 1	1200	Manhole	Adoptable	S7013	1500	Manhole	Adoptable
1.008	S36	1500	Manhole	Adoptable	S7013	1500	Manhole	Adoptable
1.009	S7013	1500	Manhole	Adoptable	S7014	1500	Manhole	Adoptable
1.010	S7014	1500	Manhole	Adoptable	S7015	1500	Manhole	Adoptable
1.011	S7015	1500	Manhole	Adoptable	S7016	1500	Manhole	Adoptable
1.012	S7016	1500	Manhole	Adoptable	S7017	1500	Manhole	Adoptable
1.013	S7017	1500	Manhole	Adoptable	S7018	1500	Manhole	Adoptable
13.000	P-N 100	1350	Manhole	Adoptable	P-N 101	1350	Manhole	Adoptable
13.001	P-N 101	1350	Manhole	Adoptable	P-N 102	1350	Manhole	Adoptable
13.002	P-N 102	1350	Manhole	Adoptable	P-N 103	1350	Manhole	Adoptable
13.003	P-N 103	1350	Manhole	Adoptable	P-N 104	1350	Manhole	Adoptable
13.004	P-N 104	1350	Manhole	Adoptable	P-N 105	1350	Manhole	Adoptable
14.000	P-N 200	1350	Manhole	Adoptable	P-N 105	1350	Manhole	Adoptable
13.005	P-N 105	1350	Manhole	Adoptable	S7018	1500	Manhole	Adoptable
1.014	S7018	1500	Manhole	Adoptable	DUMMY PIPE	1500	Manhole	Adoptable
1.015	DUMMY PIPE	1500	Manhole	Adoptable	POND C70	2100	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.016	14.016	280.3	600	Circular_Default Sewer Type	53.650	51.600	1.450	53.650	51.550	1.500
15.000	9.141	168.0	225	Circular_Default Sewer Type	54.805	53.380	1.200	54.919	53.326	1.368
15.001	22.714	115.0	225	Circular_Default Sewer Type	54.919	53.326	1.368	54.561	53.128	1.208
15.002	11.557	80.0	225	Circular_Default Sewer Type	54.561	53.128	1.208	54.422	52.984	1.213
15.003	16.895	60.0	225	Circular_Default Sewer Type	54.422	52.984	1.213	54.172	52.702	1.245
15.004	16.572	33.7	300	Circular_Default Sewer Type	54.172	52.627	1.245	53.742	52.135	1.307
16.000	13.321	168.0	225	Circular_Default Sewer Type	53.475	52.289	0.961	53.742	52.210	1.307
15.005	17.696	380.0	450	Circular_Default Sewer Type	53.742	51.985	1.307	53.493	51.938	1.105
15.006	17.697	450.0	525	Circular_Default Sewer Type	53.493	51.863	1.105	53.597	51.824	1.248
15.007	25.558	450.0	525	Circular_Default Sewer Type	53.597	51.824	1.248	53.922	51.767	1.630
15.008	9.666	450.0	525	Circular_Default Sewer Type	53.922	51.767	1.630	54.139	51.746	1.868
17.000	25.008	95.8	225	Circular_Default Sewer Type	53.732	52.307	1.200	54.139	52.046	1.868
15.009	10.288	500.0	600	Circular_Default Sewer Type	54.139	51.671	1.868	54.270	51.650	2.020
14.005	27.342	546.8	600	Circular_Default Sewer Type	54.270	51.650	2.020	53.650	51.600	1.450

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.016	POND C70	2100	Manhole	Adoptable	S	1500	Manhole	Adoptable
15.000	P-N 300	1200	Manhole	Adoptable	P-N 301	1200	Manhole	Adoptable
15.001	P-N 301	1200	Manhole	Adoptable	P-N 302	1200	Manhole	Adoptable
15.002	P-N 302	1200	Manhole	Adoptable	P-N 303	1200	Manhole	Adoptable
15.003	P-N 303	1200	Manhole	Adoptable	P-N 304	1200	Manhole	Adoptable
15.004	P-N 304	1200	Manhole	Adoptable	P-N 305	1350	Manhole	Adoptable
16.000	P-N 400	1200	Manhole	Adoptable	P-N 305	1350	Manhole	Adoptable
15.005	P-N 305	1350	Manhole	Adoptable	P-N 306	1500	Manhole	Adoptable
15.006	P-N 306	1500	Manhole	Adoptable	P-N 307	1500	Manhole	Adoptable
15.007	P-N 307	1500	Manhole	Adoptable	P-N 308	1500	Manhole	Adoptable
15.008	P-N 308	1500	Manhole	Adoptable	P-N 309	1500	Manhole	Adoptable
17.000	P-N 500	1200	Manhole	Adoptable	P-N 309	1500	Manhole	Adoptable
15.009	P-N 309	1500	Manhole	Adoptable	S7030	1350	Manhole	Adoptable
14.005	S7030	1350	Manhole	Adoptable	POND C70	2100	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	20.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	30	0	0

Node POND C70 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	51.600	Product Number	CTL-SHE-0202-2440-1991-2440
Design Depth (m)	1.991	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	24.4	Min Node Diameter (mm)	2100

Node POND C70 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	51.600
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	720.0	0.0	1.991	1400.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S8001	11	55.626	0.076	10.7	0.1361	0.0000	OK
15 minute winter	SSTUB 1	10	55.107	0.047	12.2	0.0887	0.0000	OK
15 minute winter	S8002	11	54.946	0.122	21.5	0.1404	0.0000	OK
15 minute winter	S4	11	54.927	0.121	24.0	0.1902	0.0000	OK
15 minute winter	SPARCEL-L S4 S1	10	55.356	0.056	12.8	0.1403	0.0000	OK
15 minute winter	SSTUB2	10	54.992	0.048	14.0	0.0723	0.0000	OK
15 minute winter	S8003	11	54.836	0.100	40.2	0.1588	0.0000	OK
15 minute winter	SPARCEL-M S1 S1	10	55.402	0.112	26.9	0.3945	0.0000	OK
15 minute winter	SPARCEL-M S3 S1	11	55.231	0.101	11.6	0.1971	0.0000	OK
15 minute winter	SPARCEL-M S1 S2	11	55.129	0.129	46.5	0.2281	0.0000	OK
15 minute winter	SSTUB3	11	54.737	0.242	76.4	0.6825	0.0000	OK
15 minute winter	S8004	12	54.657	0.357	122.8	0.7642	0.0000	OK
15 minute winter	S13	12	54.630	0.391	118.6	0.7448	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S1	10	55.937	0.037	5.6	0.0557	0.0000	OK
15 minute winter	S16	10	55.740	0.040	4.8	0.0692	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S2	11	55.585	0.085	23.4	0.1558	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S3	11	55.355	0.105	31.9	0.1701	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S4	11	55.245	0.095	37.7	0.1348	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S5	11	55.081	0.131	37.8	0.1478	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S6	11	54.970	0.110	37.8	0.1250	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S7	11	54.821	0.111	40.7	0.1419	0.0000	OK
15 minute winter	SPARCEL L NET L-3 S1	10	54.949	0.049	6.6	0.0703	0.0000	OK
15 minute winter	SPARCEL L NET L-3 S2	10	54.845	0.055	11.3	0.0743	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S8	12	54.743	0.133	51.9	0.1545	0.0000	OK
15 minute winter	SPARCEL P (NET)	10	55.492	0.062	9.9	0.0934	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S8001	1.000	S8002	9.7	0.830	0.243	0.9868	
15 minute winter	SSTUB 1	2.000	S8002	12.1	0.676	0.024	0.2030	
15 minute winter	S8002	1.001	S4	21.6	0.626	0.119	0.1943	
15 minute winter	S4	1.002	S8003	24.0	0.798	0.153	0.8872	
15 minute winter	SPARCEL-L S4 S1	3.000	SSTUB2	12.6	1.246	0.031	0.2231	
15 minute winter	SSTUB2	3.001	S8003	13.9	0.855	0.024	0.1170	
15 minute winter	S8003	1.003	S8004	40.2	0.963	0.112	1.9014	
15 minute winter	SPARCEL-M S1 S1	4.000	SPARCEL-M S1 S2	26.2	0.879	0.195	1.9320	
15 minute winter	SPARCEL-M S3 S1	5.000	SPARCEL-M S1 S2	11.2	0.629	0.233	0.5118	
15 minute winter	SPARCEL-M S1 S2	4.001	SSTUB3	46.1	0.848	0.262	3.5497	
15 minute winter	SSTUB3	4.002	S8004	74.6	1.106	0.734	1.1713	
15 minute winter	S8004	1.004	S13	115.9	0.771	0.533	4.9152	
15 minute winter	S13	1.005	S8005	117.3	0.673	0.533	2.1739	
15 minute winter	SPARCEL L NET L-1 S1	6.000	SPARCEL L NET L-1 S2	5.5	0.399	0.010	0.4511	
15 minute winter	S16	7.000	SPARCEL L NET L-1 S2	4.7	0.392	0.025	0.2732	
15 minute winter	SPARCEL L NET L-1 S2	6.001	SPARCEL L NET L-1 S3	22.9	0.866	0.058	0.9971	
15 minute winter	SPARCEL L NET L-1 S3	6.002	SPARCEL L NET L-1 S4	32.2	1.122	0.079	0.4035	
15 minute winter	SPARCEL L NET L-1 S4	6.003	SPARCEL L NET L-1 S5	37.8	1.110	0.066	0.4927	
15 minute winter	SPARCEL L NET L-1 S5	6.004	SPARCEL L NET L-1 S6	37.8	1.011	0.131	0.9388	
15 minute winter	SPARCEL L NET L-1 S6	6.005	SPARCEL L NET L-1 S7	37.3	1.138	0.088	0.6492	
15 minute winter	SPARCEL L NET L-1 S7	6.006	SPARCEL L NET L-1 S8	40.6	1.078	0.072	0.2784	
15 minute winter	SPARCEL L NET L-3 S1	8.000	SPARCEL L NET L-3 S2	6.5	0.639	0.024	0.1635	
15 minute winter	SPARCEL L NET L-3 S2	8.001	SPARCEL L NET L-1 S8	11.1	1.058	0.028	0.0793	
15 minute winter	SPARCEL L NET L-1 S8	6.007	S8008	51.3	0.719	0.137	1.5909	
15 minute winter	SPARCEL P (NET)	9.000	SSTUB5	9.7	0.958	0.088	0.1772	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SSTUB5	10	55.263	0.083	16.7	0.1151	0.0000	OK
15 minute winter	S29	11	56.261	0.096	18.4	0.2268	0.0000	OK
15 minute winter	SSTUB9	11	55.538	0.038	17.8	0.0543	0.0000	OK
15 minute winter	S8011	10	57.770	0.040	2.7	0.0562	0.0000	OK
15 minute winter	S8010	10	57.689	0.039	8.9	0.0664	0.0000	OK
15 minute winter	S8009	11	55.126	0.126	46.1	0.1574	0.0000	OK
15 minute winter	S8008	12	54.732	0.252	99.8	0.4691	0.0000	OK
15 minute winter	S8007	12	54.653	0.234	98.4	0.4127	0.0000	OK
15 minute winter	S8006	12	54.597	0.197	97.0	0.3563	0.0000	OK
15 minute winter	S8005	12	54.612	0.399	216.4	0.7987	0.0000	OK
15 minute winter	S7012	13	54.355	0.207	215.3	0.3653	0.0000	OK
15 minute winter	S36	13	54.105	0.316	215.6	0.5584	0.0000	OK
15 minute summer	STABLE STUB 1	1	54.000	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S7013	13	53.985	0.356	216.2	0.6291	0.0000	OK
15 minute winter	S7014	13	53.820	0.341	215.9	0.6029	0.0000	OK
15 minute winter	S7015	14	53.596	0.326	214.2	0.5762	0.0000	OK
15 minute winter	S7016	14	53.326	0.236	215.7	0.4166	0.0000	OK
15 minute winter	S7017	14	52.339	0.309	215.7	0.5456	0.0000	OK
15 minute winter	P-N 100	10	54.592	0.073	23.8	0.2804	0.0000	OK
15 minute winter	P-N 101	11	54.017	0.131	30.4	0.2549	0.0000	OK
15 minute winter	P-N 102	11	53.664	0.134	37.9	0.2810	0.0000	OK
15 minute winter	P-N 103	11	53.559	0.116	41.8	0.2045	0.0000	OK
15 minute winter	P-N 104	11	53.376	0.110	48.9	0.2259	0.0000	OK
15 minute winter	P-N 200	10	53.214	0.065	9.1	0.1529	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SSTUB5	9.001	S8009	16.5	0.675	0.109	0.7938	
15 minute winter	S29	10.000	SSTUB9	17.8	0.813	0.142	0.9063	
15 minute winter	SSTUB9	10.001	S8009	17.8	1.003	0.022	0.0578	
15 minute winter	S8011	11.000	S8010	2.6	0.565	0.066	0.0633	
15 minute winter	S8010	11.001	S8009	8.7	1.937	0.063	0.1613	
15 minute winter	S8009	9.002	S8008	46.4	1.469	0.230	1.1521	
15 minute winter	S8008	6.008	S8007	98.4	1.053	0.432	2.6613	
15 minute winter	S8007	6.009	S8006	96.1	1.392	0.409	0.6653	
15 minute winter	S8006	6.010	S8005	96.5	0.859	0.183	1.9829	
15 minute winter	S8005	1.006	S7012	215.3	1.384	0.998	4.9351	
15 minute winter	S7012	1.007	S36	215.6	2.015	0.209	0.8597	
15 minute winter	S36	1.008	S7013	216.2	1.488	0.486	2.7697	
15 minute summer	STABLE STUB 1	12.000	S7013	0.0	0.000	0.000	0.0216	
15 minute winter	S7013	1.009	S7014	215.9	1.418	0.707	5.7195	
15 minute winter	S7014	1.010	S7015	214.2	1.486	0.692	7.3474	
15 minute winter	S7015	1.011	S7016	215.7	1.835	0.704	5.2597	
15 minute winter	S7016	1.012	S7017	215.7	2.312	0.398	7.3761	
15 minute winter	S7017	1.013	S7018	216.3	1.414	0.310	1.6865	
15 minute winter	P-N 100	13.000	P-N 101	23.6	2.203	0.202	0.1194	
15 minute winter	P-N 101	13.001	P-N 102	30.0	1.032	0.382	1.1951	
15 minute winter	P-N 102	13.002	P-N 103	38.1	1.061	0.183	0.7548	
15 minute winter	P-N 103	13.003	P-N 104	42.0	1.352	0.130	0.5495	
15 minute winter	P-N 104	13.004	P-N 105	48.9	1.796	0.103	0.2164	
15 minute winter	P-N 200	14.000	P-N 105	8.9	0.960	0.172	0.1717	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	P-N 105	11	52.749	0.084	57.7	0.1198	0.0000	OK
15 minute winter	S7018	14	52.268	0.348	246.6	0.6148	0.0000	OK
15 minute winter	DUMMY PIPE	13	52.178	0.308	246.6	0.5450	0.0000	OK
15 minute winter	P-N 300	10	53.446	0.066	6.7	0.1191	0.0000	OK
15 minute winter	P-N 301	10	53.393	0.067	9.5	0.0940	0.0000	OK
15 minute winter	P-N 302	10	53.213	0.085	15.9	0.1525	0.0000	OK
15 minute winter	P-N 303	11	53.068	0.084	18.0	0.1143	0.0000	OK
15 minute winter	P-N 304	11	52.707	0.080	27.4	0.1639	0.0000	OK
15 minute winter	P-N 400	10	52.395	0.106	16.5	0.3304	0.0000	OK
15 minute winter	P-N 305	11	52.160	0.175	47.6	0.3135	0.0000	OK
15 minute winter	P-N 306	11	52.102	0.239	62.8	0.7684	0.0000	OK
15 minute winter	P-N 307	11	52.079	0.255	64.9	0.5081	0.0000	OK
15 minute winter	P-N 308	10	52.045	0.278	73.1	0.5167	0.0000	OK
15 minute winter	P-N 500	10	52.366	0.059	7.8	0.1127	0.0000	OK
15 minute winter	P-N 309	10	52.039	0.368	97.8	0.8705	0.0000	OK
15 minute winter	S7030	10	52.034	0.384	106.0	0.5498	0.0000	OK
240 minute winter	POND C70	188	51.997	0.397	88.3	314.1076	0.0000	OK
15 minute summer	S	1	51.550	0.000	17.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	P-N 105	13.005	S7018	57.7	2.023	0.057	0.9938	
15 minute winter	S7018	1.014	DUMMY PIPE	246.6	1.622	0.479	1.4067	
15 minute winter	DUMMY PIPE	1.015	POND C70	249.3	2.972	0.404	2.9929	
15 minute winter	P-N 300	15.000	P-N 301	6.6	0.672	0.165	0.0898	
15 minute winter	P-N 301	15.001	P-N 302	9.4	0.793	0.193	0.2699	
15 minute winter	P-N 302	15.002	P-N 303	15.8	1.160	0.271	0.1571	
15 minute winter	P-N 303	15.003	P-N 304	18.1	1.400	0.270	0.2189	
15 minute winter	P-N 304	15.004	P-N 305	27.5	1.883	0.143	0.2421	
15 minute winter	P-N 400	16.000	P-N 305	16.1	0.922	0.404	0.2336	
15 minute winter	P-N 305	15.005	P-N 306	47.1	0.936	0.286	0.9644	
15 minute winter	P-N 306	15.006	P-N 307	62.7	0.777	0.276	1.7657	
15 minute winter	P-N 307	15.007	P-N 308	72.0	0.823	0.317	2.7223	
15 minute winter	P-N 308	15.008	P-N 309	81.9	1.019	0.361	1.1583	
15 minute winter	P-N 500	17.000	P-N 309	7.6	0.942	0.143	0.2020	
15 minute winter	P-N 309	15.009	S7030	106.0	0.903	0.347	1.9116	
15 minute winter	S7030	14.005	POND C70	123.3	2.094	0.422	2.6224	
240 minute winter	POND C70	Hydro-Brake®	S	23.8				447.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S8001	11	55.685	0.135	28.0	0.2424	0.0000	OK
15 minute winter	SSTUB 1	13	55.349	0.289	32.1	0.5412	0.0000	OK
15 minute winter	S8002	13	55.329	0.505	57.3	0.5787	0.0000	SURCHARGED
15 minute winter	S4	13	55.313	0.507	59.9	0.7991	0.0000	SURCHARGED
15 minute winter	SPARCEL-L S4 S1	10	55.391	0.091	33.6	0.2278	0.0000	OK
15 minute winter	SSTUB2	13	55.322	0.378	37.5	0.5694	0.0000	OK
15 minute winter	S8003	13	55.316	0.580	128.5	0.9195	0.0000	SURCHARGED
15 minute winter	SPARCEL-M S1 S1	13	55.546	0.256	70.8	0.9011	0.0000	OK
15 minute winter	SPARCEL-M S3 S1	12	55.543	0.413	30.6	0.8079	0.0000	SURCHARGED
15 minute winter	SPARCEL-M S1 S2	12	55.517	0.517	125.9	0.9134	0.0000	SURCHARGED
15 minute winter	SSTUB3	13	55.403	0.908	178.5	2.5591	0.0000	SURCHARGED
15 minute winter	S8004	13	55.312	1.012	232.1	2.1663	0.0000	SURCHARGED
15 minute winter	S13	13	55.231	0.992	232.8	1.8873	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S1	10	55.958	0.058	14.8	0.0879	0.0000	OK
15 minute winter	S16	10	55.764	0.064	12.5	0.1097	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S2	10	55.643	0.143	61.6	0.2623	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S3	11	55.430	0.180	84.9	0.2906	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S4	11	55.320	0.170	99.6	0.2407	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S5	13	55.300	0.350	99.9	0.3960	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S6	13	55.306	0.446	97.3	0.5047	0.0000	OK
15 minute winter	SPARCEL L NET L-1 S7	13	55.294	0.584	101.6	0.7495	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-3 S1	13	55.289	0.389	17.3	0.5585	0.0000	OK
15 minute winter	SPARCEL L NET L-3 S2	13	55.283	0.493	37.7	0.6626	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S8	13	55.289	0.679	107.5	0.7868	0.0000	SURCHARGED
15 minute winter	SPARCEL P (NET)	10	55.534	0.104	26.2	0.1571	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S8001	1.000	S8002	26.4	1.073	0.662	2.6493	
15 minute winter	SSTUB 1	2.000	S8002	32.0	0.758	0.062	1.2453	
15 minute winter	S8002	1.001	S4	53.3	0.775	0.293	0.8927	
15 minute winter	S4	1.002	S8003	61.5	0.962	0.392	4.6563	
15 minute winter	SPARCEL-L S4 S1	3.000	SSTUB2	33.8	1.514	0.082	1.7209	
15 minute winter	SSTUB2	3.001	S8003	60.2	1.028	0.105	1.0032	
15 minute winter	S8003	1.003	S8004	83.1	0.981	0.231	4.6391	
15 minute winter	SPARCEL-M S1 S1	4.000	SPARCEL-M S1 S2	71.2	1.092	0.529	6.0700	
15 minute winter	SPARCEL-M S3 S1	5.000	SPARCEL-M S1 S2	29.6	0.786	0.614	2.0167	
15 minute winter	SPARCEL-M S1 S2	4.001	SSTUB3	98.6	1.025	0.561	7.1955	
15 minute winter	SSTUB3	4.002	S8004	157.7	1.430	1.551	1.8971	
15 minute winter	S8004	1.004	S13	223.6	1.035	1.027	6.4533	
15 minute winter	S13	1.005	S8005	229.4	1.062	1.043	2.6933	
15 minute winter	SPARCEL L NET L-1 S1	6.000	SPARCEL L NET L-1 S2	14.6	0.508	0.027	0.9386	
15 minute winter	S16	7.000	SPARCEL L NET L-1 S2	12.3	0.502	0.065	0.5590	
15 minute winter	SPARCEL L NET L-1 S2	6.001	SPARCEL L NET L-1 S3	60.3	1.081	0.153	2.0997	
15 minute winter	SPARCEL L NET L-1 S3	6.002	SPARCEL L NET L-1 S4	85.0	1.392	0.208	0.8845	
15 minute winter	SPARCEL L NET L-1 S4	6.003	SPARCEL L NET L-1 S5	99.9	1.358	0.174	1.4024	
15 minute winter	SPARCEL L NET L-1 S5	6.004	SPARCEL L NET L-1 S6	97.3	1.234	0.336	4.3730	
15 minute winter	SPARCEL L NET L-1 S6	6.005	SPARCEL L NET L-1 S7	92.0	1.224	0.218	4.0504	
15 minute winter	SPARCEL L NET L-1 S7	6.006	SPARCEL L NET L-1 S8	77.9	1.012	0.137	1.5820	
15 minute winter	SPARCEL L NET L-3 S1	8.000	SPARCEL L NET L-3 S2	25.4	0.801	0.095	2.4384	
15 minute winter	SPARCEL L NET L-3 S2	8.001	SPARCEL L NET L-1 S8	28.4	1.145	0.072	1.1113	
15 minute winter	SPARCEL L NET L-1 S8	6.007	S8008	114.8	0.715	0.307	4.7216	
15 minute winter	SPARCEL P (NET)	9.000	SSTUB5	25.8	1.246	0.232	0.3615	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SSTUB5	14	55.325	0.145	44.2	0.2023	0.0000	OK
15 minute winter	S29	10	56.329	0.164	48.3	0.3857	0.0000	OK
15 minute winter	SSTUB9	11	55.564	0.064	47.0	0.0916	0.0000	OK
15 minute winter	S8011	10	57.796	0.066	7.0	0.0922	0.0000	OK
15 minute winter	S8010	10	57.712	0.062	23.5	0.1068	0.0000	OK
15 minute winter	S8009	13	55.326	0.326	122.5	0.4064	0.0000	OK
15 minute winter	S8008	13	55.297	0.817	198.5	1.5190	0.0000	SURCHARGED
15 minute winter	S8007	13	55.242	0.823	173.2	1.4543	0.0000	SURCHARGED
15 minute winter	S8006	13	55.215	0.815	174.0	1.4757	0.0000	SURCHARGED
15 minute winter	S8005	13	55.181	0.968	405.5	1.9373	0.0000	SURCHARGED
15 minute winter	S7012	13	54.896	0.748	394.0	1.3223	0.0000	SURCHARGED
15 minute winter	S36	13	54.763	0.974	389.2	1.7210	0.0000	SURCHARGED
15 minute winter	STABLE STUB 1	14	54.562	0.562	10.3	0.6356	0.0000	SURCHARGED
15 minute winter	S7013	14	54.561	0.932	386.7	1.6468	0.0000	SURCHARGED
15 minute winter	S7014	14	54.246	0.767	384.5	1.3556	0.0000	SURCHARGED
15 minute winter	S7015	14	53.848	0.578	384.5	1.0217	0.0000	SURCHARGED
15 minute winter	S7016	14	53.425	0.335	384.5	0.5922	0.0000	OK
15 minute winter	S7017	12	52.575	0.545	384.8	0.9629	0.0000	OK
15 minute winter	P-N 100	10	54.645	0.126	62.7	0.4798	0.0000	OK
15 minute winter	P-N 101	11	54.147	0.261	80.4	0.5052	0.0000	OK
15 minute winter	P-N 102	11	53.760	0.230	99.2	0.4807	0.0000	OK
15 minute winter	P-N 103	11	53.643	0.200	109.5	0.3539	0.0000	OK
15 minute winter	P-N 104	11	53.459	0.193	128.1	0.3965	0.0000	OK
15 minute winter	P-N 200	10	53.262	0.113	24.0	0.2649	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SSTUB5	9.001	S8009	43.8	0.856	0.290	2.1735	
15 minute winter	S29	10.000	SSTUB9	47.0	1.056	0.373	1.8423	
15 minute winter	SSTUB9	10.001	S8009	47.1	1.229	0.057	0.1671	
15 minute winter	S8011	11.000	S8010	6.9	0.741	0.174	0.1264	
15 minute winter	S8010	11.001	S8009	23.2	2.488	0.168	0.7123	
15 minute winter	S8009	9.002	S8008	124.8	1.624	0.619	3.8685	
15 minute winter	S8008	6.008	S8007	173.2	1.134	0.760	5.8875	
15 minute winter	S8007	6.009	S8006	173.2	1.382	0.737	1.7248	
15 minute winter	S8006	6.010	S8005	176.8	0.887	0.336	3.4276	
15 minute winter	S8005	1.006	S7012	394.0	1.855	1.826	6.8837	
15 minute winter	S7012	1.007	S36	389.2	2.077	0.378	1.7304	
15 minute winter	S36	1.008	S7013	386.7	1.790	0.870	4.1033	
15 minute winter	STABLE STUB 1	12.000	S7013	-10.3	0.305	-0.210	0.3130	
15 minute winter	S7013	1.009	S7014	384.5	1.780	1.259	8.1176	
15 minute winter	S7014	1.010	S7015	384.5	1.780	1.242	11.0036	
15 minute winter	S7015	1.011	S7016	384.5	2.063	1.255	8.0972	
15 minute winter	S7016	1.012	S7017	384.8	2.416	0.710	13.6848	
15 minute winter	S7017	1.013	S7018	391.4	1.605	0.560	2.9365	
15 minute winter	P-N 100	13.000	P-N 101	62.3	2.402	0.533	0.3198	
15 minute winter	P-N 101	13.001	P-N 102	78.5	1.301	1.002	2.4702	
15 minute winter	P-N 102	13.002	P-N 103	99.8	1.334	0.480	1.5709	
15 minute winter	P-N 103	13.003	P-N 104	110.0	1.655	0.340	1.1773	
15 minute winter	P-N 104	13.004	P-N 105	128.4	2.258	0.269	0.4521	
15 minute winter	P-N 200	14.000	P-N 105	23.6	1.233	0.455	0.3541	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	P-N 105	11	52.800	0.135	151.5	0.1929	0.0000	OK
15 minute winter	S7018	12	52.509	0.589	513.4	1.0414	0.0000	OK
240 minute winter	DUMMY PIPE	232	52.490	0.620	146.2	1.0962	0.0000	SURCHARGED
15 minute winter	P-N 300	10	53.497	0.117	17.7	0.2115	0.0000	OK
15 minute winter	P-N 301	10	53.444	0.118	25.2	0.1644	0.0000	OK
15 minute winter	P-N 302	10	53.288	0.160	42.2	0.2861	0.0000	OK
15 minute winter	P-N 303	11	53.138	0.154	47.8	0.2099	0.0000	OK
15 minute winter	P-N 304	10	52.760	0.133	72.8	0.2709	0.0000	OK
15 minute winter	P-N 400	10	52.506	0.217	43.5	0.6778	0.0000	OK
240 minute winter	P-N 305	240	52.491	0.506	24.0	0.9085	0.0000	SURCHARGED
240 minute winter	P-N 306	240	52.491	0.628	31.7	2.0203	0.0000	SURCHARGED
240 minute winter	P-N 307	240	52.491	0.667	31.3	1.3301	0.0000	SURCHARGED
240 minute winter	P-N 308	240	52.491	0.724	29.8	1.3462	0.0000	SURCHARGED
240 minute winter	P-N 500	240	52.492	0.185	3.8	0.3545	0.0000	OK
240 minute winter	P-N 309	240	52.490	0.819	36.8	1.9388	0.0000	SURCHARGED
240 minute winter	S7030	240	52.491	0.841	35.6	1.2034	0.0000	SURCHARGED
240 minute winter	POND C70	236	52.490	0.890	176.1	779.1112	0.0000	SURCHARGED
15 minute summer	S	1	51.550	0.000	24.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	P-N 105	13.005	S7018	151.6	2.061	0.150	1.9765	
15 minute winter	S7018	1.014	DUMMY PIPE	513.0	1.998	0.997	2.3070	
240 minute winter	DUMMY PIPE	1.015	POND C70	142.9	1.695	0.232	9.4537	
15 minute winter	P-N 300	15.000	P-N 301	17.5	0.835	0.438	0.1916	
15 minute winter	P-N 301	15.001	P-N 302	24.9	0.969	0.515	0.5821	
15 minute winter	P-N 302	15.002	P-N 303	41.5	1.411	0.714	0.3401	
15 minute winter	P-N 303	15.003	P-N 304	47.9	1.753	0.712	0.4614	
15 minute winter	P-N 304	15.004	P-N 305	72.4	2.164	0.377	0.7012	
15 minute winter	P-N 400	16.000	P-N 305	42.1	1.157	1.052	0.4785	
240 minute winter	P-N 305	15.005	P-N 306	23.7	0.767	0.144	2.8038	
240 minute winter	P-N 306	15.006	P-N 307	29.9	0.636	0.131	3.8231	
240 minute winter	P-N 307	15.007	P-N 308	29.1	0.626	0.128	5.5214	
240 minute winter	P-N 308	15.008	P-N 309	28.0	0.696	0.123	2.0882	
240 minute winter	P-N 500	17.000	P-N 309	3.8	0.773	0.071	0.9340	
240 minute winter	P-N 309	15.009	S7030	35.6	0.488	0.116	2.8979	
240 minute winter	S7030	14.005	POND C70	33.7	0.887	0.115	7.7016	
240 minute winter	POND C70	Hydro-Brake®	S	24.4				586.8

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S8001	12	57.010	1.460	46.6	2.6172	0.0000	SURCHARGED
15 minute winter	SSTUB 1	13	56.663	1.603	53.3	3.0059	0.0000	SURCHARGED
15 minute winter	S8002	13	56.662	1.838	76.0	2.1079	0.0000	SURCHARGED
15 minute winter	S4	13	56.657	1.851	77.0	2.9148	0.0000	SURCHARGED
15 minute winter	SPARCEL-L S4 S1	13	56.641	1.341	85.8	3.3557	0.0000	SURCHARGED
15 minute winter	SSTUB2	13	56.646	1.702	57.3	2.5651	0.0000	SURCHARGED
15 minute winter	S8003	13	56.645	1.909	137.1	3.0283	0.0000	SURCHARGED
15 minute winter	SPARCEL-M S1 S1	11	56.900	1.610	117.7	5.6608	11.7526	FLOOD
15 minute winter	SPARCEL-M S3 S1	11	57.005	1.875	50.9	3.6687	0.0000	FLOOD RISK
15 minute winter	SPARCEL-M S1 S2	11	56.919	1.919	151.9	3.3894	0.0000	FLOOD RISK
15 minute winter	SSTUB3	13	56.777	2.282	261.0	6.4325	0.0000	SURCHARGED
15 minute winter	S8004	13	56.613	2.313	361.7	4.9490	0.0000	SURCHARGED
15 minute winter	S13	13	56.499	2.260	368.8	4.3009	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S1	12	56.730	0.830	37.9	1.2532	0.0000	SURCHARGED
15 minute winter	S16	14	56.714	1.014	37.7	1.7391	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S2	13	56.702	1.202	196.2	2.2111	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S3	13	56.660	1.410	143.0	2.2820	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S4	14	56.659	1.509	144.8	2.1320	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S5	14	56.658	1.708	140.1	1.9317	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S6	14	56.649	1.789	140.6	2.0238	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S7	13	56.642	1.932	144.7	2.4813	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-3 S1	13	56.668	1.768	46.5	2.5350	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-3 S2	13	56.655	1.865	38.0	2.5048	0.0000	SURCHARGED
15 minute winter	SPARCEL L NET L-1 S8	13	56.639	2.029	158.5	2.3514	0.0000	SURCHARGED
15 minute winter	SPARCEL P (NET)	14	56.748	1.318	43.5	1.9889	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S8001	1.000	S8002	36.7	1.044	0.920	3.3688	
15 minute winter	SSTUB 1	2.000	S8002	48.7	0.837	0.095	1.4843	
15 minute winter	S8002	1.001	S4	66.6	0.838	0.366	0.8927	
15 minute winter	S4	1.002	S8003	90.5	0.926	0.578	4.6563	
15 minute winter	SPARCEL-L S4 S1	3.000	SSTUB2	51.5	1.700	0.125	3.4766	
15 minute winter	SSTUB2	3.001	S8003	60.5	1.077	0.106	1.0576	
15 minute winter	S8003	1.003	S8004	139.9	1.010	0.389	4.6391	
15 minute winter	SPARCEL-M S1 S1	4.000	SPARCEL-M S1 S2	88.2	1.116	0.656	7.0270	
15 minute winter	SPARCEL-M S3 S1	5.000	SPARCEL-M S1 S2	45.0	0.772	0.934	2.0167	
15 minute winter	SPARCEL-M S1 S2	4.001	SSTUB3	125.7	1.140	0.715	7.1955	
15 minute winter	SSTUB3	4.002	S8004	236.0	2.140	2.321	1.8971	
15 minute winter	S8004	1.004	S13	356.8	1.652	1.640	6.4533	
15 minute winter	S13	1.005	S8005	356.2	1.649	1.620	2.6933	
15 minute winter	SPARCEL L NET L-1 S1	6.000	SPARCEL L NET L-1 S2	40.9	0.574	0.074	6.7299	
15 minute winter	S16	7.000	SPARCEL L NET L-1 S2	50.5	0.573	0.265	2.4258	
15 minute winter	SPARCEL L NET L-1 S2	6.001	SPARCEL L NET L-1 S3	-104.6	1.153	-0.265	8.1010	
15 minute winter	SPARCEL L NET L-1 S3	6.002	SPARCEL L NET L-1 S4	131.6	1.398	0.322	3.0372	
15 minute winter	SPARCEL L NET L-1 S4	6.003	SPARCEL L NET L-1 S5	140.1	1.446	0.245	3.1048	
15 minute winter	SPARCEL L NET L-1 S5	6.004	SPARCEL L NET L-1 S6	140.6	1.252	0.486	5.4198	
15 minute winter	SPARCEL L NET L-1 S6	6.005	SPARCEL L NET L-1 S7	144.7	1.191	0.342	4.2513	
15 minute winter	SPARCEL L NET L-1 S7	6.006	SPARCEL L NET L-1 S8	149.2	1.009	0.263	1.5820	
15 minute winter	SPARCEL L NET L-3 S1	8.000	SPARCEL L NET L-3 S2	21.6	0.826	0.081	2.5402	
15 minute winter	SPARCEL L NET L-3 S2	8.001	SPARCEL L NET L-1 S8	50.1	1.188	0.126	1.1113	
15 minute winter	SPARCEL L NET L-1 S8	6.007	S8008	162.4	0.752	0.435	4.7216	
15 minute winter	SPARCEL P (NET)	9.000	SSTUB5	39.5	1.379	0.354	1.2268	

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SSTUB5	14	56.737	1.557	68.3	2.1699	0.0000	SURCHARGED
15 minute winter	S29	14	56.756	0.591	80.3	1.3915	0.0000	SURCHARGED
15 minute winter	SSTUB9	14	56.732	1.232	79.1	1.7631	0.0000	SURCHARGED
15 minute winter	S8011	10	57.817	0.087	11.6	0.1216	0.0000	OK
15 minute winter	S8010	10	57.731	0.081	39.1	0.1390	0.0000	OK
15 minute winter	S8009	14	56.727	1.727	185.5	2.1534	0.0000	SURCHARGED
15 minute winter	S8008	14	56.613	2.133	239.0	3.9669	0.0000	SURCHARGED
15 minute winter	S8007	13	56.527	2.108	219.0	3.7253	0.0000	SURCHARGED
15 minute winter	S8006	13	56.488	2.088	226.5	3.7798	0.0000	SURCHARGED
15 minute winter	S8005	14	56.424	2.211	523.8	4.4270	0.0000	SURCHARGED
15 minute winter	S7012	14	55.969	1.821	517.4	3.2186	0.0000	SURCHARGED
15 minute winter	S36	14	55.756	1.967	510.9	3.4754	0.0000	SURCHARGED
15 minute winter	STABLE STUB 1	14	55.434	1.434	10.4	1.6220	0.0000	SURCHARGED
15 minute winter	S7013	14	55.433	1.804	505.4	3.1884	0.0000	SURCHARGED
15 minute winter	S7014	14	54.934	1.455	497.3	2.5704	0.0000	SURCHARGED
15 minute winter	S7015	14	54.288	1.018	494.1	1.7984	0.0000	SURCHARGED
30 minute winter	S7016	24	53.715	0.625	486.5	1.1046	0.0000	SURCHARGED
360 minute winter	S7017	352	53.087	1.057	139.8	1.8681	0.0000	SURCHARGED
15 minute winter	P-N 100	11	55.061	0.542	104.2	2.0688	0.0000	SURCHARGED
15 minute winter	P-N 101	11	54.510	0.624	124.6	1.2097	0.0000	SURCHARGED
15 minute winter	P-N 102	11	53.845	0.315	158.2	0.6578	0.0000	OK
15 minute winter	P-N 103	11	53.714	0.271	174.4	0.4781	0.0000	OK
15 minute winter	P-N 104	11	53.525	0.259	204.3	0.5323	0.0000	OK
15 minute winter	P-N 200	10	53.308	0.159	39.8	0.3716	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SSTUB5	9.001	S8009	67.1	0.889	0.445	3.4759	
15 minute winter	S29	10.000	SSTUB9	79.1	1.197	0.628	4.5588	
15 minute winter	SSTUB9	10.001	S8009	68.2	1.199	0.083	0.3328	
15 minute winter	S8011	11.000	S8010	11.5	0.849	0.288	0.1833	
15 minute winter	S8010	11.001	S8009	38.8	2.454	0.281	0.9438	
15 minute winter	S8009	9.002	S8008	134.6	1.657	0.668	4.0251	
15 minute winter	S8008	6.008	S8007	219.0	1.144	0.961	5.8875	
15 minute winter	S8007	6.009	S8006	225.9	1.396	0.961	1.7248	
15 minute winter	S8006	6.010	S8005	234.8	1.087	0.446	3.4276	
15 minute winter	S8005	1.006	S7012	517.4	2.395	2.398	6.8837	
15 minute winter	S7012	1.007	S36	510.9	2.365	0.496	1.7304	
15 minute winter	S36	1.008	S7013	505.4	2.339	1.136	4.1033	
15 minute winter	STABLE STUB 1	12.000	S7013	-10.4	-0.464	-0.213	0.3130	
15 minute winter	S7013	1.009	S7014	497.3	2.302	1.629	8.1176	
15 minute winter	S7014	1.010	S7015	494.1	2.287	1.596	11.0036	
15 minute winter	S7015	1.011	S7016	491.2	2.284	1.604	9.6768	
30 minute winter	S7016	1.012	S7017	469.1	2.241	0.866	17.0579	
360 minute winter	S7017	1.013	S7018	135.8	1.149	0.194	3.0111	
15 minute winter	P-N 100	13.000	P-N 101	96.3	2.453	0.824	0.4442	
15 minute winter	P-N 101	13.001	P-N 102	123.6	1.757	1.578	2.8123	
15 minute winter	P-N 102	13.002	P-N 103	158.2	1.456	0.761	2.2882	
15 minute winter	P-N 103	13.003	P-N 104	174.4	1.806	0.539	1.7164	
15 minute winter	P-N 104	13.004	P-N 105	204.4	2.503	0.428	0.6479	
15 minute winter	P-N 200	14.000	P-N 105	39.1	1.377	0.754	0.5262	

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	P-N 105	360	53.088	0.423	33.8	0.6046	0.0000	OK
360 minute winter	S7018	360	53.087	1.167	169.1	2.0625	0.0000	SURCHARGED
360 minute winter	DUMMY PIPE	352	53.088	1.218	168.2	2.1526	0.0000	SURCHARGED
15 minute winter	P-N 300	11	53.735	0.355	29.4	0.6400	0.0000	SURCHARGED
15 minute winter	P-N 301	11	53.700	0.374	38.9	0.5211	0.0000	SURCHARGED
15 minute winter	P-N 302	11	53.558	0.430	63.7	0.7686	0.0000	SURCHARGED
15 minute winter	P-N 303	11	53.320	0.336	72.2	0.4593	0.0000	SURCHARGED
360 minute winter	P-N 304	360	53.087	0.460	16.3	0.9367	0.0000	SURCHARGED
360 minute winter	P-N 400	352	53.087	0.798	9.5	2.4906	0.0000	SURCHARGED
360 minute winter	P-N 305	360	53.087	1.102	27.5	1.9792	0.0000	SURCHARGED
360 minute winter	P-N 306	360	53.087	1.224	35.8	3.9348	0.0000	SURCHARGED
360 minute winter	P-N 307	360	53.087	1.263	36.8	2.5168	0.0000	SURCHARGED
360 minute winter	P-N 308	360	53.088	1.321	37.2	2.4580	0.0000	SURCHARGED
360 minute winter	P-N 500	360	53.087	0.780	4.5	1.4947	0.0000	SURCHARGED
360 minute winter	P-N 309	360	53.086	1.415	46.3	3.3494	0.0000	SURCHARGED
360 minute winter	S7030	352	53.086	1.436	45.8	2.0544	0.0000	SURCHARGED
360 minute winter	POND C70	360	53.087	1.487	213.4	1453.6450	0.0000	SURCHARGED
15 minute summer	S	1	51.550	0.000	24.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	P-N 105	13.005	S7018	33.8	1.276	0.033	3.1021	
360 minute winter	S7018	1.014	DUMMY PIPE	168.2	1.475	0.327	2.5143	
360 minute winter	DUMMY PIPE	1.015	POND C70	167.9	1.704	0.272	9.4537	
15 minute winter	P-N 300	15.000	P-N 301	26.8	0.904	0.669	0.3635	
15 minute winter	P-N 301	15.001	P-N 302	37.4	0.996	0.772	0.9034	
15 minute winter	P-N 302	15.002	P-N 303	62.4	1.568	1.072	0.4596	
15 minute winter	P-N 303	15.003	P-N 304	71.5	1.836	1.063	0.6620	
360 minute winter	P-N 304	15.004	P-N 305	16.3	1.556	0.085	1.1670	
360 minute winter	P-N 400	16.000	P-N 305	9.2	0.785	0.231	0.5298	
360 minute winter	P-N 305	15.005	P-N 306	26.4	0.731	0.160	2.8038	
360 minute winter	P-N 306	15.006	P-N 307	35.2	0.590	0.155	3.8231	
360 minute winter	P-N 307	15.007	P-N 308	36.4	0.545	0.160	5.5214	
360 minute winter	P-N 308	15.008	P-N 309	36.8	0.604	0.162	2.0882	
360 minute winter	P-N 500	17.000	P-N 309	4.4	0.747	0.083	0.9946	
360 minute winter	P-N 309	15.009	S7030	45.8	0.472	0.150	2.8979	
360 minute winter	S7030	14.005	POND C70	45.5	0.867	0.156	7.7016	
360 minute winter	POND C70	Hydro-Brake®	S	24.4				671.4

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
200	0.049	5.00	53.204	1200	477190.921	165393.656	1.451
201	0.042	5.00	53.115	1200	477166.998	165378.309	1.480
210	0.096	5.00	52.855	1200	477142.070	165371.987	1.288
202	0.043	5.00	52.829	1200	477146.464	165365.137	1.296
203	0.035	5.00	52.692	1200	477129.730	165354.402	1.242
204			52.550	1200	477134.028	165348.217	1.150
205			52.550	1200	477136.459	165344.720	1.200
220	0.100	5.00	53.166	1200	477102.660	165337.036	1.500
221			52.880	1200	477115.350	165345.177	1.430
222			52.550	1200	477119.710	165338.758	1.150
223			52.550	1200	477122.014	165335.368	1.200
206			52.550	1	477139.307	165336.972	1.300
207			52.550	2100	477142.468	165333.471	1.500
208			52.000	1	477145.394	165328.656	1.050

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	200	201	28.423	0.600	51.753	51.635	0.118	240.0	300	5.47	50.0
1.001	201	202	24.396	0.600	51.635	51.533	0.102	240.0	300	5.87	50.0
2.000	210	202	8.138	0.600	51.567	51.533	0.034	240.0	300	5.13	50.0
1.002	202	203	19.881	0.600	51.533	51.450	0.083	240.0	300	6.20	50.0
1.003	203	204	11.791	0.600	51.450	51.400	0.050	235.8	300	6.39	50.0
1.004	204	205	4.259	0.600	51.400	51.350	0.050	85.2	300	6.43	50.0
1.005	205	206	5.000	0.600	51.350	51.250	0.100	50.0	300	6.47	50.0
3.000	220	221	15.077	0.600	51.666	51.450	0.216	69.8	300	5.13	50.0
3.001	221	222	7.760	0.600	51.450	51.400	0.050	155.2	300	5.24	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.010	71.4	8.9	1.151	1.180	0.049	0.0	71	0.695
1.001	1.010	71.4	16.4	1.180	0.996	0.091	0.0	98	0.825
2.000	1.010	71.4	17.3	0.988	0.996	0.096	0.0	100	0.838
1.002	1.010	71.4	41.6	0.996	0.942	0.230	0.0	164	1.047
1.003	1.019	72.0	47.9	0.942	0.850	0.265	0.0	179	1.088
1.004	1.704	120.5	47.9	0.850	0.900	0.265	0.0	132	1.611
1.005	2.228	157.5	47.9	0.900	1.000	0.265	0.0	113	1.965
3.000	1.884	133.2	18.1	1.200	1.130	0.100	0.0	74	1.328
3.001	1.259	89.0	18.1	1.130	0.850	0.100	0.0	91	0.992

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
3.002	222	223	4.099	0.600	51.400	51.350	0.050	82.0	300	5.28	50.0
3.003	223	206	5.000	0.600	51.350	51.250	0.100	50.0	300	5.31	50.0
1.006	206	207	4.717	0.600	51.250	51.050	0.200	23.6	300	6.50	50.0
1.007	207	208	5.634	0.600	51.050	50.950	0.100	56.3	300	6.54	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
3.002	1.737	122.8	18.1	0.850	0.900	0.100	0.0	77	1.251
3.003	2.228	157.5	18.1	0.900	1.000	0.100	0.0	68	1.500
1.006	3.251	229.8	66.0	1.000	1.200	0.365	0.0	110	2.823
1.007	2.098	148.3	66.0	1.200	0.750	0.365	0.0	140	2.037

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	28.423	240.0	300	Circular_Default Sewer Type	53.204	51.753	1.151	53.115	51.635	1.180
1.001	24.396	240.0	300	Circular_Default Sewer Type	53.115	51.635	1.180	52.829	51.533	0.996
2.000	8.138	240.0	300	Circular_Default Sewer Type	52.855	51.567	0.988	52.829	51.533	0.996
1.002	19.881	240.0	300	Circular_Default Sewer Type	52.829	51.533	0.996	52.692	51.450	0.942
1.003	11.791	235.8	300	Circular_Default Sewer Type	52.692	51.450	0.942	52.550	51.400	0.850
1.004	4.259	85.2	300	Circular_Default Sewer Type	52.550	51.400	0.850	52.550	51.350	0.900
1.005	5.000	50.0	300	Circular_Default Sewer Type	52.550	51.350	0.900	52.550	51.250	1.000
3.000	15.077	69.8	300	Circular_Default Sewer Type	53.166	51.666	1.200	52.880	51.450	1.130
3.001	7.760	155.2	300	Circular_Default Sewer Type	52.880	51.450	1.130	52.550	51.400	0.850
3.002	4.099	82.0	300	Circular_Default Sewer Type	52.550	51.400	0.850	52.550	51.350	0.900
3.003	5.000	50.0	300	Circular_Default Sewer Type	52.550	51.350	0.900	52.550	51.250	1.000
1.006	4.717	23.6	300	Circular_Default Sewer Type	52.550	51.250	1.000	52.550	51.050	1.200
1.007	5.634	56.3	300	Circular_Default Sewer Type	52.550	51.050	1.200	52.000	50.950	0.750

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	200	1200	Manhole	Adoptable	201	1200	Manhole	Adoptable
1.001	201	1200	Manhole	Adoptable	202	1200	Manhole	Adoptable
2.000	210	1200	Manhole	Adoptable	202	1200	Manhole	Adoptable
1.002	202	1200	Manhole	Adoptable	203	1200	Manhole	Adoptable
1.003	203	1200	Manhole	Adoptable	204	1200	Manhole	Adoptable
1.004	204	1200	Manhole	Adoptable	205	1200	Manhole	Adoptable
1.005	205	1200	Manhole	Adoptable	206	1	Manhole	Adoptable
3.000	220	1200	Manhole	Adoptable	221	1200	Manhole	Adoptable
3.001	221	1200	Manhole	Adoptable	222	1200	Manhole	Adoptable
3.002	222	1200	Manhole	Adoptable	223	1200	Manhole	Adoptable
3.003	223	1200	Manhole	Adoptable	206	1	Manhole	Adoptable
1.006	206	1	Manhole	Adoptable	207	2100	Manhole	Adoptable
1.007	207	2100	Manhole	Adoptable	208	1	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	✓	Check Discharge Rate(s)	✓
Rainfall Events	Singular	Drain Down Time (mins)	240	Check Discharge Volume	✓
Winter CV	1.000	Additional Storage (m³/ha)	20.0	100 year 360 minute (m³)	
Analysis Speed	Normal	Starting Level (m)			

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	6	0
10	0	6	0
30	40	6	0
100	40	6	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m^3)	

Node 207 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	51.050	Product Number	CTL-SHE-0142-9700-1100-9700
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	9.7	Min Node Diameter (mm)	1200

Node 206 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	51.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	184

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	124.0	0.0	1.300	440.0	0.0

Results for 2 year +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	10	51.821	0.068	8.5	0.1262	0.0000	OK
15 minute winter	201	11	51.728	0.093	15.5	0.1606	0.0000	OK
15 minute winter	210	11	51.709	0.142	16.6	0.3843	0.0000	OK
15 minute winter	202	11	51.703	0.170	38.1	0.3114	0.0000	OK
15 minute winter	203	11	51.627	0.177	43.8	0.3053	0.0000	OK
15 minute winter	204	11	51.551	0.151	43.8	0.1704	0.0000	OK
15 minute winter	205	11	51.480	0.130	43.7	0.1473	0.0000	OK
15 minute winter	220	10	51.740	0.074	17.3	0.1890	0.0000	OK
15 minute winter	221	10	51.546	0.096	17.1	0.1082	0.0000	OK
15 minute winter	222	10	51.485	0.085	16.9	0.0966	0.0000	OK
120 minute winter	223	86	51.431	0.081	6.3	0.0913	0.0000	OK
120 minute winter	206	86	51.413	0.163	42.7	23.4897	0.0000	OK
30 minute winter	207	25	51.444	0.394	43.9	1.3654	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	200	1.000	201	8.3	0.551	0.116	0.4319	
15 minute winter	201	1.001	202	15.2	0.514	0.212	0.7269	
15 minute winter	210	2.000	202	15.9	0.468	0.222	0.3005	
15 minute winter	202	1.002	203	38.1	0.903	0.533	0.8377	
15 minute winter	203	1.003	204	43.8	1.114	0.608	0.4632	
15 minute winter	204	1.004	205	43.7	1.354	0.363	0.1379	
15 minute winter	205	1.005	206	43.8	2.152	0.278	0.1261	
15 minute winter	220	3.000	221	17.1	1.044	0.128	0.2479	
15 minute winter	221	3.001	222	16.9	0.942	0.189	0.1390	
15 minute winter	222	3.002	223	16.8	1.119	0.137	0.0618	
120 minute winter	223	3.003	206	8.9	0.980	0.057	0.1361	
120 minute winter	206	1.006	207	42.3	0.809	0.184	0.2585	
30 minute winter	207	Hydro-Brake®	208	9.7				37.0

Results for 10 year +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	12	51.900	0.147	18.4	0.2724	0.0000	OK
15 minute winter	201	12	51.895	0.260	33.8	0.4510	0.0000	OK
15 minute winter	210	11	51.889	0.322	36.1	0.8736	0.0000	SURCHARGED
15 minute winter	202	11	51.876	0.343	73.6	0.6282	0.0000	SURCHARGED
15 minute winter	203	11	51.760	0.309	85.7	0.5348	0.0000	SURCHARGED
120 minute winter	204	98	51.640	0.240	31.8	0.2712	0.0000	OK
120 minute winter	205	96	51.639	0.289	31.6	0.3273	0.0000	OK
15 minute winter	220	10	51.783	0.117	37.6	0.2970	0.0000	OK
120 minute winter	221	100	51.640	0.190	12.1	0.2154	0.0000	OK
120 minute winter	222	98	51.644	0.244	13.3	0.2757	0.0000	OK
120 minute winter	223	104	51.638	0.288	21.5	0.3257	0.0000	OK
120 minute winter	206	98	51.639	0.389	53.4	66.6387	0.0000	SURCHARGED
120 minute winter	207	96	51.638	0.588	27.9	2.0380	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	200	1.000	201	18.0	0.624	0.252	1.4121	
15 minute winter	201	1.001	202	32.6	0.530	0.456	1.6508	
15 minute winter	210	2.000	202	33.8	0.504	0.474	0.5731	
15 minute winter	202	1.002	203	73.8	1.048	1.033	1.4000	
15 minute winter	203	1.003	204	85.6	1.272	1.188	0.7706	
120 minute winter	204	1.004	205	31.6	1.196	0.262	0.2769	
120 minute winter	205	1.005	206	31.4	1.424	0.199	0.3502	
15 minute winter	220	3.000	221	37.3	1.229	0.280	0.4575	
120 minute winter	221	3.001	222	12.2	0.861	0.137	0.4184	
120 minute winter	222	3.002	223	20.9	1.078	0.170	0.2673	
120 minute winter	223	3.003	206	22.0	1.092	0.140	0.3501	
120 minute winter	206	1.006	207	27.9	0.767	0.121	0.3322	
120 minute winter	207	Hydro-Brake®	208	9.7				127.3

Results for 30 year +40% CC +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	12	52.842	1.089	34.4	2.0120	0.0000	SURCHARGED
15 minute winter	201	12	52.820	1.184	55.5	2.0527	0.0000	FLOOD RISK
15 minute winter	210	12	52.783	1.216	67.4	3.2976	0.0000	FLOOD RISK
15 minute winter	202	12	52.748	1.215	137.1	2.2283	0.0000	FLOOD RISK
15 minute winter	203	12	52.364	0.914	156.0	1.5794	0.0000	SURCHARGED
15 minute winter	204	12	52.016	0.616	153.3	0.6968	0.0000	SURCHARGED
120 minute winter	205	118	51.983	0.633	51.7	0.7162	0.0000	SURCHARGED
120 minute winter	220	118	51.983	0.317	22.3	0.8074	0.0000	SURCHARGED
120 minute winter	221	118	51.983	0.533	22.3	0.6027	0.0000	SURCHARGED
120 minute winter	222	118	51.983	0.583	21.3	0.6599	0.0000	SURCHARGED
120 minute winter	223	116	51.983	0.633	20.9	0.7155	0.0000	SURCHARGED
120 minute winter	206	118	51.983	0.733	71.5	156.1179	0.0000	SURCHARGED
120 minute winter	207	118	51.982	0.932	44.2	3.2285	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	200	1.000	201	28.5	0.629	0.399	2.0015	
15 minute winter	201	1.001	202	52.9	0.752	0.741	1.7179	
15 minute winter	210	2.000	202	57.2	0.813	0.801	0.5731	
15 minute winter	202	1.002	203	132.9	1.888	1.861	1.4000	
15 minute winter	203	1.003	204	153.3	2.177	2.128	0.8303	
15 minute winter	204	1.004	205	152.1	2.161	1.263	0.2999	
120 minute winter	205	1.005	206	51.4	1.615	0.326	0.3521	
120 minute winter	220	3.000	221	22.3	1.013	0.167	1.0617	
120 minute winter	221	3.001	222	21.3	0.893	0.239	0.5465	
120 minute winter	222	3.002	223	20.9	1.091	0.170	0.2886	
120 minute winter	223	3.003	206	20.6	1.251	0.131	0.3521	
120 minute winter	206	1.006	207	44.2	0.843	0.192	0.3322	
120 minute winter	207	Hydro-Brake®	208	9.7				181.9

Results for 100 year +40% CC +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	10	53.083	1.330	44.4	2.4558	0.0000	FLOOD RISK
15 minute winter	201	10	53.011	1.376	82.5	2.3854	0.0000	FLOOD RISK
15 minute winter	210	10	52.855	1.288	87.0	3.4918	5.7786	FLOOD
15 minute winter	202	10	52.829	1.296	165.5	2.3769	4.6089	FLOOD
30 minute winter	203	20	52.481	1.031	155.1	1.7808	0.0000	FLOOD RISK
30 minute winter	204	21	52.177	0.777	154.6	0.8789	0.0000	SURCHARGED
120 minute winter	205	118	52.163	0.813	70.6	0.9190	0.0000	SURCHARGED
120 minute winter	220	118	52.161	0.495	28.4	1.2605	0.0000	SURCHARGED
120 minute winter	221	120	52.162	0.712	27.7	0.8053	0.0000	SURCHARGED
120 minute winter	222	120	52.163	0.763	26.8	0.8633	0.0000	SURCHARGED
120 minute winter	223	120	52.164	0.814	26.7	0.9203	0.0000	SURCHARGED
120 minute winter	206	120	52.161	0.911	96.2	213.8779	0.0000	SURCHARGED
120 minute winter	207	120	52.160	1.110	34.5	3.8461	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	200	1.000	201	44.5	0.633	0.624	2.0015	
15 minute winter	201	1.001	202	79.4	1.127	1.112	1.7179	
15 minute winter	210	2.000	202	62.4	0.886	0.874	0.5731	
15 minute winter	202	1.002	203	133.7	1.898	1.872	1.4000	
30 minute winter	203	1.003	204	154.6	2.196	2.146	0.8303	
30 minute winter	204	1.004	205	153.9	2.186	1.278	0.2999	
120 minute winter	205	1.005	206	70.8	1.665	0.449	0.3521	
120 minute winter	220	3.000	221	27.7	1.014	0.208	1.0617	
120 minute winter	221	3.001	222	26.8	0.879	0.302	0.5465	
120 minute winter	222	3.002	223	26.7	1.087	0.218	0.2886	
120 minute winter	223	3.003	206	26.0	1.289	0.165	0.3521	
120 minute winter	206	1.006	207	34.5	0.900	0.150	0.3322	
120 minute winter	207	Hydro-Brake®	208	9.7				187.9

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