Land at Newbarn Lane
North Bersted
Bognor Regis

Contaminated Land & Geotechnical Assessment

ARUN DISTRICT COUNCIL BE/22/18/DOC

Contaminated Land & Geotechnical Risk Assessment

Land at Newbarn Lane, North Bersted, Bognor Regis

Client: Landform Bognor Regis Limited

Reference: 72540/R/001

Status: Draft for Comment

Date: 9th September 2016

Prepared by:

Name Mark Hiatt MSci (Hons) CGeol EurGeol FGS

Signature

Title **Geotechnical Director**

Checked and Approved by:

Name Ed Bullivant BSc FGS CGeol SiLC

Signature

Title **Director**

Issued by: **Nott Group**

Unit L26

Hastingwood Industrial Park

Wood Lane

Birmingham

B24 9QR

Telephone: 0121 623 7020

www.nottgroup.co.uk

Nott Group has prepared this report with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

CONTENTS

EXECUTIVE SUMMARY

1. BRIEF 1
   1.1 Proposed Development 1
2. SITE DESCRIPTION AND RECONNAISSANCE 2
   2.1 Site Walkover 2
3. SITE HISTORY 3
   3.1 Historical Summary 4
4. GEOLOGY, HYDROLOGY AND HYDROGEOLOGY 5
   4.1 General Geology and Ground Conditions 5
   4.2 Geological Faulting 6
   4.3 Radon 6
   4.4 Natural Geological Hazards 7
   4.5 Mining, Extraction and Natural Cavities 8
   4.6 Historical Surface Ground Working Features 8
   4.7 Historical Underground Workings Features 8
   4.8 Current Ground Workings 9
   4.9 Landfills and Waste Sites 10
5. REVIEW OF ENVIRONMENTAL DATABASES 11
   5.1 Industrial Sites Holding Authorisations, Permits and Licenses 11
   5.2 Designated Environmentally Sensitive Sites 11
   5.3 Environment Agency (EA) Recorded Pollution Incidents 11
   5.4 Sites Determined as Contaminated Land Under Part2A 11
   5.5 Records of Potentially Contaminative Industrial sites 11
   5.6 Records of Historical Potentially Contaminative Industrial Sites 12
   5.7 Records of Historical Tanks 12
   5.8 Historical Petrol, Fuel, Garage and Motor Vehicle Repair Sites 12
   5.9 Existing Petrol and Fuel Sites 13
   5.10 Records of Potentially Infilled Ground 13
6. DEVELOPMENT OF PRELIMINARY CONCEPTUAL MODEL 14
   6.1 Contaminated Land Background Information 14
   6.2 Potential Sources 14
   6.3 Potential Receptors 15
   6.4 Risk Assessment 16
   6.5 Findings of Preliminary Conceptual Model 18
7. DESIGN OF SITE INVESTIGATION AND WORKS UNDERTAKEN 19
   7.1 On-Site Activities 19
8. GROUND CONDITIONS ENCOUNTERED 20
   8.1 Description of Strata 20
   8.2 Topsoil 25
   8.3 Made Ground 25
   8.4 Natural Superficial Deposits 25
   8.5 Solid Geology – Chalk 26
   8.6 Field Observations and Field Screening 27
   8.7 Groundwater Encountered During Investigations 28
   8.8 Gas Monitoring Data and Groundwater Levels 29
9. CHEMICAL TESTING RESULTS 33
   9.1 Soil Chemical Testing Results 33
   9.2 Asbestos Screening 36
   9.3 Waste Acceptance Criteria (WAC) Analysis 36
   9.4 Groundwater Chemical Testing Results 37
10. GEOTECHNICAL TESTING RESULTS 45
   10.1 Laboratory Test Results 45
   10.2 In –Situ Testing 53
11. GEOTECHNICAL MATERIAL PARAMETERS 56
12. GEOTECHNICAL ASSESSMENT AND DISCUSSION 58

12.1 Foundation Design 58
12.2 Ground Bearing Floor Slabs 59
12.3 Groundwater 60
12.4 Excavations 60
12.5 Concrete Classification 60
12.6 Shrinkable Clay Soils, Building Near Trees and Desiccation of Existing Site Soils 60
12.7 Roads and Pavement Assessment 61
12.8 Reuse of Site Won Material within Earthworks Construction 62

13. GAS RISK ASSESSMENT 62

14. CONTAMINATED LAND ASSESSMENT 63

14.1 Potentially Significant Pollution Linkages 63
14.1 Potential Sources 63
14.2 Risk Assessment 64

15. CONCLUSIONS AND RECOMMENDATIONS 65

15.1 Ground Conditions Encountered 65
15.2 Contamination Assessment and Recommendations 65
15.3 Geotechnical Assessment 65

APPENDICES

APPENDIX A SITE PLANS
APPENDIX B HISTORICAL MAPS
APPENDIX C ENVIRONMENTAL DATABASES
APPENDIX D ENVIRONMENTAL RECEPTORS
APPENDIX E RISK RATING MATRIX
APPENDIX F EXPLORATORY HOLE LOGS
APPENDIX G CHEMICAL TESTING RESULTS – SOILS
APPENDIX H CHEMICAL TESTING RESULTS - GROUNDWATER'S
APPENDIX I GEOTECHNICAL TESTING RESULTS
APPENDIX J IN-SITU DYNAMIC CONE PENETROMETER TESTING RESULTS

ARUN DISTRICT COUNCIL BE/22/18/DOC

EXECUTIVE SUMMARY

SCOPE

Purpose of the report	Contaminated land and geotechnical assessment of site.
Future Site End-use	The proposed development comprises the construction of a number of residential properties with garden areas and associated access roads and landscaped areas.

SITE INFORMATION

Grid Reference	491568,101074	***Site Area (approx.)***	3.72 hectares
Current Site Status	The site consists of a grassed field used for livestock grazing purposes.		
History	Based on the historical map review the site has been Greenfield or open fields from 1876 until the present day.		
Published Geology	Superficial deposits (River Terrace Deposits- sand and gravel with occasional layers of silt, clay or peat) are mapped across the entire site. The solid geology comprises the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) and is mapped across the entire site. The solid geology is described by the BGS as comprising of chalk with flints with discrete marl seams, nodular chalk, sponge-rich and flint seams throughout.		
Hydrogeology	The superficial geology is classed as a secondary A aquifer and the solid geology a principal aquifer. The site is not located in a source protection zone.		
Hydrology	Three unspecified surface water features are located within the site boundary while a number of unspecified features are located at various distances from the site. The nearest detailed river network entry is a tertiary river (drain) located 151m west of the site. No primary river entries have been recorded within a 500m radius of the site boundary.		

GROUND CONDITIONS ENCOUNTERED

Works Undertaken	The site works comprised twenty window sample holes advanced to depths of 4.45m bgl and four cable percussive boreholes advanced to 20.00m bgl. In addition, twenty machine excavated trail pits were advanced to depths between 3.00m and 3.50m bgl. In-situ dynamic cone penetrometer tests were also undertaken. All exploratory holes were logged and representative soil samples taken for chemical and geotechnical testing. Twelve dual-purpose groundwater and ground gas monitoring installations were installed and subsequently monitored. Groundwater samples were retrieved from boreholes and chemical testing undertaken.
Ground Conditions	The investigation works has encountered granular topsoil (to a maximum depth of 0.44m bgl) overlying natural superficial granular and soft low strength to very stiff very high strength clay deposits (encountered to a maximum depth of 4.80m bgl). The solid geology of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) was encountered within a number of exploratory holes underlying the natural superficial deposits and comprised weathered structureless grade Dm and Dc chalk (encountered to a maximum depth of 20.00m bgl – depth of hole termination).

CONTAMINATION ASSESSMENT

Assessment and Recommendations	A number of exploratory holes have been advanced and no visual or olfactory evidence of contamination was noted. No elevated soil concentrations of the determinants tested have been encountered and the risk of encountering contamination during development has been assessed as low. As a result, no therefore work is warranted or recommended with respect to soil contamination. Slightly elevated concentrations of ammonium as NH4 were recorded in waters taken from both CP1 (590µg/l) and CP2 (540µg/l). In addition, a slightly elevated concentration of mercury (dissolved) was encountered in waters taken from CP2 (0.58µg/l). These slightly elevated exceedances are not considered significant to warrant further investigations or remedial work. Further discussions with Environment Agency and Local Authority may be required. Waste acceptance criteria (WAC) analysis undertaken upon representative natural superficial deposits indicates the tested samples can be classed as inert waste.

GEOTECHNICAL ASSESSMENT

Assessment and Recommendations	The topsoil horizon, soft and loose natural superficial deposits and weathered structure-less grade Dm chalk do not constitute a reliable founding medium for any form of traditional foundation or ground bearing floor slab design. It is therefore recommended that foundation loads should be transferred to more reliable and competent underlying natural soils. Foundations for the proposed structures could be constructed using strip footings or isolated pad bases bearing upon the natural clay and granular soils and structure-less grade Dc medium density chalk. These could be deepened when required using mass concrete trench fill where soft and loose natural superficial deposits and structure-less grade Dm chalk is encountered. Index property tests indicate the tested natural superficial clay deposits are of a low to immediate plasticity (Class CL and CI) with a calculated low to medium volume change potential based on a modified plasticity index in accordance with BRE Digest 240 (1993). Foundations should not bear onto clay soils if they are affected by seasonal desiccation which could result in movement. Due to the presence of soils of a medium volume change potential seasonal desiccation can cause movement to a depth of up to 0.90m below ground level. Therefore, it is recommended foundations which are outside the zone of influence of existing and/or proposed trees be extended to a minimum depth of 0.90m bgl. It is recommended that an appropriate assessment be undertaken in accordance with NHBC guidelines (4.2 'Building near trees') when the final layout/location of proposed and existing trees are known. This is required in order to determine the minimum foundation depth required for each proposed structure to accommodate the effects of existing and proposed trees and hedgerows on shrinkable soils without excessive movement. Ground bearing floor slabs should be feasible providing the floor slab is not within influencing distance of trees, is not founded within desiccated soils, all topsoil, made ground (if encountered), very soft to soft and very loose to loose natural soils and structure-less grade Dm chalk is removed from beneath the proposed ground-bearing floor slab. Providing medium dense granular soils, clay soils of a consistent firm undrained shear strength (cu greater than 50) and structure-less grade Dc low density chalk is exposed at formation level these strata are capable of supporting a ground floor slab employing 15kN/m2 for settlements of less than 25mm. Where made ground or poor natural soils remain, a fully suspended slab will be required. Where suspended floor slabs are required precast concrete, timber or in-situ concrete are acceptable design options. The minimum void dimensions under the suspended floor slab should consider the presence of clays of a medium volume change potential. Based on the ground conditions encountered, it is anticipated that excavations should readily be achieved adopting standard excavation plant. It is recommended full support of all excavations is undertaken during excavation and construction to prevent collapse and provide safe-working conditions particularly should it be necessary for personnel to enter.

Based upon the information obtained groundwater may be encountered during excavation particularly as perched groundwater. If only minor influxes are encountered, then a flexible system of pumping from sumps would be sufficient to deal with groundwater. At best, the use of such a system could be sporadic but may in the worst case necessitate continuous pumping.

A design sulphate class of DS-1 and an ACEC class of AC-1 is deemed appropriate for the site.

A preliminary design California Bearing Ratio of 3.5% (equivalent sub grade Stiffness Modulus of 39MPa) be used for design of the road and pavement foundations across the site.

The use of site won material within earthworks construction is feasible; however, suitable processing will be required in order for the material to confirm to the required end product specification. It is recommended that a dedicated earthworks method statement and specification is prepared prior to starting construction works if earthworks are required as part of the development.

The gas monitoring undertaken has encountered elevated concentrations of carbon dioxide (maximum 2.3%) with zero measured flow rates (<0.1l/hr). No methane or depleted oxygen levels have been encountered. This indicates a gas screening value (GSV) of <0.07 l/h. For carbon dioxide and methane this corresponds to a gas characteristic situation of 1 (very low risk) and no further works are warranted (CIRIA Report C665). No special precautions in respect to gas protective measures are warranted.

1. BRIEF

The Nott Group have been instructed by Landform Bognor Regis Limited to undertake a contaminated land and geotechnical assessment at an area of land located off Newbarn Lane, North Bersted, Bognor Regis, West Sussex.

This report has been prepared for the exclusive use of the client for assisting them in evaluating the potential risks associated with contaminated land and geotechnical issues at the site.

The information presented within this report is based on observations made on site, a review of available historical, geological, geotechnical, hydrogeological sources and other environmental information obtained and site investigation information only.

The Nott Group has endeavoured to assess all information provided to them during this assessment, but makes no guarantees or warranties as to the accuracy or completeness of this information obtained and reviewed.

The scope of this report does not include an assessment of Japanese Knotweed, or other invasive species, on site.

1.1 PROPOSED DEVELOPMENT

The proposed development comprises the construction of residential dwellings with garden areas and associated access roads and landscaped areas.

A site location plan is included in Appendix A (drawing 1) and a plan showing the proposed site development is also included in Appendix A (drawing 2).

2. SITE DESCRIPTION AND RECONNAISSANCE

A description of the site and the surrounding area is summarised in Table 1. A site location plan is included in Appendix A - drawing 1.

TABLE 1: SITE DESCRIPTION AND SURROUNDS

Data	Information	
Address	Land to the west of Newbarn Lane, North Bersted, Bognor Regis, West Sussex	
Current Site Use and Description:	The site consists of a grassed field used for livestock grazing purposes.	
National Grid Reference:	491568,101074	
Site Area:	Approximately 3.72 hectares	
Surrounding Land Use	North	Caravan park
	East	Residential
	South	Agricultural (fields)
	West	Agricultural (fields)

2.1 SITE WALKOVER

Mark Hiatt of the Nott Group undertook a site walkover on the 29th July 2015. The weather was sunny, warm and dry. During the walkover, no geotechnical or contamination issues were noted.

ARUN DISTRICT COUNCIL BE/22/18/DOC

3. SITE HISTORY

Historical maps dating from 1876 have been obtained and reviewed. The relevant information is summarised in the following table. The historical maps obtained have been included in Appendix B.

TABLE 2: HISTORICAL REVIEW OF SITE AND ADJACENT AREAS

Date	On Site Observations	Off Site Observations
1876	The site is shown to form part of a large field.	The north, east and west of the site are bounded by fields while an unnamed highway bounds the south of the site with fields beyond. 'L' and rectangular shaped unspecified buildings are shown approximately 120m and 170m east of the site respectively. The surrounding land is dominantly agricultural use (fields).
1896 - 1898	No significant changes shown from previous mapping.	The highway, which bounds the south of the site, now labelled as 'Newbarn Lane'. The rectangular shaped building approximately 120m east of the site is now labelled as 'New Barn' indicating farming use.
1910 - 1912	No significant changes shown from previous mapping.	'Babsham Farm', which comprises of a number of buildings of various shape and size, is now shown approximately 480m north of the site.
1932	No significant changes shown from previous mapping.	Residential development is now shown approximately 180m east of the site.
1938	No significant changes shown from previous mapping.	'Brick fields' are now shown approximately 150m east and 220m southeast of the site. In addition, an unspecified pit (associated with the brick works) is also now shown approximately 220m southeast of the site.
1940	No significant changes shown from previous mapping.	Residential development is now shown approximately 60m to 280m east and 100m to 170m northeast of the site. The brickfield approximately 150m east of the site is now shown to be absent. The unspecified 'L' shaped building approximately 170m east of the site is now shown to be absent. The unspecified pit feature approximately 220m southeast of the site is now shown to be absent indicating it may have been infilled. A nursery is now shown approximately 325m south of the site. An unspecified pit is now shown approximately 390m southeast of the site.
1961	No significant changes shown from previous mapping.	The brickfield approximately 220m southeast of the site is now shown to be absent. The unspecified pit approximately 390m southeast of the site is now shown to be absent indicating it may have been infilled.
1964	No significant changes shown from	Residential development is now shown

Date	On Site Observations	Off Site Observations
	previous mapping.	approximately 50m to 70m northeast and 50m southeast of the site. respectively. An electrical substation is now shown approximately 110m northeast of the site. 'New barn', shown approximately 120m east of the site is now shown to be absent. A 'garage' is now shown approximately 160m east of the site.
1971	The site is now shown to consist of a single field.	The north of the site is now shown to be bounded by 'Orchard Caravan Park' while the east of the site is now shown to be bounded by a highway (Newbarn Lane) with residential properties immediately beyond. An electrical substation is now shown approximately 65m east of the site.
1976 - 1977	No significant changes shown from previous mapping.	No significant changes shown from previous mapping.
1993 - 1994	No significant changes shown from previous mapping.	No significant changes shown from previous mapping.
2002	No significant changes shown from previous mapping.	No significant changes shown from previous mapping.
2010	No significant changes shown from previous mapping.	No significant changes shown from previous mapping.
2014	No significant changes shown from previous mapping.	No significant changes shown from previous mapping.

3.1 HISTORICAL SUMMARY

Based on the historical map review the site has been Greenfield or open fields from 1876 until the present day. No on-site sources of contamination have been identified.

A number of potential off-site sources of contamination have been identified within 500m radius of the site and these include farming activities, former brick works, infilled ground (associated with the infilling of various pit features with unknown material), electrical substations and a garage/filling station.

4. GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

4.1 GENERAL GEOLOGY AND GROUND CONDITIONS

The geology beneath the site has been established from the British Geological Survey (BGS) 1: 50,000 digital geological map of Great Britain. In addition, the hydrology and hydrogeology is summarised in the following tables.

TABLE 3: SITE GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

Data	Information
Solid Geology	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) is mapped across the entire site and is described by the BGS as comprising of chalk with flints with discrete marl seams, nodular chalk, sponge-rich and flint seams throughout.
Superficial Geology	River Terrace Deposits are mapped across the entire site and are described as comprising sand and gravel, locally with lenses of silt, clay or peat.
Made Ground	None mapped by the BGS
Closest Surface Waters	Three unspecified surface water features are located within the site boundary while a further seventeen unspecified features are located at various distances ranging from 3m southeast, south and northeast to 247m northwest of the site boundary respectively. The nearest detailed river network entry is a tertiary river (drain) located 151m west of the site. No primary river entries have been recorded within a 500m radius of the site boundary.
Surface Water Abstractions within 1000m	No surface water abstractions have been identified.
Groundwater Vulnerability	River Terrace Deposits (Superficial Deposits): Secondary A aquifer Chalk (Solid Geology): Principal aquifer
Groundwater Abstractions within 1000m	Three groundwater abstractions have been recorded as summarised below: • 98m northwest: Details - General use relating to secondary category (medium loss) • 737m west: Details - Spray Irrigation (direct) • 781m west: Details - Spray Irrigation (storage)
Potable Water Abstractions within 1000m	No potable water abstractions have been identified.
Source Protection Zones (SPZs)	The site is not located in or within 500m of a SPZ.

ARUN DISTRICT COUNCIL BE/22/18/DOC

TABLE 4: SUMMARY OF HYDROGEOLOGICAL PROPERTIES OF THE MAIN GEOLOGICAL STRATA

Strata	Hydrogeological Significance	Classification (Environment Agency)
River Terrace Deposits (Superficial Deposits)	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.	Secondary A aquifer
Chalk (Solid Geology)	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale.	Principal aquifer

4.2 GEOLOGICAL FAULTING

There are no recorded geological faults within 500m of the site boundary.

4.3 RADON

A radon report obtained from the British Geological Survey and Health Protection Agency indicates that the site is not located within a radon-affected area, as less than 1% of properties are above the action level, and protective measures are not necessary. No further work or assessment is required in respect to radon on site.

4.4 NATURAL GEOLOGICAL HAZARDS

British Geological Survey GeoSure data has been reviewed in respect to potential natural geological hazards on site and within 50m radius of the site boundary, the findings are summarised in the following table.

TABLE 5: SUMMARY OF NATURAL GEOLOGICAL HAZARDS

Hazard	Hazard Rating	Details
Shrink Swell Clays	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE).
Landslides	Very low	Slope instability problems are unlikely to be present. No special actions required to avoid problems with landslides. No special ground investigation required.
Soluble Rocks	Very low	Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required,
Compressible Ground	Negligible	No indicators for compressible deposits identified. No further action required.
Collapsible Rocks	Low	Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soakaways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation.
Running Sands	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build, consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site.

4.5 Mining, Extraction and Natural Cavities

A review of the available information obtained indicates the following have been recorded within a 1000m radius of the site (summarised in the below table).

Table 6: Summary of Non-Coal Mining Areas

Distance	Direction	Commodity	Assessment of likelihood
0.0m	On site	Chalk	Occasional minor mining may have occurred but of restricted extent.
122m	South	Chalk	Rare and localised small-scale mining may have occurred

4.6 Historical Surface Ground Working Features

There are a number surface ground working features within 250m of the site have been noted which is summarised in the following table.

Table 7: Summary of Historical Ground Working Features

Distance	Direction	NGR	Use	Dates
149m	East	491951, 100990	Brick field	1934
199m	Southwest	491234, 100975	Pond	1876
221m	Southeast	491991, 100830	Brick field	1934
221m	Southeast	491968, 100839	Unspecified pit	1934

4.7 Historical Underground Workings Features

There are no recorded historical underground working features within 1000m of the site boundary.

4.8 CURRENT GROUND WORKINGS

There are a number of current British Geological Survey current ground workings within 1000m of the site boundary as summarised in the following table.

TABLE 8: RECORDS OF BGS CURRENT GROUND WORKINGS

Distance	Direction	NGR	Details
239m	East	491954, 100986	Commodity Produced: Clay and shale Pit name: North Bersted Brick Field Type of working: A surface mineral working Status: Ceased
297m	Southeast	491985, 100855	Commodity Produced: Clay and shale Pit name: North Bersted Brick Field Type of working: A surface mineral working Status: Ceased
305m	Southeast	491900, 100736	Commodity Produced: Clay and shale Pit name: North Bersted Brick Field Type of working: A surface mineral working Status: Ceased
618m	East	492306, 100798	Commodity Produced: Clay and shale Pit name: North Bersted Brick Field Type of working: A surface mineral working Status: Ceased
739m	East	492451, 100915	Commodity Produced: Clay and shale Pit name: North Bersted Brick Field Type of working: A surface mineral working Status: Ceased
841m	South	491490, 100070	Commodity Produced: Clay and shale Pit name: Chalcroft Lane Brick Works Type of working: A surface mineral working Status: Ceased
958m	Southeast	492452, 100366	Commodity Produced: Clay and shale Pit name: Middle Bersted Brick Field Type of working: A surface mineral working Status: Ceased

ARUN DISTRICT COUNCIL BE/22/18/DOC

Distance	Direction	NGR	Details
981m	Southeast	492580, 100515	Commodity Produced: Clay and shale Pit name: North Bersted Brick Field Type of working: A surface mineral working Status: Ceased

4.9 LANDFILLS AND WASTE SITES

A review of the available information obtained indicates the following in respect to landfill and waste sites:

- There are no recorded Environmental Agency (EA) landfill sites within 1000m of the site
- There are no recorded EA historic landfill sites within 1500m of the site
- There are no recorded Local Authority landfill sites within 1500m of the site
- There are no recorded BGS/DoE non - operational landfill sites within 1500m of the site
- There are no recorded operational or non-operational waste treatment, transfer or disposal sites within 500m of the site

There is a single recorded Environmental Agency (EA) licensed waste sites within 1500m of the site boundary as summarised in the following table.

TABLE 9: SUMMARY OF RECORDED EA LICENSED WASTE SITES

Distance	Direction	Details
941m	North	NGR: 491345, 102146 Address: Elbridge Farm Business Centre, Chichester Road, Bersted, Bognor Regis, West Sussex, PO21 5EF Type: HCI Waste transfer and treatment Waste Licence Number: MYN001 Operator: Recycle Southern Limited

5. REVIEW OF ENVIRONMENTAL DATABASES

Environmental information has been obtained from Groundsure. This information comprises data provided by the British Geological Survey, Environment Agency, Health Protection Agency and the Coal Authority and has been reviewed and summarised below. A full copy of this report has been enclosed in Appendix C.

5.1 INDUSTRIAL SITES HOLDING AUTHORISATIONS, PERMITS AND LICENSES

Information obtained from the Environment Agency and Local Authority indicates there are no records of Part A(1) and IPPC Authorised Activities within 500m of the site.

5.2 DESIGNATED ENVIRONMENTALLY SENSITIVE SITES

The following designated sites have been identified within 500m of the site boundary.

TABLE 10: RECORDS OF DESIGNATED ENVIRONMENTALLY SENSITIVE SITES

Distance	Direction	Details
0.0m	On site	Nitrate vulnerable zone

5.3 ENVIRONMENT AGENCY (EA) RECORDED POLLUTION INCIDENTS

No significant pollution incidents have been recorded within 250m of the site.

5.4 SITES DETERMINED AS CONTAMINATED LAND UNDER PART2A

No designated contaminated sites have been identified within 500m of the site.

5.5 RECORDS OF POTENTIALLY CONTAMINATIVE INDUSTRIAL SITES

There are six recorded potentially contaminative industrial sites within 250m of the site boundary as summarised in the following table.

TABLE 11: RECORDS OF POTENTIALLY CONTAMINATIVE INDUSTRIAL SITES

Distance	Direction	Details
77m	East	Electrical substation
130m	East	Electrical substation
131m	Northeast	Electrical substation
171m	Northeast	Petrol and fuel station
179m	Northeast	Electrical substation

Distance	Direction	Details
197m	Northeast	Petrol and fuel station

5.6 Records of Historical Potentially Contaminative Industrial Sites

The following sites with a potentially contaminative past land use have been identified within 250m of the site as summarised in the following table.

Table 12: Records of Potentially Contaminative Historical Land Uses

Distance	Direction	Details
59m	Southeast	Brickfield
149m	East	Brickfield
221m -	Southeast	Brickfield
221m -	Southeast	Unspecified pit
323m - 325m	Southeast	Nursery
328m	Southeast	Nursery
387m	Southeast	Unspecified pit
428m	South	Cemetery

5.7 Records of Historical Tanks

There are no recorded historical tanks within 500m radius of the site boundary.

5.8 Historical Petrol, Fuel, Garage and Motor Vehicle Repair Sites

The following historical petrol, fuel, garage and motor vehicle repair sites have been identified within 250m of the site as summarised in the following table

Table 13: Records of Historical Petrol, Fuel, Garage and Motor Vehicle Repair Sites

Distance	Direction	Details
155m - 160m	Northeast	Garage/filling station

ARUN DISTRICT COUNCIL BE/22/18/DOC

5.9 Existing Petrol and Fuel Sites

A single existing petrol or fuel site has been recorded within 500m of the site boundary as summarised in the following table.

Table 14: Records of Existing Petrol or Fuel Sites

Distance	Direction	Details
191m	Northeast	NGR: 491775, 101212 Address: 449 Chichester Road, North Bersted, Bognor Regis, West Sussex, PO21 5DS LPG: No Status: Open

5.10 Records of Potentially Infilled Ground

The following historical potentially infilled features have been identified within 250m of the site as summarised in the following table.

Table 15: Records of Historical Potentially Infilled Features

Distance	Direction	Details
59m	Southeast	Brickfield
149m	East	Brickfield
199m	Southwest	Pond
221m	Southeast	Unspecified pit
221m	Southeast	Brickfield
387m	Southeast	Unspecified pit
428m	South	Cemetery
473m	South	Ponds
478m	South	Pond

ARUN DISTRICT COUNCIL BE/22/18/DOC

6. DEVELOPMENT OF PRELIMINARY CONCEPTUAL MODEL

6.1 CONTAMINATED LAND BACKGROUND INFORMATION

The Environmental Protection Act 1990 Part IIA, as amended, provides a statutory definition of contaminated land. To fall within this definition, it is necessary that, as a result of the condition of the land, substances may be present in, on or under the land such that:

(a) Significant harm is being caused or there is a significant possibility of such harm being caused; or

(b) Significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused.

Risk from contamination is assessed by consideration of possible linkages between contaminant sources and potential receptors via pathways, which is usually termed a conceptual model.

6.2 POTENTIAL SOURCES

TABLE 16: POTENTIAL CONTAMINATION SOURCES AT OR ADJACENT TO THE SUBJECT SITE

Source	Location	Activity	Potential Contaminants
On-Site			
No sources identified			
Off-Site			
Infilled ground	Various locations from 59m southeast to 478m south of the site	Infilled ground associated former brickworks, infilling of unspecified pits, ponds and a cemetery as identified from the historical map review and groundsure data	Gas, hydrocarbons, metals and leachate
Former brickfields	59m southwest, 149m east and 221m southeast of the site respectively	Former brickfields as identified from the historical map review and groundsure data	Metals, inorganic chemicals and hydrocarbons
Electrical substations	Various locations from 65m east to 179m northeast of the site	Operational electrical substations	Metals, inorganic chemicals, asbestos, PCBs and hydrocarbons
Former petrol/filling station	155m to 160m northeast of site	Former fuel site	Hydrocarbons
Existing petrol and fuel site	191m northeast of the site	Existing fuel site with no LPG	Hydrocarbons
Existing farming activities	Approximately 480m north of the site	Farming activities associated with Babsham	Metals, inorganic chemicals, asbestos, pesticides and

Source	Location	Activity	Potential Contaminants
		Farm	hydrocarbons
Recorded EA licensed waste site	941m north of the site	HCI waste transfer and treatment	Metals, inorganic chemicals, asbestos and hydrocarbons

6.3 POTENTIAL RECEPTORS

Receptors that are required to be considered under Part IIA of the Environmental Protection Act 1990 are summarised in Appendix D.

The potential environmental receptors identified during this study are summarised in the following table.

TABLE 17: POTENTIAL RECEPTORS IDENTIFIED FOR THE SITE AND SURROUNDING AREAS

Category	Receptor	Location	Comments
Humans	Existing site users	Onsite	Site is used is for pastoral farming with no public access
	Site end users	Onsite	Residential - areas of the site will have new garden areas
	Construction workers	Onsite	
Property (materials)	Site structures and buildings	Onsite	Primarily foundations and services (proposed)
Property (crops)	Non Identified		
Ecological systems	Non Identified		
Controlled waters	Secondary A aquifer	Under the site	Superficial Geology - River Terrace Deposits
	Principal aquifer	Under the site	Solid Geology - Chalk
	Unspecified surface water features	On site	Three separate features identified within the site boundary
	Unspecified surface water features	3m southeast, south and northeast to 247m northwest of the site boundary	Seventeen separate features identified
	Tertiary river	151m west of the site	Drain

6.4 RISK ASSESSMENT

The risk of significant harm or pollution of controlled waters has been assessed qualitatively as low, medium or high using the criteria shown in Appendix E.

A risk estimation matrix for all pollutant linkages identified is shown below.

TABLE 18: PRELIMINARY CONTAMINATION RISK ASSESSMENT

Receptor	Sources	Risk	Justification
Human Heath			
Existing site users	On-site - No source identified	Low	No contamination source identified
	Off-site - infilled ground, former brickworks, electrical substations, former and existing fuel sites, existing farming activities and EA licensed waste site	Low	No feasible receptor identified
Future site users	On-site - No source identified	Low	Further work warranted to confirm risk.
	Off-site - infilled ground, former brickworks, electrical substations, former and existing fuel sites, existing farming activities and EA licensed waste site	Low to medium	Further work warranted to confirm low risk.
Construction workers	On-site - No source identified	Low	Further work warranted to confirm low risk.
	Off-site - infilled ground, former brickworks, electrical substations, former and existing fuel sites, existing farming activities and EA licensed waste site	Low	Further work warranted to confirm low risk.
Property			
Site structures (concrete structures)	Concrete aggressive ground conditions	Low	Further work warranted to confirm low risk.

Receptor	Sources	Risk	Justification
Potable water plastic pipes	Hydrocarbon contamination	Low	Further work warranted to confirm low risk.
Controlled Waters			
Secondary A aquifer	On-site - No source identified	Low	Further work warranted to confirm low risk.
	Off-site - infilled ground, former brickworks, electrical substations, former and existing fuel sites, existing farming activities and EA licensed waste site	Low	Further work warranted to confirm low risk.
Principal aquifer	On-site - No source identified	Low	Further work warranted to confirm low risk.
	Off-site - infilled ground, former brickworks, electrical substations, former and existing fuel sites, existing farming activities and EA licensed waste site	Low	Further work warranted to confirm low risk.
Tertiary river	On-site - No source identified	Low	Further work warranted to confirm low risk.
	Off-site - infilled ground, former brickworks, electrical substations, former and existing fuel sites, existing farming activities and EA licensed waste site	Low	Further work warranted to confirm low risk.
Unspecified surface water features	On-site - No source identified	Low	Further work warranted to confirm low risk.
	Off-site - infilled ground, former brickworks, electrical substations, former and existing fuel sites, existing farming activities and EA licensed waste site	Low	Further work warranted to confirm low risk.

ARUN DISTRICT COUNCIL BE/22/18/DOC

6.5 FINDINGS OF PRELIMINARY CONCEPTUAL MODEL

Based upon the development of the preliminary conceptual site model a site investigation was undertaken with subsequent chemical testing of soil and groundwater samples and a programme of ground gas monitoring.

7. DESIGN OF SITE INVESTIGATION AND WORKS UNDERTAKEN

The site investigation works were undertaken, where access was possible, to confirm the preliminary contamination risk assessment outlined in the desk study and to assess possible foundations for the proposed development. This was based on the findings of the information review and the development of preliminary conceptual model. It is not possible to cover all areas of the site and contamination may exist in other areas of the site not covered by the sampling regime.

7.1 ON-SITE ACTIVITIES

The fieldwork was undertaken during the period of the 27th July to 2nd August 2016 and comprised the following works:

- 20 window sample holes (WS1 to WS20) advanced to a depth of 4.45m below ground level (bgl).
- 4 cable percussive boreholes (CP1 to CP4) advanced to a depth of 20.00m bgl.
- 20 machine excavated trial pits (TP1 to TP20) advanced to depths between 3.00m and 3.50m bgl.
- 10 in situ dynamic cone penetrometer tests (DCP1 to DCP10).
- All exploratory holes were logged and sampled for chemical and geotechnical purposes by a Chartered Geologist.
- Installation of 12 dual purpose groundwater and ground gas monitoring installations.
- Geotechnical and chemical soil testing on recovered soil samples.
- Testing of groundwater samples retrieved from monitoring installations following appropriate well development
- Gas and groundwater levels monitoring (six visits undertaken).

During drilling and excavation, representative soil samples were obtained from the exposed strata and sealed in 1 litre plastic tubs, glass brown jars and vials with airtight lids. The samples were then despatched under a 'Chain of Custody' procedure to a NAMAS (UKAS) and MCERTS accredited laboratory, for subsequent chemical testing.

During excavation and drilling representative soil samples were obtained from the exposed strata and sealed in 1 litre plastic tubs and plastic bulk bags. In addition, during advancement of the cable percussive boreholes undisturbed U100 samples were obtained. The samples were then despatched to a NAMAS (UKAS) and MCERTS accredited laboratory, for subsequent geotechnical testing.

Following installation of the window sample and cable percussive boreholes soil gas monitoring was undertaken comprising six separate site visits. As far, as was reasonably practicable, the ground gas monitoring was undertaken when the barometric atmospheric pressure was falling. On each of the monitoring visits, the peak and steady concentration readings of methane, carbon dioxide, and oxygen were recorded at each installed monitoring standpipe along with borehole gas flow readings and atmospheric pressure. This was undertaken using a Gas Data GFM430 gas analyser and gas flow data monitor. Groundwater levels were also measured on each visit.

One round of groundwater monitoring and testing was undertaken. The boreholes were initially developed and then purged to obtain a representative groundwater sample.

Exploratory hole location plans (drawing no. 3 to 5) are included in Appendix A.

8. GROUND CONDITIONS ENCOUNTERED

8.1 DESCRIPTION OF STRATA

The description of strata encountered is summarised in the following table. Detailed logs of the strata encountered are provided in Appendix F.

TABLE 19: DESCRIPTION OF STRATA

Strata Encountered	Description	Depth in meters below ground level (m bgl)
Topsoil	Very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets.	CP1: 0.00m – 0.35m CP2: 0.00m – 0.34m CP3: 0.00m – 0.40m CP4: 0.00m – 0.29m WS1: 0.00m – 0.26m WS2: 0.00m – 0.32m WS3: 0.00m – 0.31m WS4: 0.00m – 0.39m WS5: 0.00m – 0.29m WS6: 0.00m – 0.44m WS7: 0.00m – 0.44m WS8: 0.00m – 0.34m WS9: 0.00m – 0.36m WS10: 0.00m – 0.34m WS11: 0.00m – 0.36m WS12: 0.00m – 0.42m WS13: 0.00m – 0.36m WS14: 0.00m – 0.36m WS15: 0.00m – 0.40m WS16: 0.00m – 0.37m WS17: 0.00m – 0.35m WS18: 0.00m – 0.34m WS19: 0.00m – 0.36m WS20: 0.00m – 0.31m TP1: 0.00m – 0.42m TP2: 0.00m – 0.26m TP3: 0.00m – 0.34m TP4: 0.00m – 0.36m TP5: 0.00m – 0.34m TP6: 0.00m – 0.36m TP7: 0.00m – 0.35m TP8: 0.00m – 0.38m TP9: 0.00m – 0.40m TP10: 0.00m – 0.37m TP11: 0.00m – 0.28m TP12: 0.00m – 0.32m TP13: 0.00m – 0.30m TP14: 0.00m – 0.33m TP15: 0.00m – 0.28m TP16: 0.00m – 0.31m

Strata Encountered	Description	Depth in meters below ground level (m bgl)
		TP17: 0.00m – 0.21m TP18: 0.00m – 0.25m TP19: 0.00m – 0.30m TP20: 0.00m – 0.32m
Natural Superficial Deposits	Slightly sandy to sandy slightly gravelly to gravelly silty CLAY	CP1: 0.35m – 2.80m CP2: 1.00m – 3.00m CP3: 1.00m – 3.80m CP4: 1.31m – 2.00m WS1: 1.56m – 2.33m WS1: 2.45m – 2.82m WS1: 2.92m – 4.45m (depth of hole termination) WS2: 1.45m – 1.80m WS2: 1.94m – 2.87m WS3: 1.44m – 2.16m WS4: 1.48m – 1.94m WS5: 1.31m – 2.00m WS5: 3.80m – 4.45m (depth of hole termination) WS6: 1.23m – 2.10m WS6: 2.32m – 3.66m WS6: 3.80m – 4.45m (depth of hole termination) WS7: 0.44m – 3.79m WS8: 1.57m – 3.09m WS9: 0.36m – 2.88m WS10: 2.70m – 3.00m WS10: 3.88m – 4.45m (depth of hole termination) WS11: 1.43m – 2.45m WS11: 3.60m – 4.45m (depth of hole termination) WS12: 1.00m – 3.41m WS13: 0.36m – 2.32m WS13: 2.82m – 3.53m WS14: 0.36m – 3.60m WS16: 2.80m – 3.80m WS17: 0.35m – 3.63m WS18: 1.37m – 2.41m WS18: 3.60m – 4.45m (depth of hole termination) WS19: 1.60m – 3.11m WS20: 1.87m – 2.02m WS20: 3.85m – 4.45m (depth of hole termination) TP3: 1.00m – 3.50m (depth of hole termination) TP4: 1.03m – 3.10m (depth of hole termination) TP5: 0.92m – 3.00m (depth of hole termination) TP6: 0.96m – 3.00m (depth of hole termination) TP11: 0.28m – 0.86m TP12: 0.32m – 0.89m TP13: 0.30m – 1.30m TP17: 0.21m – 3.50m (depth of hole termination) TP18: 0.25m – 3.50m (depth of hole termination) TP19: 0.30m – 3.00m (depth of hole termination) TP20: 0.32m – 3.00m (depth of hole termination)

Strata Encountered	Description	Depth in meters below ground level (m bgl)
Natural Superficial Deposits	Slightly sandy to sandy slightly gravelly silty CLAY with occasional COBBLES	TP1: 1.23m – 3.00m (depth of hole termination) TP2: 0.70m – 3.00m (depth of hole termination) TP7: 0.55m – 3.40m (depth of hole termination) TP8: 0.55m – 3.50m (depth of hole termination) TP9: 0.60m – 3.00m (depth of hole termination) TP11: 0.86m – 3.00m (depth of hole termination) TP12: 0.89m – 3.20m (depth of hole termination) TP13: 1.30m – 3.40m (depth of hole termination) TP14: 1.34m – 3.50m (depth of hole termination) TP15: 0.69m – 3.50m (depth of hole termination) TP16: 0.65m – 3.50m (depth of hole termination)
Natural Superficial Deposits	Slightly sandy to sandy silty CLAY	CP2: 0.34m – 1.00m CP3: 0.40m – 1.00m CP4: 0.29m – 1.31m CP4: 2.00m – 4.80m WS1: 0.26m – 1.56m WS2: 0.32m – 1.45m WS3: 0.31m – 1.44m WS3: 2.16m – 3.46m WS4: 0.39m – 1.48m WS5: 0.29m – 1.31m WS5: 2.00m – 3.80m WS6: 0.44m – 1.23m WS8: 0.34m – 1.57m WS10: 0.34m – 2.49m WS11: 0.36m – 1.43m WS12: 0.42m – 1.00m WS15: 0.40m – 0.91m WS18: 0.34m – 1.37m WS19: 0.36m – 1.60m WS20: 0.31m – 1.87m WS20: 2.02m – 3.85m TP1: 0.42m – 0.90m TP2: 0.26m – 0.70m TP3: 0.34m – 1.00m TP4: 0.36m – 1.03m TP5: 0.34m – 0.94m TP6: 0.36m – 0.96m TP7: 0.35m – 0.55m TP8: 0.38m – 0.55m TP9: 0.40m – 0.60m TP10: 0.37m – 1.00m TP14: 0.33m – 1.34m TP15: 0.28m – 0.69m TP16: 0.31m – 0.65m
Natural Superficial Deposits	Slightly sandy gravelly CLAY	WS15: 0.91m – 2.24m WS16: 1.00m – 2.80m TP10: 1.00m – 3.00m
Natural Superficial Deposits	Slightly gravelly silty CLAY with occasional COBBLES	WS2: 2.87m – 3.70m

Strata Encountered	Description	Depth in meters below ground level (m bgl)
Natural Superficial Deposits	Slightly gravelly to gravelly silty CLAY	WS3: 3.46m – 4.45m (depth of hole termination) WS4: 1.94m – 4.45m (depth of hole termination) WS8: 3.09m – 4.45m (depth of hole termination) WS9: 2.88m – 3.95m WS11: 3.46m – 3.60m WS18: 3.50m – 3.60m WS19: 3.11m – 4.45m (depth of hole termination)
Natural Superficial Deposits	Very clayey gravelly fine to coarse grained SAND	WS1: 2.33m – 2.45m WS6: 2.10m – 2.32m WS10: 2.49m – 2.70m WS10: 3.00m – 3.22m
Natural Superficial Deposits	Very clayey gravelly fine grained SAND with frequent frim sandy silty clay pockets	TP1: 0.90m – 1.23m
Natural Superficial Deposits	Very clayey very sandy GRAVEL	WS1: 2.82m – 2.92m
Natural Superficial Deposits	Very clayey fine to coarse grained SAND	WS2: 1.80m – 1.94m WS6: 3.66m – 3.80m
Natural Superficial Deposits	Silty CLAY	WS10: 3.22m – 3.88m WS11: 2.45m – 3.46m WS13: 2.32m – 2.82m WS18: 2.41m – 3.50m
Structure-less CHALK - Grade Dm (Solid Geology)	Structure-less CHALK composed of uncompact slightly gravelly slightly sandy SILT	CP1: 2.80m – 11.50m CP1: 13.50m – 20.00m (depth of hole termination) CP2: 3.00m – 13.50m CP2: 15.50m – 20.00m (depth of hole termination) CP3: 3.80m – 11.50m CP3: 13.50m – 20.00m (depth of hole termination) CP4: 4.80m – 13.50m CP4: 15.50m – 20.00m (depth of hole termination) WS2: 3.70m – 4.45m (depth of hole termination) WS7: 3.79m – 4.45m (depth of hole termination) WS9: 3.95m – 4.45m (depth of hole termination) WS12: 3.41m – 4.45m (depth of hole termination) WS13: 3.53m – 4.45m (depth of hole termination) WS14: 3.60m – 3.80m WS15: 2.24m – 4.45m (depth of hole termination) WS16: 3.80m – 4.45m (depth of hole termination) WS17: 3.63m – 3.81m
Structure-less CHALK - Grade Dc (Solid Geology)	Structure-less CHALK composed of slightly clayey to clayey sandy GRAVEL.	CP1: 11.50m – 13.50m CP2: 13.50m – 15.50m CP3: 11.50m – 13.50m CP4: 13.50m – 15.50m WS14: 3.80m – 4.45m (depth of hole termination) WS17: 3.81m – 4.45m (depth of hole termination)

8.2 TOPSOIL

Topsoil was encountered within all exploratory holes from ground level to depths ranging from 0.21m (TP17) to 0.44m (WS6 and WS7) and comprised a single horizon of very clayey gravelly fine grained sand with occasional firm sandy friable clay pockets, roots and rootlets. The gravel content of the topsoil was noted to comprise of coarse sub angular chalk.

8.3 MADE GROUND

Made ground deposits were not encountered during this investigation.

8.4 NATURAL SUPERFICIAL DEPOSITS

Natural superficial deposits were encountered within all exploratory holes below the topsoil horizon from depths ranging from 0.21m (TP17) to 0.44m (WS6 and WS7) and encountered to a maximum depth of 4.80m below ground level (CP4).

Within CP1, the superficial deposits comprised slightly sandy to sandy slightly gravelly silty clays, while within CP2 the deposits comprised of a succession of slightly sandy to sandy silty clay and slightly sand to sandy slightly gravelly to gravelly silty clays. Within CP3, the deposits comprised of slightly sandy silty clay overlying slightly sandy to sandy gravelly silty clays while within CP4 the deposits comprised of slightly sandy to sandy silty clays and sandy slightly gravelly silty clay.

Within WS1, the superficial deposits comprised of a succession of sandy silty clay, slightly sandy to sandy slightly gravelly to gravelly silty clays, very clayey gravelly fine to medium grained sand and very clayey very sandy gravel. Within WS2, the deposits comprised of a succession of sandy silty clay, sandy slightly gravelly silty clay, very clayey coarse grained sand, slightly gravelly to gravelly silty clay and slightly gravelly silty clay with occasional cobbles.

Within exploratory holes WS3 to WS5, WS8, WS11, WS12, WS19 and WS20, the superficial deposits comprised of a variable succession of slightly sandy to sandy clays, slightly sandy to sandy slightly gravelly to gravelly silty clays and slightly gravelly to gravelly silty clay.

Within WS6, the superficial deposits comprised of a succession sandy silt clay, slightly sandy to sandy slightly gravelly to gravelly clays, very clayey gravelly coarse grained sand and very clayey fine to medium grained sand while within WS10 the deposits comprised of a succession of slightly sandy to sandy clays, very clayey gravelly fine grained sands and slightly sandy to sandy slightly gravelly to gravelly silty clays.

Within WS7, WS14 and WS17, the superficial deposits comprised of slightly sandy to sandy slightly gravelly to gravelly silty clays while within WS9 the deposits comprised of slightly sandy to sandy slightly gravely silty clay overlying slightly gravelly clay.

Within WS13, the superficial deposits comprised of sandy slightly gravelly to gravelly silty clays and silty clay while within WS15 the deposits comprised of sandy silty clay overlying slightly sandy gravelly clay.

Within WS16, the superficial deposits comprised of a succession of slightly sandy silty clay, slightly sandy gravelly clay and sandy gravelly silty clay while within WS18 the deposits comprised of a succession of slightly sandy silty clay, slightly sandy slightly gravelly to gravelly silty clay, silty clay and slightly gravelly silty clay.

Within TP1, the superficial deposits comprised of a succession of sandy silty clay, very clayey gravelly fine grained sand with frequent sandy silty clay pockets and slightly sandy to sandy slightly gravelly silty clay with occasional cobbles while within TP2 the deposits comprised of sandy silty clay overlying slightly sandy to sandy slightly gravelly silty clay with occasional cobbles.

Within exploratory holes TP3 to TP6 and TP10, the superficial deposits comprised of slightly sandy to sandy silty clay overlying slightly sandy slightly gravelly to gravelly silty clay while within exploratory

holes TP7 to TP9 and TP14 to TP16, the superficial deposits comprised of slightly sandy to sandy silty clay overlying slightly sandy to sandy slightly gravelly to gravelly silty clay with occasional cobbles.

Within TP11 and TP12, the superficial deposits comprised of sandy slightly gravelly silty clay overlying slightly sandy to sandy slightly gravelly silty clay with occasional cobbles, while within TP13 the deposits comprised of slightly sandy slightly gravelly silty clay overlying slightly sandy slightly gravelly silty clay with occasional cobbles.

Within exploratory holes TP17 to TP20, the superficial deposits comprised of a single horizon of slightly sandy to sandy slightly gravelly silty clay.

The gravel content of the superficial deposits comprised of fine to coarse angular to rounded chalk and medium to coarse angular to sub rounded flint. Cobbles, when encountered comprised of angular flint.

8.5 Solid Geology – Chalk

The solid geology of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) was encountered within exploratory holes CP1 to CP4, WS2, WS7, WS9 and WS12 to WS17 only from depths ranging from 2.24m (WS15) to 4.80m (CP4) and was encountered to a maximum depth of 20.00m (CP1 to CP4 – depth

The solid geology was encountered as weathered structure-less chalk and comprised of both grade Dc chalk (clast dominated) and grade Dm (matrix dominated) chalk. Where the chalk is graded Dm the material will act as a cohesive fine soil while where the soil grade is graded as Dc it will act as a coarse granular soil. The point at which chalk material ceases to act as a cohesive soil and starts to behave as a granular soil can vary. The approximate soil compositions are summarised in the following table.

Table 20: Subdivisions of Grade D Chalk by Engineering Behaviour

Suffix	Engineering Behaviour	Dominant Element	Percentage of Chalk Matrix	Coarser Fragments
Dm	Fine soil	Matrix	Approx >35%	Approx <65%
Dc	Coarse soil	Clasts	Approx <35%	Approx >65%

Within exploratory holes WS2, WS7, WS9, WS12, WS13, WS15 and WS16, the weathered bedrock comprised of a single horizon of grade Dm chalk, typically comprising of slightly gravelly slightly sandy silt.

Within WS14 and WS17, the weathered bedrock comprised grade Dm chalk, typically comprising a single horizon of slightly gravelly slightly sandy silt, overlying structure-less weathered clast dominated grade Dc chalk which typically comprised of slightly clayey to clayey sandy gravel.

Within exploratory holes CP1 to CP4, the weathered bedrock comprised of a variable succession of grade Dm matrix dominated chalk (slightly gravelly slightly sandy silt) and grade Dc clast dominated chalk (slightly clayey to clayey sandy gravel).

The gravel content of the weathered matrix dominated grade Dm chalk typically comprised fine to coarse angular to sub rounded extremely weak to weak chalk clasts while the gravel content of the clast dominated grade Dc chalk typically comprised of medium to coarse angular extremely weak to moderately strong chalk clasts. In addition, occasional angular flint cobbles were also encountered within a number of grade Dm and Dc horizons.

8.6 Field Observations and Field Screening

During the investigation, the recovered soils were inspected for visual and olfactory evidence of contamination. A summary of the field observations and testing is presented in the following table.

Table 22: Field Observations of Contamination

Exploratory Hole	Visual and Olfactory Evidence of Contamination
CP1	None observed
CP2	None observed
CP3	None observed
CP4	None observed
WS1	None observed
WS2	None observed
WS3	None observed
WS4	None observed
WS5	None observed
WS6	None observed
WS7	None observed
WS8	None observed
WS9	None observed
WS10	None observed
WS11	None observed
WS12	None observed
WS13	None observed
WS14	None observed
WS15	None observed
WS16	None observed
WS17	None observed
WS18	None observed

Exploratory Hole	Visual and Olfactory Evidence of Contamination
WS19	None observed
WS20	None observed
TP1	None observed
TP2	None observed
TP3	None observed
TP4	None observed
TP5	None observed
TP6	None observed
TP7	None observed
TP8	None observed
TP9	None observed
TP10	None observed
TP11	None observed
TP12	None observed
TP13	None observed
TP14	None observed
TP15	None observed
TP16	None observed
TP17	None observed
TP18	None observed
TP19	None observed
TP20	None observed

8.7 GROUNDWATER ENCOUNTERED DURING INVESTIGATIONS

Groundwater was encountered within a number of exploratory holes as summarised in the following table.

TABLE 21: GROUNDWATER OBSERVATIONS DURING EXCAVATION

Exploratory Hole	Depth Encountered	Resting Level	Observed Inflow Behaviour
CP1	3.50m	2.17m after 20 minutes	Moderate inflow
CP2	3.50m	2.14m after 20 minutes	Moderate inflow
CP3	3.55m	2.20m after 20 minutes	Moderate inflow
CP4	3.50m	2.17m after 20 minutes	Moderate inflow
WS1	2.35m	--------	Seepage
WS6	3.70m	--------	Seepage
WS10	2.50m 3.50m	--------	Seepage

8.8 Gas Monitoring Data and Groundwater Levels

Soil ground gas and groundwater level monitoring has been undertaken on six separate visits. The data obtained during the monitoring is summarised in the following table.

Table 23: Gas and Groundwater Monitoring Data

Well	Date	CH_4 (%)	O_2 (%)	CO_2 (%)	Atmospheric Pressure (mB)	Relative Pressure (mB)	Average Flow (l/hr)	Water Level (mbgl)
CP1	08/08/2016	0.0	20.5	0.0	1018	0.0	0.0	1.85
	11/08/2016	0.0	20.4	0.0	1016	0.0	0.0	1.90
	18/08/2016	0.0	20.3	0.0	1006	0.0	0.0	1.88
	25/08/2016	0.0	20.1	0.0	1005	0.0	0.0	1.87
	31/08/2016	0.0	20.3	0.0	1020	0.0	0.0	1.85
	02/09/2016	0.0	20.3	0.0	1005	0.0	0.0	1.84
CP2	08/08/2016	0.0	20.3	0.0	1018	0.0	0.0	2.08
	11/08/2016	0.0	20.2	0.0	1016	0.0	0.0	2.10
	18/08/2016	0.0	20.3	0.0	1006	0.0	0.0	2.13
	25/08/2016	0.0	20.4	0.0	1005	0.0	0.0	2.09
	31/08/2016	0.0	20.2	0.0	1020	0.0	0.0	2.11
	02/09/2016	0.0	20.1	0.0	1005	0.0	0.0	2.10
WS1	08/08/2016	0.0	20.1	0.5	1018	0.0	0.0	2.11

ARUN DISTRICT COUNCIL BE/22/18/DOC

Well	Date	CH_4 (%)	O_2 (%)	CO_2 (%)	Atmospheric Pressure (mB)	Relative Pressure (mB)	Average Flow (l/hr)	Water Level (mbgl)
	11/08/2016	0.0	20.2	0.3	1016	0.0	0.0	2.13
	18/08/2016	0.0	20.1	0.5	1006	0.0	0.0	2.10
	25/08/2016	0.0	20.3	0.4	1005	0.0	0.0	2.12
	31/08/2016	0.0	20.3	0.5	1020	0.0	0.0	2.13
	02/09/2016	0.0	20.2	0.2	1005	0.0	0.0	2.10
WS3	08/08/2016	0.0	19.8	1.2	1018	0.0	0.0	2.05
	11/08/2016	0.0	19.7	1.4	1016	0.0	0.0	2.09
	18/08/2016	0.0	19.9	1.3	1006	0.0	0.0	2.13
	25/08/2016	0.0	20.0	1.1	1005	0.0	0.0	2.08
	31/08/2016	0.0	19.7	1.3	1020	0.0	0.0	2.07
	02/09/2016	0.0	19.7	1.4	1005	0.0	0.0	2.10
WS5	08/08/2016	0.0	20.4	0.0	1017	0.0	0.0	2.18
	11/08/2016	0.0	20.2	0.0	1016	0.0	0.0	2.13
	18/08/2016	0.0	20.4	0.0	1006	0.0	0.0	2.10
	25/08/2016	0.0	20.2	0.0	1004	0.0	0.0	2.09
	31/08/2016	0.0	20.4	0.0	1020	0.0	0.0	2.13
	02/09/2016	0.0	20.5	0.0	1005	0.0	0.0	2.15
WS8	08/08/2016	0.0	20.5	0.0	1017	0.0	0.0	2.25
	11/08/2016	0.0	20.2	0.0	1016	0.0	0.0	2.20
	18/08/2016	0.0	20.4	0.0	1006	0.0	0.0	2.21
	25/08/2016	0.0	20.3	0.0	1004	0.0	0.0	2.20
	31/08/2016	0.0	20.5	0.0	1020	0.0	0.0	2.23
	02/09/2016	0.0	20.5	0.0	1005	0.0	0.0	2.23
WS9	08/08/2016	0.0	19.6	1.8	1017	0.0	0.0	1.97
	11/08/2016	0.0	19.4	2.0	1016	0.0	0.0	2.00
	18/08/2016	0.0	19.5	1.9	1005	0.0	0.0	1.98
	25/08/2016	0.0	19.7	1.7	1004	0.0	0.0	1.96
	31/08/2016	0.0	19.4	2.0	1019	0.0	0.0	1.97

Well	Date	CH_4 (%)	O_2 (%)	CO_2 (%)	Atmospheric Pressure (mB)	Relative Pressure (mB)	Average Flow (l/hr)	Water Level (mbgl)
	02/09/2016	0.0	19.8	1.9	1005	0.0	0.0	1.95
WS10	08/08/2016	0.0	19.5	2.0	1017	0.0	0.0	2.25
	11/08/2016	0.0	19.2	2.2	1016	0.0	0.0	2.22
	18/08/2016	0.0	19.4	2.3	1005	0.0	0.0	2.15
	25/08/2016	0.0	19.3	2.1	1004	0.0	0.0	2.18
	31/08/2016	0.0	19.2	2.3	1019	0.0	0.0	2.21
	02/09/2016	0.0	19.2	2.2	1005	0.0	0.0	2.20
WS11	08/08/2016	0.0	19.8	1.4	1017	0.0	0.0	1.81
	11/08/2016	0.0	19.8	1.6	1016	0.0	0.0	1.85
	18/08/2016	0.0	19.5	1.5	1005	0.0	0.0	1.76
	25/08/2016	0.0	19.7	1.7	1004	0.0	0.0	1.85
	31/08/2016	0.0	19.8	1.6	1019	0.0	0.0	1.81
	02/09/2016	0.0	19.7	1.5	1005	0.0	0.0	1.79
WS13	08/08/2016	0.0	20.3	0.0	1017	0.0	0.0	1.59
	11/08/2016	0.0	20.2	0.0	1016	0.0	0.0	1.58
	18/08/2016	0.0	20.4	0.0	1005	0.0	0.0	1.58
	25/08/2016	0.0	20.3	0.0	1004	0.0	0.0	1.55
	31/08/2016	0.0	20.4	0.0	1019	0.0	0.0	1.59
	02/09/2016	0.0	20.5	0.0	1005	0.0	0.0	1.61
WS14	08/08/2016	0.0	20.4	0.3	1017	0.0	0.0	1.80
	11/08/2016	0.0	20.5	0.0	1016	0.0	0.0	1.73
	18/08/2016	0.0	20.3	0.1	1005	0.0	0.0	1.77
	25/08/2016	0.0	20.2	0.2	1004	0.0	0.0	1.74
	31/08/2016	0.0	20.4	0.3	1019	0.0	0.0	1.73
	02/09/2016	0.0	20.4	0.3	1005	0.0	0.0	1.75
WS15	08/08/2016	0.0	20.6	0.0	1017	0.0	0.0	1.95
	11/08/2016	0.0	20.5	0.0	1016	0.0	0.0	1.96

Well	Date	CH_4 (%)	O_2 (%)	CO_2 (%)	Atmospheric Pressure (mB)	Relative Pressure (mB)	Average Flow (l/hr)	Water Level (mbgl)
	18/08/2016	0.0	20.6	0.0	1005	0.0	0.0	2.00
	25/08/2016	0.0	20.4	0.0	1004	0.0	0.0	1.97
	31/08/2016	0.0	20.6	0.0	1019	0.0	0.0	1.95
	02/09/2016	0.0	20.5	0.0	1005	0.0	0.0	1.93

Readings are steady state concentrations within a 5-minute measurement period.

CH_4 – methane; O_2 – oxygen; CO_2 carbon dioxide;

mbgl – metres below ground level; mB – millibars; l/hr – litres per hour.

9. CHEMICAL TESTING RESULTS

9.1 SOIL CHEMICAL TESTING RESULTS

A selection of soil samples were submitted for chemical analysis, the results of which are presented in Appendix G. The testing suite included metals, inorganic determinants, speciated petroleum hydrocarbons, polyaromatic hydrocarbons (PAHs), PCBs (7 congeners) and asbestos as shown in the following tables. All tests were undertaken by a UKAS accredited laboratory, under a 'Chain of Custody' procedure. All tests, where appropriate, were carried out in accordance with MCERTS accreditation.

Soil samples were selected for testing based on the field observations recorded, to allow good spatial coverage across the site and to assess potential sources and receptors outlined within the desk study report. A summary of the testing results is presented in the following table along with a comparison with screening values relevant to a future use of the site (residential).

TABLE 24: CHEMICAL RESULTS SUMMARY – SOIL

Substance		Screening Criteria (residential)		Number of Analyses	Reported Minimum Value	Reported Maximum Value	Statistical Mean	Number of Exceedances
Boron (H20 Soluble)	mg/kg	291	SGV / GAC (6% SOM)	23		3.1	1.09	0
Arsenic	mg/kg	32	SGV / GAC (6% SOM)	23	6.4	12	7.96	0
Cadmium	mg/kg	10	SGV / GAC (6% SOM)	23	<0.2	0.3	0.2	0
Chromium (trivalent)	mg/kg	627	SGV / GAC (6% SOM)	23	21	34	25	0
Copper	mg/kg	2330	SGV / GAC (6% SOM)	23	11	22	15.8	0
Lead (using old SGV)	mg/kg	450	SGV / GAC (6% SOM)	23	12	25	16.8	0
Mercury (elemental)	mg/kg	1	SGV / GAC (6% SOM)	23	<0.3	0.8	0.44	0
Nickel	mg/kg	130	SGV / GAC (6% SOM)	23		33	17.9	0
Selenium	mg/kg	350	SGV / GAC (6% SOM)	23		1.8	1.01	0
Zinc	mg/kg	3750	SGV / GAC (6% SOM)	23	44	870	86	0
Chromium (hexavalent)	mg/kg	4.3	SGV / GAC (6% SOM)	13	<4	<4	4	0
Sulphur	mg/kg	5000	ICRCL values	20	84	620	161	0
Vanadium	mg/kg	75	SGV / GAC (6% SOM)	13	30	47	35.9	0
Berylium	mg/kg	51	SGV / GAC (6% SOM)	13	0.63	1.3	0.84	0
Barium	mg/kg	1300	EIC-CI:aire	13	63	98	79.5	0
Sulphide	mg/kg	250	ICRCL Values	5	<1	5.5	1.9	0
Cyanide (free)	mg/kg	20	Dutch Intervention	5	<1	<1	1	0
Cyanide (Total)	mg/kg	3100	RBSL Resi	5	<1	<1	1	0
Phenols (Total)	mg/kg	290	GAC (2.5%	5	<1	<1	1	0

Substance		Screening Criteria (residential)		Number of Analyses	Reported Minimum Value	Reported Maximum Value	Statistical Mean	Number of Exceedances
			SOM)					
Benzene	mg/kg	0.16	GAC (2.5% SOM)	10	<0.16	<0.16	0.16	0
Toluene	mg/kg	270	GAC (2.5% SOM)	10	<1	<1	1	0
Ethylbenzene	mg/kg	150	GAC (2.5% SOM)	10	<1	<1	1	0
m-Xylene	mg/kg	100	GAC (2.5% SOM)	10	<1	<1	1	0
o-Xylene	mg/kg	110	GAC (2.5% SOM)	10	<1	<1	1	0
p-Xylene	mg/kg	98	GAC (2.5% SOM)	10	<1	<1	1	0
Acenaphthene	mg/kg	480	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Acenaphthylene	mg/kg	400	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Anthracene	mg/kg	4900	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Benz(a)anthracene	mg/kg	4.7	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Benzo(a)pyrene	mg/kg	5	CS4L	11	<0.1	<0.1	0.1	0
Benzo(b)fluoranthene	mg/kg	6.5	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Benzo(ghi)perylene	mg/kg	46	GAC (2.5% SOM)	11	<0.05	<0.05	0.05	0
Benzo(k)fluoranthene	mg/kg	9.6	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Chrysene	mg/kg	8	GAC (2.5% SOM)	11	<0.05	<0.05	0.05	0
Dibenz(ah)anthracene	mg/kg	0.86	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Fluoranthene	mg/kg	460	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Fluorene	mg/kg	380	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Indeno(123-cd)pyrene	mg/kg	3.9	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Naphthalene	mg/kg	3.7	GAC (2.5% SOM)	11	<0.05	<0.05	0.05	0
Phenanthrene	mg/kg	200	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Pyrene	mg/kg	1000	GAC (2.5% SOM)	11	<0.1	<0.1	0.1	0
Aliphatic EC 5-6	mg/kg	55	GAC (2.5% SOM)	7	<0.1	<0.1	0.1	0
Aliphatic EC >6-8	mg/kg	160	GAC (2.5% SOM)	7	<0.1	<0.1	0.1	0
Aliphatic EC >8-10	mg/kg	46	GAC (2.5% SOM)	7	<0.1	<0.1	0.1	0
Aliphatic EC >10-12	mg/kg	230	GAC (2.5% SOM)	7	<1	<1	1	0
Aliphatic EC >12-16	mg/kg	1700	GAC (2.5% SOM)	7	<2	<2	2	0
Aliphatic EC >16-35	mg/kg	64000	GAC (2.5% SOM)	7	<8	<8	8	0

Substance		Screening Criteria (residential)		Number of Analyses	Reported Minimum Value	Reported Maximum Value	Statistical Mean	Number of Exceedances
Aliphatic EC >35-44	mg/kg	64000	GAC (2.5% SOM)	7	<8	<8	8	0
Aromatic EC 5-7 (benzene)	mg/kg	130	GAC (2.5% SOM)	7	<0.1	<0.1	0.1	0
Aromatic EC >7-8 (toluene)	mg/kg	270	GAC (2.5% SOM)	7	<0.1	<0.1	0.1	0
Aromatic EC >8-10	mg/kg	65	GAC (2.5% SOM)	7	<0.1	<0.1	0.1	0
Aromatic EC >10-12	mg/kg	160	GAC (2.5% SOM)	7	<1	<1	1	0
Aromatic EC >12-16	mg/kg	310	GAC (2.5% SOM)	7	<2	<2	2	0
Aromatic EC >16-21	mg/kg	480	GAC (2.5% SOM)	7	<10	<10	10	0
Aromatic EC >21-35	mg/kg	1100	GAC (2.5% SOM)	7	<10	<10	10	0
Aromatic EC >35-44	mg/kg	1100	GAC (2.5% SOM)	7	<10	<10	10	0
Sulphate	mg/kg	2000	WRAS screen	5	310	710	424	0
pH		-	-	31	5.9	8.8	7.68	-
PAHs total	mg/kg	50	WRAS screen	11	<1.6	<1.6	1.6	0
Petroleum Hydrocarbons	mg/kg	50	WRAS screen	7	<10	<10	10	0
Mineral Oil (C10 - C40)	mg/kg	-	-	3	All below detection limit			0
Total BTEX	ug/kg	-	-	3	All below detection limit			0
PCB Congener 28	mg/kg	-	-	3	All below detection limit			0
PCB Congener 52	mg/kg	-	-	3	All below detection limit			0
PCB Congener 101	mg/kg	-	-	3	All below detection limit			0
PCB Congener 118	mg/kg	-	-	3	All below detection limit			0
PCB Congener 128	mg/kg	-	-	3	All below detection limit			0
PCB Congener 153	mg/kg	-	-	3	All below detection limit			0
PCB Congener 180	mg/kg	-	-	3	All below detection limit			0
Total PCBs	mg/kg	-	-	3	All below detection limit			0

Values presented in mg/kg, correct to two significant figures (unless greater level of accuracy is possible from analysis or published as a screening value). Bold values indicate where values have been exceeded their respective screening values.

The screening values comprise published Soil Guideline Values (SGVs) issued by the Environment Agency / DEFRA or, where SGVs have not yet been published, Generic Acceptance Criteria (GAC) published by Land Quality Management (LQM) or calculated by Nott Group.

Published SGVs and the CLEA UK software were withdrawn by DEFRA and the Environment Agency on 13th August 2008. New guidance has been published by the Environment Agency along with an updated version of the CLEA software (version 1.03, beta). The software has been released for comment and may be subject to amendment in the coming months. The EA will be issuing revised SGVs based on the new guidance but this is not anticipated until March 2009. Key guidance documents which will be needed in the generation of guideline values using the new software have not yet been published. In the interim Nott Group will continue to use published SGVs and GACs generated using CLEA UK to ensure a consistent approach in the assessment of chemical analysis results

The above testing indicates that no elevated concentrations of the determinants tested have been encountered and therefore no potential sources have been identified.

9.2 Asbestos Screening

Ten soil samples were screened for asbestos at various locations across the site. The results of the screening are presented within Appendix G. No asbestos was identified within any of the soil samples tested.

9.3 Waste Acceptance Criteria (WAC) Analysis

Waste acceptance criteria (WAC) analysis was undertaken upon representative natural superficial deposits in order to classify its waste acceptance criteria. The analytical results are included within Appendix G. The test results indicate that the soil samples tested can be classed as inert waste.

9.4 GROUNDWATER CHEMICAL TESTING RESULTS

One round of groundwater monitoring and testing was undertaken. The boreholes were initially developed and then purged to obtain a representative groundwater sample. Following purging, it was noted that it was not possible to obtain a water sample to undertake chemical testing in a number of boreholes. This groundwater was considered to be localised and perched.

The water samples retrieved were tested for a number of determinants including general inorganics, total phenols, speciated PAHs, total PAH, metals, monoaromatics, speciated petroleum hydrocarbons, volatile organic compounds (VOCs) and semi volatile organic compounds (SVOCs). The testing results are included within Appendix H. All tests were undertaken by a UKAS accredited laboratory, under a 'Chain of Custody' procedure. All tests, where appropriate, were carried out in accordance with MCERTS accreditation.

The boreholes, which were sampled, are shown in the following table.

TABLE 25: BOREHOLE MONITORING DATA

Borehole	Elevation (mAOD)	Date	Response Zone m	Groundwater Depth before Purging (mbgl)	Comments
CP1	-----	31/08/2016	3 – 19.5m	1.85	Underlying groundwater table within chalk aquifer - Water sample obtained.
CP2	-----	31/08/2016	3 – 19.5m	2.11	Underlying groundwater table within chalk aquifer - Water sample obtained.
WS1	-----	31/08/2016	1 – 4m	2.13	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS3	-----	31/08/2016	1 – 4m	2.07	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS5	-----	31/08/2016	1 – 4m	2.13	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS8	-----	31/08/2016	1 – 4m	2.23	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS9	-----	31/08/2016	1 – 4m	1.97	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.

Borehole	Elevation (mAOD)	Date	Response Zone m	Groundwater Depth before Purging (mbgl)	Comments
WS10	-----	31/08/2016	1 – 4m	2.21	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS11	-----	31/08/2016	1 – 4m	1.81	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS13	-----	31/08/2016	1 – 4m	1.59	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS14	-----	31/08/2016	1 – 4m	1.73	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.
WS15	-----	31/08/2016	1 – 4m	1.95	Recharge not sufficient to allow water sampling following purging of well. No testing undertaken. Perched localised water.

A summary of the testing results is presented in the following tables along with a comparison with relevant screening values for each tested determinant (where applicable).

TABLE 26: WATER CHEMICAL RESULTS SUMMARY – GROUNDWATER FROM BOREHOLES

				CP1	CP2
				Underlying groundwater table within chalk aquifer	Underlying groundwater table within chalk aquifer
Substance		**Screening Criteria**			
pH	pH Units	--	--	7.6	7.7
Electrical Conductivity	µS/cm	2500	UKDW	810	680
Total Cyanide	µg/l	50	UKDW	< 10	< 10
Complex Cyanide	µg/l	1500	Dutch Intervention Value	< 10	< 10
Free Cyanide	µg/l	1	EQS Inland Waters	< 10	< 10
Sulphate	ug/l	400000	EQS Inland Waters	35700	62600
Sulphide	µg/l			< 5.0	< 5.0
Chloride	mg/l	250000	EQS Inland Waters	78	39
Ammonium as NH_4	µg/l	500	UKDW	**590**	**540**
Total Organic Carbon (TOC)	mg/l	--	--	1.7	4.5
Total Phenols (monohydric)	µg/l	30	EQS Inland Waters	< 10	< 10
Naphthalene	µg/l	10	EQS Inland Waters	< 0.01	< 0.01
Acenaphthylene	µg/l	210	USEPA	< 0.01	< 0.01

				CP1	CP2
				Underlying groundwater table within chalk aquifer	Underlying groundwater table within chalk aquifer
Substance		**Screening Criteria**			
Acenaphthene	µg/l	400	USEPA	< 0.01	< 0.01
Fluorene	µg/l	2200	USEPA	< 0.01	< 0.01
Phenanthrene	µg/l	40	USEPA	< 0.01	< 0.01
Anthracene	µg/l	0.02	EQS Inland Waters	< 0.01	< 0.01
Fluoranthene	µg/l	0.02	EQS Inland Waters	< 0.01	< 0.01
Pyrene	µg/l	180	USEPA	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.5	Dutch Intervention Value	< 0.01	< 0.01
Chrysene	µg/l	0.2	Dutch Intervention Value	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.1	UKDW	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.1	UKDW	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	UKDW	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.1	UKDW	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.0092	USEPA	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.1	UKDW	< 0.01	< 0.01
Total EPA-16 PAHs	µg/l			< 0.16	< 0.16
Antimony (dissolved)	µg/l	5	UKDW	0.4	0.7
Arsenic (dissolved)	µg/l	50	EQS Inland Waters	0.26	0.91
Barium (dissolved)	µg/l	700	WHO	49	44
Beryllium (dissolved)	µg/l	15	Dutch Intervention Value	< 0.1	0.6
Boron (dissolved)	µg/l	2000	EQS Inland Waters	67	40
Cadmium (dissolved)	µg/l	5	UKDW	< 0.02	0.02
Chromium (hexavalent)	µg/l	50	EQS Inland Waters	< 5.0	< 5.0
Chromium (dissolved)	µg/l	50	EQS Inland Waters	< 0.2	< 0.2
Cobalt (dissolved)	µg/l	100	Dutch Intervention Value	0.6	4
Copper (dissolved)	µg/l	2000	UKDW	2.3	1.2
Iron (dissolved)	mg/l	1000	EQS Inland Waters	< 0.004	0.017
Lead (dissolved)	µg/l	250	EQS Inland Waters	7.9	3.4
Manganese (dissolved)	µg/l	400	WHO	36	210
Mercury (dissolved)	µg/l	0.3	EQS Estuary & Coastal Waters	< 0.05	**0.58**
Molybdenum (dissolved)	µg/l	70	WHO	0.84	1.3
Nickel (dissolved)	µg/l	200	EQS Inland Waters	1.6	3.9
Phosphorus (dissolved)	µg/l			< 20.0	< 20.0
Selenium (dissolved)	µg/l	10	UKDW	2.3	1.6
Tin (dissolved)	µg/l	10	EQS Estuary & Coastal Waters	0.45	0.32

				CP1	CP2
				Underlying groundwater table within chalk aquifer	Underlying groundwater table within chalk aquifer
Substance		**Screening Criteria**			
Vanadium (dissolved)	µg/l	60	EQS Inland Waters	0.3	< 0.2
Zinc (dissolved)	µg/l	5000	UKDW	25	46
Calcium (dissolved)	mg/l			100	120
Magnesium (dissolved)	mg/l			6.8	7.7
Potassium (dissolved)	mg/l			1.7	3.1
Sodium (dissolved)	mg/l	170000	EQS Inland Waters	84	40
Benzene	µg/l	30	EQS Inland Waters	< 1.0	< 1.0
Toluene	µg/l	50	EQS Inland Waters	< 1.0	< 1.0
Ethylbenzene	µg/l	20	EQS Inland Waters	< 1.0	< 1.0
p & m-xylene	µg/l	30	EQS Inland Waters	< 1.0	< 1.0
o-xylene	µg/l	30	EQS Inland Waters	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	9200	Dutch Intervention Value	< 1.0	< 1.0
Mineral Oil (C10 - C40)	µg/l	600	Dutch Intervention Value	< 10.0	< 10.0
Diesel Range Organics (C10 - C25)	µg/l	10	UKDW	< 10	< 10
TPH1 (C10 - C40)	µg/l	10	UKDW	< 10	< 10
TPH2 (C6 - C10)	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	30	Dutch Intervention Value	< 10	< 10
TPH-CWG - Aromatic >C7 - C8	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aromatic >C8 - C10	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aromatic >C10 - C12	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	UKDW	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	UKDW	< 10	< 10
Chloromethane	µg/l	160	USEPA	< 1.0	< 1.0
Chloroethane	µg/l	4.6	USEPA	< 1.0	< 1.0

				CP1	CP2
				Underlying groundwater table within chalk aquifer	Underlying groundwater table within chalk aquifer
Substance		**Screening Criteria**			
Bromomethane	µg/l	8.7	USEPA	< 1.0	< 1.0
Vinyl Chloride	µg/l	0.5	UKDW	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1300	USEPA	< 1.0	< 1.0
1,1-dichloroethene	µg/l	10	Dutch Intervention Value	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l			< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	20	Dutch Intervention Value	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	9200	Dutch Intervention Value	< 1.0	< 1.0
1,1-dichloroethane	µg/l	900	Dutch Intervention Value	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	80	Dutch Intervention Value	< 1.0	< 1.0
Trichloromethane	µg/l	12	EQS Inland Waters	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	100	EQS Inland Waters	< 1.0	< 1.0
1,2-dichloroethane	µg/l	10	EQS Inland Waters	< 1.0	< 1.0
1,1-Dichloropropene	µg/l			< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	20	Dutch Intervention Value	< 1.0	< 1.0
Benzene	µg/l	30	EQS Inland Waters	< 1.0	< 1.0
Tetrachloromethane	µg/l	3	UKDW	< 1.0	< 1.0
1,2-dichloropropane	µg/l	80	Dutch Intervention Value	< 1.0	< 1.0
Trichloroethene	µg/l	10	EQS Inland Waters	< 1.0	< 1.0
Dibromomethane	µg/l	0.0056	USEPA	< 1.0	< 1.0
Bromodichloromethane	µg/l	60	WHO	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	0.4	USEPA	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	0.4	USEPA	< 1.0	< 1.0
Toluene	µg/l	50	EQS Inland Waters	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	400	EQS Inland Waters	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	80	Dutch Intervention Value	< 1.0	< 1.0
Dibromochloromethane	µg/l	100	WHO	< 1.0	< 1.0
Tetrachloroethene	µg/l	10	EQS Inland Waters	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	0.4	WHO	< 1.0	< 1.0
Chlorobenzene	µg/l	110	USEPA	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	70	USEPA	< 1.0	< 1.0
Ethylbenzene	µg/l	20	EQS Inland Waters	< 1.0	< 1.0
p & m-xylene	µg/l	30	EQS Inland Waters	< 1.0	< 1.0
Styrene	µg/l	50	EQS Inland Waters	< 1.0	< 1.0
Tribromomethane	µg/l	630	Dutch Intervention Value	< 1.0	< 1.0
o-xylene	µg/l	30	EQS Inland Waters	< 1.0	< 1.0

				CP1	CP2
				Underlying groundwater table within chalk aquifer	Underlying groundwater table within chalk aquifer
Substance		**Screening Criteria**			
1,1,2,2-Tetrachloroethane	µg/l	70	USEPA	< 1.0	< 1.0
Isopropylbenzene	µg/l	660	USEPA	< 1.0	< 1.0
Bromobenzene	µg/l	20	USEPA	< 1.0	< 1.0
N-Propylbenzene	µg/l	240	USEPA	< 1.0	< 1.0
2-Chlorotoluene	µg/l	120	USEPA	< 1.0	< 1.0
4-Chlorotoluene	µg/l	100	USEPA	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	20	EQS Inland Waters	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	240	USEPA	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	12	USEPA	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	240	USEPA	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	20	EQS Inland Waters	< 1.0	< 1.0
P-Isopropyltoluene	µg/l			< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	20	EQS Inland Waters	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	20	EQS Inland Waters	< 1.0	< 1.0
Butylbenzene	µg/l			< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l			< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	0.4	EQS Inland Waters	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	EQS Inland Waters	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l			< 1.0	< 1.0
Aniline	µg/l	12	Dutch Intervention Value	< 0.05	< 0.05
Phenol	µg/l	30	EQS Inland Waters	< 0.05	< 0.05
2-Chlorophenol	µg/l	50	EQS Inland Waters	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.01	USEPA	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l			< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l			< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l			< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.27	USEPA	< 0.05	< 0.05
2-Methylphenol	µg/l	100	EQS Inland Waters	< 0.05	< 0.05
Hexachloroethane	µg/l	4.8	USEPA	< 0.05	< 0.05
Nitrobenzene	µg/l	3.4	USEPA	< 0.05	< 0.05
4-Methylphenol	µg/l	100	EQS Inland Waters	< 0.05	< 0.05
Isophorone	µg/l	71	USEPA	< 0.05	< 0.05
2-Nitrophenol	µg/l	20	EQS Inland Waters	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	730	USEPA	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	10	USEPA	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.4	EQS Inland Waters	< 0.05	< 0.05

				CP1	CP2
				Underlying groundwater table within chalk aquifer	Underlying groundwater table within chalk aquifer
Substance		**Screening Criteria**			
Naphthalene	µg/l	10	EQS Inland Waters	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	20	EQS Inland Waters	< 0.05	< 0.05
4-Chloroaniline	µg/l	150	USEPA	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.1	EQS Inland Waters	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	40	EQS Inland Waters	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	10	Dutch Intervention Value	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	10	Dutch Intervention Value	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	2	USEPA	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	490	USEPA	< 0.05	< 0.05
Dimethylphthalate	µg/l	800	EQS Inland Waters	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.099	USEPA	< 0.05	< 0.05
Acenaphthylene	µg/l	210	USEPA	< 0.01	< 0.01
Acenaphthene	µg/l	400	USEPA	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.099	USEPA	< 0.05	< 0.05
Dibenzofuran	µg/l	12	USEPA	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	350	Dutch Intervention Value	< 0.05	< 0.05
Diethyl phthalate	µg/l	200	EQS Inland Waters	< 0.05	< 0.05
4-Nitroaniline	µg/l	3.2	USEPA	< 0.05	< 0.05
Fluorene	µg/l	2200	USEPA	< 0.01	< 0.01
Azobenzene	µg/l	0.61	USEPA	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l			< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.03	EQS Inland Waters	< 0.05	< 0.05
Phenanthrene	µg/l	40	USEPA	< 0.01	< 0.01
Anthracene	µg/l	0.02	EQS Inland Waters	< 0.01	< 0.01
Carbazole	µg/l	3.4	USEPA	< 0.05	< 0.05
Dibutyl phthalate	µg/l	8	EQS Inland Waters	< 0.05	< 0.05
Anthraquinone	µg/l			< 0.05	< 0.05
Fluoranthene	µg/l	0.02	EQS Inland Waters	< 0.01	< 0.01
Pyrene	µg/l	180	USEPA	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	20	EQS Inland Waters	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.5	Dutch Intervention Value	< 0.01	< 0.01
Chrysene	µg/l	0.2	Dutch Intervention Value	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.1	UKDW	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.1	UKDW	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	UKDW	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.1	UKDW	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.0092	USEPA	< 0.01	< 0.01

				CP1	CP2
				Underlying groundwater table within chalk aquifer	Underlying groundwater table within chalk aquifer
Substance		**Screening Criteria**			
Benzo(ghi)perylene	µg/l	0.1	UKDW	< 0.01	< 0.01

Slightly elevated concentrations of ammonium as NH_4 were recorded in waters taken from both CP1 (590µg/l) and CP2 (540µg/l). In addition, a slightly elevated concentration of mercury (dissolved) was encountered in waters taken from CP2 (0.58µg/l). These slightly elevated exceedances are not considered significant to warrant further investigations or remedial work. Further discussions with Environment Agency and Local Authority may be required.

No other elevated concentrations were encountered in the waters sampled and tested.

10. GEOTECHNICAL TESTING RESULTS

10.1 LABORATORY TEST RESULTS

A representative selection of soil samples were chosen for geotechnical testing. Geotechnical testing was undertaken by a UKAS accredited laboratory and comprised the following:

- Moisture content and index testing
- Unconsolidated undrained triaxial compression testing
- Dry density and saturation moisture content of chalk
- Moisture condition value (MCV)
- Moisture content and dry density relationship (compaction 2.5kg and 4.5kg rammer method)
- Particle size distribution (PSD) analysis (sedimentation by pipette)
- Sulphate content of 2:1 water soil extract, pH value and total sulphate as SO_4.of soils (concrete classification testing)

The concrete classification testing results are included in Appendix G and the geotechnical laboratory results are included in Appendix I.

10.1.1 Moisture Content and Index Testing

Representative samples were tested to determine the natural moisture content (NMC), the plastic limit (PL), the liquid limit (LL) and the plasticity index (PI) of the natural superficial deposits.

A summary of the testing undertaken is presented in the following tables:

TABLE 27: SUMMARY OF INDEX TESTING

Stratum	Material type	Range (min-max)					No of tests
		NMC (%)	LL (%)	PL (%)	PI	LI	
Natural Superficial Deposits	Clay	13 - 23	22 - 46	12 - 21	9 - 25	-0.17 – 0.80	19

TABLE 28: SUMMARY OF ATTERBERG CLASSIFICATION AND MODIFIED PI

Stratum	Atterberg Classification Range	Calculated Modified I'_P	Calculated Volume Change Potential based on Modified I'_P
Natural Superficial Deposits	CL - CI	8.5 – 25.0	Low to medium

Liquid limit, plastic limit and plasticity index testing indicate the tested natural superficial clay deposits are of a low to immediate plasticity (Class CL and CI) with a calculated low to medium volume change potential based on a modified plasticity index in accordance with BRE Digest 240 (1993).

In accordance with BRE Digest 412 (1996), comparison of the soil water contents with soil index properties was undertaken in order to assess the presence of potentially desiccated soils. As per BRE Digest 412, an indicator of the onset of significant desiccation occurs when the soils water content is at 0.4 times the liquid limit. When the water content is less than 0.4 times the liquid limit the soil can be classed as being significantly desiccated. The following table summarises the assessment of potentially desiccated soils as per BRE Digest 412 guidelines.

TABLE 29: SUMMARY OF ASSESSMENT OF POTENTIALLY DESICCATED SOILS

Exploratory Hole ID	Depth	Strata Type	NMC (%)	LL (%)	0.4 of LL (%)	Desiccation Assessment
CP1	0.50m	Natural superficial deposits	18	41	16.4	Soils NMC only 1.6% greater than 0.4 of LL indicating the possible onset of desiccation
CP2	0.50m	Natural superficial deposits	20	44	17.6	Not desiccated
CP3	1.95m	Natural superficial deposits	18	30	12	Not desiccated
WS1	1.00m	Natural superficial deposits	21	44	17.6	Not desiccated
WS2	0.50m	Natural superficial deposits	21	46	18.4	Not desiccated
WS4	1.50m	Natural superficial deposits	17	30	12	Not desiccated
WS5	1.00m	Natural superficial deposits	19	40	16	Not desiccated
WS6	2.00m	Natural superficial deposits	17	25	10	Not desiccated
WS7	1.20m	Natural superficial deposits	15	28	11.2	Not desiccated
WS8	0.75m	Natural superficial deposits	22	40	16	Not desiccated
WS9	0.70m	Natural superficial	19	33	13.2	Not desiccated

Exploratory Hole ID	Depth	Strata Type	NMC (%)	LL (%)	0.4 of LL (%)	Desiccation Assessment
		deposits				
WS10	0.50m	Natural superficial deposits	20	46	18.4	Soils NMC only 1.6% greater than 0.4 of LL indicating the possible onset of desiccation
WS11	0.80m	Natural superficial deposits	23	44	17.6	Not desiccated
WS12	1.00m	Natural superficial deposits	23	40	16	Not desiccated
WS13	1.20m	Natural superficial deposits	17	33	13.2	Not desiccated
WS14	0.50m	Natural superficial deposits	19	38	15.2	Not desiccated
WS14	1.00m	Natural superficial deposits	13	27	10.8	Not desiccated
WS15	1.00m	Natural superficial deposits	15	26	10.4	Not desiccated
WS15	1.50m	Natural superficial deposits	20	22	8.8	Not desiccated

The above assessment indicates the tested soils are not desiccated as the soils water contents are greater than 0.4 times the respective liquid limit. However, soils tested from CP1 and WS10 at 0.50m exhibit natural moisture contents only 1.6% greater than 0.4 times the respective liquid limit indicating the possible onset of desiccation. This assessment is confirmed by the soils respective calculated liquidity index (LI) which confirms the presence the possible onset of desiccation as well as expansion potential.

10.1.2 Moisture Content Testing

An indication of the penetration of weathering is generally obtained by inspection of moisture content variation with depth. For natural superficial clay soils when moisture content is plotted against depth the test results do not show a linear relationship of generally decreasing with depth but rather exhibit a relationship of being variable both vertically and horizontally across the site. This relationship indicates that the effects of weathering (physical and chemical degradation) and are variable across the site, both vertically and horizontally.

10.1.3 Unconsolidated Undrained Tri-axial Compression Testing

Two unconsolidated undrained tri-axial compression tests were undertaken on U100 undisturbed samples extruded from clay soils of the natural superficial deposits. The samples were tested as multi stage at three effective cell pressures selected on the basis of the depth the sample was taken and the strata type. A summary of the tri-axial testing is summarised in the following table.

TABLE 30: SUMMARY OF UNDRAINED COMPRESSION TEST RESULTS - CLAYGATE MEMBER

Exploratory Hole ID	Depth (m)	Natural Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Selected Cell Pressure(s) (kPa)	Cu Range (kPa)	Average Cu (kPa)	Mode of Failure	Indicated Soil Strength
CP1	1.50	19	2.12	1.79	30,60,120	58 - 62	60	Plastic	Firm/medium strength
CP2	1.50	17	2.09	1.79	30,60,120	34 - 42	38	Compound	Soft/low strength

The tri-axial test results undertaken on the natural superficial clay soils indicate undrained shear strengths of 38kPa (soft/low strength) and 60kPa (firm/medium strength).

The results of the tri-axial testing, which were carried out over a range of effective confining stresses, generally indicate that the determined effective friction angle decreases as higher confining stress are applied. An increase and a decrease in friction angle are also noted with disaggregation, which is associated with decreasing moisture content at failure.

10.1.4 Moisture Condition Value (MCV) Testing

Three moisture condition value (MCV) tests were undertaken upon bulk-disturbed soil samples of the natural superficial deposits in order to assess their respective acceptability for use in earthworks construction if required. The MCV test curve plots are included within Appendix G and the results summarised in the below table.

TABLE 31: SUMMARY OF MCV RESULTS

Exploratory hole ID	Depth (m)	Strata Description	Moisture Content (%)	MCV
TP4	0.50m	Natural superficial deposits – sandy silty CLAY	21	10.7
TP16	1.00m	Natural superficial deposits – slightly sandy slightly gravelly silty CLAY with occasional COBBLES	18	10.1
TP19	0.90m	Natural superficial deposits – slightly sandy slightly gravelly silty CLAY	22	10.9

Review of the MCV test results for natural superficial clay soils indicate the natural moisture contents are consistently higher (ranging from 7.9% to 11.1%) than the soils respective MCV as indicated by the MCV plot, in which the change in penetration is uniformly high. This indicates that the soils may be unsuitable within their current state for direct use within earthwork construction and appropriate processing may be required in order to reduce the soils natural moisture before placement as engineered fill.

10.1.5 Moisture Content and Dry Density Relationship

Five moisture content and dry density relationship tests (compaction 2.5kg and 4.5kg rammer method respectively) were undertaken on representative natural superficial clay deposits. The results of the compaction testing are summarised in the below table.

TABLE 32: MOISTURE CONTENT AND DRY DENSITY RELATIONSHIP TESTING RESULTS

Exploratory Hole ID	Depth	Strata Description	Maximum Dry Density (Mg/m^3)	Natural Moisture Content (%)	Optimum Moisture Content (%)
TP7	0.60m	Natural superficial deposits – slightly sandy to sandy slightly gravelly silty CLAY with occasional COBBLES	1.88	16	11.8
TP13	1.00m	Natural superficial deposits – Slightly sandy slightly	1.91	18	11
TP15	0.80m	Natural superficial deposits – slightly sandy slightly gravelly silty CLAY with occasional	1.79	15	14.7

Exploratory Hole ID	Depth	Strata Description	Maximum Dry Density (Mg/m^3)	Natural Moisture Content (%)	Optimum Moisture Content (%)
		COBBLES			
TP17	1.20m	Natural superficial deposits – slightly sandy to sandy slightly gravelly silty CLAY	1.81	13	14.8
TP18	1.40m	Natural superficial deposits – slightly sandy to sandy slightly gravelly silty CLAY	1.90	16	13.1

The test results indicate clays soils of the natural superficial deposits have natural moisture contents 0.3% to 7.0% of the optimum moisture content. The results of the compaction testing also confirm those of the MCV tests indicating that soils within certain locations on site within it's 'as dug' state is unsuitable for use as engineered fill. Suitable processing will be required in order for the material to meet the appropriate specification.

10.1.6 Particle Size Distribution (PSD) Analysis

Five particle size distribution (PSD) tests were undertaken on representative clay soils of the natural superficial deposits. The analysis method was wet sieving analysis with pipette analysis. A summary of the grading analyses is presented in the following table.

TABLE 33: SUMMARY OF GRADING ANALYSIS

Stratum & Material Type	Range of Particle Sizes % (min-max)					No of tests
	Cobbles	Gravel	Sand	Silt	Clay	
Natural Superficial Deposits – Fine grained soils	0.0	1.4 – 2.9	10.1 – 22.8	49.3 – 65.6	19.4 – 25.0	5

The PSD analyses generally confirm the material descriptions provided on the exploratory hole logs.

10.1.7 Dry Density and Saturation Moisture Content of Chalk

The most easily measured chalk property that is indicative of its mass behaviour beneath a foundation is the dry density (or porosity) of the intact blocks of chalk. For engineering purposes, a four-fold classification has been adopted that corresponds with changes in engineering behaviour. The following table shows the intact dry density chalk scales as described within CIRIA C574 (2002).

TABLE 34: INTACT DRY DENSITY OF CHALK

Density Scale	Intact Dry Density (Mg/m3)	Porosity*	Saturation Moisture Content*
Low density	<1.55	>0.43	>27.5%
Medium density	1.55 - 1.70	0.43 - 0.37	27.5% - 21.8%
High density	1.70 - 1.95	0.37 - 0.28	21.8% - 14.3%
Very high density	>1.95	<0.28	<14.3%

* = Based on the specific gravity of calcite of 2.70

Four samples retrieved from grade Dc weathered chalk at varying depths were tested across the site when chalk was encountered. A summary of the dry density and saturation moisture contents are outlined within the following table.

TABLE 35: DRY DENSITY, MOISTURE CONTENTS AND POROSITY RESULTS

Exploratory Hole ID	Depth	Bulk Density (Mg/m^3)	Natural Moisture Content (%)	Dry Density (Mg/m^3)	Saturated Moisture Content (%)	Porosity (%)	Assigned Density
CP1	11.50m	2.01	25	1.61	25	40	Medium
CP2	13.50m	2.03	23	1.64	24	39	Medium
CP3	12.00m	1.95	25	1.56	27	42	Medium
WS14	3.90m	1.97	26	1.59	26	41	Medium

The results indicate the tested chalk samples are of a consistent medium density. With reference to the appropriate strength terminology this indicate the chalk is consistently weak.

10.1.8 Concrete in Aggressive Ground Testing

Twenty soil samples were tested to assess their chemical properties in relation to their potential effect on buried concrete structures as per BRE guidelines. The results of the testing are included within Appendix G and are summarised within the following table.

TABLE 36: CONCRETE IN AGGRESSIVE GROUND TESTING RESULTS

Exploratory hole ID	Depth	Sulphate Content of 2:1 Water: Soil Extract (g/l)	pH Value	Total Potential Sulfate as (SO_4 %)#
WS1	0.80m	0.0110	7.5	0.039
WS2	0.50m	0.0140	8.3	0.030
WS3	0.60m	0.0086	7.8	0.045
WS4	1.00m	0.0099	8.5	0.033
WS5	0.90m	0.0145	8.4	0.024
WS6	1.10m	0.0079	8.7	0.027
WS7	0.75m	0.0081	8.5	0.033
WS8	1.00m	0.0120	8.4	0.030
WS9	0.70m	0.0130	8.6	0.036
WS11	0.70m	0.0170	8.1	0.013
WS12	1.00m	0.0130	8.5	0.027
WS14	1.50m	0.0100	8.7	0.033
WS16	1.00m	0.0110	8.5	0.030
CP1	1.00m	0.0110	8.5	0.033
CP1	3.00m	0.0130	8.8	0.048
TP1	0.20m	0.0110	6.4	0.075
TP6	0.35m	0.0120	5.9	0.078
TP10	0.05m	0.0180	7.4	0.186
TP13	0.60m	0.0081	6.4	0.057
TP18	0.35m	0.0130	6.2	0.063

= Total potential sulfate (SO_4 %) calculated using the stoichiometric equation as per BRE SD 1:2005 guidance.

10.2 IN –SITU TESTING

10.2.1 Standard Penetration Testing (SPTs)

Standard penetration tests (SPT's) were undertaken within all cable percussive boreholes from 1m and every metre thereafter for the first 5 metres and 1.5m intervals thereafter until the required hole termination depth. SPT's were also undertaken within the window sample holes from 1.00m thereafter until termination depth of 4.00m or refusal (SPT N value of 50 or greater).

The SPT N values range within each respective stratum is outlined within the following table. Calculated undrained shear strengths (c_u) derived from SPT N and characteristic plasticity values are outlined for cohesive strata.

TABLE 37: STANDARD PENETRATION TEST RESULTS

Stratum	SPT N Value Range	Calculated C_u Range (kPa)[#]	C_u based on SPT N value*	Indicated In Situ Density
Superficial Deposits - Clay soils	4 - 33	40 (firm) to 207 (very stiff)	Soft to very stiff	------
Superficial Deposits - Granular	No SPTs recorded			
Structureless Weathered Chalk (solid geology) – Grade Dm	5 ->50	------	------	------
Structureless Weathered Chalk (solid geology) – Grade Dc	6 - 16	------	------	------

[#] = calculated undrained shear strengths (c_u) derived from SPT N and plasticity (PI) values employing equation ($c_u = F_1$ N) as outlined within CIRIA Report 143 (1995).

** Based on correlation between N value and assumed insitu shear strength outlined by Stroud (1974).*

SPT's were not recorded within granular natural superficial deposits, this was due to the latter not coinciding with the appropriate SPT N test interval depth.

SPT N values recorded within superficial clay deposits ranged from 4 to 33. Based on the correlation outlined by Stroud (1974) this approximates to soils of a soft to very stiff undrained shear strength. Calculated undrained shear strength values derived from SPT N values and plasticity values employing the formula c_u = F1 x N as outlined within CIRIA Report 143 (1995) range from 40kPa to 207kPa indicating clays of a soft to very stiff strength.

SPT N values recorded within weathered structure grade Dm chalk ranged from 5 to >50, while values recorded within grade Dc chalk ranged from 6 to 16. It should be noted for chalk in which N values are less than 25 it is not possible to distinguish on the basis of SPT N value results between low density relatively unweathered chalk or medium to high density chalk with open discontinuities. In addition, flint cobbles and/or bands (as encountered during this investigation) can result in erroneously high N values within weathered structureless chalk.

SPT results within chalk do not correlate well with many of the parameters, such as mass compressibility, that are required for engineering design. Therefore, SPT results cannot be expected to yield good predictions of the engineering behaviour of chalk. Consequently, SPT N values have not

been employed in the derivation of appropriate geotechnical design parameters for shallow foundation design.

10.2.2 Hand Shear Vane Tests

Hand shear vane tests were undertaken within all trial pits when cohesive soils were encountered at minimum test intervals of 0.30m. Full details of the hand shear vane test results are presented within the trial pit logs included within Appendix F. The following table summarises the results as obtained in each respective stratum type.

TABLE 38: HAND SHEAR VANE TEST RESULTS

Stratum	C_u Range (kPa)	Indicated Soil Strength
Natural Superficial Deposits	43 - 121	Firm medium strength to stiff high strength

10.2.3 Dynamic Cone Penetrometer (DCP) Testing

Ten in-situ light dynamic cone penetration tests (LDCPT) were undertaken in order to assess potential sub grade soils for proposed access road and pavement design.

A review of the appropriate trial pit logs indicate the dynamic cone penetrometer tests were undertaken within topsoil (granular) and natural superficial deposits (clays).

At the time of the investigation formation levels in relation to existing ground levels were not known, therefore all tests were undertaken from existing ground level.

Employing the relationship between the numbers of blows per 100mm the following table presents the range of calculated CBR values for each respective test location.

The DCP results and graphical plot of blows versus depth are included within Appendix J.

TABLE 39: DYNAMIC CONE PENETROMETER TESTING RESULTS

Test ID	Calculated CBR Range (%)	Mode Lower Bound CBR (%)
DCP1	1 – 6	3.5
DCP2	1 – 3.5	3.5
DCP3	3.5 – 25[#]	6
DCP4	1 – 25[#]	6
DCP5	1 – 6	3.5
DCP6	3.5 – 10	3.5
DCP7	0.5 – 3.5	3.5
DCP8	3.5 – 10	3.5
DCP9	1 – 18	3.5
DCP10	1 – 10	3.5

[#] = Upper end values appear to be erroneously high. This may be attributable to friction between the dynamic cone rods and the ground, or a possible obstruction such as gravel or cobbles.

11. GEOTECHNICAL MATERIAL PARAMETERS

Based on the ground conditions encountered, in-situ and laboratory testing, published data and from engineering experience the following table highlights the suitable parameters for each strata encountered.

TABLE 40: GEOTECHNICAL MATERIAL PARAMETERS

Stratum	Parameter	Value	References
Natural Superficial Deposits (*clay, soft/low strength to very stiff/very high strength)*	Bulk density (Mg/m^3)	1.7 - 2.3	Carter, M. and Bentley, S. (1991): Correlation of Soil Properties. Pentech Press Ltd. Barnes, GE (2010): Soil Mechanics – Principals and Practice, Macmillan Press Limited. Site specific laboratory testing data
	Undrained shear strength (kPa)	38 - 207	Quantitative descriptions on exploratory hole logs Calculation as outlined within CIRIA Report 143 (1995) Hand shear vane test results Site specific laboratory testing data
	Angle of Friction (°)	26 - 33	Empirical relationship to plasticity tests in conjunction with Published Value as outlined within Carter, M. and Bentley, S. (1991): Correlation of Soil Properties. Pentech Press Ltd.
	Coefficient of volume compressibility, m_v (m^2/MN)	0.05 – 0.25 low to medium compressibility class)	Calculation as outlined within CIRIA Report 143 (1995) Carter, M. and Bentley, S. (1991): Correlation of Soil Properties. Pentech Press Ltd.
	Subgrade stiffness modulus – E (MPa)	11.3 – 138.1	Calculation outlined within Interim Advice Note 73/06 Revision 1 (2009) – Design Guidance for Road Pavement Foundations (Draft HD25) based on CBR range as derived from DCP test results
	Modulus of subgrade reaction – k (pci)	25 - 290	Correlation of CBR range (as derived from DCP results) as outlined within Yang H. Huang (2003): Pavement Analysis and Design, Prentice Hall.
Natural Superficial Deposits (*granular, assumed medium dense*	Bulk density (Mg/m^3)	1.9 – 2.1	Carter, M. and Bentley, S. (1991): Correlation of Soil Properties. Pentech Press Ltd

Stratum	Parameter	Value	References
based on trial pit wall stability and ease of excavation – no SPTs undertaken within granular superficial deposits)	Angle of Friction (°)	30 - 34	Carter, M. and Bentley, S. (1991): Correlation of Soil Properties. Pentech Press Ltd
Weathered Chalk - Structureless grade Dc *(medium density)*	Bulk density (Mg/m^3)	1.95 – 2.03	Site specific laboratory testing data
	Dry density (Mg/m^3)	1.56 – 1.64	Site specific laboratory testing data
	Saturation moisture content (%)	24 - 27	Site specific laboratory testing data
	Porosity (%)	39 - 42	Site specific laboratory testing data
	Approximate unconfined compressive stress (UCS) based on CIRIA chalk density (MN/m2)	<5	Lord et all (2002) CIRIA C574 Engineering in Chalk
	Angle of Friction (°)	25	Waltham, T. (2002). Foundation of Engineering Geology, 2nd Edition. Spon Press, London.
	Yield modulus of chalk (E_Y) - (MN/m^2)	20 - 30	Lord et all (1994) CIRIA Project Report 11 Foundations in Chalk
	Yield stress of chalk (q_Y) - (kN/m^2)	250 - 500	Lord et all (1994) CIRIA Project Report 11 Foundations in Chalk

12. GEOTECHNICAL ASSESSMENT AND DISCUSSION

12.1 FOUNDATION DESIGN

The investigation has encountered granular topsoil (to a maximum depth of 0.44m bgl) overlying natural superficial granular and soft low strength to very stiff very high strength clay deposits (encountered to a maximum depth of 4.80m bgl). The solid geology of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) was encountered within a number of exploratory holes underlying the natural superficial deposits and comprised weathered structureless grade Dm and Dc chalk (encountered to a maximum depth of 20.00m bgl – depth of hole termination).

The topsoil horizon, soft and loose natural superficial deposits and weathered structure-less grade Dm chalk do not constitute a reliable founding medium for any form of traditional foundation or ground bearing floor slab design. It is therefore recommended that foundation loads should be transferred to more reliable and competent underlying natural soils.

Foundations for the proposed structures could be constructed using strip footings or isolated pad bases bearing upon the natural clay and granular soils and structure-less grade Dc medium density chalk. These foundations can be deepened when required using mass concrete trench fill where soft and loose natural superficial deposits and structureless grade Dm chalk is encountered.

Subject to the recommendations outlined in section 12.6 and from the evidence of this investigation trench fill foundations may need to extend to depths of at least **0.90m** below ground level to make allowance for 0.20m over excavation in order to be founded within clay soils of a minimum undrained shear strength of 50 kPa.

Providing the following soils are exposed at formation level these strata should be capable of supporting the following allowable bearing capacities as outlined in the below table for long term total settlements of less than 25mm and differential settlements less than 15mm.

- Natural clay soils of consistent firm undrained shear strength (c_u >50kPa).
- Natural granular soils of a minimum medium dense in-situ density (angle of friction (°) >30)
- Structureless grade Dc medium density chalk.

TABLE 41: CALCULATED ALLOWABLE BEARING CAPACITIES

Design Undrained Shear Strength (clay soils)	Design Angle of Friction (granular soils)	Design CIRIA Chalk Grade	Foundation Type			
			Strip Footings			Pads
			0.45m wide	0.60m wide	0.90m wide	1.00m x 1.00m
50kPa	>30	Dc – medium density	115KN/m^2	110KN/m^2	100KN/m^2	125KN/ m^2

Upon exposure a suitably qualified/experienced person should carefully inspect the formation soils. Any very loose/loose, very soft/soft strata or weathered Dm chalk should be over excavated and replaced by well-compacted, well-graded granular material or lean mix concrete.

It is recommended all formation soils, once exposed, be protected with a blinding layer of concrete in order to prevent deterioration.

In addition, due to the heterogeneous nature of the natural superficial deposits and solid geology it is recommended that light mesh reinforcement be provided top and bottom within the footings.

12.2 Ground Bearing Floor Slabs

Ground bearing floor slabs should be feasible with the following assumptions:

- The floor slab is not within influencing distance of trees.
- The floor slab is not founded within desiccated soils and/or soils exhibiting the onset of desiccation.
- All topsoil, made ground (if encountered), very soft to soft and very loose to loose natural soils and structure-less grade Dm chalk is removed from beneath the plan area of the proposed ground-bearing floor slab.
- Providing medium dense granular soils, clay soils of a consistent firm undrained shear strength (c_u greater than 50) and structure-less grade Dc low to medium density chalk is exposed at formation level these strata are capable of supporting a ground floor slab employing 15kN/m^2 for settlements of less than 25mm.

It may prove necessary when adopting a ground-bearing slab to build up ground levels of the underside of the slab and it is recommended that a suitably imported inert compacted granular material should be used.

All formation soils should be carefully inspected and proof rolled. Any soft/very loose pockets, soft/very loose deeper made ground or significant roots should be removed and replaced with a well compacted granular hardcore. Mesh reinforcement should also be provided.

Once the formation soils have been exposed and suitably inspected the soils should be covered by a binding layer of concrete to prevent any deterioration or heaving.

The formation level should not be excavated and exposed during periods of heavy periods of precipitation.

Where made ground or poor natural soils remain, where heave can occur within the area bounded by the foundation (for example due to the presence of desiccated soils) and/or the proposed structure is within influencing distance of trees a fully suspended slab is required.

Where suspended floor slabs are required precast concrete, timber or in-situ concrete are acceptable design options. The minimum void dimensions under the suspended floor slab should consider the presence of clays of a medium volume change potential.

12.3 GROUNDWATER

Groundwater may be encountered during excavation, particularly as perched groundwater within the encountered superficial granular soils. Based on experience inflow rates of slow to fast may be encountered.

However, the depth and extent of groundwater may vary with the incidence of rainfall. If only minor influxes are revealed, then a flexible system of pumping from sumps would be sufficient to deal with groundwater. At best, the use of such a system could be sporadic but may in the worst case necessitate continuous pumping.

12.4 EXCAVATIONS

Based on the ground conditions encountered it is anticipated excavations should readily be achieved adopting standard excavation plant.

Based on the ground conditions encountered during the ground investigation it is anticipated excavations should readily be achieved adopting standard excavation plant.

Full support of all excavations is recommended both during excavation and construction to prevent collapse and provide safe-working conditions, particularly should it be necessary for personnel to enter.

Formation levels should not be excavated and exposed during periods precipitation regardless of intensity.

All excavations should be undertaken in accordance with CIRIA Report 97.

12.5 CONCRETE CLASSIFICATION

BRE concrete classification tests on retrieved soil samples has been undertaken. The results were analysed in accordance with BRE Special Digest 1 'Concrete in aggressive ground' 2005 in order to classify the concrete for the proposed development.

A design sulphate class of DS-1 and an ACEC class of AC-1 is deemed appropriate for the site.

12.6 SHRINKABLE CLAY SOILS, BUILDING NEAR TREES AND DESICCATION OF EXISTING SITE SOILS

Index property tests have been undertaken upon the natural superficial clay deposits as the modified plasticity index can be used as an indicator of soil volume change potential.

Liquid limit, plastic limit and plasticity index testing indicate the tested natural superficial clay deposits are of a low to immediate plasticity (Class CL and CI) with a calculated low to medium volume change potential based on a modified plasticity index in accordance with BRE Digest 240 (1993).

In accordance with BRE Digest 412, comparison of the soil water contents with soil index properties was undertaken in order to assess the presence of potentially desiccated soils. As per BRE Digest 412, an indicator of the onset of significant desiccation occurs when the soils water content is at 0.4 times the liquid limit. When the water content is less than 0.4 times the liquid limit the soil can be classed as being significantly desiccated.

Geotechnical laboratory testing results indicate the tested soils are not desiccated as the soils water contents are greater than 0.4 times the respective liquid limit. However, soils tested from CP1 and WS10 at 0.50m exhibit natural moisture contents only 1.6% greater than 0.4 times the respective liquid limit indicating the possible onset of desiccation. This assessment is confirmed by the soils respective

ARUN DISTRICT COUNCIL BE/22/18/DOC

calculated liquidity index (LI) which confirms the presence the possible onset of desiccation as well as expansion potential.

Foundations should not bear onto clay soils if they are affected by seasonal desiccation which could result in movement. Due to the presence of soils of a medium volume change potential seasonal desiccation can cause movement to a depth of up to 0.90m below ground level. Therefore, it is recommended foundations which are outside the zone of influence of existing and/or proposed trees be extended to a minimum depth of 0.90m bgl. The depth of 0.90m should be measured from either the original ground level where seasonal desiccation of the soils is either unknown or is known to be present or raised ground levels (if proposed) as the geotechnical laboratory testing indicates the soils are not desiccated providing that the foundations are founded within competent strata (see section 12.1).

In addition, it is recommended that an appropriate assessment be undertaken in accordance with NHBC guidelines (4.2 'Building near trees') when the final layout/location of proposed and existing trees are known. This is required in order to determine the minimum foundation depth required for each proposed structure to accommodate the effects of existing and proposed trees and hedgerows on shrinkable soils without excessive movement.

12.7 Roads and Pavement Assessment

Based on the calculated values obtained from in-situ light dynamic cone penetration tests (LDCPT) it is recommended that a preliminary design California Bearing Ratio of 3.5% (equivalent sub grade Stiffness Modulus of 39MPa) be used for design of the road and pavement foundations across the site.

It is recommended all formation levels are inspected and proof rolled prior to the construction of roads or pavements. Cobbles and large roots should also be removed if encountered at formation level.

If the exposed sub grade soils appear unsuitable, for example, if saturated very soft-to-soft clays or very loose to loose granular soils are encountered, it is recommended these soils are excavated and replaced with compacted sub base material. The use of geotextiles may also be considered in such areas to reduce the road construction thickness and improve any poor sub grade soils.

The design CBR should be confirmed by in-situ tests prior to construction.

Excavation and exposure of clay soils at formation level may result in potential heaving. It is recommended that during construction the potential for moisture content changes within formation soils are kept to a minimum as follows:

- Excavation should not take place during any form of precipitation regardless of intensity.
- Surface water should not be allowed to enter any excavation or exposed formations level.
- If delays occur during construction, the exposed formation level should be protected by either a waterproof membrane, which can be removed once construction resumes or suitable placement of sub base material.

12.8 Reuse of Site Won Material within Earthworks Construction

Three moisture condition value (MCV) tests and five moisture content and dry density relationship (compaction 2.5kg and 4.5kg rammer method respectively) tests along with associated particle size distribution analysis were undertaken on respective natural superficial deposits in order to assess the suitability of site won material within earthworks construction.

The moisture condition value (MCV) tests for natural superficial clay soils indicate the natural moisture contents are consistently higher (ranging from 7.9% to 11.1%) than the soils respective MCV as indicated by the MCV plot, in which the change in penetration is uniformly high.

Moisture content and dry density relationship (compaction) tests indicate the natural superficial clay soils have natural moisture contents 0.3% to 7.0% of the optimum moisture content.

The results of the compaction testing also confirm those of the MCV tests indicating that soils within certain locations on site within it's 'as dug' state are unsuitable for use as engineered fill. The employment of site won material within earthworks construction is feasible; however, suitable processing will be required in order for the material to confirm to the required end product specification.

It is recommended that a dedicated earthworks method statement and specification is prepared prior to starting construction works if earthworks are required as part of the development.

13. Gas Risk Assessment

The gas monitoring undertaken has encountered elevated concentrations of carbon dioxide (maximum 2.3%) with zero measured flow rates (<0.1l/hr). No methane or depleted oxygen levels have been encountered. This indicates a gas screening value (GSV) of <0.07 l/h. For carbon dioxide and methane this corresponds to a gas characteristic situation of 1 (very low risk) and no further works are warranted (CIRIA Report C665). No special precautions in respect to gas protective measures are warranted.

14. CONTAMINATED LAND ASSESSMENT

14.1 POTENTIALLY SIGNIFICANT POLLUTION LINKAGES

A revised conceptual model comprising the identification and assessment of potentially significant pollutant linkages has been undertaken.

14.1 POTENTIAL SOURCES

Potential contamination sources identified from the ground investigation and chemical testing have been summarised in the following table.

TABLE 42: POTENTIAL CONTAMINATION SOURCES IDENTIFIED DURING SITE WORKS

Source	Location	Comments
No sources identified	N/A	No further works is recommended or warranted

14.2 RISK ASSESSMENT

The risk of significant harm or pollution of controlled waters has been assessed qualitatively as **low, medium** or **high** using the criteria shown in Appendix C.

A risk estimation matrix for all pollutant linkages identified is shown in the following table.

TABLE 43: REVISED CONTAMINATION ASSESSMENT BASED UPON RESULTS OF SITE WORK

Receptor	Sources	Risk	Justification
Existing site users	No sources identified	Low	
Future site users	No sources identified	Low	No sources identified therefore no further works is recommended
Construction workers	No sources identified	Low	Use of appropriate risk assessment and PPE
Property			
Site structures (concrete structures)	Concrete aggressive ground	Low	A design sulphate class of DS-1 and an ACEC class of AC-1 is deemed to be appropriate for the site
Safety of water supply pipes	No elevated hydrocarbons encountered	Low	No further work warranted
Controlled Waters			
Secondary A aquifer	No sources identified	Low	No further work warranted.
Principal aquifer	No sources identified	Low	No further work warranted.
Unspecified surface water features	No sources identified	Low	No further work warranted.
Unspecified surface water features	No sources identified	Low	No further work warranted.
Tertiary river	No sources identified	Low	No further work warranted.

15. CONCLUSIONS AND RECOMMENDATIONS

The Nott Group have been instructed by Landform Bognor Regis Limited to undertake a contaminated land and geotechnical assessment at an area of land located off Newbarn Lane, North Bersted, Bognor Regis, West Sussex.

The Nott Group has undertaken a review of available site information provided and developed a conceptual model. A ground investigation has been undertaken included cable percussive boreholes, window sample holes and machine excavated trial pits. This was followed up by geotechnical testing on selected soils samples, chemical testing on selected soil and groundwater samples as well as a programme of ground gas and groundwater level monitoring. A conceptual model for the site in accordance with the current Contaminated Land Legislation has been developed with the following conclusions and recommendations. In addition, a geotechnical appraisal has also been developed in respect to potential foundation solutions.

15.1 GROUND CONDITIONS ENCOUNTERED

The investigation has encountered granular topsoil (to a maximum depth of 0.44m bgl) overlying natural superficial granular and soft low strength to very stiff very high strength clay deposits (encountered to a maximum depth of 4.80m bgl). The solid geology of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) was encountered in a number of exploratory holes underlying the natural superficial deposits and comprised weathered structureless grade Dm and Dc chalk (encountered to a maximum depth of 20.00m bgl – depth of hole termination).

15.2 CONTAMINATION ASSESSMENT AND RECOMMENDATIONS

Based on the historical map review the site has been Greenfield or open fields from 1876 until the present day.

A number of exploratory holes have been advanced and no visual or olfactory evidence of contamination was noted.

No elevated soil concentrations of the determinants tested have been encountered and the risk of encountering contamination during development has been assessed as low. As a result, no therefore work is warranted or recommended with respect to soil contamination.

Slightly elevated concentrations of ammonium as NH_4 were recorded in waters taken from both CP1 (590µg/l) and CP2 (540µg/l). In addition, a slightly elevated concentration of mercury (dissolved) was encountered in waters taken from CP2 (0.58µg/l). These slightly elevated exceedances are not considered significant to warrant further investigations or remedial work. Further discussions with Environment Agency and Local Authority may be required.

Waste acceptance criteria (WAC) analysis undertaken upon representative natural superficial deposits indicates the tested samples can be classed as inert waste.

15.3 GEOTECHNICAL ASSESSMENT

The topsoil horizon, soft and loose natural superficial deposits and weathered structure-less grade Dm chalk do not constitute a reliable founding medium for any form of traditional foundation or ground bearing floor slab design. It is therefore recommended that foundation loads should be transferred to more reliable and competent underlying natural soils. Foundations for the proposed structures could be constructed using strip footings or isolated pad bases bearing upon the natural clay and granular soils and structure-less grade Dc medium density chalk. These could be deepened when required using

ARUN DISTRICT COUNCIL BE/22/18/DOC

mass concrete trench fill where soft and loose natural superficial deposits and structure-less grade Dm chalk is encountered.

Index property tests indicate the tested natural superficial clay deposits are of a low to immediate plasticity (Class CL and CI) with a calculated low to medium volume change potential based on a modified plasticity index in accordance with BRE Digest 240 (1993). Foundations should not bear onto clay soils if they are affected by seasonal desiccation which could result in movement. Due to the presence of soils of a medium volume change potential seasonal desiccation can cause movement to a depth of up to 0.90m below ground level. Therefore, it is recommended foundations which are outside the zone of influence of existing and/or proposed trees be extended to a minimum depth of 0.90m bgl. It is recommended that an appropriate assessment be undertaken in accordance with NHBC guidelines (4.2 'Building near trees') when the final layout/location of proposed and existing trees are known. This is required in order to determine the minimum foundation depth required for each proposed structure to accommodate the effects of existing and proposed trees and hedgerows on shrinkable soils without excessive movement.

Ground bearing floor slabs should be feasible providing the floor slab is not within influencing distance of trees, is not founded within desiccated soils, all topsoil, made ground (if encountered), very soft to soft and very loose to loose natural soils and structure-less grade Dm chalk is removed from beneath the proposed ground-bearing floor slab. Providing medium dense granular soils, clay soils of a consistent firm undrained shear strength (cu greater than 50) and structure-less grade Dc low density chalk is exposed at formation level these strata are capable of supporting a ground floor slab employing 15kN/m2 for settlements of less than 25mm. Where made ground or poor natural soils remain, a fully suspended slab will be required. Where suspended floor slabs are required precast concrete, timber or in-situ concrete are acceptable design options. The minimum void dimensions under the suspended floor slab should consider the presence of clays of a medium volume change potential.

Based on the ground conditions encountered, it is anticipated that excavations should readily be achieved adopting standard excavation plant. It is recommended full support of all excavations is undertaken during excavation and construction to prevent collapse and provide safe-working conditions particularly should it be necessary for personnel to enter.

Based upon the information obtained groundwater may be encountered during excavation particularly as perched groundwater. If only minor influxes are encountered, then a flexible system of pumping from sumps would be sufficient to deal with groundwater. At best, the use of such a system could be sporadic but may in the worst case necessitate continuous pumping.

A design sulphate class of DS-1 and an ACEC class of AC-1 is deemed appropriate for the site.

A preliminary design California Bearing Ratio of 3.5% (equivalent sub grade Stiffness Modulus of 39MPa) be used for design of the road and pavement foundations across the site.

The employment of site won material within earthworks construction is feasible; however, suitable processing will be required in order for the material to confirm to the required end product specification. It is recommended that a dedicated earthworks method statement and specification is prepared prior to starting construction works if earthworks are required as part of the development.

The gas monitoring undertaken has encountered elevated concentrations of carbon dioxide (maximum 2.3%) with zero measured flow rates (<0.1l/hr). No methane or depleted oxygen levels have been encountered. This indicates a gas screening value (GSV) of <0.07 l/h. For carbon dioxide and methane this corresponds to a gas characteristic situation of 1 (very low risk) and no further works are warranted (CIRIA Report C665). No special precautions in respect to gas protective measures are warranted.

GLOSSARY

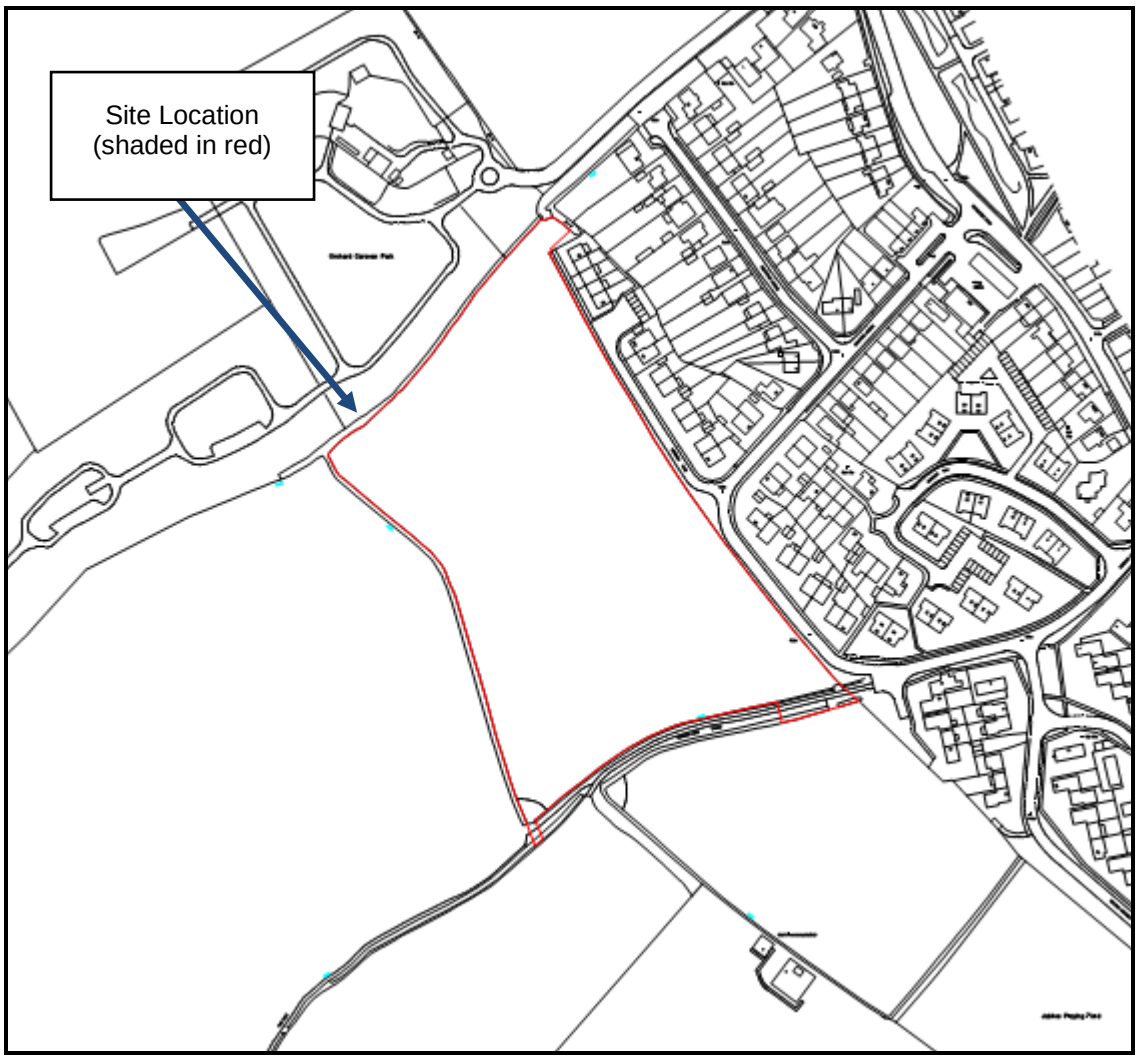
For the purpose of this report the following terms and definitions apply (see BS 10175:2001).

Accuracy	Level of agreement between true value and observed value.
Conceptual Model	Textual and or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the base of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process. **Note 1:** The conceptual model is initially derived from the information obtained by the preliminary investigation. This conceptual model is used to focus subsequent investigations, where these are considered to be necessary, in order to meet the objectives of the investigations and the risk assessment. The results of the field investigation can provide additional data that can be used to further refine the conceptual model.
Contamination	Presence of a substance which is in, on or under land, and which has the potential to cause significant harm or to cause significant pollution of controlled water. **Note 1:** There is no assumption in this definition that harm results from the presence of the contamination. **Note 2:** Naturally enhanced concentrations of harmful substances can fall within this definition of contamination. **Note 3:** Contamination may relate to soils, groundwater or ground gas.
Controlled water	Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three-mile limit of territorial waters. **Note 1:** See Section 104 of The Water Resources Act 1991.
Harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case humans, including property.
Hazard	Inherently dangerous quality of a substance, procedure or event.
Pathway	Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.
Precision	Level of agreement within a series of measurements of a parameter.
Receptor	Persons, living organisms, ecological systems, controlled water, atmosphere, structures and utilities that could be adversely affected by the contaminant(s).
Risk	Probability of the occurrence of, and magnitude of the consequences of, an unwanted adverse effect on a receptor.
Risk assessment	Process of establishing, to the extent possible, the existence, nature and significance of risk.
Sampling	Methods and techniques used to obtain a representative sample of the material under investigation.
Soil	Upper layer of the earth's crust composed of mineral parts, organic substance, water, air and living matter. **Note 1:** In accordance with BS 10175:2001 the term soil has the meaning ascribed to it through general use in civil engineering and includes topsoil and subsoil; deposits such as clays, silt, sand, gravel, cobbles, boulders and organic deposits such as peat; and material of natural or human origin (e.g. fills and deposited wastes). The term embraces all components of soil, including mineral matter, organic matter, soil gas and moisture, and living organisms.
Source	Location from which contamination is, or was, derived. **Note 1:** This could be the location of the highest soil or groundwater concentration of the contaminant(s).
Uncertainty	Parameter, associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurement.

Appendix A SITE PLANS

Drawing 1 - Site Location Plan

Not to scale



Drawing No. 2 - Proposed Site Layout

Drawing No. 3 - Exploratory Hole Location Plan – Window Sample and Cable Percussive Boreholes

Drawing No. 4 - Exploratory Hole Location Plan – Trial Pits

Drawing No. 5 - Exploratory Hole Location Plan – In-Situ Light Dynamic Cone Penetration Tests Locations

On separate sheet



Do Not Scale

NottGroup

Title:	**Appendix A – Proposed Site Layout**
Project Name:	**Land at Newbarn Lane, North Bersted, Bognor Regis**
Client:	**Landform Bognor Regis Limited**
Project No: **72540**	Date: **06/09/2016** — Drawing No **2**

ARUN DISTRICT COUNCIL BE/22/18/DOC

Key

Window Sample Hole
(WS1 – WS20)

Cable Percussive Borehole
(CP1 – CP4)



Do Not Scale

NottGroup

Title:	**Appendix A – Exploratory Hole Location Plan – Window Sample & Cable Percussive Boreholes**
Project Name:	**Land at Newbarn Lane, North Bersted, Bognor Regis**
Client:	**Landform Bognor Regis Limited**
Project No: **72540**	Date: **06/09/2016** / Drawing No **3**

ARUN DISTRICT COUNCIL BE/22/18/DOC

Key

Machine Excavated Trial Pit
(TP1 – TP20)



Do Not Scale

NottGroup

Title:	**Appendix A – Exploratory Hole Location Plan – Trial Pits**
Project Name:	**Land at Newbarn Lane, North Bersted, Bognor Regis**
Client:	**Landform Bognor Regis Limited**
Project No: **72540**	Date: **06/09/2016** — Drawing No **4**

ARUN DISTRICT COUNCIL BE/22/18/DOC

Key

In-situ DCP (CBR) Test Location (DCP1 – DCP10)



Do Not Scale

NottGroup

Title:	**Appendix A – Exploratory Hole Location Plan – Insitu Light Dynamic Cone Penetration Test Locations**
Project Name:	**Land at Newbarn Lane, North Bersted, Bognor Regis**
Client:	**Landform Bognor Regis Limited**
Project No: **72540**	Date: **06/09/2016** — Drawing No **5**

ARUN DISTRICT COUNCIL BE/22/18/DOC

Appendix B HISTORICAL MAPS

ARUN DISTRICT COUNCIL BE/222/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series

Map date: **1875-1876**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

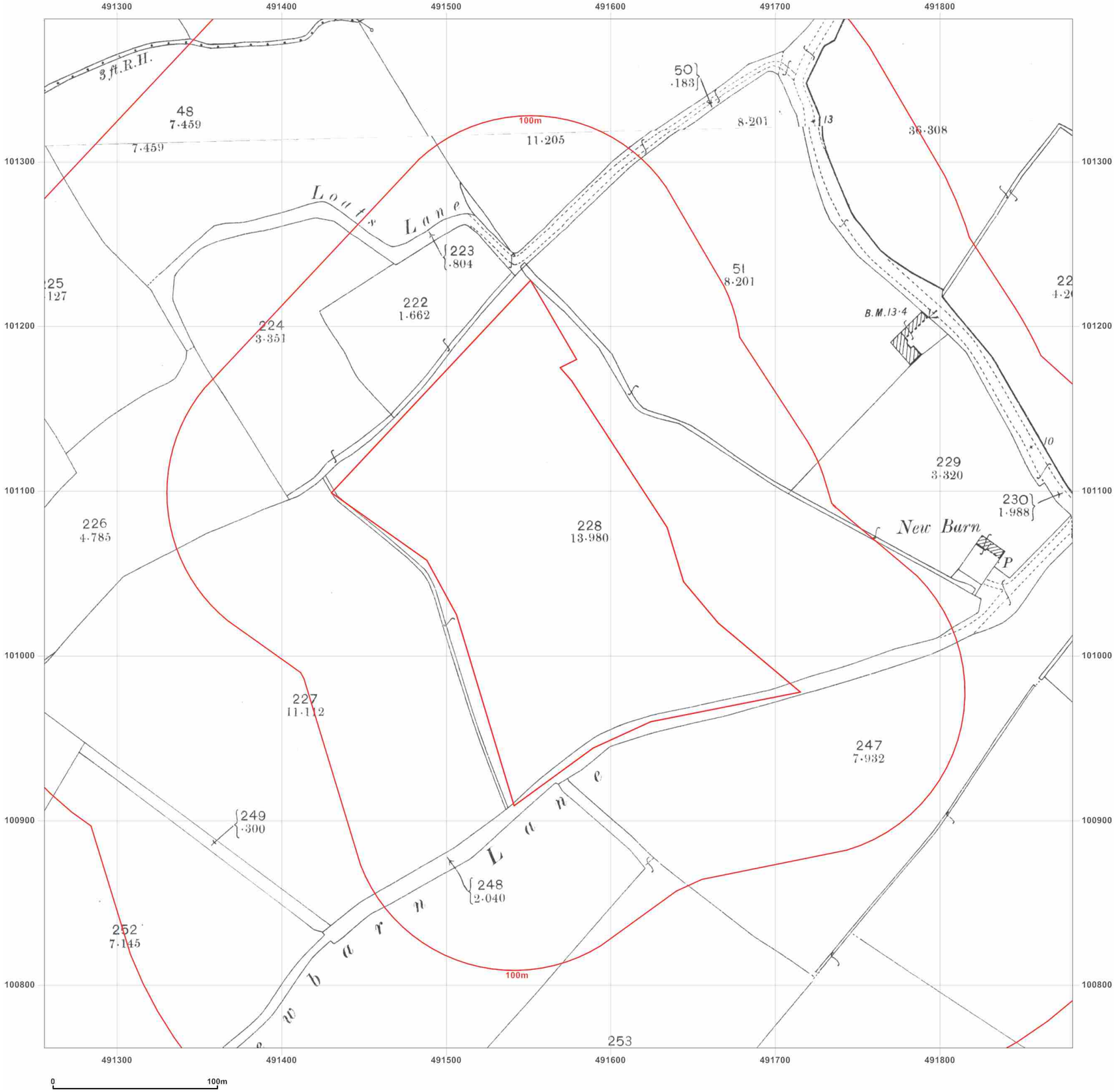
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/222/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series

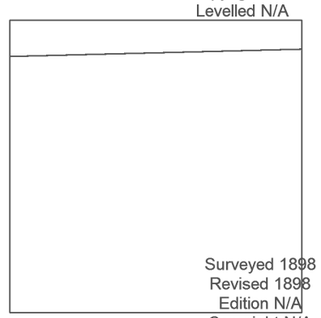
Map date: **1898**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

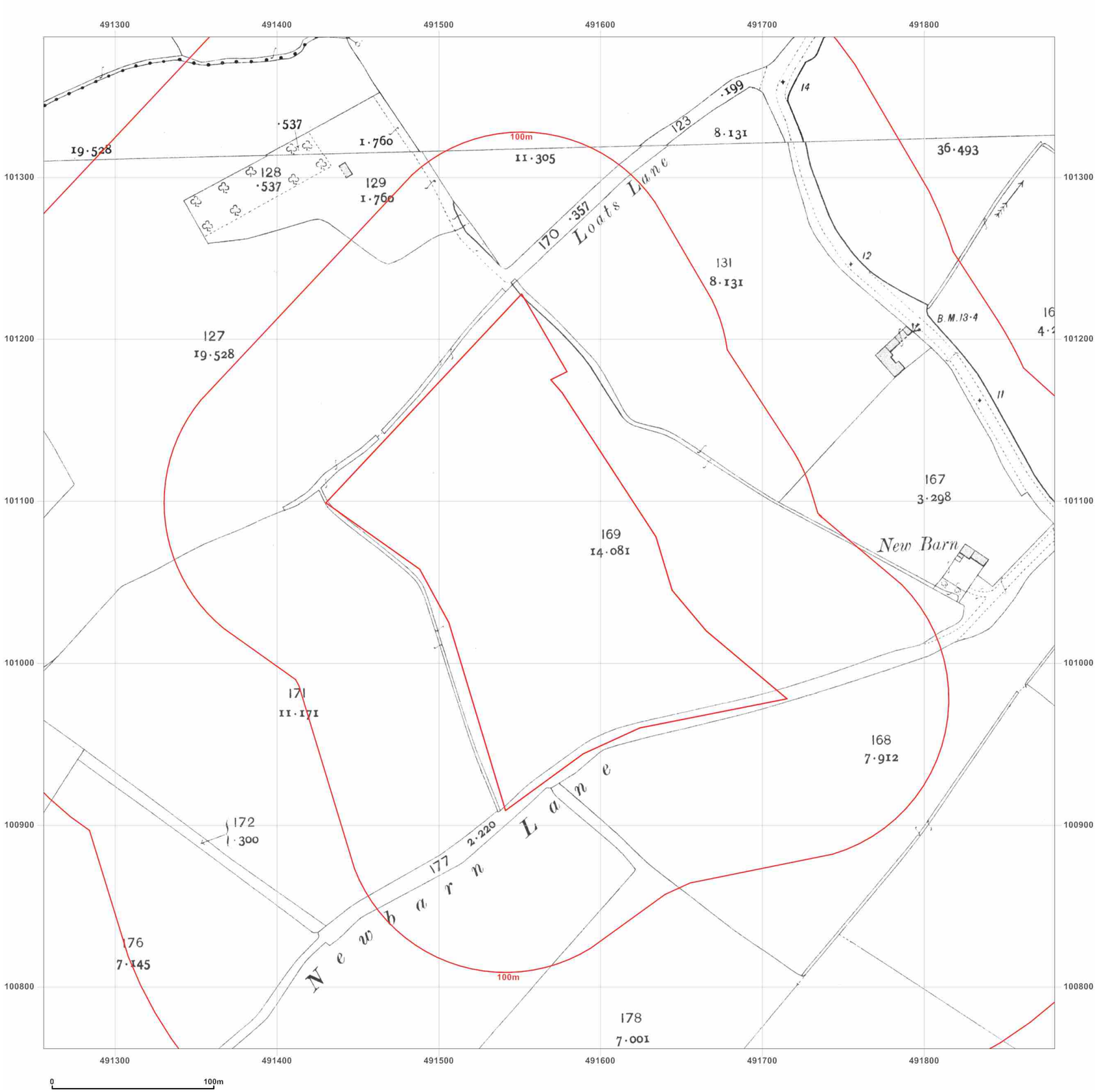
Ordnance Survey Licensed Partner

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/222/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series

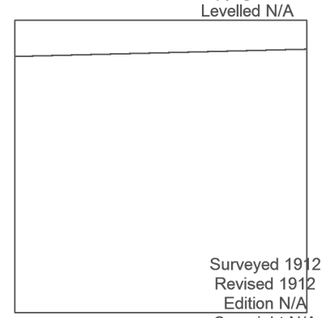
Map date: **1912**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1912
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1912
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/222/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

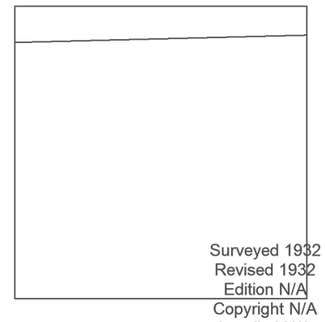
Map Name: County Series

Map date: **1932**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Groundsure INSIGHTS

Ordnance Survey Licensed Partner

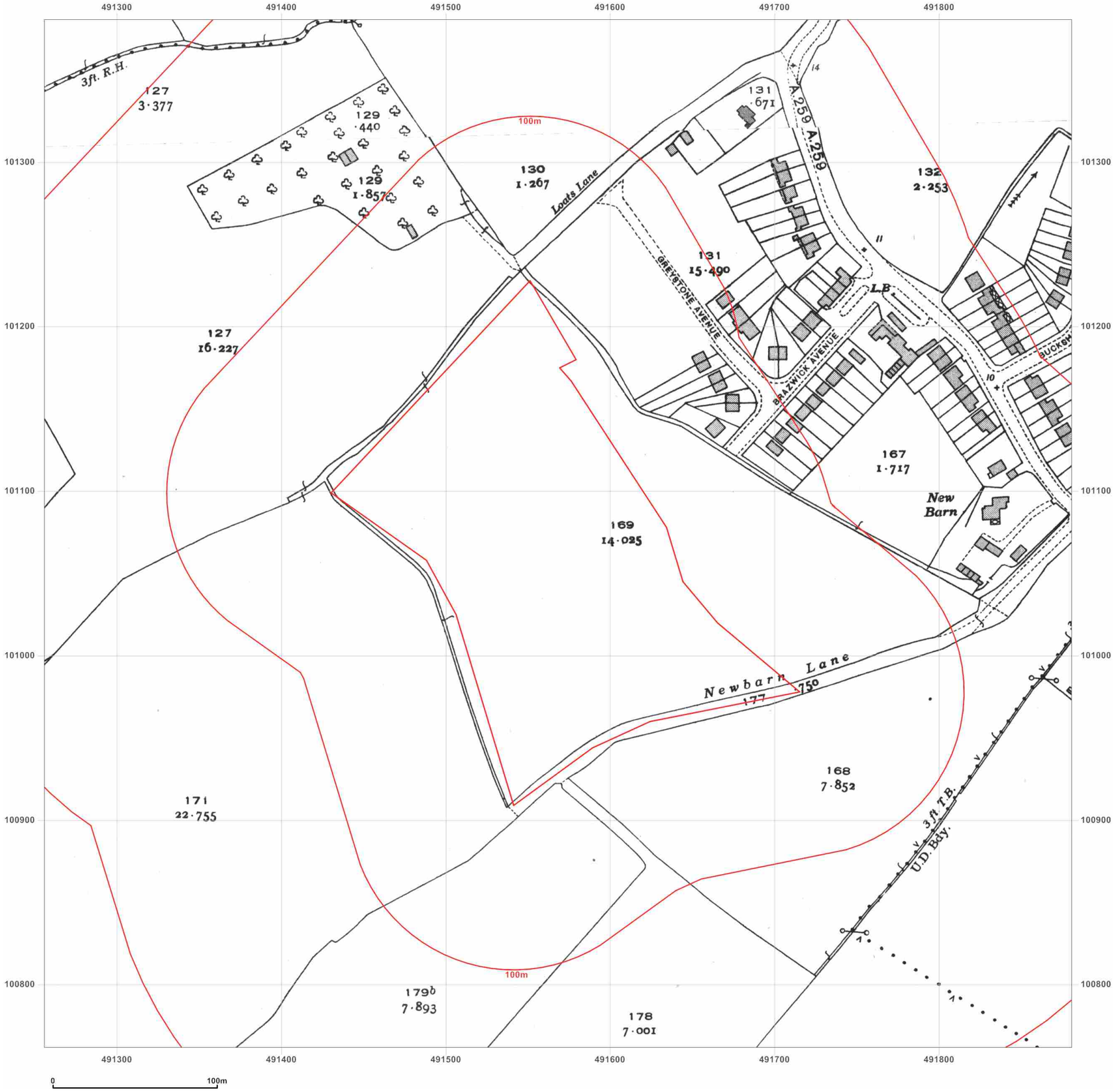
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

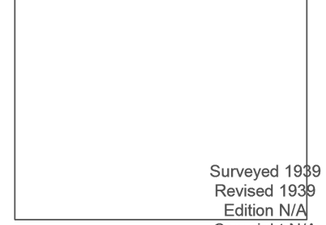
Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series
Map date: **1939-1940**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1940
Revised 1940
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1939
Revised 1939
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

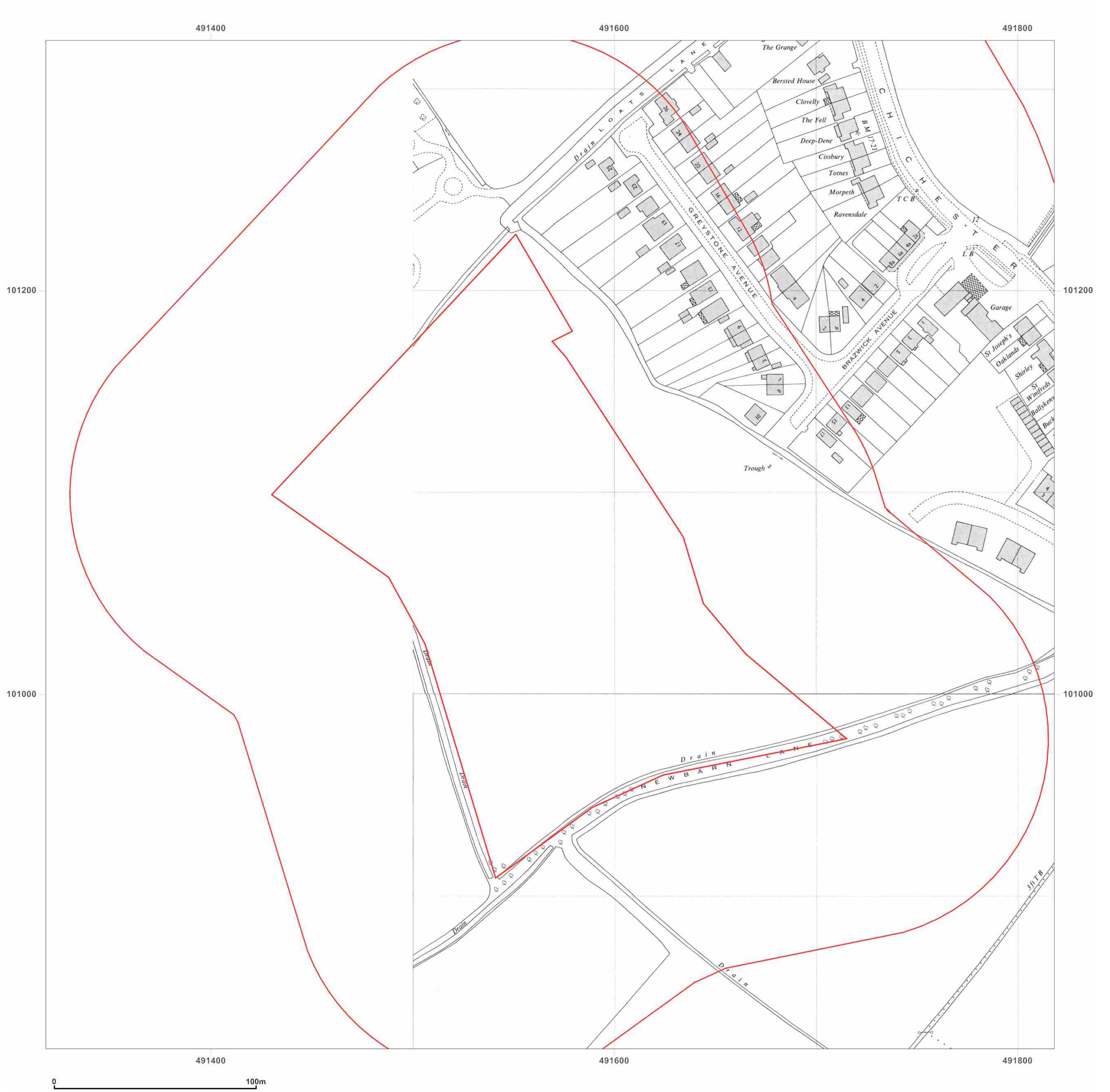
Ordnance Survey Licensed Partner

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/22/18/DOC



![FIND logo]

Site Details:

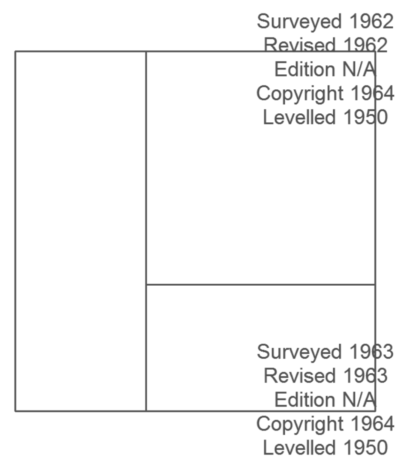
Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid

Map date: **1964**

Scale: 1:1,250

Printed at: 1:2,000



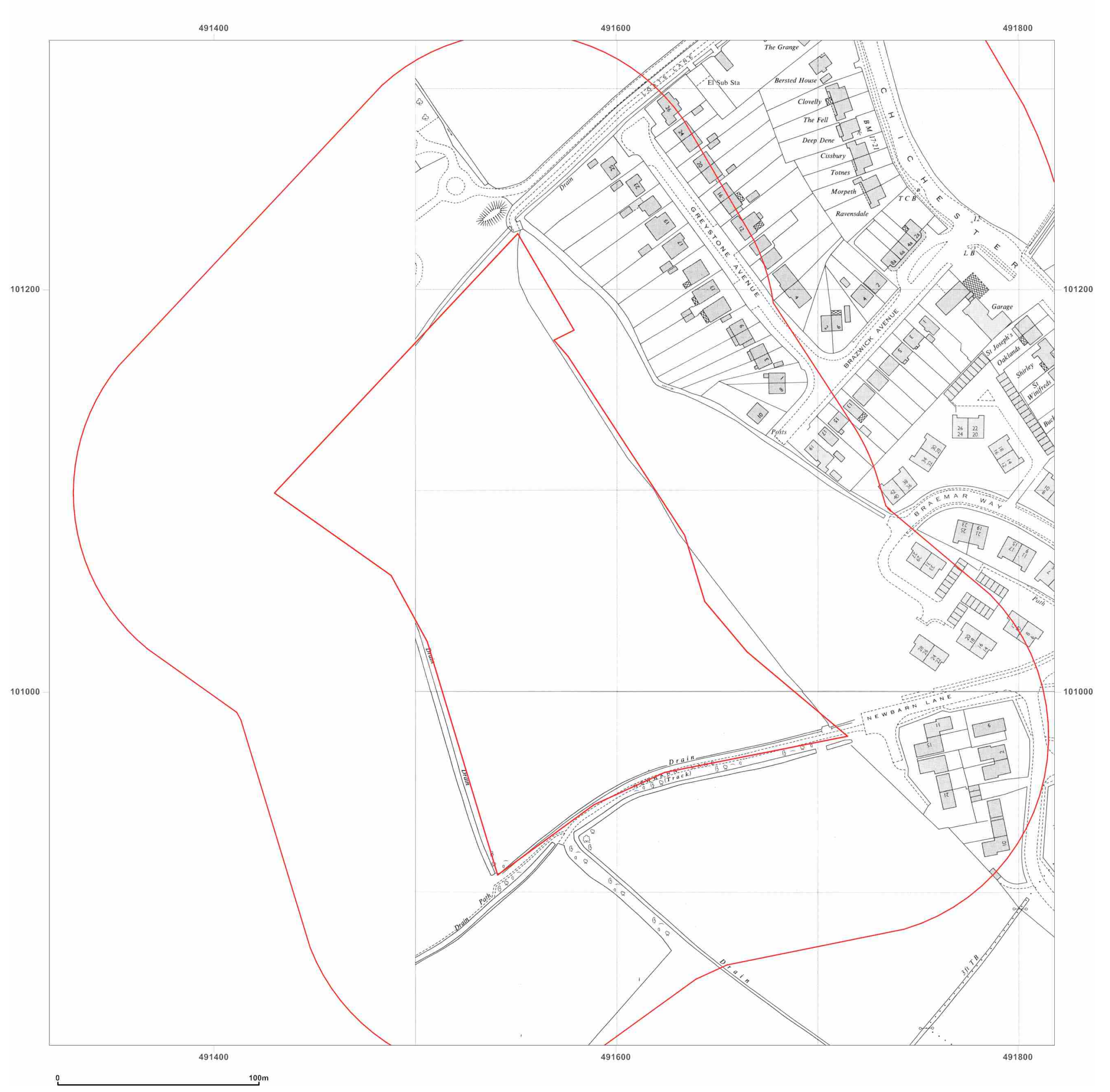
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/22/18/DOC



FIND

PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

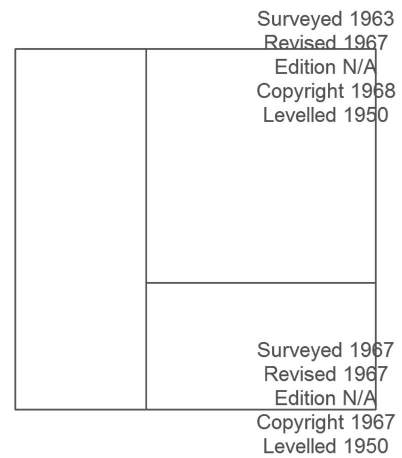
Map Name: National Grid

Map date: **1967-1968**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
S



Groundsure INSIGHTS

Ordnance Survey Licensed Partner

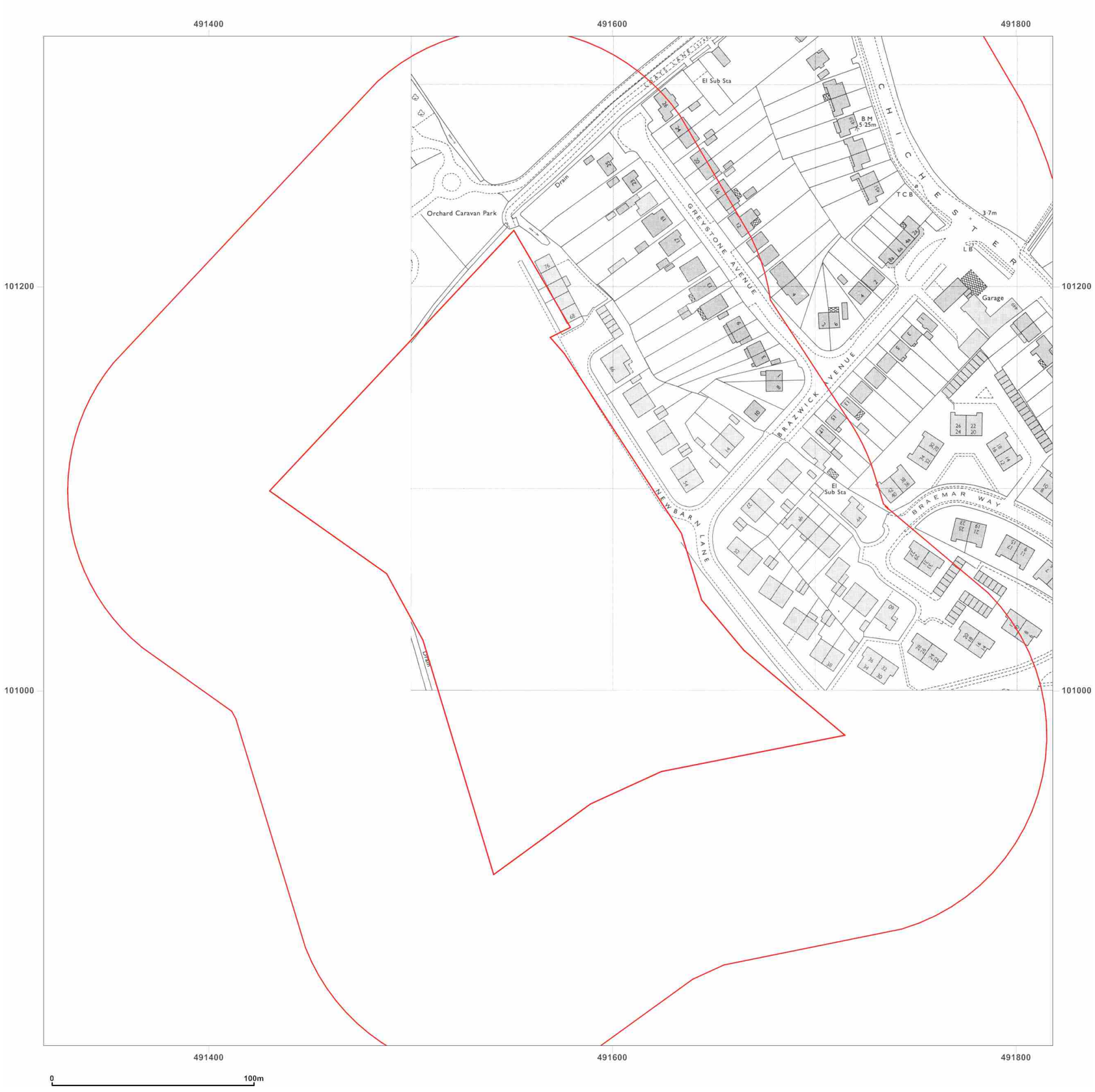
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid

Map date: **1971**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
S

Surveyed 1963
Revised 1971
Edition N/A
Copyright 1971
Levelled 1950

Groundsure INSIGHTS

Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

Ordnance Survey Licensed Partner

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221810/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid
Map date: **1976**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

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

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

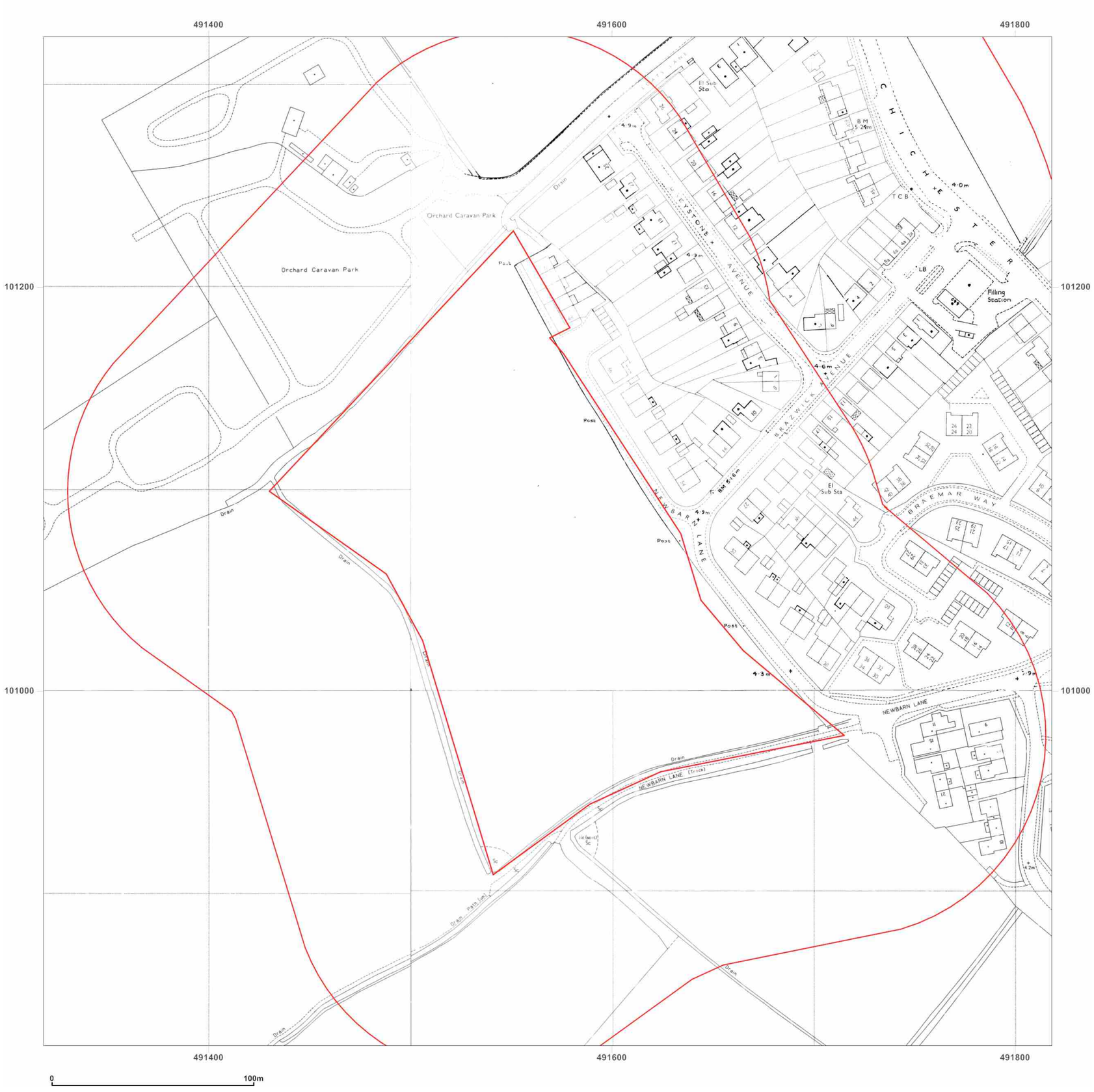
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid

Map date: **1991-1994**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
S

Surveyed 1994 Revised N/A Edition N/A Copyright 1994 Levelled N/A	Surveyed 1975 Revised 1991 Edition N/A Copyright 1991 Levelled 1975
Surveyed 1994 Revised N/A Edition N/A Copyright 1994 Levelled N/A	Surveyed 1994 Revised N/A Edition N/A Copyright 1994 Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

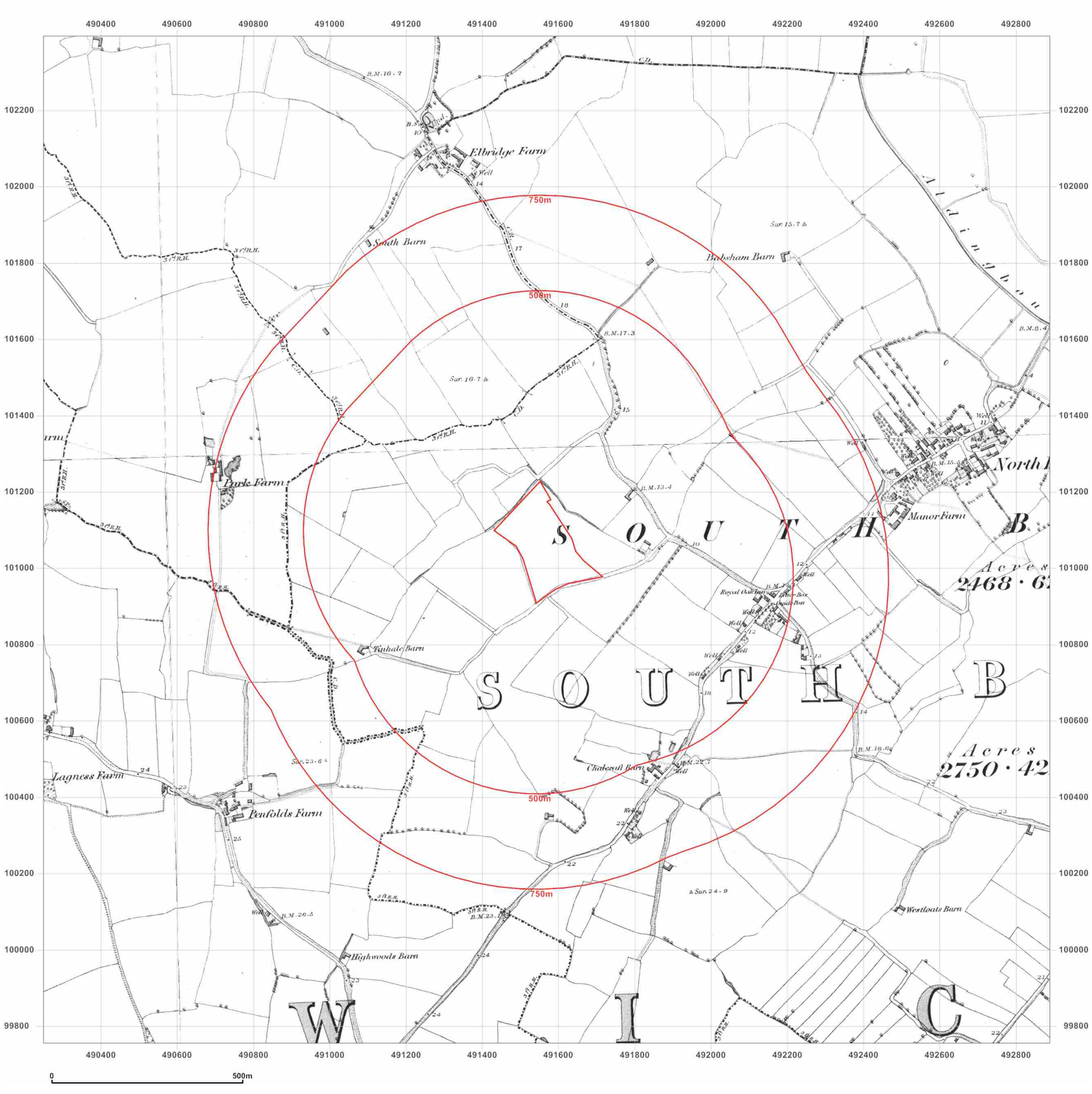
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221810/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

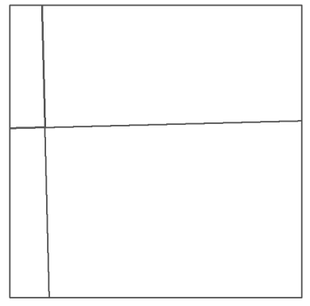
Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series
Map date: **1875-1876**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

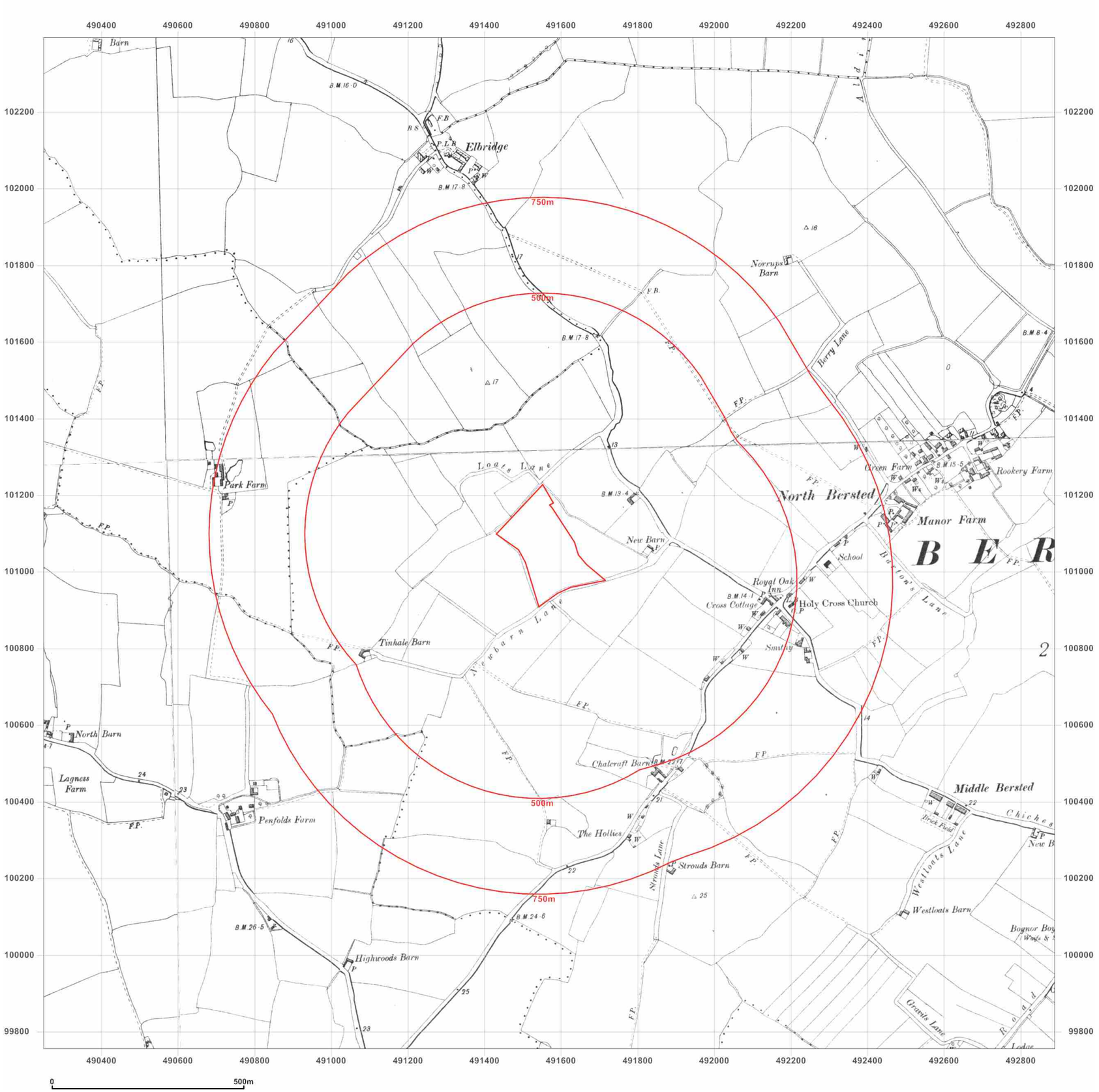
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series

Map date: **1896**

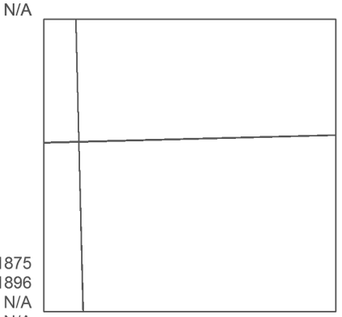
Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1875
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1875
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

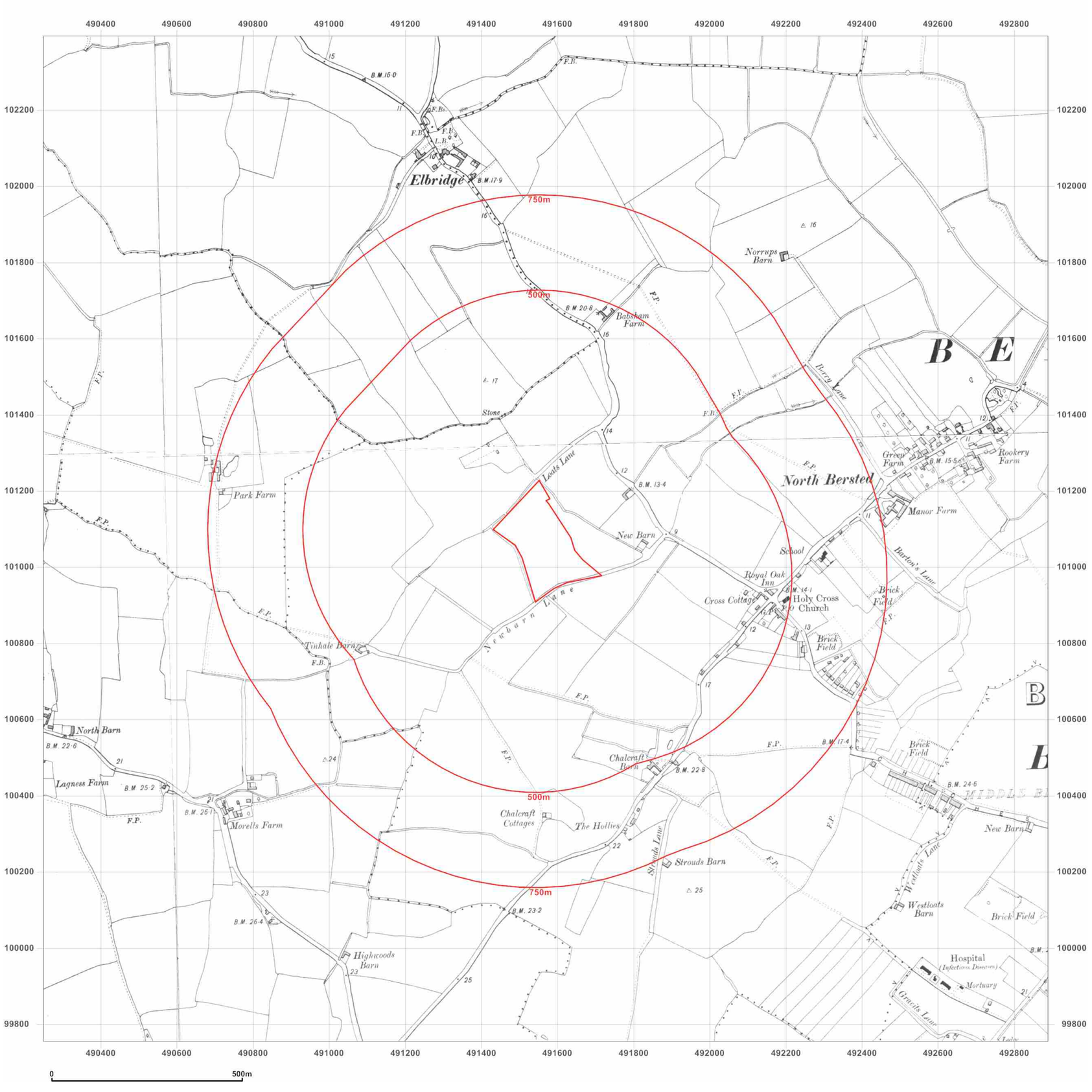
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

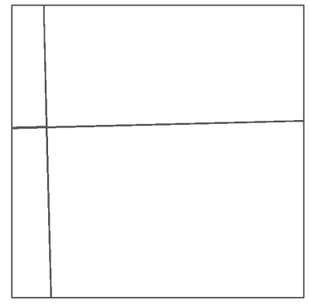
Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series
Map date: **1909-1910**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1874
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1874
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

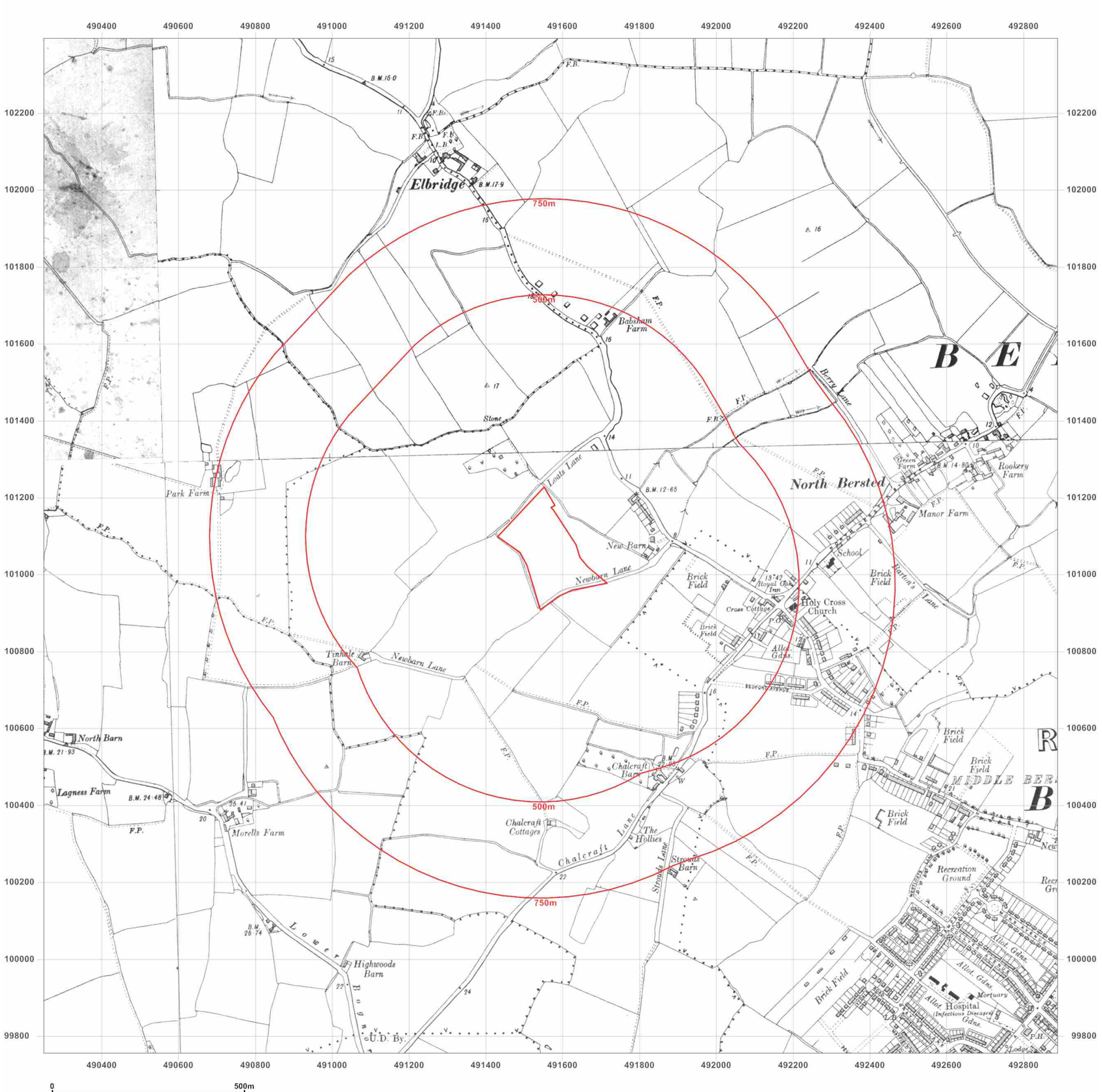
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

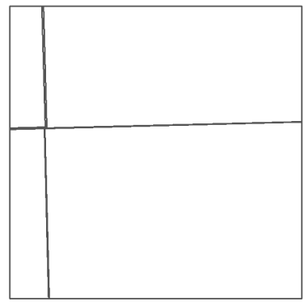
Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series
Map date: **1933-1938**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1874
Revised 1933
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1874
Revised 1933
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1934
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

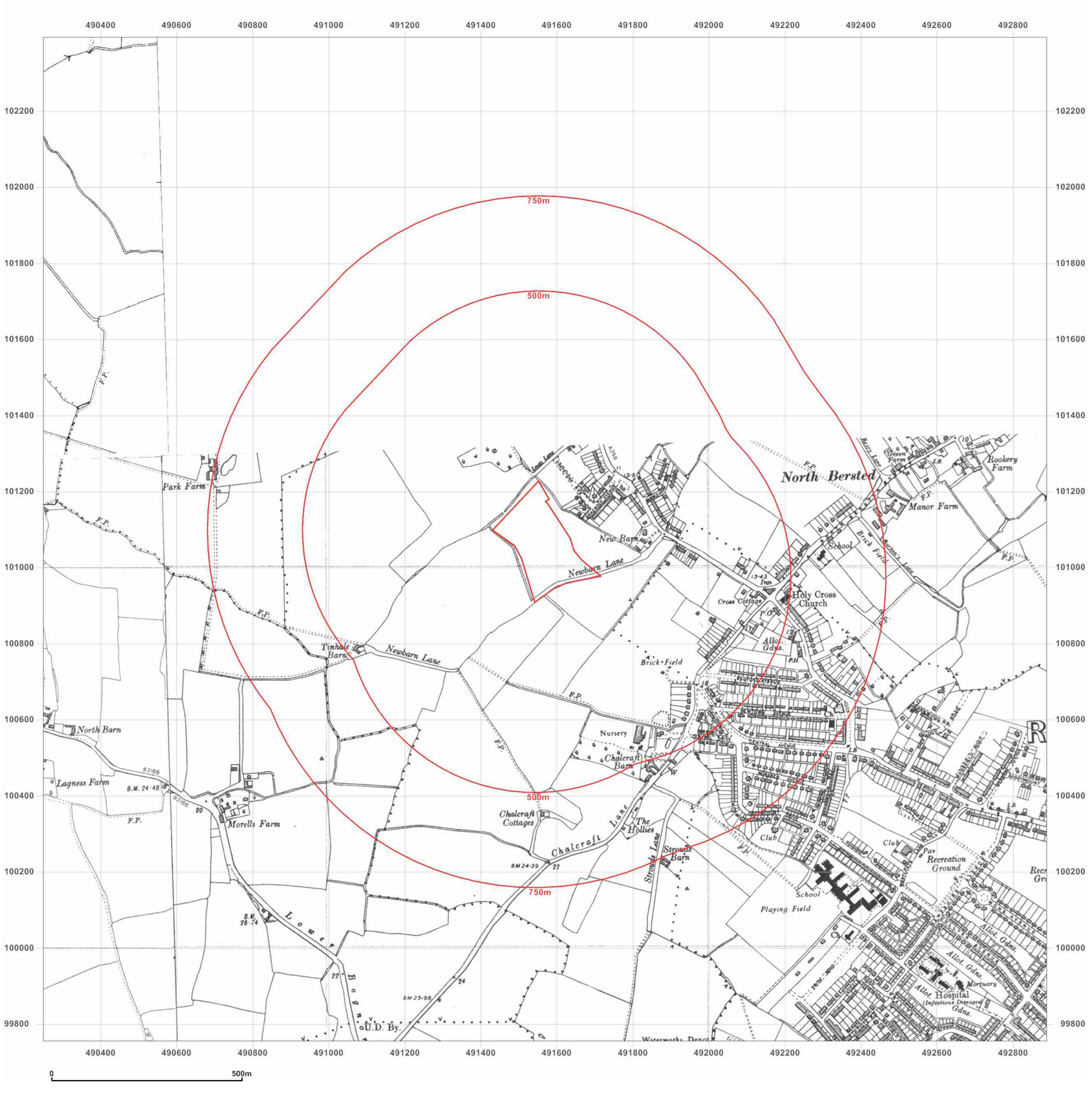
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221810/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series

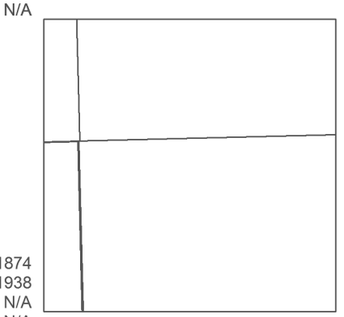
Map date: **1938-1940**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1874
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1874
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1940
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

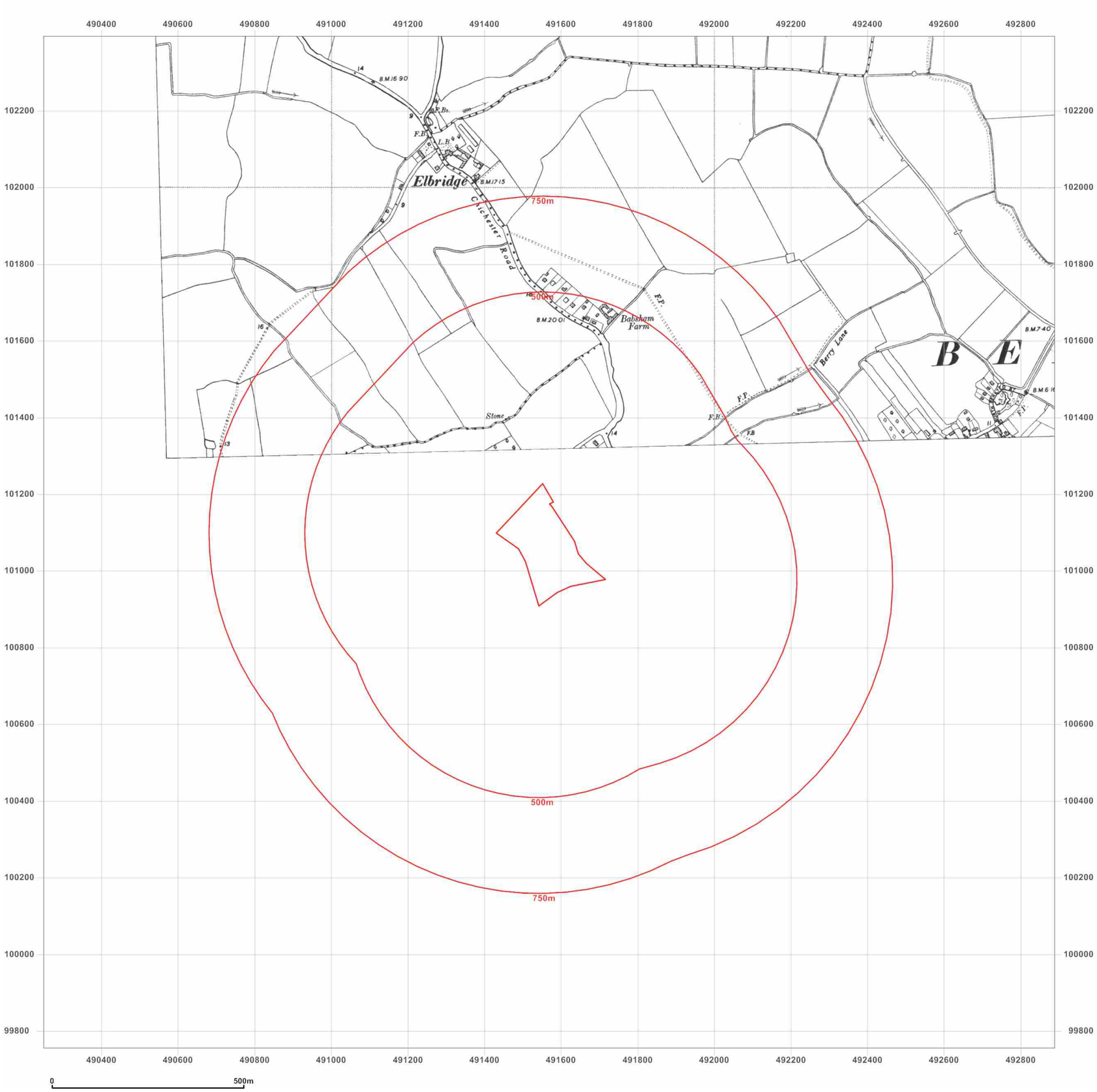
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: County Series

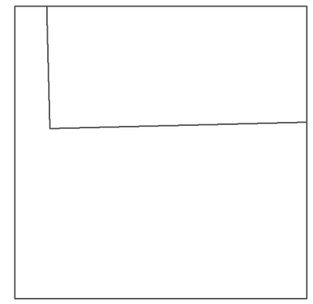
Map date: **1950**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1874
Revised 1950
Edition N/A
Copyright N/A
Levelled N/A



Groundsure INSIGHTS

Ordnance Survey Licensed Partner

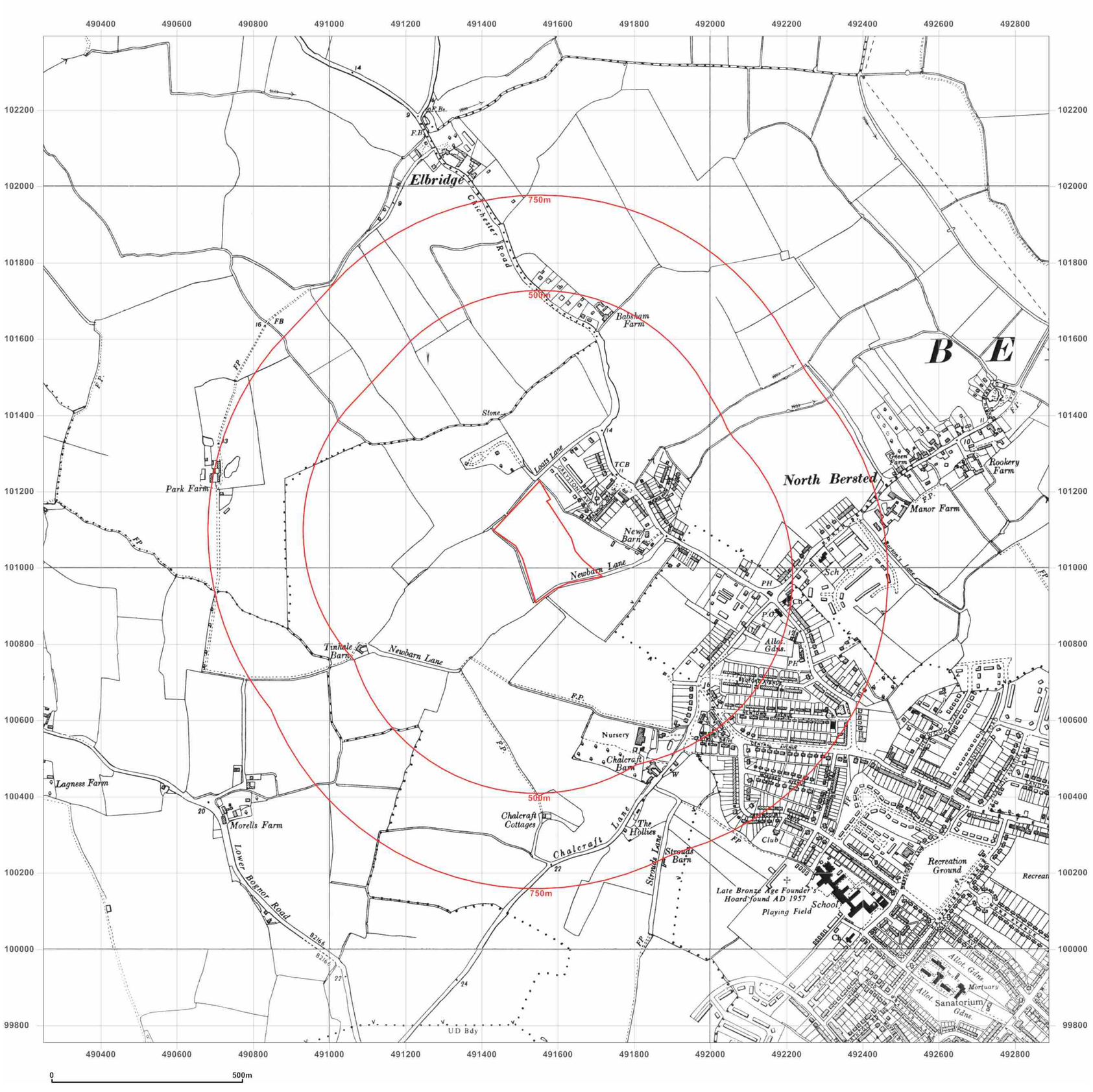
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: Provisional

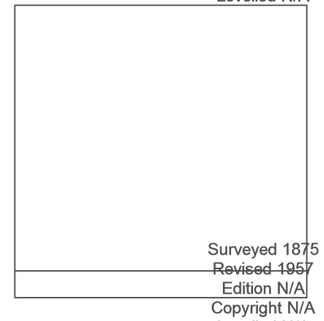
Map date: **1957-1961**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed N/A
Revised 1961
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1875
~~Revised 1957~~
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

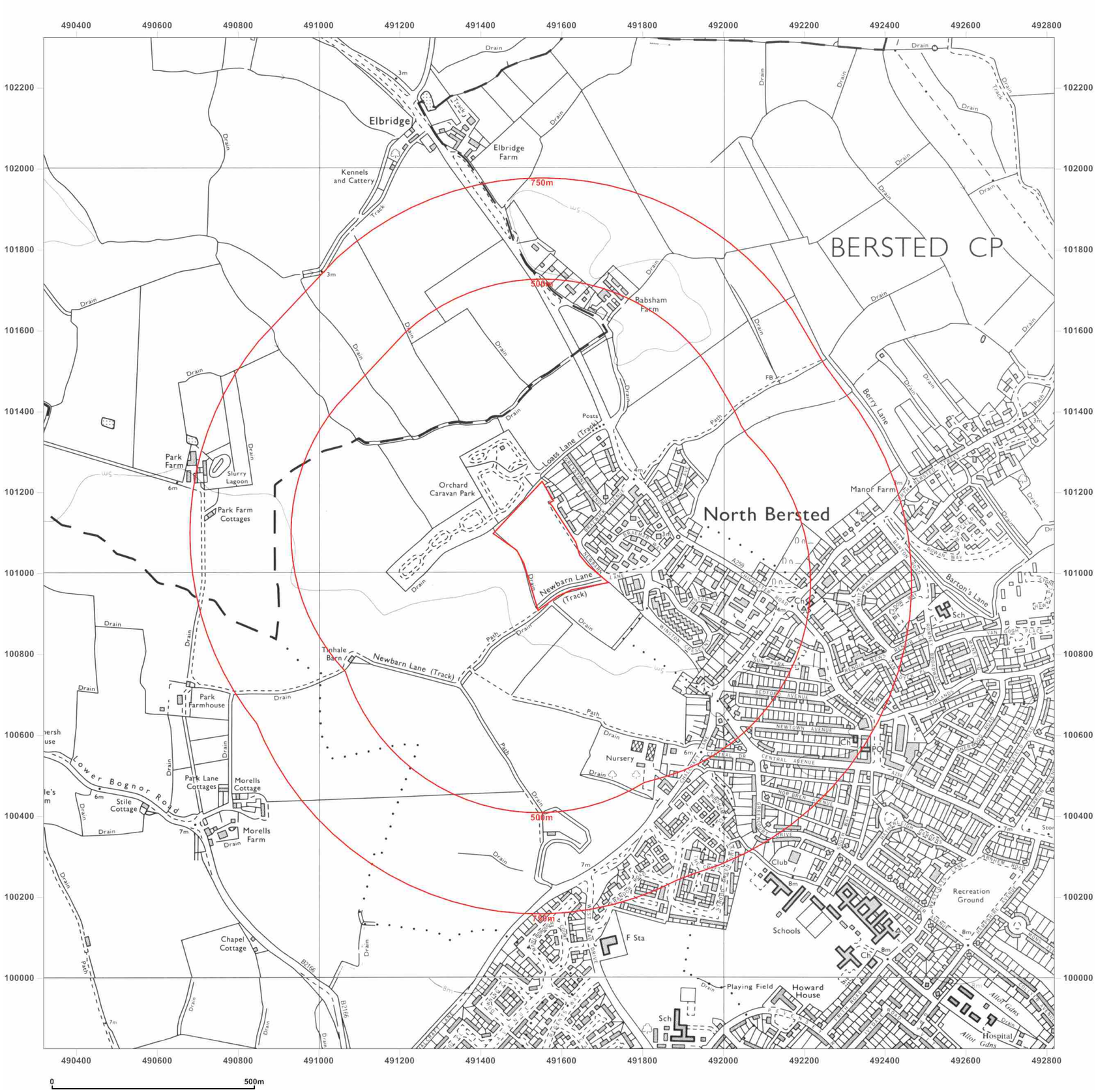
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/18/DOC



Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid

Map date: **1973-1977**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1975
Revised 1977
Edition N/A
Copyright N/A
Levelled N/A

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

Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid

Map date: **1989-1993**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1992
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1988
Revised 1989
Edition N/A
Copyright N/A
Levelled N/A

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

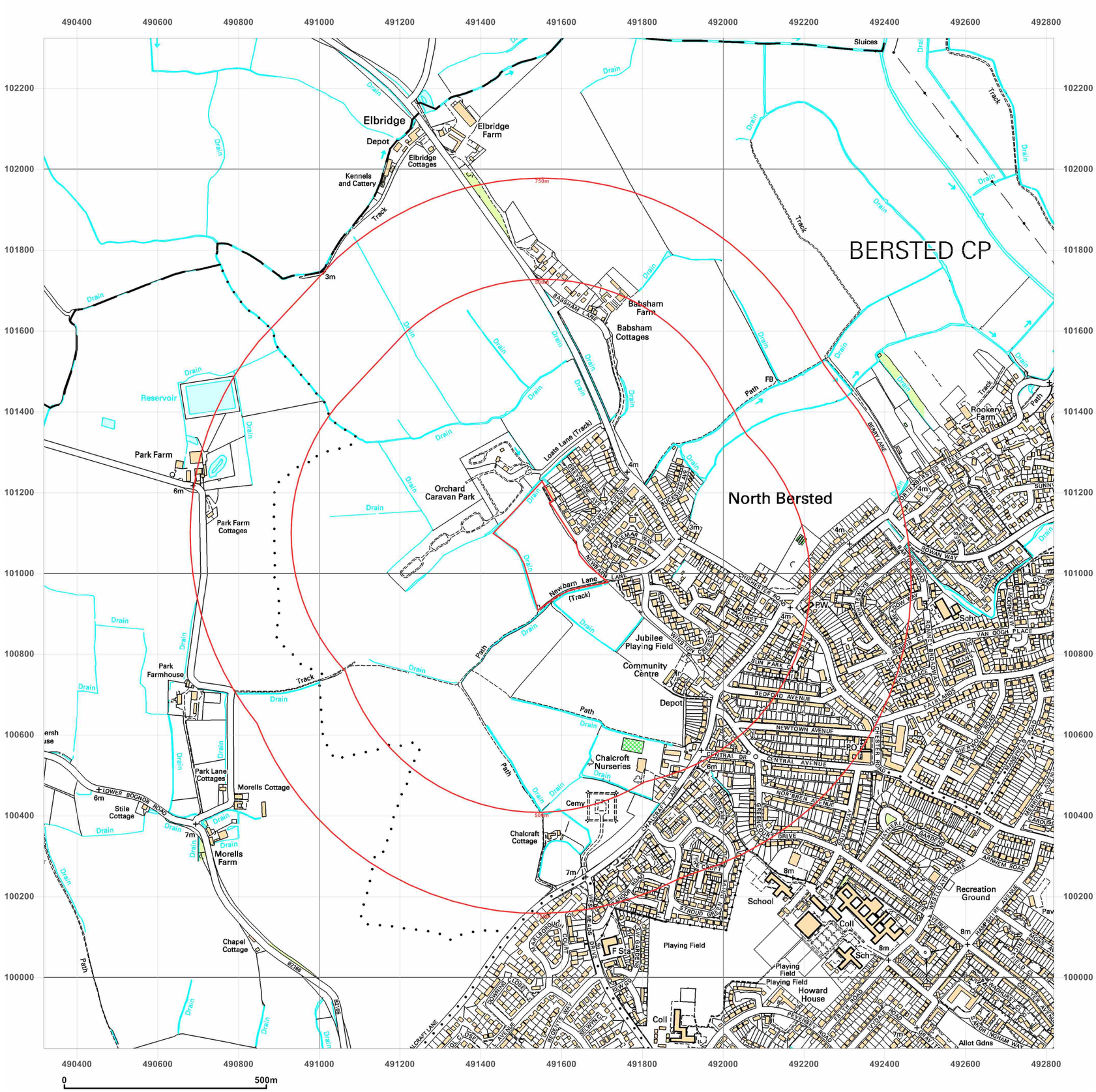
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: 1:10,000 Raster
Map date: **2002**
Scale: 1:10,000
Printed at: 1:10,000

N
W E
S

2002

Groundsure INSIGHTS

Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

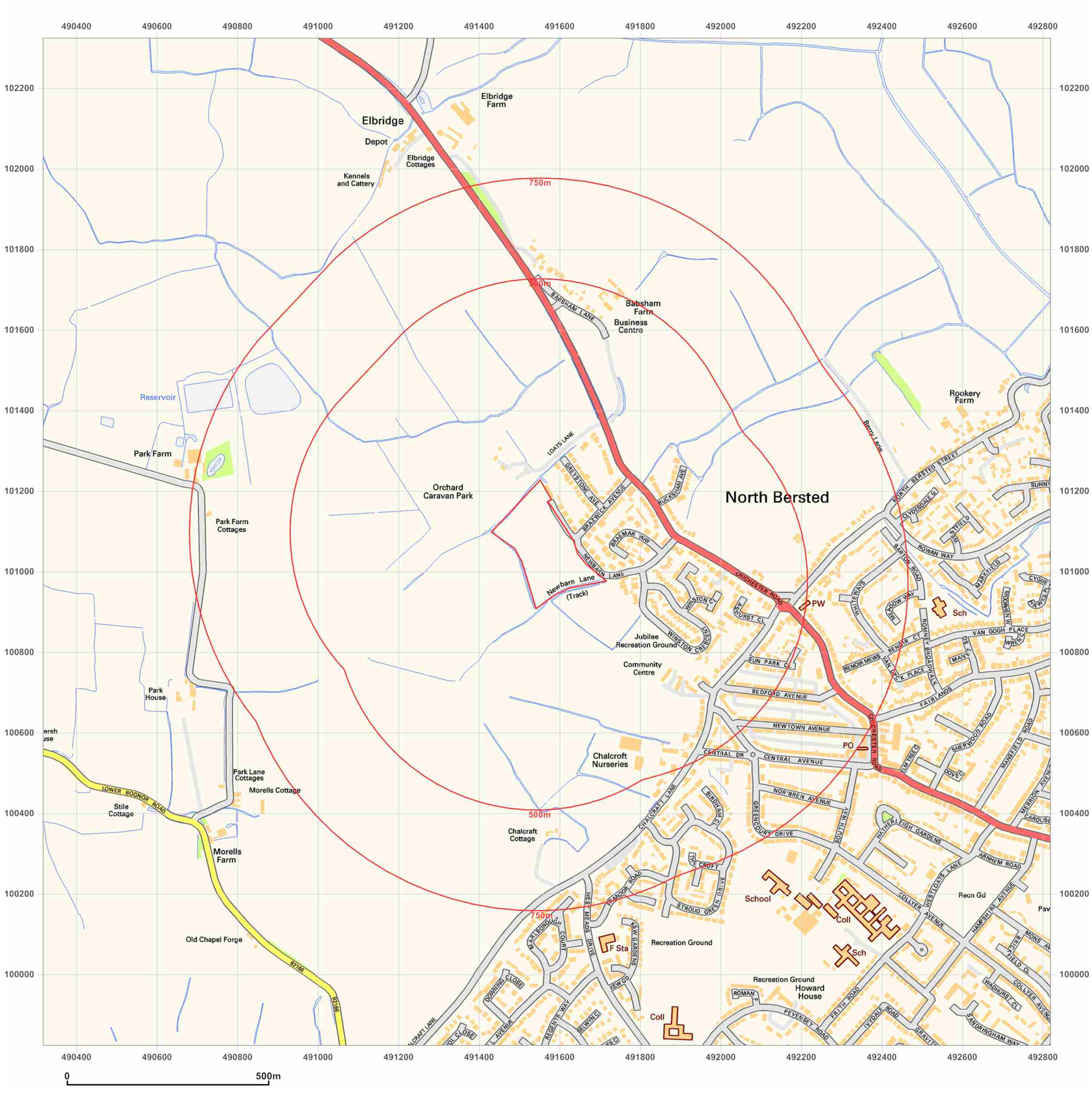
Ordnance Survey Licensed Partner

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/18/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2010

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

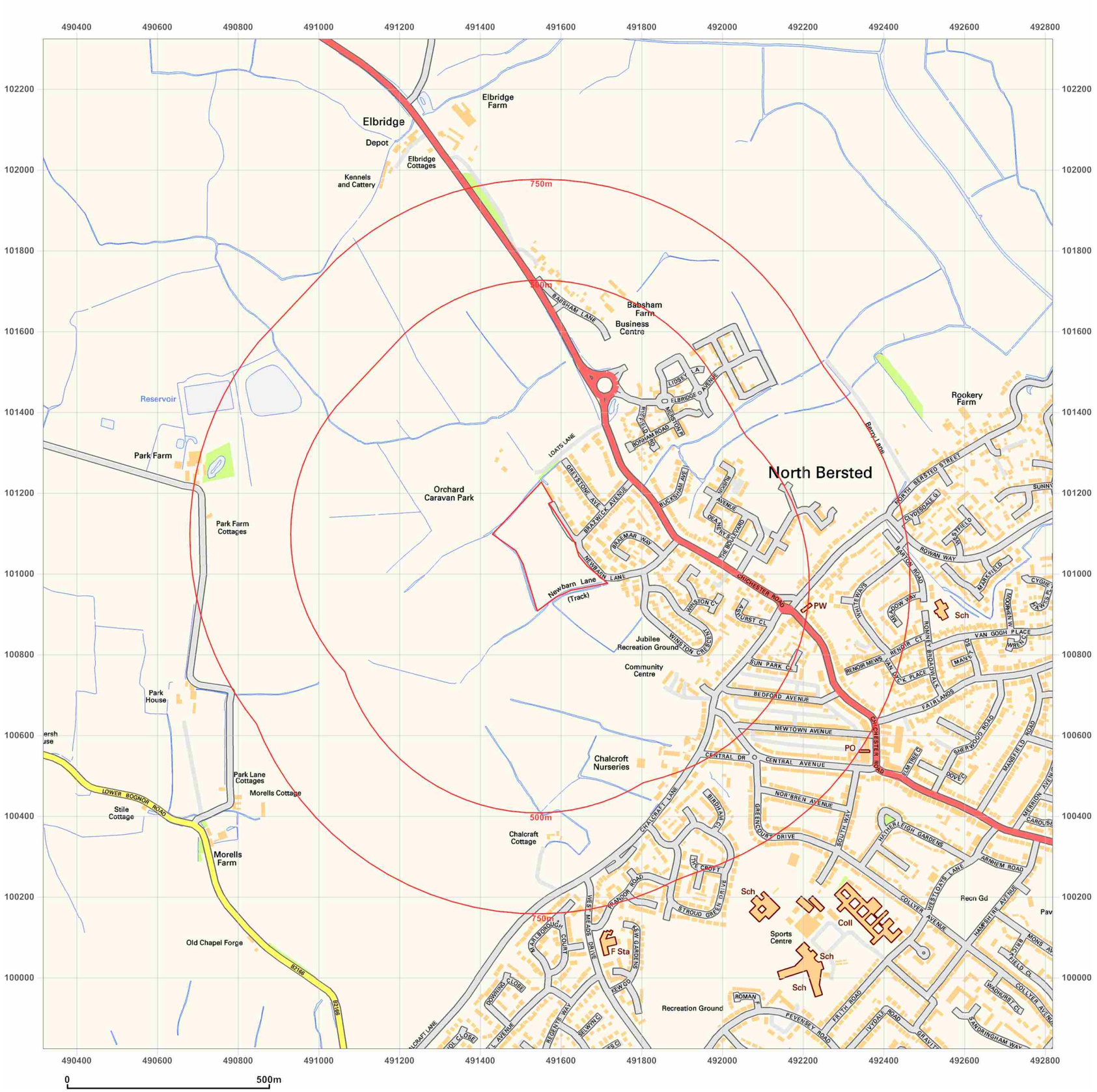
Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

ARUN DISTRICT COUNCIL BE/221/8/DOC



FIND
PROFESSIONAL MAPPING INTELLIGENCE

Site Details:

Client Ref: New Barn Lane
Report Ref: FIND-48514
Grid Ref: 491568, 101074

Map Name: National Grid
Map date: **2014**
Scale: 1:10,000
Printed at: 1:10,000

N
W E
S

2014

Groundsure INSIGHTS

Ordnance Survey Licensed Partner

Produced by
Groundsure Insights
www.groundsure.com
Supplied by:
www.findmaps.co.uk
support@findmaps.co.uk
Tel: 0845 521 1410

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 17 July 2015

To view map legend click here *Legend*

Appendix C ENVIRONMENTAL DATABASES

Groundsure Geoinsight

Address:	,
Date:	16 Jul 2015
Reference:	FIND-48515
Client:	FIND

NW N NE

W E



SW S SE

Aerial Photograph Capture date:	03-May-2013
Grid Reference:	491568,101074
Site Size:	3.72ha

Contents Page

Overview of Findings 5
1 Geology 8
1.1 Artificial Ground Map 8
1 Geology 9
1.1 Artificial Ground 9
1.1.1Artificial/ Made Ground 9
1.1.2 Permeability of Artificial Ground 9
1.2 Superficial Deposits and Landslips Map 10
1.2 Superficial Deposits and Landslips 11
1.2.1 Superficial Deposits/ Drift Geology 11
1.2.2 Permeability of Superficial Ground 11
1.2.3 Landslip 11
1.2.4 Landslip Permeability 11
1.3 Bedrock and Faults Map 12
1.3 Bedrock, Solid Geology & Faults 13
1.3.1 Bedrock/ Solid Geology 13
1.3.2 Permeability of Bedrock Ground 13
1.3.3 Faults 13
1.4 Radon Data 14
1.4.1 Radon Affected Areas 14
1.4.2 Radon Protection 14
2 Ground Workings Map 15
2 Ground Workings 16
2.1 Historical Surface Ground Working Features derived from Historical Mapping 16
2.2 Historical Underground Working Features derived from Historical Mapping 16
2.3 Current Ground Workings 17
3 Mining, Extraction & Natural Cavities Map 18
3 Mining, Extraction & Natural Cavities 19
3.1 Historical Mining 19
3.2 Coal Mining 19
3.3 Johnson Poole and Bloomer 19
3.4 Non-Coal Mining 19
3.5 Non-Coal Mining Cavities 20
3.6 Natural Cavities 20
3.7 Brine Extraction 20
3.8 Gypsum Extraction 20
3.9 Tin Mining 20
3.10 Clay Mining 21
4 Natural Ground Subsidence 22
4.1 Shrink-Swell Clay Map 22
4.2 Landslides Map 23
4.3 Ground Dissolution Soluble Rocks Map 24
4.4 Compressible Deposits Map 25
4.5 Collapsible Deposits Map 26
4.6 Running Sand Map 27
4 Natural Ground Subsidence 28
4.1 Shrink-Swell Clays 28
4.2 Landslides 28
4.3 Ground Dissolution of Soluble Rocks 28

4.4 Compressible Deposits....29
4.5 Collapsible Deposits....29
4.6 Running Sands....29
5 Borehole Records Map....30
5 Borehole Records....31
6 Estimated Background Soil Chemistry....32
7 Railways and Tunnels Map....33
7 Railways and Tunnels....34
7.1 Tunnels....34
7.2 Historical Railway and Tunnel Features....34
7.3 Historical Railways....35
7.4 Active Railways....35
7.5 Railway Projects....35

ARUN DISTRICT COUNCIL BE/22/18/DOC

Overview of Findings

The Groundsure Geoinsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1:Geology		
1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

Section 2:Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	5	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	1	2	5

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	1	0	1	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

Section 4: Natural Ground Subsidence	On-site
4.1 Shrink Swell Clay	Low
4.2 Landslides	Very Low
4.3 Ground Dissolution of Soluble Rocks	Very Low
4.4 Compressible Deposits	Negligible
4.5 Collapsible Deposits	Low
4.6 Running Sand	Low

Section 5: Borehole Records	On-site	0-50m	51-250
5 BGS Recorded Boreholes	0	0	2

Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250
6 Records of Background Soil Chemistry	4	2	2

Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500
7.1 Tunnels	0	0	0	Not Searched
7.2 Historical Railway and Tunnel Features	0	0	0	Not Searched
7.3 Historical Railways	0	0	0	Not Searched
7.4 Active Railways	0	0	0	Not Searched

Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500
7.5 Railway Projects	0	0	0	0

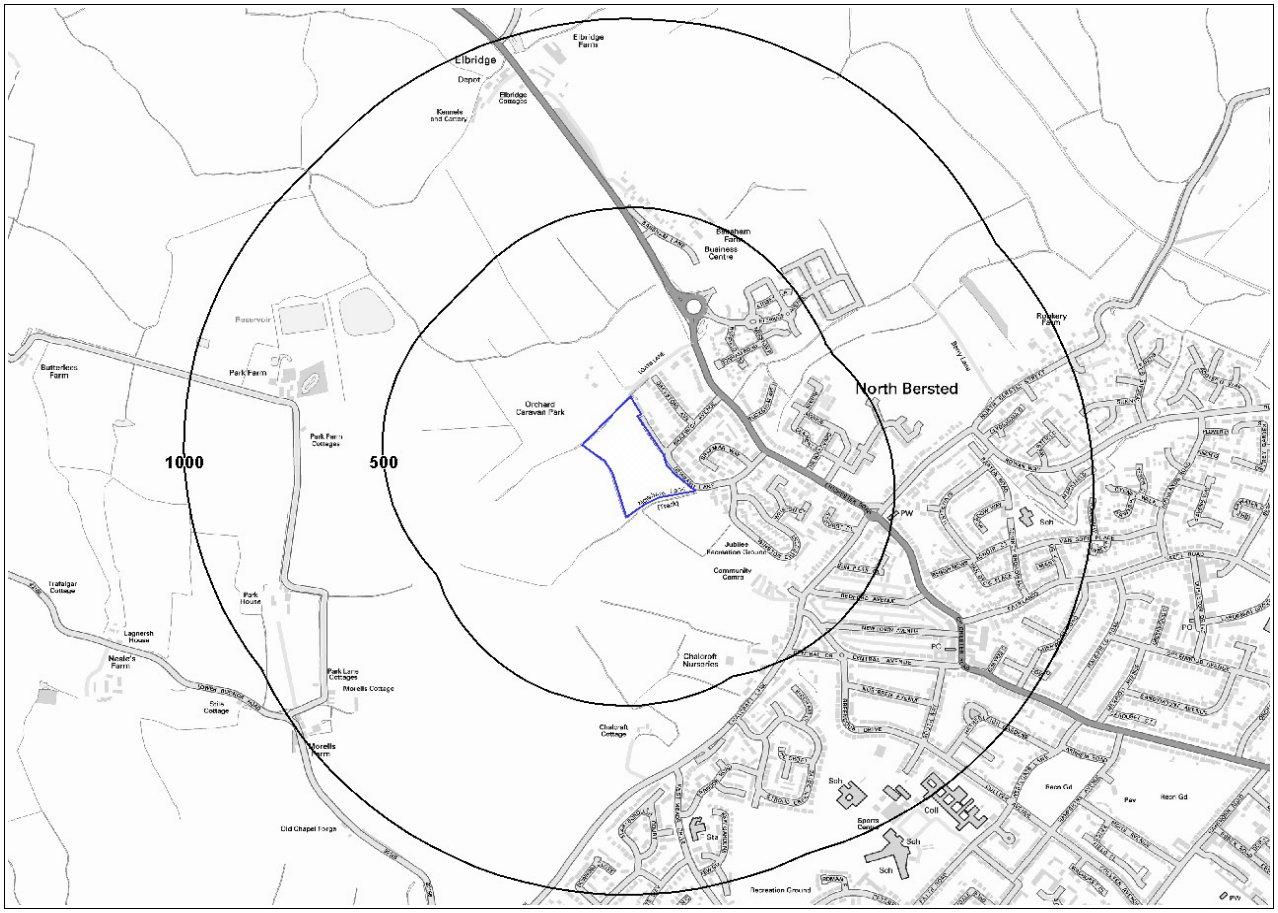
1 Geology

1.1 Artificial Ground Map

NW N NE

W E

SW S SE



Artificial Ground Legend

Mapping sourced from Ordnance Survey®

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

1 Geology

1.1 Artificial Ground

1.1.1Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:332

Are there any records of Artificial/Made Ground within 500m of the study site boundary? No

Database searched and no data found.

1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

1.2 Superficial Deposits and Landslips Map



Superficial Deposits and Landslips Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

500
1000
Search Buffers (m)

Report Reference: FIND-48515
Client Reference: New Barn Lane

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	RTDU	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY [UNLITHIFIED DEPOSITS CODING SCHEME]
2	255.0	NE	RMD	RAISED MARINE DEPOSITS	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	High	Low

1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.2.4 Landslip Permeability

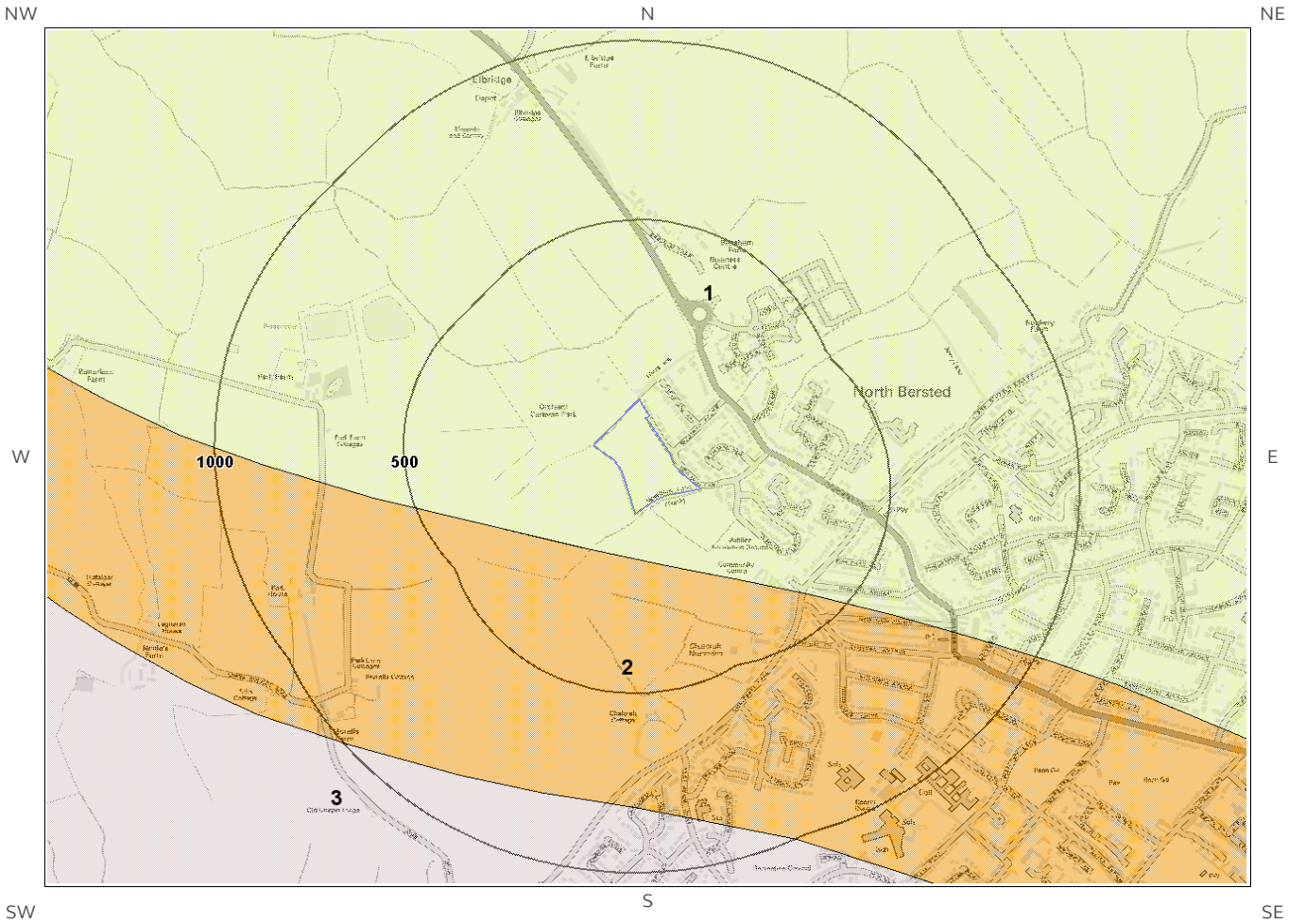
Are there any records relating to permeability of landslips within the study site* boundary? No

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site

ARUN DISTRICT COUNCIL BE/22/18/DOC

1.3 Bedrock and Faults Map



Bedrock and Faults Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

500
1000
Search Buffers (m)

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:332

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/ Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	LPCK-CHLK	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown C	Campanian / Turonian
2	122.0	S	LMBE-CLSISA	Lambeth Group - Clay, Silt And Sand	No Details

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Very High	Very High

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

* This includes an automatically generated 50m buffer zone around the site

1.4 Radon Data

1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level

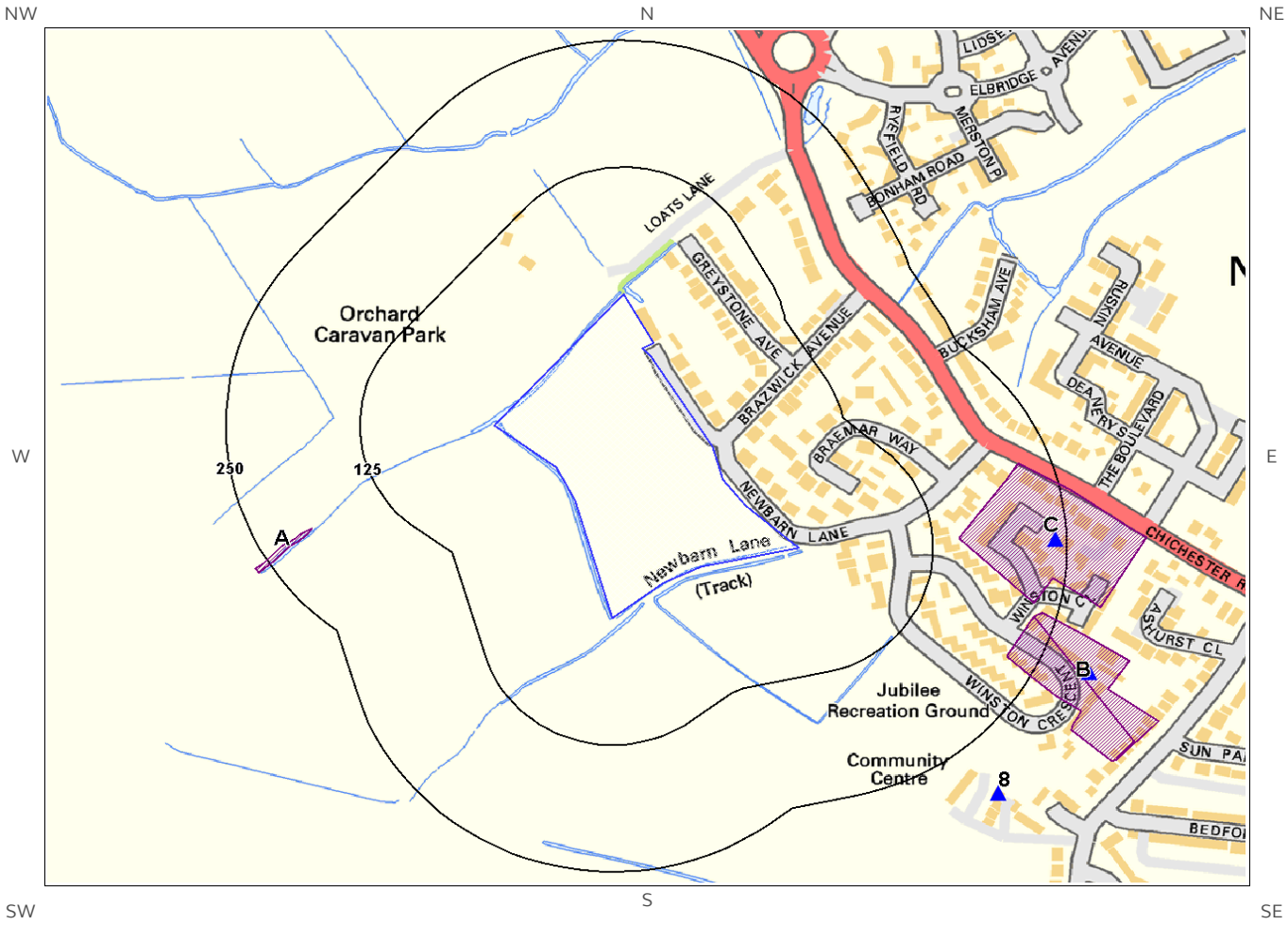
---

1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary

---

2 Ground Workings Map



Ground Workings Legend

Mapping sourced from Ordnance Survey®

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

- Site Outline
- 125 / 250 Search Buffers (m)
- Historic Surface Ground Workings
- Historic Underground Workings
- Current Ground Workings

2 Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

The following Historical Surface Ground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
1C	149.0	E	491951 100990	Brick Field	1934
2A	199.0	SW	491234 100975	Pond	1876
3A	199.0	SW	491234 100975	Pond	1876
4B	221.0	SE	491991 100830	Brick Field	1934
5B	221.0	SE	491968 100839	Unspecified Pit	1934

2.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

2.3 Current Ground Workings

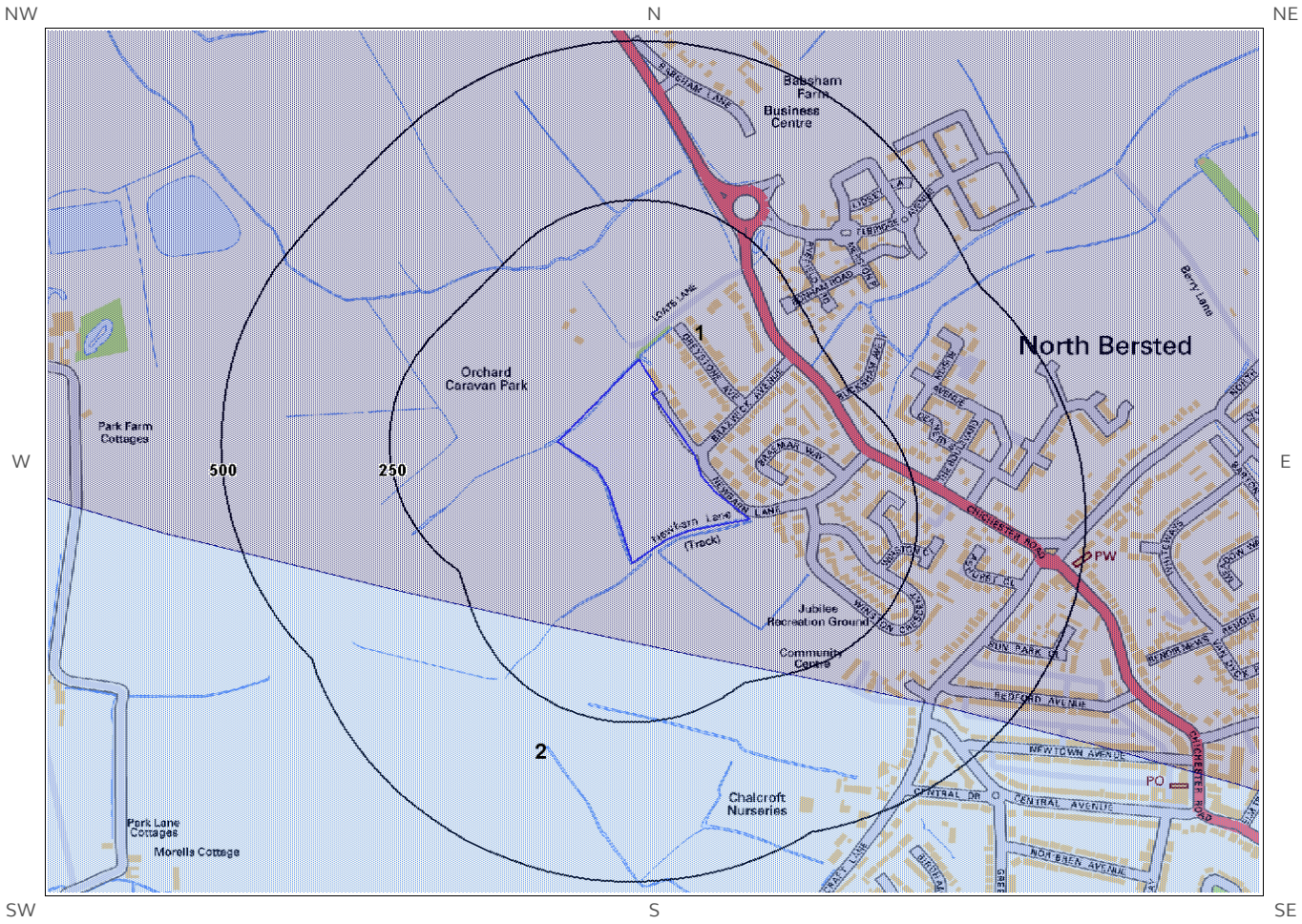
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
6C	239.0	E	491954 100986	Clay & Shale	North Bersted Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
7B	297.0	SE	491985 100855	Clay & Shale	North Bersted Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
8	305.0	SE	491900 100736	Clay & Shale	North Bersted Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	618.0	E	492306 100798	Clay & Shale	North Bersted Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	739.0	E	492451 100915	Clay & Shale	North Bersted Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	841.0	S	491490 100070	Clay & Shale	Chalcroft Lane Brick Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	958.0	SE	492452 100366	Clay & Shale	Middle Bersted Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	981.0	SE	492580 100515	Clay & Shale	North Bersted Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

3 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

Mapping sourced from Ordnance Survey®

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

250
500
Search Buffers (m)

Historical Mining

Non-Coal Mining Cavities

Natural Cavities

Non-Coal Mining

Highly likely

Likely

Unlikely

Highly unlikely

Rare

3 Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

3.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Chalk	Occasional minor mining may have occurred but of restricted extent.
2	122.0	S	Not available	Chalk	Rare and localised small scale mining may have occurred.

3.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.10 Clay Mining

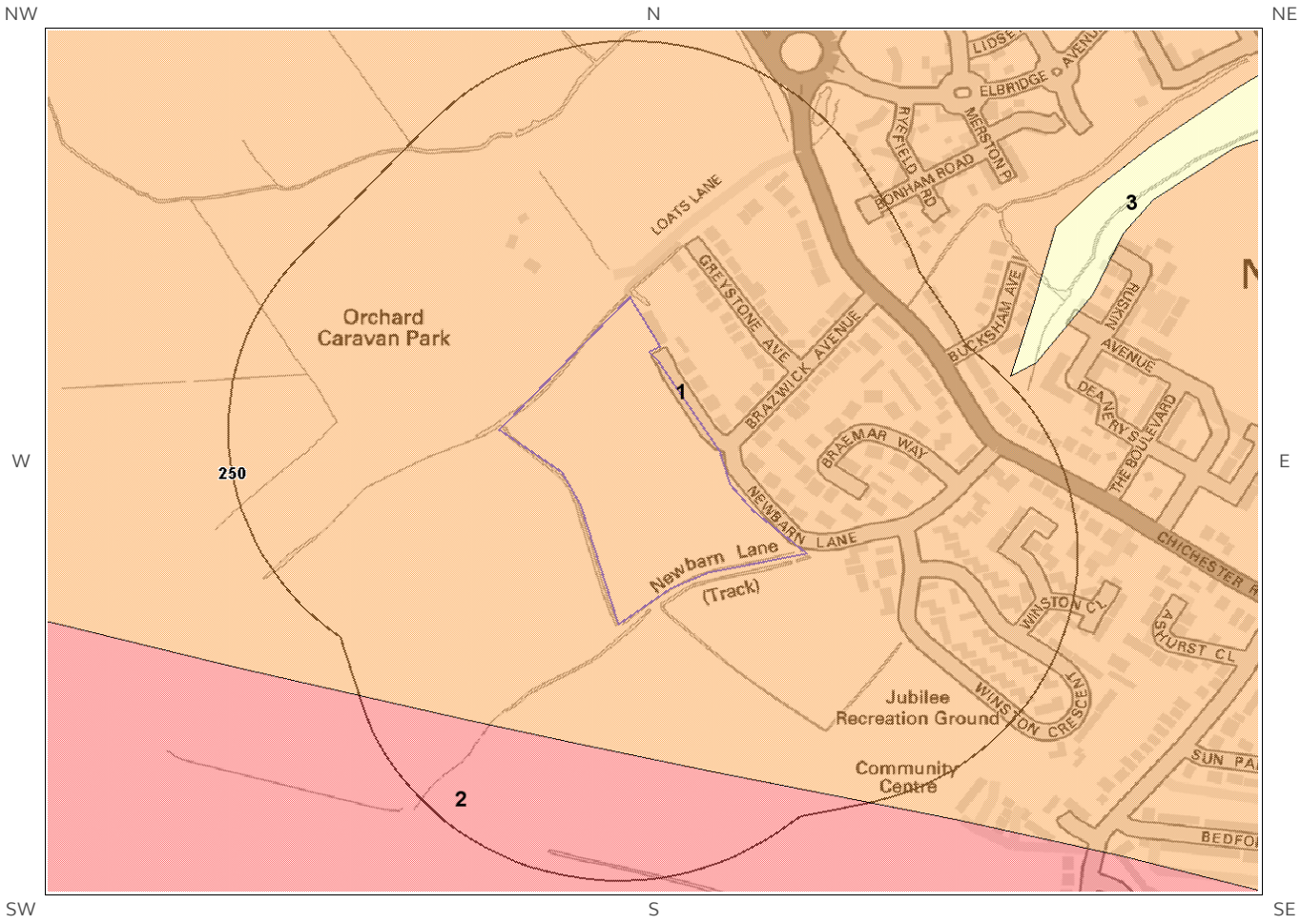
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

4 Natural Ground Subsidence

4.1 Shrink-Swell Clay Map



Shrink Swell Clay Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

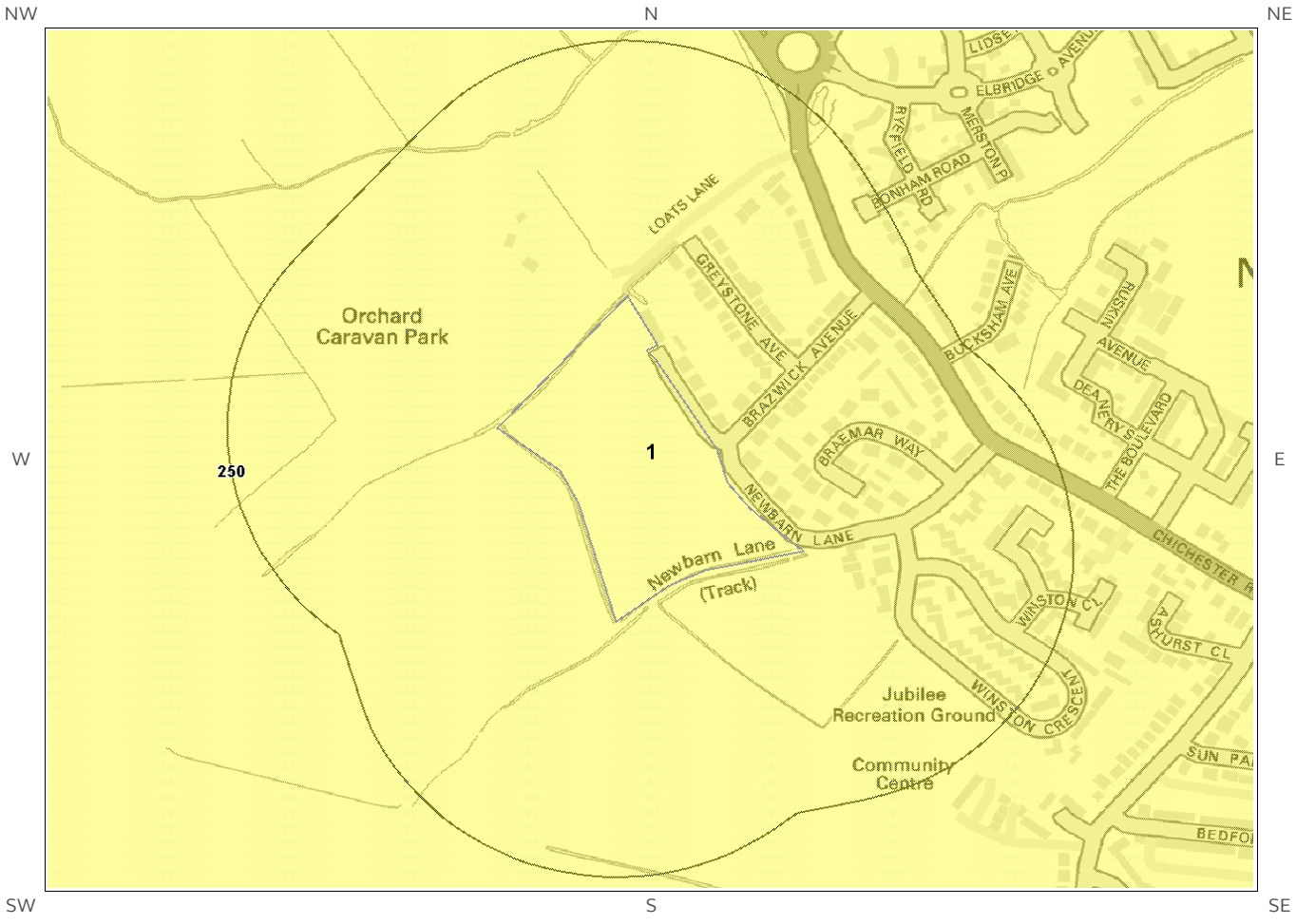
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.2 Landslides Map



Landslides Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

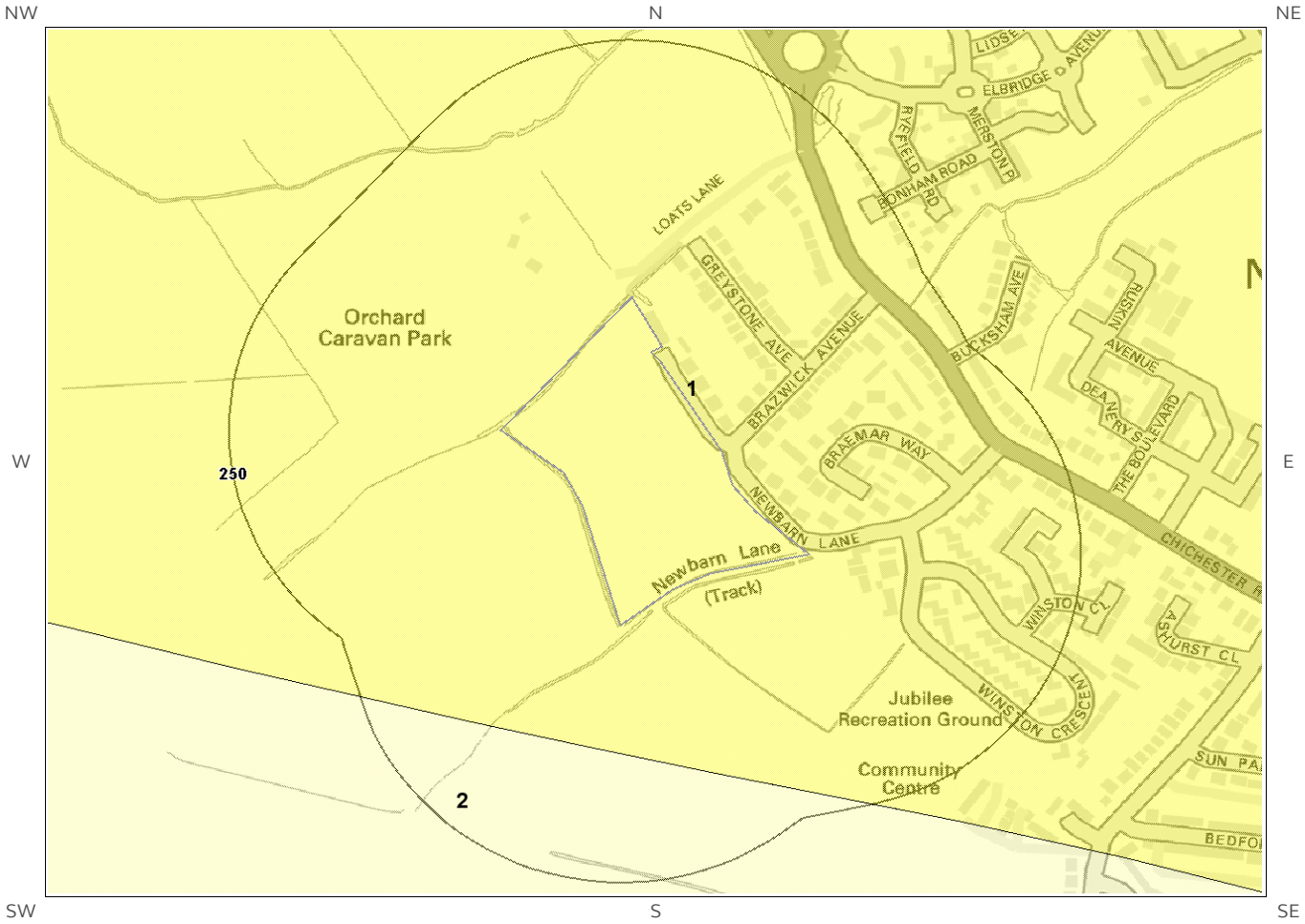
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.3 Ground Dissolution Soluble Rocks Map



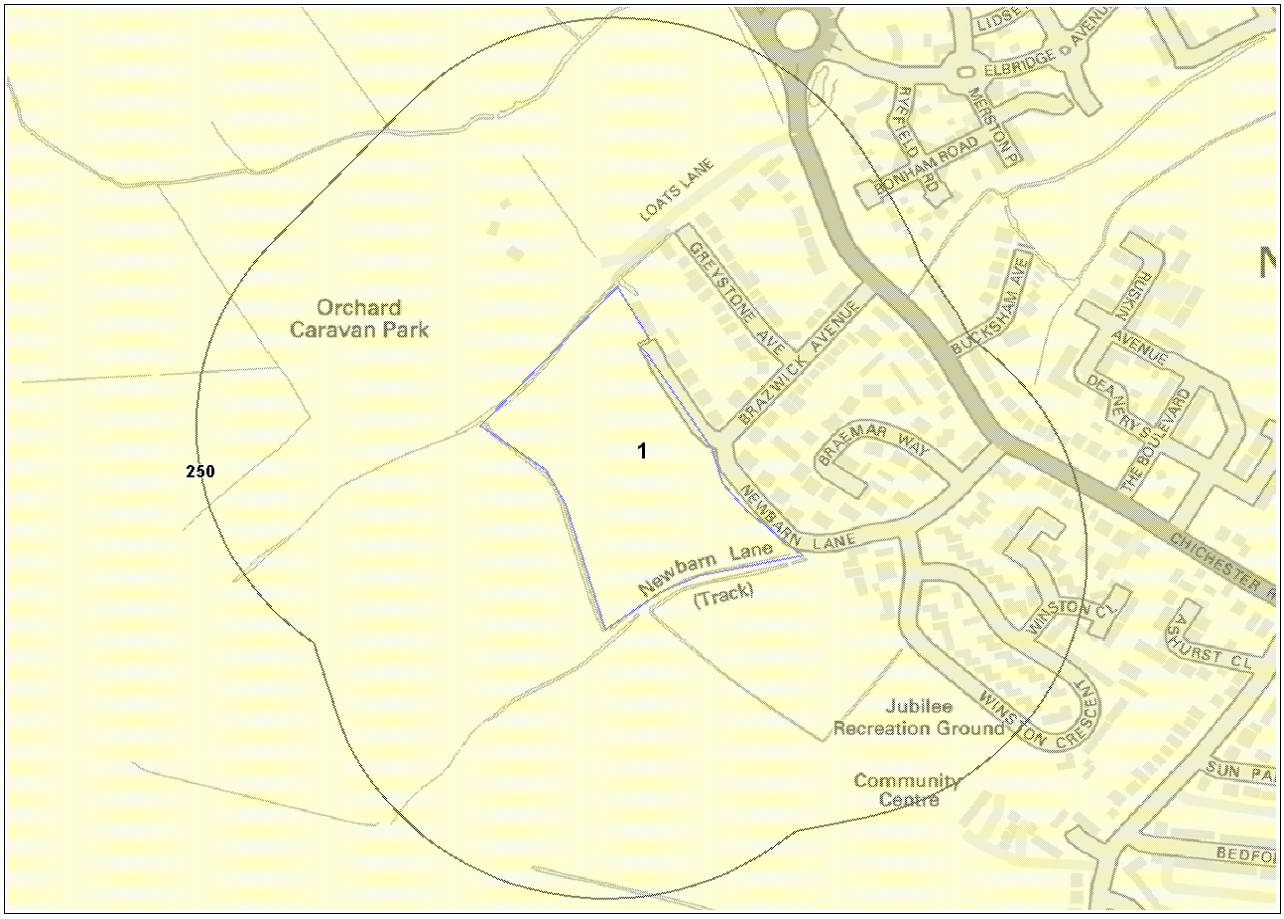
Ground Dissolution Soluble Rocks Legend

Mapping sourced from Ordnance Survey®

© Crown copyright and database rights 2015. Ordnance Survey license 100035207.



4.4 Compressible Deposits Map



Compressible Deposits Legend

Mapping sourced from Ordnance Survey®

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

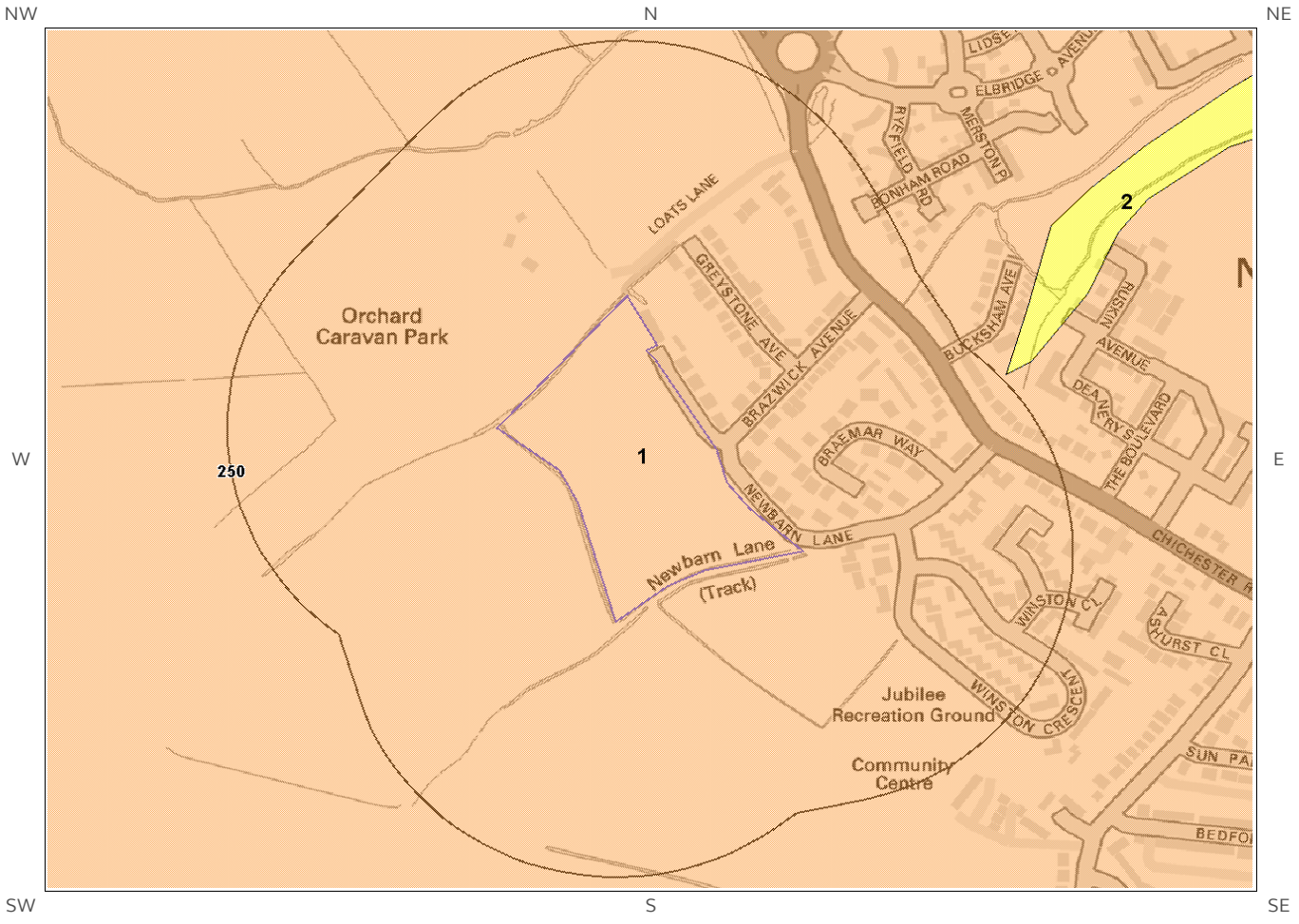
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.5 Collapsible Deposits Map



Collapsible Deposits Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

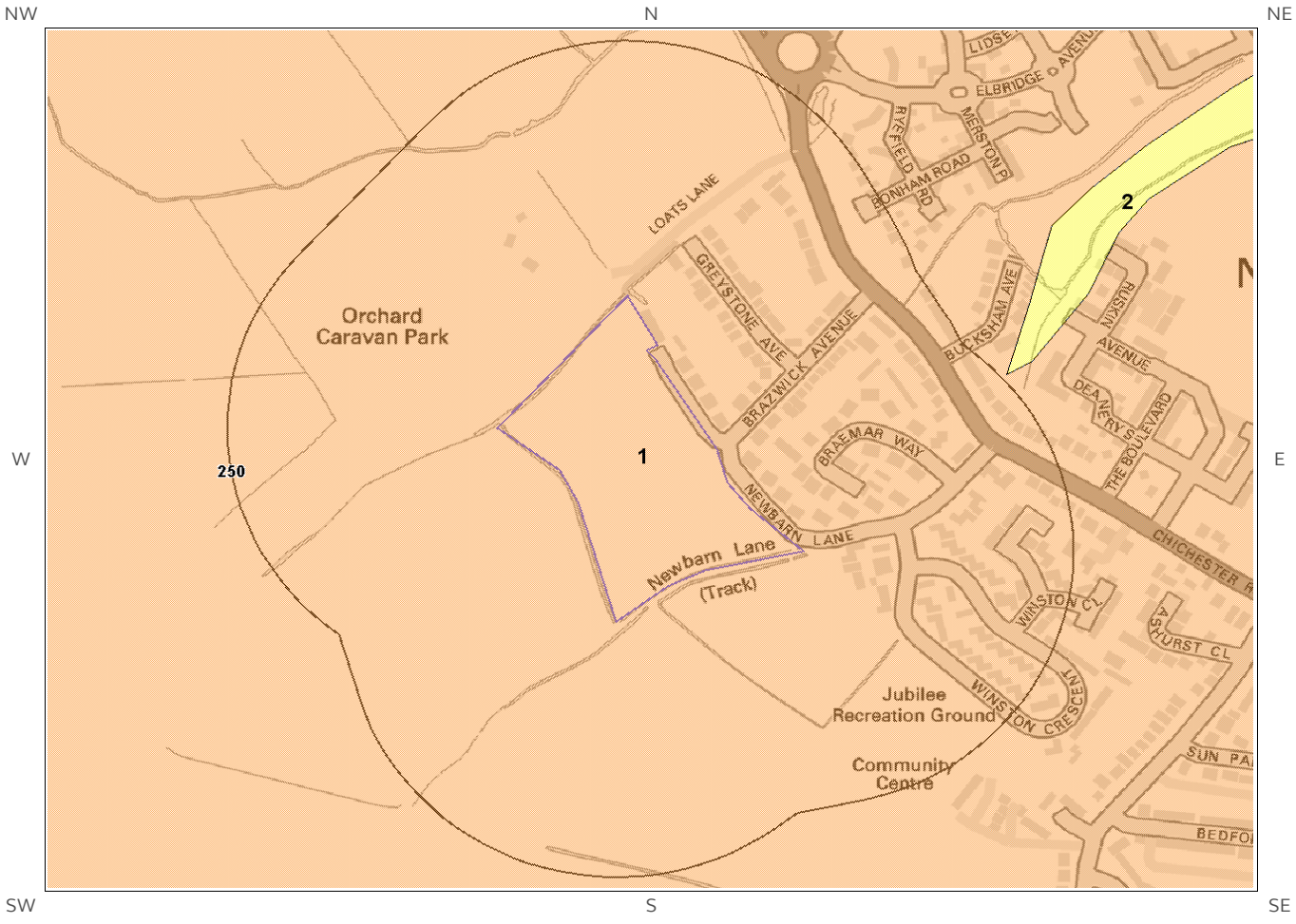
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4.6 Running Sand Map



Running Sand Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site*[*] boundary? Low

4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

4.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.

* This includes an automatically generated 50m buffer zone around the site

4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible ground identified. No special actions required to avoid problems due to compressible ground. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible ground.

4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

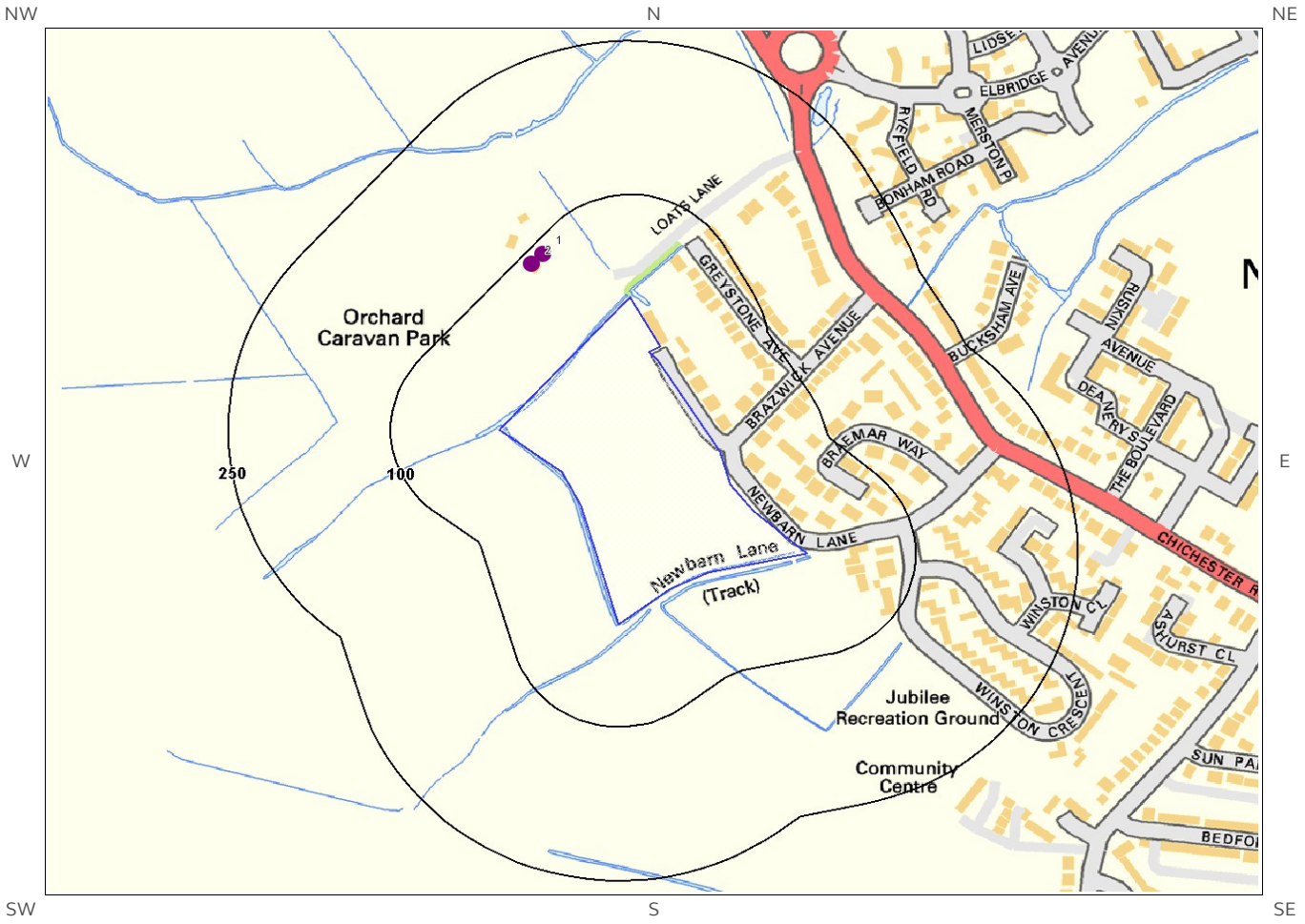
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soak-aways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation. For existing property, no significant increase in insurance risk from collapsible deposits is likely.

4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build, consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property, no significant increase in insurance risk due to running sand problems is likely.

5 Borehole Records Map



Borehole Records Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

Borehole Locations

125
250
Search Buffers (m)

5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary: 2

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	88.0	NW	491470 101270	SU90SW1	34.0	ORCHARD CARAVAN PARK N BERSTED SUSSEX
2	88.0	NW	491460 101260	SU90SW25	34.0	ORCHARD CARAVAN PARK SUSSEX

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/434432
#2: scans.bgs.ac.uk/sobi_scans/boreholes/434456

6 Estimated Background Soil Chemistry

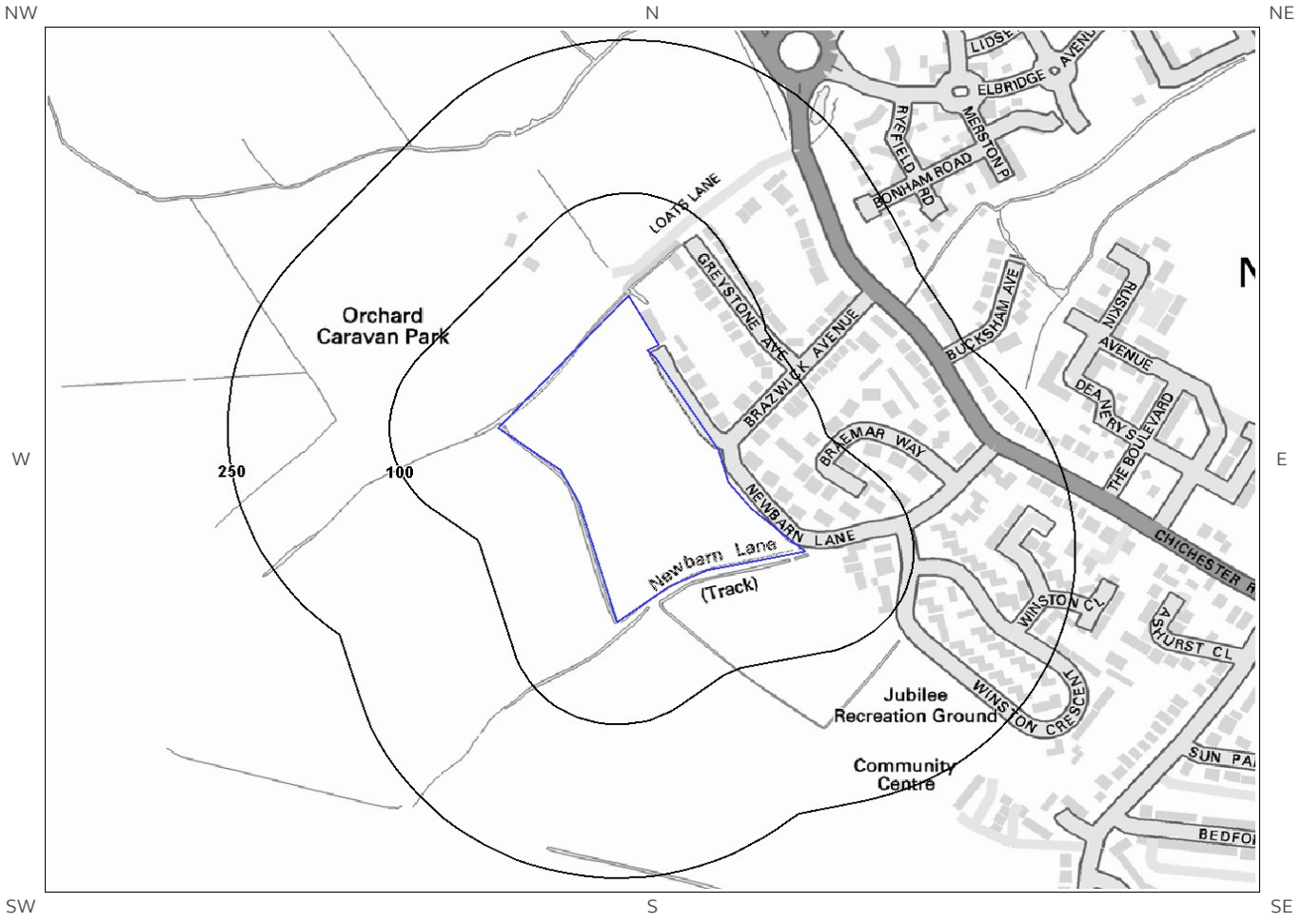
Records of background estimated soil chemistry within 250m of the study site boundary: 8

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geoinsight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
13.0	W	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
13.0	W	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
122.0	S	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
123.0	S	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

7 Railways and Tunnels Map



Railways and Tunnels Legend

Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.
© OpenStreetMapContributors

- Site Outline
- Search Buffers (m) — 250 / 500
- Underground or Partially Underground Railway / Subway System
- Railway Tunnel (OS Mapping)
- Abandoned or Dismantled Railway (OpenStreetMap)
- Railway Track (OS Mapping)
- Railway Track (OpenStreetMap)
- High Speed 2
- Crossrail 1
- Railway and/or Tunnel Feature from Historical Mapping

7 Railways and Tunnels

7.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

7.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

7.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels Map.

7.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels Map.

7.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

*Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a **Groundsure HS2 and Crossrail 1 Report**.*

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Contact Details

FIND

Telephone: 0845 521 1410
support@findmaps.co.uk
The Top Floor, 222 Borough High Street
London, SE1 1JX

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:**enquiries@bgs.ac.uk**
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries

British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
https://www.gov.uk/government/organisations/public-health-england
Email: **enquiries@phe.gov.uk**
Main switchboard: 020 7654 8000

Johnson Poole & Bloomer Limited

Harris and Pearson Building, Brettel Lane
Brierley Hill, West Midlands
DY5 3LH
Tel: +44 (0) 1384 262 000
Email:**enquiries.gs@jpb.co.uk**
Website: **www.jpb.co.uk**

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS

Tel: 08456 050505
Website: http://www.ordnancesurvey.co.uk/

Getmapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444
Website:**http://www1.getmapping.com/**

Peter Brett Associates

Caversham Bridge House
Waterman Place
Reading
Berkshire RG1 8DN
Tel: +44 (0)118 950 0761 E-mail:**reading@pba.co.uk**
Website:**http://www.peterbrett.com/home**

Contact Details

Acknowledgements: Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028]. This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

I**n these terms and conditions unless the context otherwise requires:**
"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.
"Client" means the party or parties entering into a Contract with Groundsure.
"Commercial" means any building or property which is not Residential.
"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than
(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and
(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).
"Support Services" means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.
"Contract" means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.
"Third Party Data Provider" means any third party providing Third Party Content to Groundsure.
"Data Reports" means reports comprising factual data with no accompanying interpretation.
"Fees" has the meaning set out in clause 5.1.
"Groundsure" means Groundsure Limited, a company registered in England and Wales under number 03421028.
"Groundsure Materials" means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.
"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.
"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.
"Order" means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.
"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.
"Order Website" means the online platform through which Orders may be placed by the Client and accepted by Groundsure.
"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.
"Residential" means any building or property used as or intended to be used as a single dwelling.
"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.
"Services" means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.
"Site" means the area of land in respect of which the Client has requested Groundsure to provide the Services.
"Third Party Content" means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.
"User Guide" means the user guide, as amended from time to time, available upon request from Groundsure and on the website (www.Groundsure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 Groundsure agrees to provide the Services in accordance with the Contract.
2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.
2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.
2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.
2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.
2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure. Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1The Client shall comply with the terms of this Contract and
(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and
(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.
3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.
3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.
3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.
3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.
3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.
4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;
(i) the Beneficiary,
(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),
(iv) the first purchaser or first tenant of the Site, and
(v) the professional advisers and lenders of the first purchaser or tenant of the Site.
4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.
4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1Groundsure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").
5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.
5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to
(i) full payment of all relevant Fees and
(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.
6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure

acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.
6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.
6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.
6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7.Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.
7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.
7.4 Groundsure shall not be liable for

(i) loss of profits;
(ii) loss of business;
(iii) depletion of goodwill and/or similar losses;
(iv) loss of anticipated savings;
(v) loss of goods;
(vi) loss of contract;
(vii) loss of use;
(viii) loss or corruption of data or information;
(ix) business interruption;
(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;
(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;
(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;
(xiii) loss or damage to a computer, software, modem, telephone or other property; and
(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.
7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

8 Groundsure's right to suspend or terminate

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.
8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.
9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event
(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.
12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.
12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.
12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.
12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.
12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.
12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

(i) the Client or Beneficiary's failure to provide facilities, access or information;
(ii) fire, storm, flood, tempest or epidemic;
(iii) Acts of God or the public enemy;
(iv) riot, civil commotion or war;
(v) strikes, labour disputes or industrial action;
(vi) acts or regulations of any governmental or other agency;
(vii) suspension or delay of services at public registries by Third Party Data Providers;
(viii) changes in law; or
(ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent
required by law

© Groundsure Limited June 2013

Groundsure Enviroinsight

Address:	,
Date:	16 Jul 2015
Reference:	FIND-48516
Client:	FIND

NW N NE

W E

SW S SE



Aerial Photograph Capture date:	03-May-2013
Grid Reference:	491568,101074
Site Size:	3.72ha

Contents Page

Contents Page 3
Overview of Findings 6
Using this report 10
1. Historical Land Use 11
1. Historical Industrial Sites 12
1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping 12
1.2 Additional Information – Historical Tank Database 12
1.3 Additional Information – Historical Energy Features Database 12
1.4 Additional Information – Historical Petrol and Fuel Site Database 13
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database 13
1.6 Potentially Infilled Land 13
2. Environmental Permits, Incidents and Registers Map 15
2. Environmental Permits, Incidents and Registers 16
2.1 Industrial Sites Holding Licences and/or Authorisations 16
2.1.1 Records of historic IPC Authorisations within 500m of the study site: 16
2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: 16
2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 16
2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: 16
2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: 16
2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: 17
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations: 17
2.1.8 Records of Licensed Discharge Consents within 500m of the study site: 17
2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 18
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: 19
2.2 Dangerous or Hazardous Sites 19
2.3 Environment Agency Recorded Pollution Incidents 19
2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site: 19
2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site: 19
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990 19
3. Landfill and Other Waste Sites Map 20
3. Landfill and Other Waste Sites 21
3.1 Landfill Sites 21
3.1.1 Records from Environment Agency landfill data within 1000m of the study site: 21
3.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site: 21
3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site: 21
3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site: 21
3.2 Other Waste Sites 21
3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site: 21
3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site: 22
4. Current Land Use Map 23
4. Current Land Uses 24
4.1 Current Industrial Data 24
4.2 Petrol and Fuel Sites 24
4.3 National Grid High Voltage Underground Electricity Transmission Cables 25
4.4 National Grid High Pressure Gas Transmission Pipelines 25
5. Geology 26

5.1 Artificial Ground and Made Ground....26
5.2 Superficial Ground and Drift Geology....26
5.3 Bedrock and Solid Geology....26
6 Hydrogeology and Hydrology 27
6a. Aquifer Within Superficial Geology 27
6b. Aquifer Within Bedrock Geology and Abstraction Licenses 28
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses 29
6d. Hydrogeology – Source Protection Zones within confined aquifer 30
6e. Hydrology – Detailed River Network and River Quality 31
6.Hydrogeology and Hydrology 32
6.1 Aquifer within Superficial Deposits....32
6.2 Aquifer within Bedrock Deposits....32
6.3 Groundwater Abstraction Licences....33
6.4 Surface Water Abstraction Licences....34
6.5 Potable Water Abstraction Licences....35
6.6 Source Protection Zones....35
6.7 Source Protection Zones within Confined Aquifer....36
6.8 Groundwater Vulnerability and Soil Leaching Potential....36
6.9 River Quality....36
6.9.1 Biological Quality:....37
6.9.2 Chemical Quality:....37
6.10 Detailed River Network....37
6.11 Surface Water Features....38
7a. Environment Agency Flood Map for Planning (from rivers and the sea) 39
7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map 40
7 Flooding 41
7.1 River and Coastal Zone 2 Flooding....41
7.2 River and Coastal Zone 3 Flooding....41
7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating....41
7.4 Flood Defences....41
7.5 Areas benefiting from Flood Defences....41
7.6 Areas benefiting from Flood Storage....42
7.7 Groundwater Flooding Susceptibility Areas....42
7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes....42
7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?....42
7.8 Groundwater Flooding Confidence Areas....42
8. Designated Environmentally Sensitive Sites Map 43
8. Designated Environmentally Sensitive Sites 44
8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:....44
8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:....44
8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:....44
8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:....44
8.5 Records of Ramsar sites within 2000m of the study site:....44
8.6 Records of Ancient Woodland within 2000m of the study site: 45
8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:....45
8.8 Records of World Heritage Sites within 2000m of the study site:....45
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site: 45
8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site: 45
8.11 Records of National Parks (NP) within 2000m of the study site: 45

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:....46
8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:....46
8.14 Records of Green Belt land within 2000m of the study site:....46
9. Natural Hazards Findings 47
9.1 Detailed BGS GeoSure Data....47
9.1.1 Shrink Swell....47
9.1.2 Landslides....47
9.1.3 Soluble Rocks....47
9.1.4 Compressible Ground....48
9.1.5 Collapsible Rocks....48
9.1.6 Running Sand....48
9.2 Radon....48
9.2.1 Radon Affected Areas....48
9.2.2 Radon Protection....49
10. Mining 50
10.1 Coal Mining....50
10.2 Non-Coal Mining....50
10.3 Brine Affected Areas....50
Contact Details 51
Standard Terms and Conditions 53

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	0	0	4	6
1.2 Additional Information – Historical Tank Database	0	0	0	0
1.3 Additional Information – Historical Energy Features Database	0	0	14	4
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	2	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	3	0
1.6 Potentially Infilled Land	0	0	5	4

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	1	2	5
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	0
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Groundsure
LOCATION INTELLIGENCE

FIND
PROFESSIONAL MAPPING INTELLIGENCE

Section 3: Landfill and Other Waste Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-5000
3.1 Landfill Sites						
3.1.1 Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency Historic Landfill Sites	0	0	0	0	0	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency Licensed Waste Sites	0	0	0	0	1	0

Section 4: Current Land Use

	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	6	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	1	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology

5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology

	0-500m
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	1	0	3	6
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	6
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	2	0	3	1	Not searched	Not searched

	On-site	0-50m	51-250	251-500	501-1000	1000-1500

Section 6: Hydrogeology and Hydrology

	0-500m					
6.9 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	No
6.10 Detailed River Network entries within 500m of the site	0	0	9	6	Not searched	Not searched
6.11 Surface water features within 250m of the study site	Yes	Yes	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Are there any Enviroment Agency Zone 2 floodplains within 250m of the study site?	No
7.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site	No
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Very Low
7.4 Are there any Flood Defences within 250m of the study site?	No
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential at Surface
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	High

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	1
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	1	0	0	0	1	5
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards

9.1 What is the maximum risk of natural ground subsidence?	Low
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Low
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Very Low
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Negligible
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	Yes
10.3 Are there any brine affected areas within 75m of the study site?	No

Groundsure
LOCATION INTELLIGENCE

FIND
PROFESSIONAL MAPPING INTELLIGENCE

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

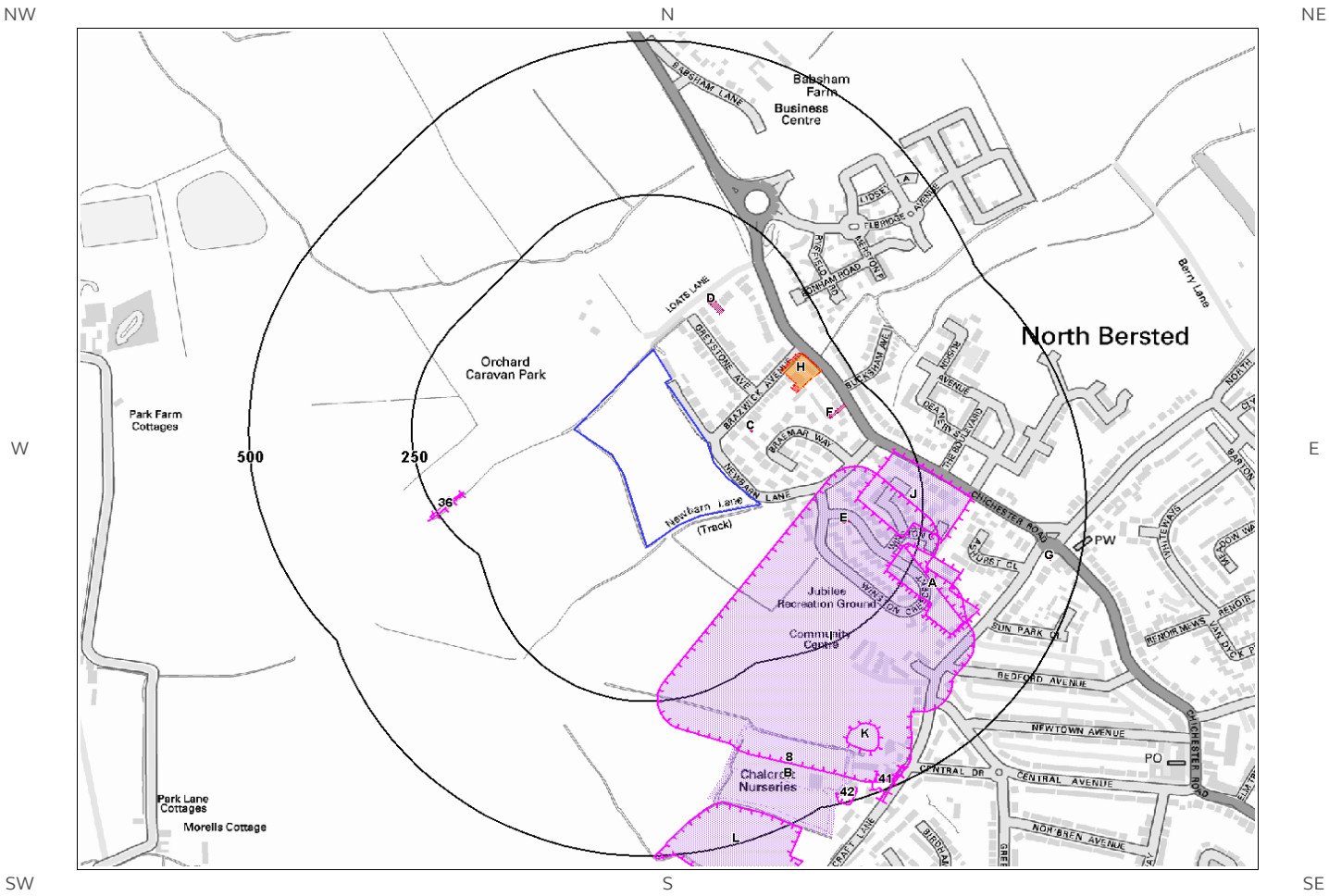
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

Groundsure
LOCATION INTELLIGENCE

FIND
PROFESSIONAL MAPPING INTELLIGENCE

1. Historical Land Use



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015. Ordnance Survey license 100035207.

Site Outline

250
500
Search Buffers (m)

Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 10

ID	Distance [m]	Direction	Use	Date
1I	59	SE	Brick Field	1940
2J	149	E	Brick Field	1934
3A	221	SE	Brick Field	1934
4A	221	SE	Unspecified Pit	1934
5B	323	SE	Nursery	1977
6B	323	SE	Nursery	1993
7B	325	SE	Nursery	1940
8	328	SE	Nursery	1961
9K	387	SE	Unspecified Pit	1940
10L	428	S	Cemetery	1993

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 0

Database searched and no data found.

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 18

ID	Distance (m)	Direction	Use	Date
11C	66	E	Electricity Substation	1991
12C	66	E	Electricity Substation	1971
13C	67	E	Electricity Substation	1991
14D	113	NE	Electricity Substation	1971
15D	114	NE	Electricity Substation	1968
16D	114	NE	Electricity Substation	1967

17D	114	NE	Electricity Substation	1974
18E	128	E	Electricity Substation	1979
19E	128	E	Electricity Substation	1991
20E	129	E	Electricity Substation	1971
21F	174	NE	Electricity Substation	1968
22F	174	NE	Electricity Substation	1970
23F	174	NE	Electricity Substation	1979
24F	174	NE	Electricity Substation	1991
25G	449	E	Electricity Substation	1984
26G	450	E	Electricity Substation	
27G	450	E	Electricity Substation	
28G	450	E	Electricity Substation	

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 2

ID	Distance (m)	Direction	Use	Date
29H	155	NE	Filling Station	1991
30H	157	NE	Filling Station	

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 3

ID	Distance (m)	Direction	Use	Date
31H	160	NE	Garage	1968
32H	160	NE	Garage	1971
33H	160	NE	Garage	1964

1.6 Potentially Infilled Land

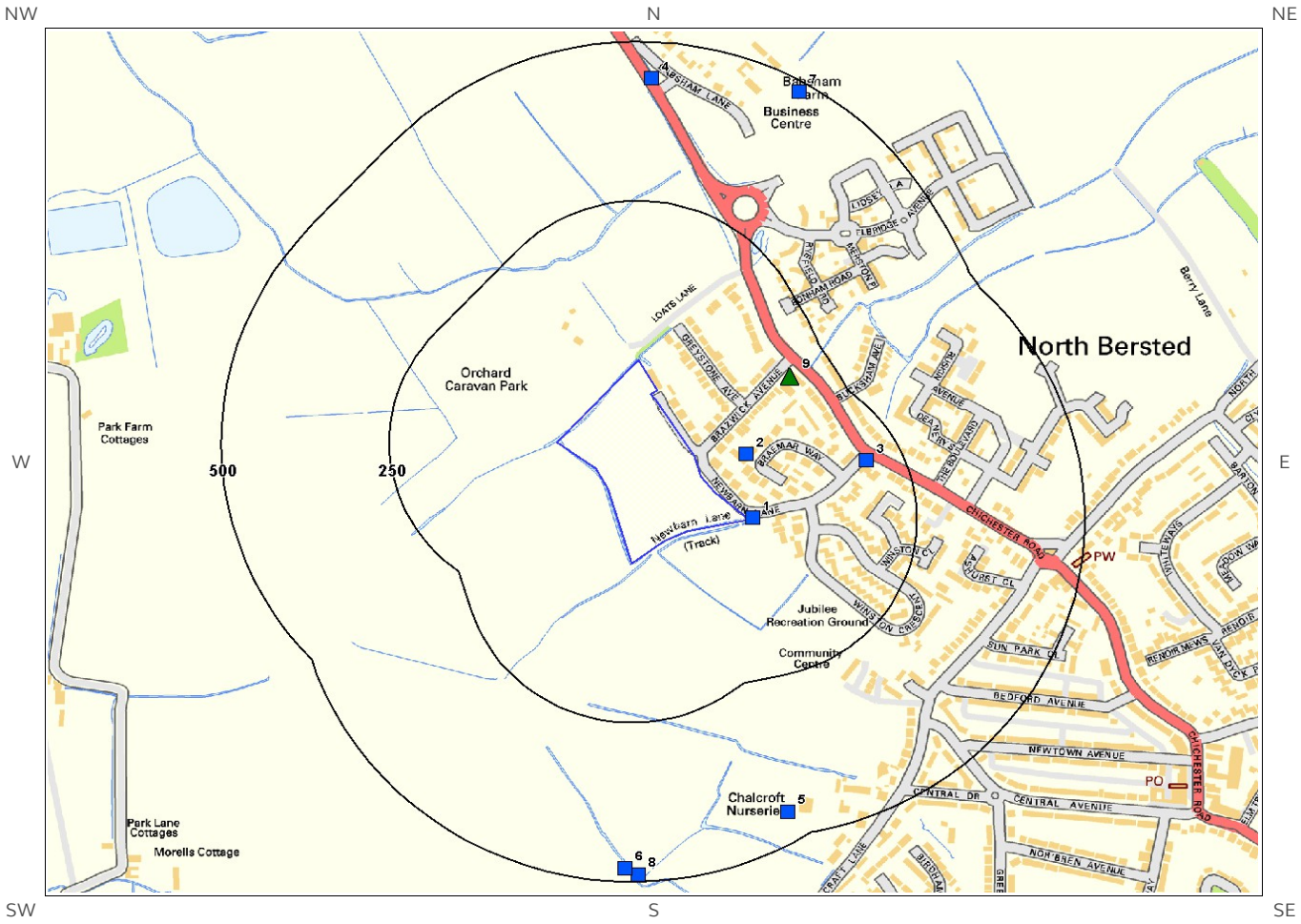
Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 9

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
34I	59	SE	Brick Field	1940
35J	149	E	Brick Field	1934
36	199	SW	Pond	1876

37A	221	SE	Unspecified Pit	1934
38A	221	SE	Brick Field	1934
39K	387	SE	Unspecified Pit	1940
40L	428	S	Cemetery	1993
41	473	S	Ponds	1876
42	478	S	Pond	1876

2. Environmental Permits, Incidents and Registers Map



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

- Site Outline
- Search Buffers (m) — 250 / 500
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

1

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
9	185	NE	491776 101199	Address: Regis Service Station, 449 Chichester Road, Bognor Regis, West Sussex, PO21 5DS Process: Unloading Petrol into Storage Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

8

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1	5	E	491720 100980	Address: NEW-BARN FARM ESTATE, NEW-BARN FARM ESTATE, NORTH BERSTED, BOGNOR REGIS WEST SUSSEX Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: S01647 Permit Version: 1	Receiving Water: Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 09/10/1967 Effective Date: 09-Oct-1967 Revocation Date: 31/03/1997
2	73	NE	491710 101080	Address: NEW-BARN FARM ESTATE, NEW-BARN FARM ESTATE, NORTH BERSTED, BOGNOR REGIS WEST SUSSEX Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: S01647 Permit Version: 1	Receiving Water: Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 09/10/1967 Effective Date: 09-Oct-1967 Revocation Date: 31/03/1997
3	198	NE	491890 101070	Address: NEWBARN ESTATE, NEWBARN ESTATE, NORTH BERSTED, BOGNOR REGIS WEST SUSSEX Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: S01165 Permit Version: 1	Receiving Water: Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 04/10/1961 Effective Date: 04-Oct-1961 Revocation Date: 31/03/1997

ID	Distance (m)	Direction	NGR	Details	
4	442	N	491570 101670	Address: ROSEMARY COTTAGE, BOGNOR REGIS, ROSEMARY COTTAGE, BABSHAM LANE, BOGNOR REGIS, WEST SUSSEX, PO21 5EL Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P12184 Permit Version: 1	Receiving Water: Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 28/10/2004 Effective Date: 28-Oct-2004 Revocation Date: -
5	453	SE	491772 100519	Address: CHALCROFT NURSERIES, CHALCROFT LANE, BOGNOR REGIS, WEST SUSSEX, ., PO21 5TS Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD006114 Permit Version: 1	Receiving Water: Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 23/01/2009 Effective Date: 23-Jan-2009 Revocation Date: -
6	479	S	491530 100430	Address: LAND ADJ CHALCRAFT LANE CEMETERY, LAND ADJ CHALCRAFT LANE CEMETERY, CHALCRAFT LANE, BERSTED, BOGNOR REGIS, WEST SUSSEX, PO21 5XX Effluent Type: MISCELLANEOUS DISCHARGES - MINE/GROUNDWATER AS RAISED Permit Number: P13108 Permit Version: 1	Receiving Water: Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 17/09/2007 Effective Date: 17-Sep-2007 Revocation Date: -
7	485	NE	491790 101650	Address: MEADOW HOME, MEADOW HOME, BABSHAM LANE, BOGNOR REGIS WEST SUSSEX Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P02477 Permit Version: 1	Receiving Water: Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 23/08/1989 Effective Date: 23-Aug-1989 Revocation Date: -
8	489	S	491550 100420	Address: CHALCRAFT CEMETARY, CHALCRAFT CEMETARY, CHALCRAFT LANE, BOGNOR REGIS, WEST SUSSEX Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P03403 Permit Version: 1	Receiving Water: Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 18/01/1991 Effective Date: 18-Jan-1991 Revocation Date: 31/03/1997

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

0

Database searched and no data found.

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

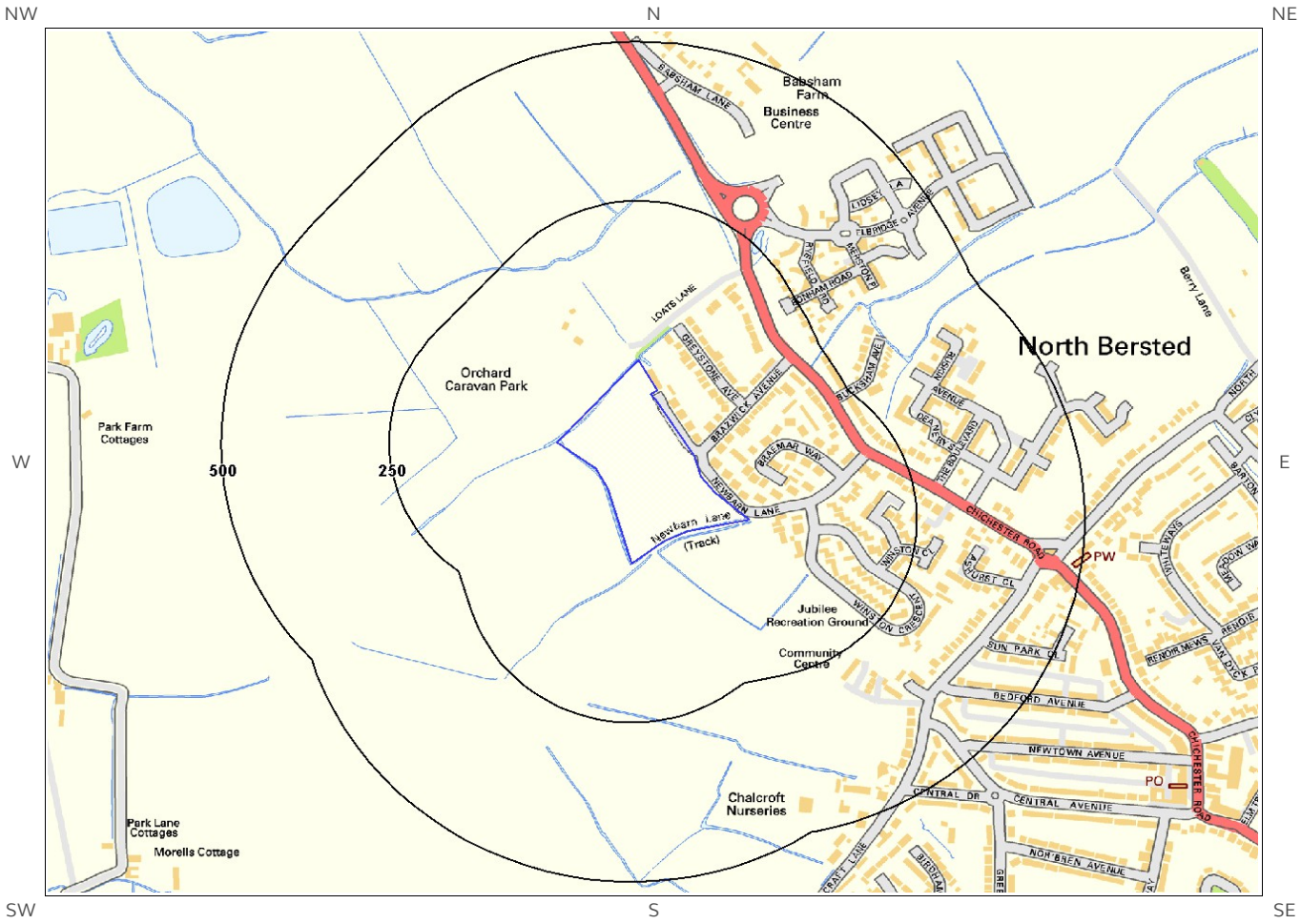
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

250
500
Search Buffers (m)

E.A. Active Landfill

E.A. Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

E.A. Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

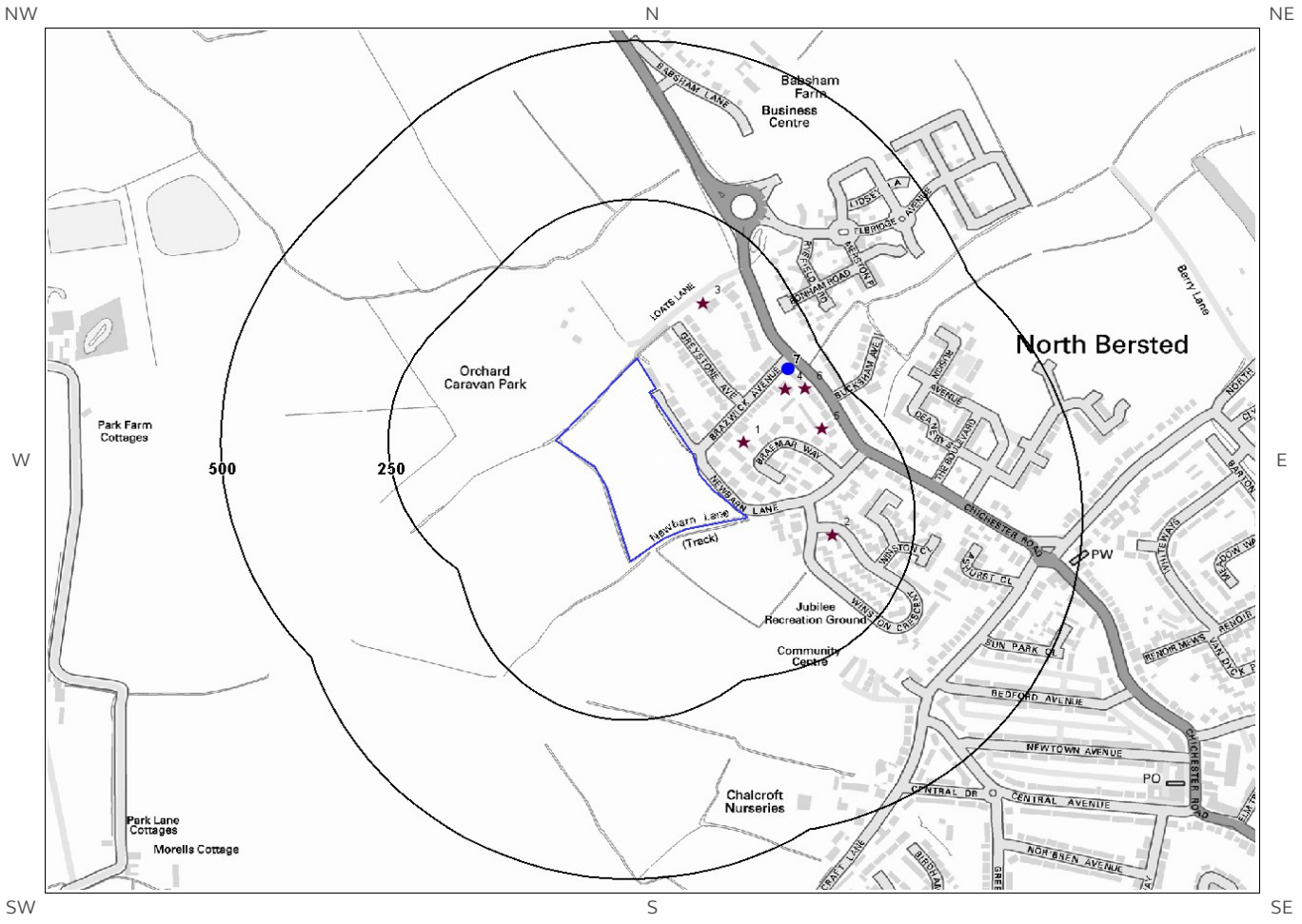
3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	941	N	491345 102146	Site Address: Elbridge Farm Business Centre, Chichester Road, Bersted, Bognor Regis, West Sussex, PO21 5EF Type: HCI Waste TS + treatment Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MYN001 EPR reference: EA/EPR/CB3201TM/A001 Operator: Recycle Southern Limited Waste Management licence No: 401894 Annual Tonnage: 75000.0	Issue Date: 02/12/2014 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Elbridge Farm Transfer Station Correspondence Address: -, -

4. Current Land Use Map



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

Search Buffers (m)
250
500

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 6

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	77	E	Electricity Sub Station	491709 101097	PO21	Electrical Features	Infrastructure and Facilities
2	130	E	Electricity Sub Station	491842 100951	PO21	Electrical Features	Infrastructure and Facilities
3	131	NE	Electricity Sub Station	491648 101316	PO21	Electrical Features	Infrastructure and Facilities
4	171	NE	Esso	491770 101181	449, Chichester Road, Bognor Regis, PO21 5DS	Petrol and Fuel Stations	Road and Rail
5	179	NE	Electricity Sub Station	491826 101118	PO21	Electrical Features	Infrastructure and Facilities
6	197	NE	Regis Service Station	491801 101181	449, Chichester Road, Bognor Regis, PO21 5DS	Petrol and Fuel Stations	Road and Rail

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 1

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
7	191	NE	491775 101212	Esso	Regis Service Station, 449, Chichester Road, Chichester Road, Brazwick Avenue, North Bersted, Bognor Regis, West Sussex, PO21 5DS	No	Open

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

---

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
RTDU	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY [UNLITHIFIED DEPOSITS CODING SCHEME]

5.3 Bedrock and Solid Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
LPCK-CHLK	LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED)	CHALK

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

6a. Aquifer Within Superficial Geology

NW N NE

W E

SW S SE



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015 Ordnance Survey license 100035207.

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

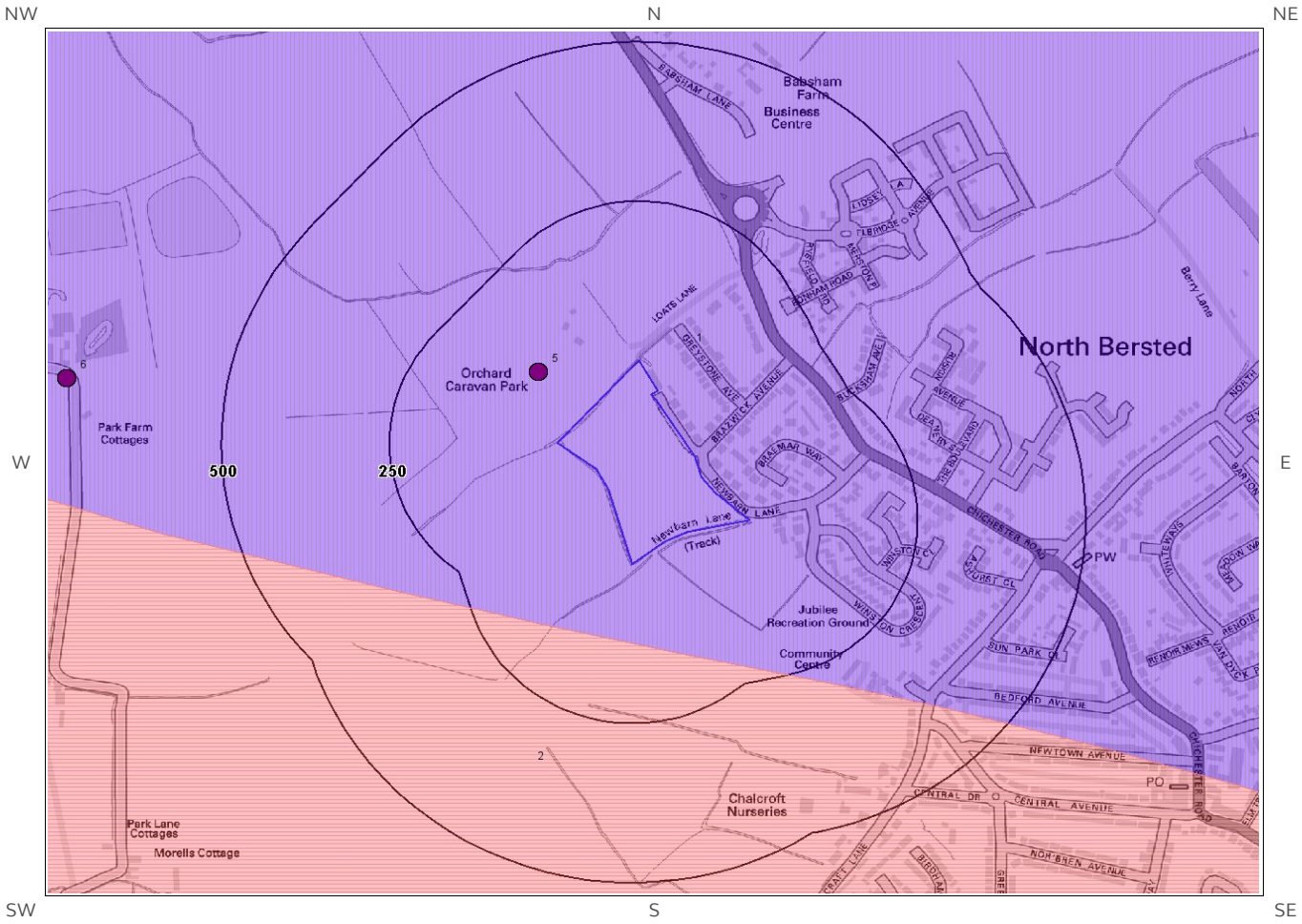
Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

6b. Aquifer Within Bedrock Geology and Abstraction Licenses



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015
Ordnance Survey license 100035207.

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

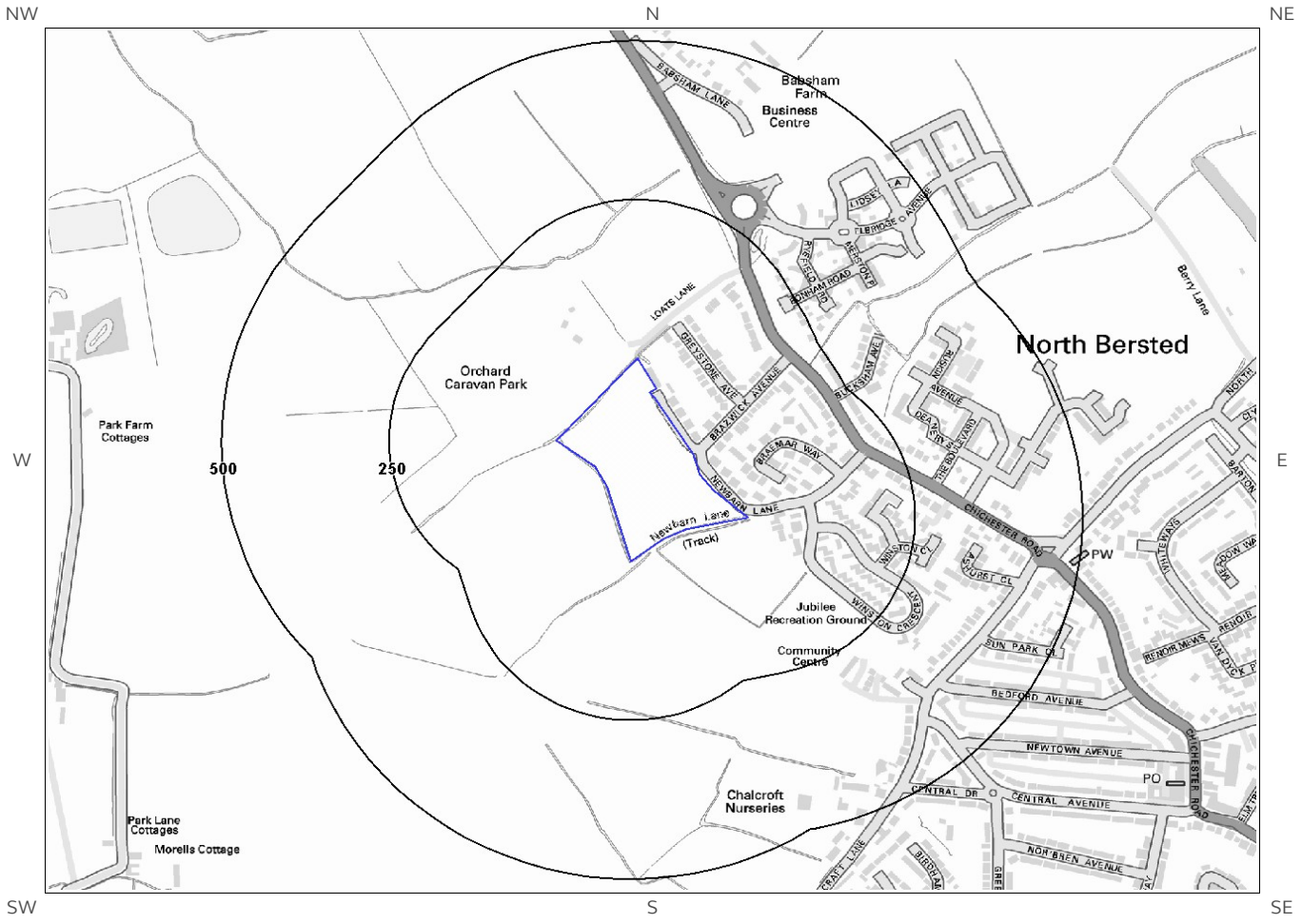
Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015
Ordnance Survey license 100035207.

Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

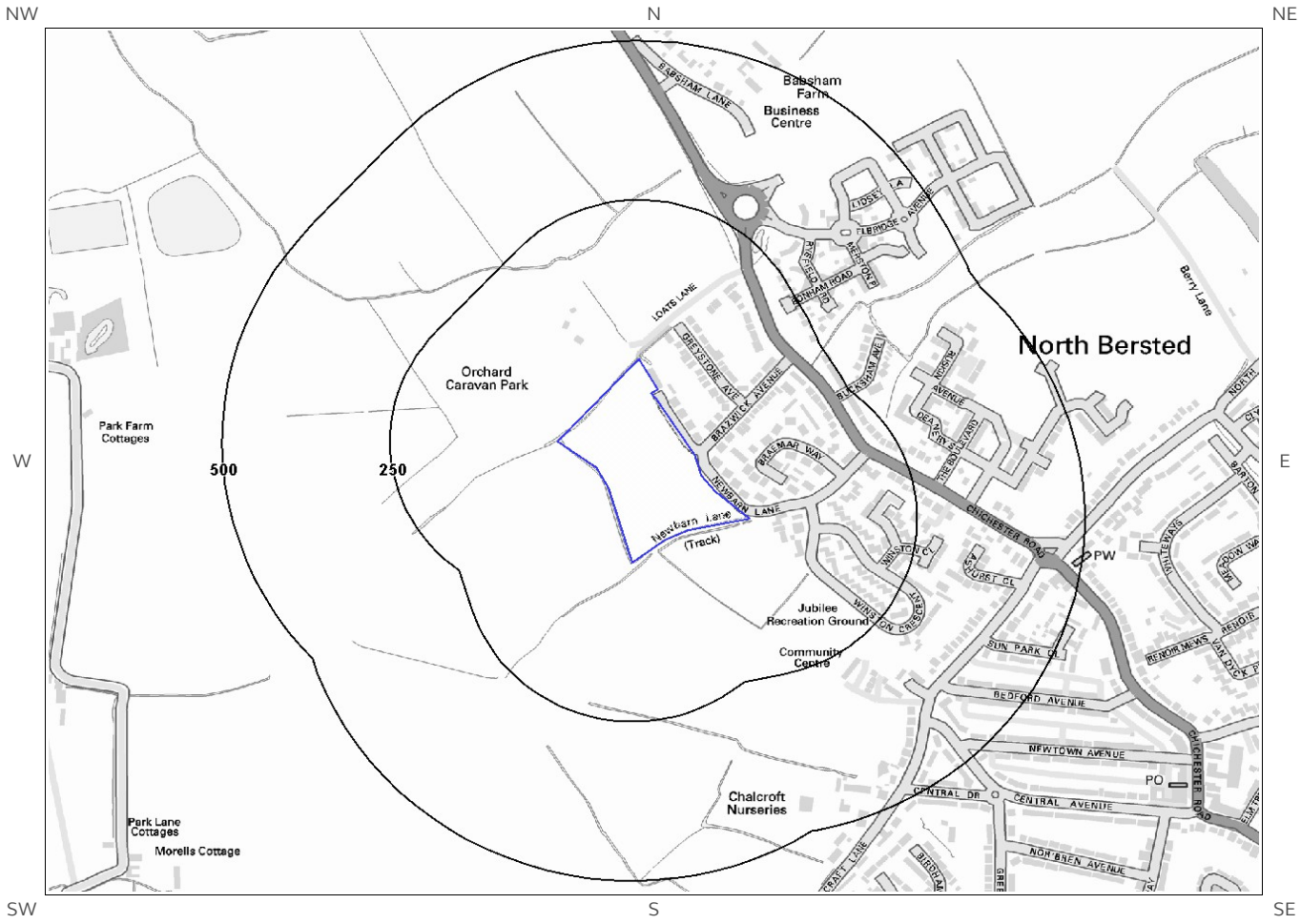
Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

6d. Hydrogeology – Source Protection Zones within confined aquifer



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015
Ordnance Survey license 100035207.

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

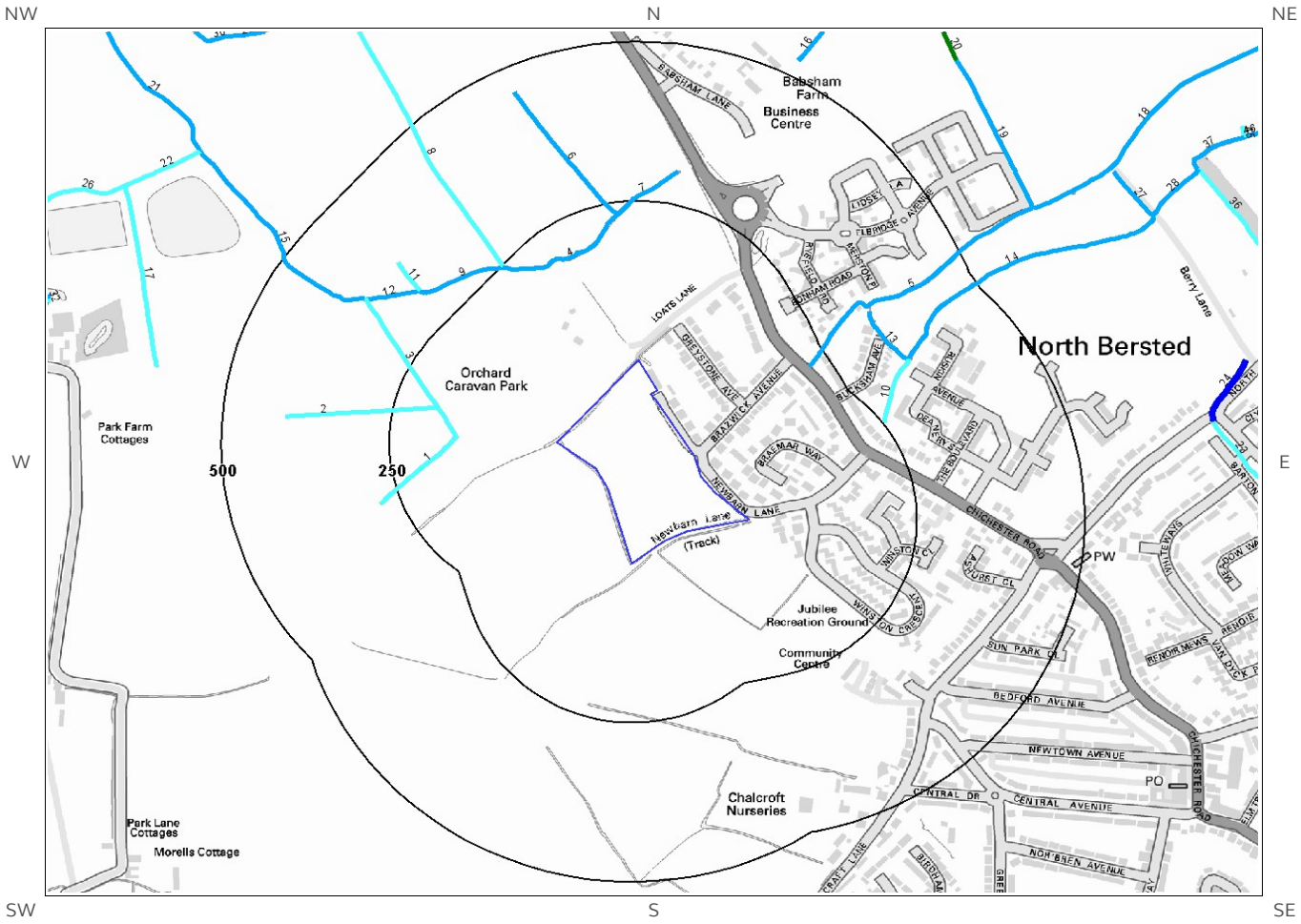
Source Protection Zone 3C - Total Catchment within Confined Aquifer

Site Outline

250
500
Search Buffers (m)

Potable Water Abstraction Licence

6e. Hydrology – Detailed River Network and River Quality



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

- Site Outline
- 250 / 500 Search Buffers (m)
- Primary River
- Secondary River
- Tertiary River
- Lake/Reservoir
- Underground River (inferred)
- General Quality Assessment: Biology
- General Quality Assessment: Chemistry
- Canal
- Canal Tunnel
- Culvert
- Multiple Channel Culvert
- Underground River (Potential Sewer)
- Underground River (local knowledge)

6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	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

6.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	122	S	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

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
5	98	NW	491400 101210	Licence No: 10/41/541005 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Southern Region Groundwater Point: Point A At Orchard Caravan Park,north Bersted Data Type: Point Name: Rickard	Annual Volume (m^3): 11365 Max Daily Volume (m^3): 68.1 Original Application No: - Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 1/4/2008 Version End Date:
6	737	W	490700 101200	Licence No: 27/166 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: Point A At Park Farm, Lagness Data Type: Point Name: Langmead Farms Ltd	Annual Volume (m^3): 59527 Max Daily Volume (m^3): 589 Original Application No: 169/1059 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 16/6/2009 Version End Date:
Not shown	781	W	490660 101230	Licence No: 27/192 Details: Spray Irrigation - Storage Direct Source: Southern Region Groundwater Point: Winter Storage At Park Farm, Lagness Data Type: Point Name: Langmead Farms Ltd	Annual Volume (m^3): 22727 Max Daily Volume (m^3): 444 Original Application No: 169/1587 Original Start Date: - Expiry Date: 18/7/2007 Issue No: 102 Version Start Date: 1/11/2003 Version End Date:
Not shown	781	W	490660 101230	Licence No: 27/192A Details: Spray Irrigation - Storage Direct Source: Southern Region Groundwater Point: Winter Storage At Park Farm, Lagness Data Type: Point Name: Langmead Farms Ltd	Annual Volume (m^3): 22727 Max Daily Volume (m^3): 444 Original Application No: 169/1587 Original Start Date: 9/11/2005 Expiry Date: 31/3/2016 Issue No: 1 Version Start Date: 16/6/2009 Version End Date:
Not shown	1592	N	491580 102820	Licence No: 10/41/541104 Details: General Farming & Domestic Direct Source: Southern Region Groundwater Point: A Well At Colworth Manor, Chichester Data Type: Point Name: Hall Hunter Partnership (Farming)	Annual Volume (m^3): 22730 Max Daily Volume (m^3): 91.2 Original Application No: NPS/WR/018719 Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 18/3/2015 Version End Date:
Not shown	1791	NE	492870 102440	Licence No: 10/41/541004 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: At Shripney Farm, Bognor Regis Data Type: Point Name: Langmead Farms Ltd	Annual Volume (m^3): 45460 Max Daily Volume (m^3): 547.2 Original Application No: WR.0009 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 10/6/2009 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1803	N	491490 103030	Licence No: 10/41/541204 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: Point A At Woodend Farm Colworth Data Type: Point Name: Hall Hunter Partnership (Farming)	Annual Volume (m^3): 15911 Max Daily Volume (m^3): 72.7 Original Application No: NPS/WR/018721 Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 18/3/2015 Version End Date:
Not shown	1846	NE	492580 102760	Licence No: 10/41/541002 Details: General Farming & Domestic Direct Source: Southern Region Groundwater Point: Point 1 At Shripney Farm & Flansham Farm Data Type: Point Name: The Donald Langmead Partnership	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: WR.0009 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 21/3/2001 Version End Date:
Not shown	1922	W	489580 101620	Licence No: 10/41/531301 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Southern Region Groundwater Point: Newlands Nursery, Lagness, Chichester Data Type: Point Name: Roundstone Nurseries	Annual Volume (m^3): 11228 Max Daily Volume (m^3): 109.1 Original Application No: NPS/WR/009883 Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 10/4/2012 Version End Date:
Not shown	1922	W	489580 101620	Licence No: 10/41/531301 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: Newlands Nursery, Lagness, Chichester Data Type: Point Name: Roundstone Nurseries	Annual Volume (m^3): 11228 Max Daily Volume (m^3): 109.1 Original Application No: NPS/WR/009883 Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 10/4/2012 Version End Date:

6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1361	NE	492920 101610	Licence No: 10/41/541001 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Aldingbourne Rife At Whitehouse Farm. Data Type: Line Name: The Donald Langmead Partnership	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: WR.1265 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 7/12/1996 Version End Date:
Not shown	1579	NE	492430 102540	Licence No: 27/186 Details: Spray Irrigation - Storage Direct Source: Southern Region Surface Waters Point: Left Bank Of The Aldingbourne Rife Looking Downstream Data Type: Point Name: Langmead Farms Ltd	Annual Volume (m^3): 90920 Max Daily Volume (m^3): 1440 Application No: - Original Start Date: - Expiry Date: - Issue No: 103 Version Start Date: 16/6/2009 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1579	NE	492430 102540	Licence No: 10/41/541309 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Left Bank Of The Aldingbourne Rife Looking Downstream Data Type: Point Name: Ashmarden Ltd	Annual Volume (m^3): 12274 Max Daily Volume (m^3): 909.2 Application No: WR.714 Original Start Date: - Expiry Date: 31/3/2016 Issue No: 101 Version Start Date: 10/6/2009 Version End Date:
Not shown	1579	NE	492430 102540	Licence No: 10/41/541001 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Left Bank Of The Aldingbourne Rife Looking Downstream Data Type: Point Name: Langmead	Annual Volume (m^3): 9092 Max Daily Volume (m^3): 545.5 Application No: WR. 265 Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 10/6/2009 Version End Date:
Not shown	1579	NE	492430 102540	Licence No: 10/41/542102 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Left Bank Of The Aldingbourne Rife Looking Downstream Data Type: Point Name: Ashmarden Ltd	Annual Volume (m^3): 19639 Max Daily Volume (m^3): 909.2 Application No: WR.0714 Original Start Date: 20/5/1966 Expiry Date: 31/3/2016 Issue No: 101 Version Start Date: 10/6/2009 Version End Date:
Not shown	1866	NE	492490 102840	Licence No: 27/185 Details: Spray Irrigation - Storage Direct Source: Southern Region Surface Waters Point: Right Bank Of The Aldingbourne Rife Looking Downstream. Data Type: Point Name: Hall Hunter Partnership (Farming)	Annual Volume (m^3): 61371 Max Daily Volume (m^3): 1440 Application No: NPS/WR/018718 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 18/3/2015 Version End Date:

6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? No

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site? No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
0	On Site	Major Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
53	S	Major Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
163	S	Minor Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
169	E	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
348	S	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

6.9 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? No

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? Yes

The following Detailed River Network records are represented on the Hydrology Map (6e):

ID	Distance (m)	Direction	Details	
1	151	W	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
2	186	W	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
3	186	W	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
4	189	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
5	220	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
6	231	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
7	231	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
8	246	NW	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
9	246	NW	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
10	252	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11	312	NW	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12	312	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
13	335	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
14	346	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
15	364	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined

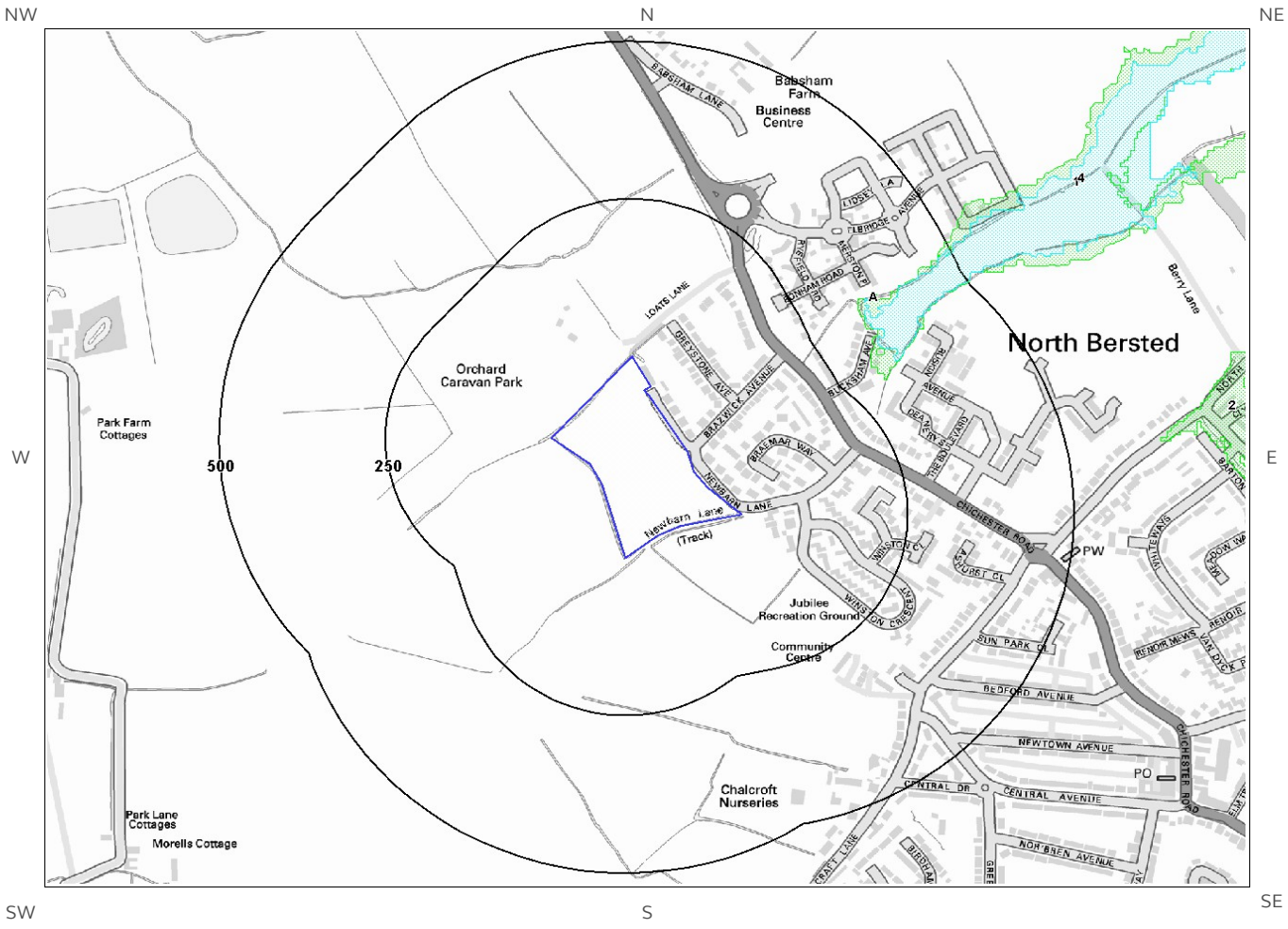
6.11 Surface Water Features

Are there any surface water features within 250m of the study site? Yes

The following surface water records are not represented on mapping:

Distance (m)	Direction
0	On Site
0	On Site
0	On Site
3	SE
3	NE
3	S
22	W
34	NW
135	SW
151	W
171	SW
186	W
186	W
188	NW
192	NW
211	NE
220	NE
222	NE
223	SW
228	S
247	NW

7a. Environment Agency Flood Map for Planning (from rivers and the sea)



Mapping sourced from Ordnance Survey®

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

100
250
Search Buffers (m)

Zone 2 Floodplain

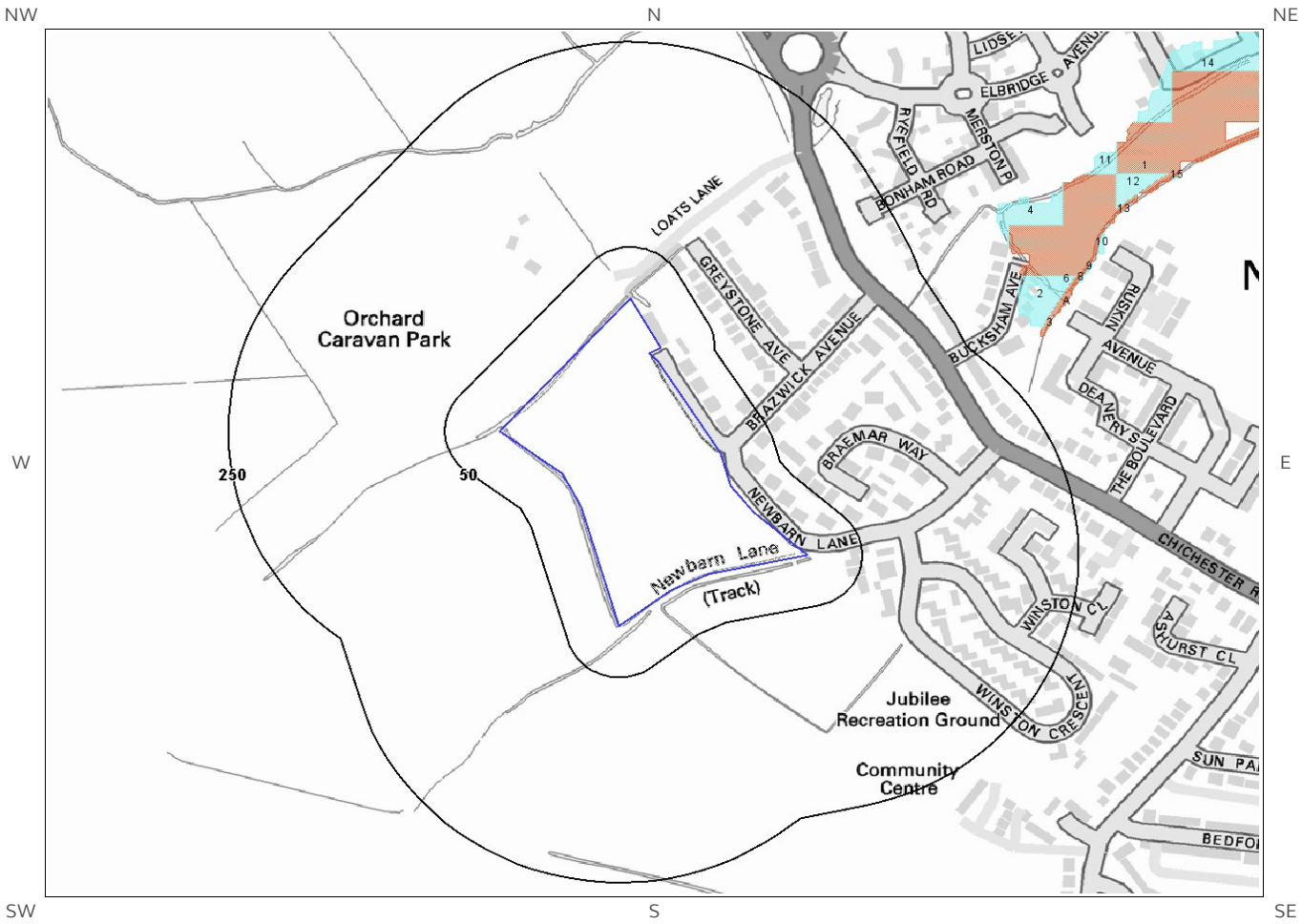
Zone 3 Floodplain

Flood Defences

Area used for Flood Storage

Area Benefiting from Flood Defences

7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

Site Outline

100
250
Search Buffers (m)

RoFRaS Rating

- Very Low
- Low
- Medium
- High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency Zone 2 floodplain? No

Environment Agency Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency Zone 3 floodplain? No

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

What is the highest risk of flooding onsite? Very Low

The Environment Agency RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No

Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

---

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

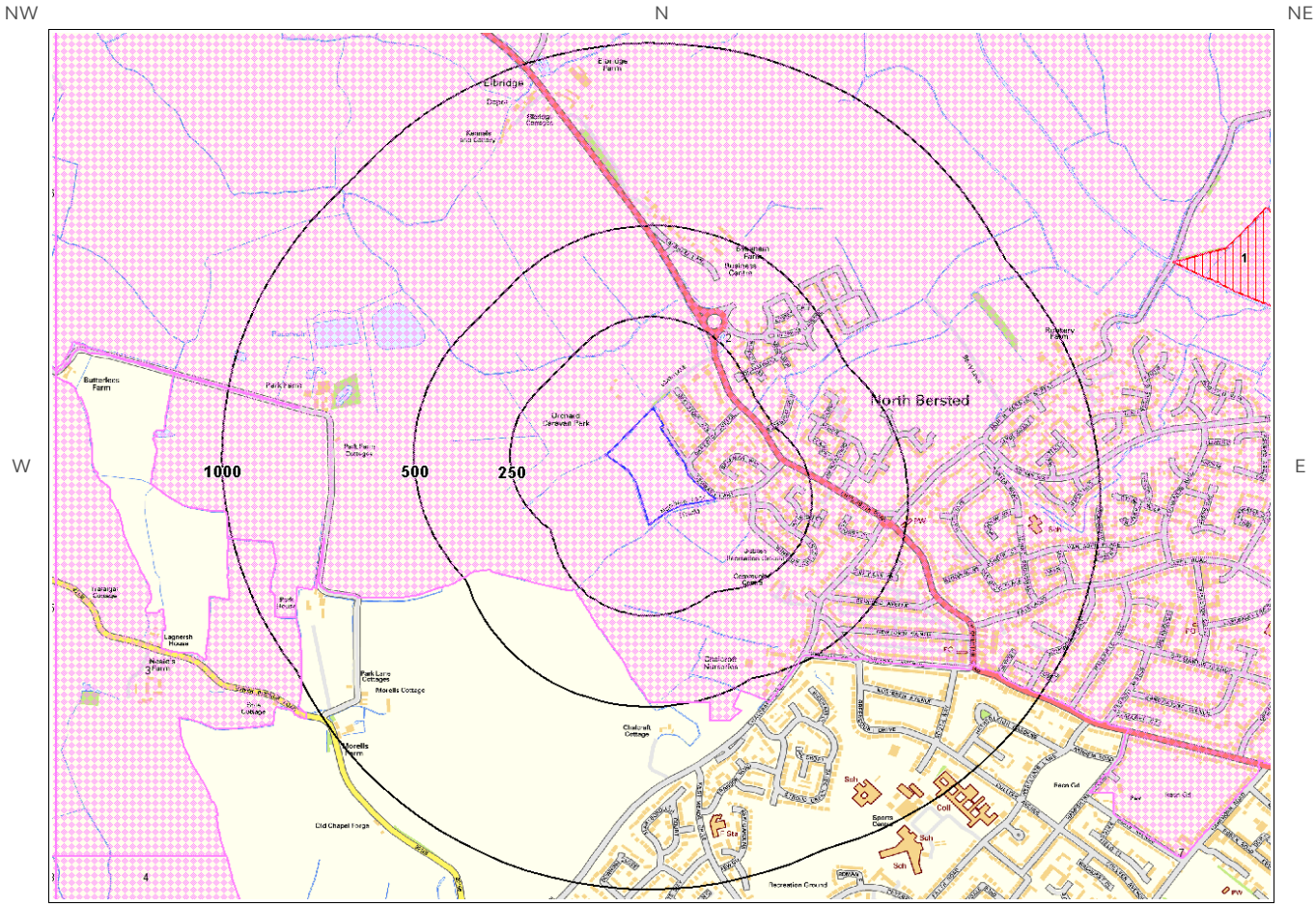
7.8 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? High

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



Mapping sourced from Ordnance Survey

© Crown copyright and database rights 2015.
Ordnance Survey license 100035207.

- Site Outline
- 100 / 250 Search Buffers (m)
- AONB
- National Park
- SSSI
- Special Protection Areas
- Nitrate Vulnerable Zones
- Green Belt
- Environmentally Sensitive Areas
- Special Areas of Conservation
- World Heritage Sites
- Nitrate Sensitive Areas
- Ancient Woodland
- National Nature Reserve
- Local Nature Reserves
- Ramsar Sites

8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?	Yes

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

1

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
1	1357	NE	The Brooks	Natural England

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

7

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
2	0	On Site	Existing	DEFRA
3	811	W	New	DEFRA
4	1427	SW	New	DEFRA
5	1430	W	New	DEFRA
6	1449	W	Existing	DEFRA
7	1550	SE	Existing	DEFRA
8	1789	SW	New	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure GeoInsight, available from our website. The following information has been found:

9.1.1 Shrink Swell

What is the maximum Shrink-Swell*[*] hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

9.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soak-aways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation. For existing property, no significant increase in insurance risk from collapsible deposits is likely.

9.1.6 Running Sand

What is the maximum Running Sand** hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build Ö consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property Ö no significant increase in insurance risk due to running sand problems is likely.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

* This indicates an automatically generated 50m buffer and site.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Are there any coal mining areas within 75m of the study site? No

Database searched and no data found.

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

Distance (m)	Direction	Name	Commodity	Assessment of likelihood
0.0	On Site	Not available	Chalk	Occasional minor mining may have occurred but of restricted extent.

Past underground mine workings are uncommon, localised and of limited area. The rock types present in this area are such that minor mineral veins may be present within them on which it is possible that there have been attempts to work these by underground methods and/or it is possible that small scale underground extraction of other materials may have occurred. All such occurrences are likely to be restricted in size and infrequent. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. However, if in a coalfield area you should still consider a Coal Authority mining search for the area of interest.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No
Guidance: No Guidance Required.

Contact Details

FIND
Telephone: 0845 521 1410
support@findmaps.co.uk
The Top Floor, 222 Borough High Street
London, SE1 1JX

British Geological Survey Enquiries
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency
National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 08708 506 506
Web:**www.environment-agency.gov.uk**
Email:**enquiries@environment-agency.gov.uk**

Public Health England
Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email:**enquiries@phe.gov.uk**
Main switchboard**: 020 7654 8000**

The Coal Authority
200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey
Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority
Authority: Arun District Council
Phone: 01903 737 500
Web: http://www.arun.gov.uk/
Address: Maltavers Road, Littlehampton, West Sussex, BN17 5LF

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444

Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England who retain the Copyright and Intellectual Property Rights for the data.
PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028].
This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

I**n these terms and conditions unless the context otherwise requires:**

"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.

"Client" means the party or parties entering into a Contract with Groundsure.

"Commercial" means any building or property which is not Residential.

"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

"Support Services" means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

"Third Party Data Provider" means any third party providing Third Party Content to Groundsure.

"Data Reports" means reports comprising factual data with no accompanying interpretation.

"Fees" has the meaning set out in clause 5.1.

"Groundsure" means Groundsure Limited, a company registered in England and Wales under number 03421028.

"Groundsure Materials" means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.

"Order" means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.

"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

"Order Website" means the online platform through which Orders may be placed by the Client and accepted by Groundsure.

"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.

"Residential" means any building or property used as or intended to be used as a single dwelling.

"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.

"Services" means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.

"Site" means the area of land in respect of which the Client has requested Groundsure to provide the Services.

"Third Party Content" means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from Groundsure and on the website (www.Groundsure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 Groundsure agrees to provide the Services in accordance with the Contract.

2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure. Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1Groundsure shall charge and the Client shall pay fees at the rate and

frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.

6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7.Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 Groundsure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

8 Groundsure's right to suspend or terminate

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event

(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.

12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.

12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

(i) the Client or Beneficiary's failure to provide facilities, access or information;

(ii) fire, storm, flood, tempest or epidemic;

(iii) Acts of God or the public enemy;

(iv) riot, civil commotion or war;

(v) strikes, labour disputes or industrial action;

(vi) acts or regulations of any governmental or other agency;

(vii) suspension or delay of services at public registries by Third Party Data Providers;

(viii) changes in law; or

(ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law. **© Groundsure Limited June 2013**

Appendix D ENVIRONMENTAL RECEPTORS

Pollution to controlled waters.

'Section 78A(9) of the EPA 1990 defines the pollution of controlled waters as: "the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter".' (A35)

'Before determining that pollution of controlled water is being, or is likely to be, caused, the local authority should be satisfied that a substance is continuing to enter controlled waters or is likely to enter controlled waters. The local authority should regard something as being "likely" to be caused when the local authority judge it more likely than not to occur.' (A36)

'Land should **not** be designated as contaminated land where:

(a) a substance is already present in controlled waters;

(b) entry into controlled waters of that substance from land has ceased; and

(c) it is not likely that further entry will take place.' (A37)

'Substances should be regarded as having entered controlled waters where:

(a) they are dissolved or suspended in those waters; or

if they are immiscible with water, they have direct contact with those waters on or beneath the surface of the water.' (A38)

The term 'continuing to enter' should be taken to mean any entry additional to any which has already occurred. (A39)

Reproduced from DETR (2000) Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990 Circular 2/2000 and Scottish Executive Rural Affairs Department (2000) Circular 1/2000. Environmental Protection Act 1990: Part IIA – Contaminated Land.

Significant harm to various receptors.

Type of receptor	**Description of harm to that type of receptor that is to be regarded as significant harm**
Human beings	Death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned. In the Guidance, this description of significant harm is referred to as a 'human health effect'.
Any ecological system, or living organism forming part of such a system, within a location which is: • an area notified as an area of Special Scientific Interest under Section 28 of the Wildlife and Countryside Act 1981. • any land declared a National Nature Reserve under Section 35 of that Act • any area designated as a Marine Nature Reserve under Section 36 of that Act • an area of Special Protection of Birds, established under Section 3 of that Act • any European Site within the meaning of regulation 10 of the Conservation (Natural Habitats etc.) Regulations 1994 (i.e. Special Areas of Conservation and Special protection Areas) • any candidate Special Areas of Conservation or potential Special Protection Areas given	For any protected location: Harm which results in an irreversible adverse change, or in some other substantial adverse change, in the functioning of the ecological system within any substantial part of that location; or Harm which affects any species of special interest within that location and which endangers the long-term maintenance of the population of that species at that location. In addition, in the case of a protected location, which is a European Site (or a candidate Special Area of Conservation or a potential Special Protection Ares), harm which is incompatible with the favourable conservation status of natural habitats at that location or species typically found there. In determining what constitutes such harm, the local authority should have regard to the advice of English nature and to the requirements of the Conservation

Type of receptor	Description of harm to that type of receptor that is to be regarded as significant harm
equivalent protection • any habitat or site afforded policy protection under paragraph 13 of Planning Policy Guidance Note 9 (PPG9) on nature conservation (i.e. candidate Special Areas of Conservation, potential Special protection Areas and listed Ramsar sites); or • any nature reserve established under Section 21 of the National Parks and Access to the Countryside Act 1949.	(Natural Habitats etc Regulations 1994. In the Guidance this description of significant harm is referred to as an 'ecological system effect'.
Property in the form of: • crops, including timber • produce grown domestically, or on allotments, for consumption • livestock • other owned or domesticated animals; wild animals which are the subject of shooting or fishing rights.	For crops, a substantial diminution in yield or other substantial loss in their value, resulting from death, disease or other physical damage. For domestic pets, death, serious disease or serious physical damage. For other property in this category, a substantial loss in its value resulting from death, disease or other serious physical damage. The local authority should regard a substantial loss in value as occurring only when a substantial proportion of the animals or crops are dead or otherwise no longer fit for their intended purpose. Food should be regarded as being no longer fit for purpose when it fails to comply with the provisions of the Food Safety Act 1990. Where a diminution in yield or loss in value is caused by a pollutant linkage, a 20% diminution or loss should be regarded as a benchmark for what constitutes a substantial diminution or loss. In the Guidance this description of significant harm is referred to as an 'animal or crop effect'.
Property in the form of buildings. For this purpose 'building' means any structure or erection and any part of a building, including any part below ground level, but does not include plant or machinery comprised in a building.	Structural failure, substantial damage or substantial interference with any right of occupation. For this purpose, the local authority should regard substantial damage or substantial interference as occurring when any part of the building ceases to be capable of being used for the purpose for which it is or was intended. Additionally, in the case of a scheduled Ancient Monument, substantial damage should be regarded as occurring when the damage significantly impairs the historic, architectural, traditional, artistic or archaeological interest by reason of which the monument was scheduled in the Guidance this description of significant harm is referred to as a 'building effect'.

Reproduced from DETR (2000) Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990. Circular 2/2000 and Scottish Executive Rural Affairs Department (2000) Circular 1/2000. Environmental Protection Act 1990: Part IIA – Contaminated Land.

Appendix E RISK RATING MATRIX

Risk rating for contaminated land qualitative risk assessment.

Risk is this context is a combination of the pollution probability, or frequency and the magnitude of the pollution.

Level of Scale and Seriousness (severity or magnitude)	Probability/Frequency		
	Most Likely	**Reasonably Foreseeable**	**Unlikely**
Severed pollution and high magnitude	High	High	Low
Moderately severe pollution and moderate magnitude	Medium	Medium	Low
Low severity of pollution and low magnitude	Low	Low	Low

Part IIA Amended Regulations 2012 Guidance
High Risk = Category 1
Medium Risk = Category 2-3
Low Risk = Category 4

Appendix F EXPLORATORY HOLE LOGS

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				CP1
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.35	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D								
1.00	D					(2.15)	Firm medium strength brown and orange brown sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk.		
1.00	ES								
1.50	U100	40 blows	1						
1.95	D					2.50			
2.50	D					2.80	Firm light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk and coarse sub angular flint.		
2.50	S	N4	1				Structureless CHALK composed of cream, white and occasionally light brown, slightly gravelly slightly sandy SILT. Gravel is extremely weak to weak, cream to white, fine to coarse and subangular to sub rounded. (Grade Dm).		
3.00	D								
3.00	ES								
3.50	D								
3.50	S	N9							
4.45	D								
4.45	S	N8							
6.00	D								
6.00	S	N14							
						(8.70)			
7.50	D								
7.50	S	N27							
8.00	D								
9.00	D								
9.00	S	N19							
10.50	D								
10.50	S	N7				11.50			
11.50	D						Structureless CHALK composed of slightly clayey to clayey sandy angular medium to coarse GRAVEL. Gravel is weak to moderately strong, medium density and white. Matrix is cream and white. Occasional angular flint cobbles. (Grade Dc).		
12.00	D								
12.00	S	N6				(2.00)			
						13.50			
13.50	D						Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is extremely weak, cream, fine to medium and angular. Occasional angular flint cobbles. (Grade Dm).		
13.50	S	N11							
15.00	D								
15.00	S	N50							
16.50	D					(6.50)			
16.50	S	N50/ 275 mm							
18.00	D								
18.00	S	N50/ 245 mm							
19.50	D					20.00			
19.50	S	N35							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. Groundwater encountered at 3.50m (moderate inflow) rising to 2.17m after 20 minutes.

All dimensions in metres Scale 1:128.125	Client Landform Bognor Regis Limited	Method/ Plant Used Shell & Auger Rig	Logged By IC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				CP2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.34	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D					1.00			
1.00	D						Firm brown and orange brown slightly sandy to sandy silty CLAY.		
1.50	U100	51 blows				1.95	Firm low strength brown sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded flint and chalk.		
1.95	D					2.50			
2.50	D		1			3.00	Firm light brown and light grey slightly sandy to sandy gravelly silty CLAY. Gravel is fine to coarse aub angular to sub rounded chalk and coarse sub angular flint.		
2.50	S	N8	▼1						
3.00	D						Firm light brown and dark orange brown slightly sandy gravelly silty CLAY. Gravel is coarse sub angular chalk.		
3.00	ES								
3.50	D						Structureless CHALK composed of cream, white and occasionally light brown, slightly gravelly slightly sandy SILT. Gravel is moderately weak, cream to white, fine to coarse and angular. (Grade Dm).		
3.50	S	N11							
4.45	D								
4.45	S	N9							
6.00	D								
6.00	S	N9							
7.50	D								
7.50	S	N9				(10.50)			
8.00	D								
9.00	D								
9.00	S	N14							
10.50	D								
10.50	S	N5							
11.50	D								
12.00	D								
12.00	S	N8							
						13.50			
13.50	D						Structureless CHALK composed of slightly clayey to clayey sandy angular medium to coarse GRAVEL. Gravel is weak to moderately weak, medium density and white. Matrix is cream and white. (Grade Dc).		
13.50	S	N14				(2.00)			
15.00	D					15.50			
15.00	S	N12					Structureless CHALK composed of white slightly gravelly slightly sandy SILT. Gravel is extremely weak, white, fine to medium and angular. (Grade Dm).		
16.50	D								
16.50	S	N50/ 180 mm				(4.50)			
18.00	D								
18.00	S	N40							
19.50	D					20.00			
19.50	S	N37							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. Groundwater encountered at 3.50m (moderate inflow) rising to 2.14m after 20 minutes.

All dimensions in metres Scale 1:128.125	Client Landform Bognor Regis Limited	Method/ Plant Used Shell & Auger Rig	Logged By IC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				CP3
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.40	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D					1.00			
1.00	D						Firm brown and orange brown slightly sandy silty CLAY.		
1.00	ES								
1.50	U100	38 blows	1			(1.80)	Firm light grey, light brown and orange brown mottled slightly sandy gravelly silty CLAY. Gravel is fine to coarse sub angular chalk.		
1.95	D								
2.50	D					2.80			
2.50	S	N19	1			(1.00)	Stiff light brown sandy gravelly silty CLAY. Gravel is coarse sub angular flint and medium to coarse sub angular to sub rounded chalk.		
3.00	D					3.80			
3.00	ES						Structureless CHALK composed of cream, white and occasionally light brown, slightly gravelly slightly sandy SILT. Gravel is extremely weak to weak, cream to white, fine to coarse and subangular to sub rounded. (Grade Dm).		
3.50	D								
3.50	S	N18							
4.45	D								
4.45	S	N14							
6.00	D								
6.00	S	N15							
7.50	D					(7.70)			
7.50	S	N27							
8.00	D								
9.00	D								
9.00	S	N19							
10.50	D								
10.50	S	N7				11.50			
11.50	D						Structureless CHALK composed of slightly clayey to clayey sandy angular medium to coarse GRAVEL. Gravel is weak to moderately strong, medium density and white. Matrix is cream and white. Occasional angular flint cobbles. (Grade Dc).		
12.00	D								
12.00	S	N6				(2.00)			
						13.50			
13.50	D						Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is extremely weak, cream, fine to medium and angular. Occasional angular flint cobbles. (Grade Dm).		
13.50	S	N11							
15.00	D								
15.00	S	N50							
16.50	D					(6.50)			
16.50	S	N50/ 275 mm							
18.00	D								
18.00	S	N50/ 245 mm							
19.50	D					20.00			
19.50	S	N35							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. Groundwater encountered at 3.55m (moderate inflow) rising to 2.20m after 20 minutes.

All dimensions in metres Scale 1:128.125	Client Landform Bognor Regis Limited	Method/ Plant Used Shell & Auger Rig	Logged By IC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				CP4
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.29	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D					(1.02)			
1.00	D					1.31	Firm brown and orange brown sandy silty CLAY.		
1.00	ES								
1.50	U100	40 blows	1			2.00	Firm light brown and light orange brown sandy slightly gravelly silty CLAY. Gravel is fine sub rounded chalk.		
1.95	D								
2.50	D						Firm light brown and orange brown and light grey slightly sandy silty CLAY.		
2.50	S	N11	1						
3.00	D					(2.80)			
3.00	ES								
3.50	D								
3.50	S	N11				4.80			
4.45	D						Structureless CHALK composed of cream, white and occasionally light brown, slightly gravelly slightly sandy SILT. Gravel is weak, cream to white, fine to coarse and angular. (Grade Dm).		
4.45	S	N20							
6.00	D								
6.00	S	N14							
7.50	D								
7.50	S	N28							
8.00	D								
9.00	D					(8.70)			
9.00	S	N19							
10.50	D								
10.50	S	N10							
11.50	D								
12.00	D								
12.00	S	N8							
						13.50			
13.50	D						Structureless CHALK composed of slightly clayey to clayey sandy angular medium to coarse GRAVEL. Gravel is weak to moderately weak and white. Matrix is cream and white. (Grade Dc).		
13.50	S	N11				(2.00)			
15.00	D					15.50			
15.00	S	N50					Structureless CHALK composed of white slightly gravelly slightly sandy SILT. Gravel is extremely weak, white, fine to medium and angular. (Grade Dm).		
16.50	D								
16.50	S	N46							
						(4.50)			
18.00	D								
18.00	S	N35							
19.50	D					20.00			
19.50	S	N39							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. Groundwater encountered at 3.50m (moderate inflow) rising to 2.17m after 20 minutes.

All dimensions in metres Scale 1:128.125	Client Landform Bognor Regis Limited	Method/ Plant Used Shell & Auger Rig	Logged By IC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	ES					(0.26) 0.26	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.40	ES						Stiff brown and orange brown sandy silty CLAY.		
0.80	ES					(1.30)			
1.00	D								
1.00	S	N19				1.56			
1.50	D						Firm light grey and orange brown slightly sandy slighty gravelly silty CLAY. Gravel is fine to medium sub rounded to rounded chalk and coarse angular to sub angular flint.		
2.00	S	N17	1			(0.77) 2.33			
						2.45	Light orange brown and light grey very clayey gravelly fine to medium grained SAND. Gravel is medium sub rounded to rounded chalk.		
2.50	D					(0.37) 2.82	Firm light grey and light orange brown sandy slightly gravelly silty CLAY. Gravel is medium to coarse sub rounded to rounded chalk and coarse sub angular flint.		
						2.92	Light brown and light grey very clayey very sandy GRAVEL. Gravel is coarse angular flint and fine to medium sub rounded to rounded chalk.		
3.00	S	N8					Firm light grey and orange brown slightly sandy to sandy gravelly silty CLAY. Gravel is fine to coarse sub rounded to rounded chalk.		
3.50	D					(1.53)			
4.00	S	N12				4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. Groundwater seepage encountered at 2.35m.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				WS2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.32)	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.25	ES					0.32			
							Firm brown and orange brown sandy silty CLAY.		
0.50	D								
0.50	ES								
						(1.13)			
1.00	S	N13							
						1.45			
1.50	D					(0.35)	Firm dark orange brown and light grey sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub rounded to rounded chalk and medium to coarse sub angular flint.		
						1.80			
						1.94	Light brown and orange brown very clayey coarse grained SAND.		
2.00	S	N13					Firm light grey and orange brown slightly gravelly to gravelly silty CLAY. Gravel is medium to coarse sub rounded to rounded chalk.		
						(0.93)			
2.50	D								
						2.87			
3.00	S	N9					Firm light grey and orange brown mottled slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to coarse sub angular flint. Cobbles are angular flint.		
						(0.83)			
3.50	D								
						3.70			
							Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is very weak to weak, cream, fine to coarse and angular to sub angular. Occasional angular flint cobbles. Locally light brown with traces of light brown clay. (Grade Dm).		
4.00	S	N5				(0.75)			
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				WS3
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.15	ES					(0.31) 0.31	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D						Stiff brown and light orange brown sandy silty CLAY.		
0.60	ES					(1.13)			
1.00	S	N18				1.44			
1.50	D					(0.72)	Firm light orange brown and light grey sandy slightly gravelly silty CLAY. Gravel is fine to medium sub rounded chalk and coarse sub angular flint.		
2.00	S	N15				2.16			
2.50	D					(1.30)	Firm light and dark orange brown and light grey slighty sandy silty CLAY.		
3.00	S	N8	1			3.46			
3.50	D		1			(0.99)	Stiff light grey slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk.		
4.00	S	N25				4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS4**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	ES					(0.39) 0.39	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.45	ES						Firm brown and orange brown sandy silty CLAY.		
1.00	D					(1.09)			
1.00	ES								
1.00	S	N9				1.48			
1.50	D					(0.46) 1.94	Firm light orange brown and light grey slightly sandy slightly to gravelly silty CLAY. Gravel is fine to coarse sub rounded chalk and coarse angular flint.		
2.00	S	N8					Firm light grey slightly gravelly silty CLAY. Gravel is fine to medium sub rounded chalk.		
2.50	D								
3.00	D						2.98 Becoming soft.		
3.00	S	N4				(2.51)			
3.50	D						3.47 Becoming firm.		
4.00	S	N17					4.00 Becoming stiff.		
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS5**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	ES					(0.29) 0.29	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.60	ES					(1.02)	Firm brown and orange brown sandy silty CLAY.		
1.00	D								
1.00	S	N9				1.31			
1.50	D					(0.69) 2.00	Firm light brown and light orange brown sandy slightly gravelly silty CLAY. Gravel is fine sub rounded chalk.		
2.00	S	N9					Firm light brown and orange brown and light grey slightly sandy silty CLAY.		
2.50	D					(1.80)			
3.00	S	N6							
3.50	D					3.80			
4.00	S	N20				(0.65) 4.45	Stiff light brown sandy gravelly silty CLAY. Gravel is medium to coarse sub rounded chalk and coarse angular flint.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS6**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.44) 0.44	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.45	ES						Stiff brown and orange brown sandy silty CLAY.		
0.50	D					(0.79)			
1.00	S	N18							
1.10	ES					1.23			
1.50	D					(0.87)	Firm orange brown and light grey sandy slightly gravelly silty CLAY. Gravel is coarse sub angular flint.		
2.00	D					2.10			
2.00	S	N12				2.32	Light brown and grey very clayey gravelly coarse grained SAND. Gravel is medium sub rounded chalk.		
						(1.05)	Firm light and dark orange brown and light grey sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk.		
3.00	D								
3.00	S	N13				3.37			
			1			(0.29) 3.66	Firm light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk.		
						3.80	Light brown very clayey fine to medium grained SAND.		
							Firm light brown slightly sandy slightly gravelly silty CLAY. Gravel is medium to coarse sub angular to sub rounded chalk.		
4.00	S	N8				(0.65)			
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. Groundwater seepage encountered at 3.70m.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS7**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	ES					(0.44)	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.40	ES					0.44			
0.75	ES						Firm brown and dark orange brown sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk.		
1.00	S	N12							
1.20	D					(1.56)			
						2.00			
2.00	D						Firm light brown, orange brown and light grey slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk.		
2.00	S	N8							
						(1.79)			
3.00	D								
3.00	S	N9							
						3.79			
3.80	D						Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is very weak to weak, cream, fine to coarse and angular to sub angular. Occasional angular flint cobbles. Locally light brown with traces of light brown clay. (Grade Dm).		
4.00	S	N40				(0.66)			
						4.45			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS8**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	ES					(0.34) 0.34	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.45	ES						Firm brown and orange brown sandy silty CLAY.		
0.75	D								
1.00	ES					(1.23)			
1.00	S	N8							
1.50	D					1.57			
							Firm light grey and light orange brown slightly sandy slightly gravelly silty CLAY. Gravel is coarse sub angular to sub rounded chalk and coarse sub angular flint.		
2.00	S	N8				(1.32)			
2.50	D								
						2.89			
3.00	S	N11				3.09	Firm light brown and light orange brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk.		
							Stiff light brown gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk.		
3.50	D					(1.36)			
4.00	S	N32					4.00 Becoming very stiff.		
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS9**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.36) 0.36	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.40	ES						Firm orange brown and light grey slightly sandy to sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk.		
0.70	D								
0.70	ES								
1.00	S	N10							
1.50	D					(2.52)			
2.00	S	N7							
2.50	D					2.88			
3.00	S	N12					Firm light brown and brown slightly gravelly CLAY. Gravel is fine to coarse sub angular to sub rounded chalk and coarse angular flint.		
3.50	D					(1.07) 3.95			
4.00	S	N12					Structureless CHALK composed of cream and white slightly gravelly slightly sandy SILT. Gravel is very weak to weak, cream to white, fine to coarse and angular to sub angular. (Grade Dm).		
						(0.50) 4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS10**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.25	ES					(0.34) 0.34	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D						Firm dark orange brown and brown slightly sandy silty CLAY.		
0.60	ES					(1.06)			
1.00	S	N14				1.40			
1.50	D						Firm orange brown and light grey sandy silty CLAY.		
2.00	S	N8				(1.09)			
			1			2.49			
2.50	D					2.70	Light brown very clayey gravelly fine grained SAND. Gravel is fine to medium sub angular to sub rounded chalk.		
						(0.30) 3.00	Firm light grey and orange brown mottled slightly sandy slightly gravelly silty CLAY. Gravel is medium sub angular flint.		
3.00	S	N11	2			3.22	Light brown very clayey gravelly fine grained SAND. Gravel is fine to medium sub rounded to rounded chalk.		
3.50	D					(0.66)	Firm light grey and orange brown mottled silty CLAY.		
						3.88			
4.00	S	N22				(0.57)	Stiff light brown and orange brown sandy gravelly silty CLAY. Gravel is coarse sub angular to sub rounded chalk.		
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. Groundwater seepage encountered at 2.50m and 3.10m.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS11**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.36)	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.30	ES					0.36			
							Firm brown and orange brown slighty sandy silty CLAY.		
0.70	ES								
0.80	D					(1.07)			
1.00	S	N10							
						1.43			
1.50	D						Firm light grey and orange brown slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk and coarse sub angular flint.		
						(1.02)			
2.00	S	N13							
						2.45			
2.50	D						Firm light grey and orange brown mottled silty CLAY.		
						(1.01)			
3.00	S	N17							
						3.46			
3.50	D					3.60	Firm light grey slightly gravelly silty CLAY. Gravel is fine sub rounded to rounded chalk.		
							Firm light brown slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk and coarse sub angular flint.		
4.00	S	N14				(0.85)			
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS12**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.25	ES					(0.42) 0.42	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
						(0.58) 1.00	Firm brown and orange brown slightly sandy silty CLAY.		
1.00	D								
1.00	ES					(0.31) 1.31	Firm brown slightly sandy gravelly silty CLAY. Gravel is coarse angular flint and medium sub angular to sub rounded chalk.		
1.00	S	N15							
1.50	D					(1.31) 2.62	Firm orange brown and light grey slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is coarse sub angular flint and medium sub rounded to rounded chalk.		
2.00	S	N16							
2.50	D								
3.00	S	N11				(0.79) 3.41	Firm light grey sandy slightly gravelly silty CLAY. Gravel is medium to coarse sub rounded chalk and coarse sub angular flint.		
3.50	D					(1.04) 4.45	Structureless CHALK composed of cream and white slightly gravelly slightly sandy SILT. Gravel is very weak to weak, cream to white, fine to coarse and angular to sub angular. (Grade Dm).		
4.00	S	N16							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS13**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.36) 0.36	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	ES					(0.74) 1.10	Firm brown and orange brown mottled sandy slightly gravelly silty CLAY. Gravel is fine sub angular chalk.		
1.00		N20							
1.20	D						Stiff light grey and orange brown sandy gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk and medium to coarse sub angular flint.		
1.20	ES					(1.22) 2.32			
2.00	D								
2.00		N16							
2.50	D					(0.50) 2.82	Firm light grey and orange brown silty CLAY.		
3.00		N10				(0.71) 3.53	Firm light grey and orange brown mottled sandy slightly gravelly silty CLAY. Gravel is coarse sub angular to sub rounded chalk.		
3.50	D					(0.92) 4.45	Structureless CHALK composed of cream and white slightly gravelly slightly sandy SILT. Gravel is very weak to weak, cream to white, fine to coarse and angular to sub angular. (Grade Dm).		
4.00		N29							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS14**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.15	ES					(0.36) 0.36	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D						Stiff light grey and orange brown slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to rounded chalk and medium to coarse sub angular flint.		
1.00	D								
1.00		N19							
1.50	D								
1.50	ES					(2.95)			
2.00		N16							
2.50	D								
3.00	D								
3.00		N15				3.31			
						(0.29) 3.60	Firm light grey sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk.		
						3.80	Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is very weak to weak, cream, fine to coarse and angular to sub angular. Occasional angular flint cobbles. Locally light brown with traces of light brown clay. (Grade Dm).		
3.90	D								
4.00		N15				(0.65) 4.45	Structureless CHALK composed of slightly clayey to clayey sandy angular coarse GRAVEL. Gravel is extremely weak to weak, medium density and white. Matrix is uncompact and cream and white. (Grade Dc).		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS15**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.25	ES					(0.40) 0.40	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
						(0.51) 0.91	Firm orange brown sandy silty CLAY.		
1.00	D						Stiff light brown and cream slightly sandy gravelly CLAY. Gravel is medium to coarse angular to sub rounded chalk and coarse sub angular flint.		
1.00	S	N23							
1.50	D					(1.33)			
2.00	S	N17				2.24			
2.50	D						Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is extremely weak, cream, fine to medium and angular. Occasional angular flint cobbles. Locally light brown with traces of light brown clay. (Grade Dm).		
3.00	S	N11				(2.21)			
3.50	D								
4.00	S	N6				4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS16**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.37) 0.37	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D					(0.63) 1.00	Firm brown and orange brown slightly sandy silty CLAY.		
0.60	ES								
1.00	ES						Stiff light grey, light brown and orange brown mottled slightly sandy gravelly CLAY. Gravel is fine to coarse sub angular chalk.		
1.00	S	N20							
1.50	D					(1.80) 2.80			
2.00	S	N19							
2.50	D								
3.00	S	N15				(1.00) 3.80	Firm light brown sandy gravelly silty CLAY. Gravel is coarse sub angular flint and medium to coarse sub angular to sub rounded chalk.		
3.50	D								
4.00	S	N17				(0.65) 4.45	Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is extremely weak, cream, fine to medium and angular. Locally light brown with traces of light brown clay. (Grade Dm).		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS17**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	ES					(0.35) 0.35	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.60	ES						Firm light grey and orange brown slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to rounded chalk and medium to coarse sub angular flint.		
1.00	D								
1.00	S	N18							
1.50	D					(2.94)			
2.00	S	N17							
2.50	D								
3.00	S	N17				3.29			
3.50	D					(0.34) 3.63	Firm light grey sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk.		
4.00	S	N16				3.81	Structureless CHALK composed of cream slightly gravelly slightly sandy SILT. Gravel is very weak to weak, cream, fine to coarse and angular to sub angular. Occasional angular flint cobbles. Locally light brown with traces of light brown clay. (Grade Dm).		
						(0.64) 4.45	Structureless CHALK composed of slightly clayey to clayey sandy angular coarse GRAVEL. Gravel is extremely weak to weak and white. Matrix is uncompact and cream and white. (Grade Dc).		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS18**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.25	ES					(0.34) 0.34	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.50	D						Firm brown and orange brown slighty sandy silty CLAY.		
0.55	ES					(1.03)			
1.00	S	N11				1.37			
1.50	D						Firm light grey and orange brown slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk and coarse sub angular flint.		
2.00	S	N12				(1.04) 2.41			
2.50	D						Firm light grey and orange brown mottled silty CLAY.		
3.00	S	N14				(1.09) 3.50			
3.50	D					3.60	Firm light grey slightly gravelly silty CLAY. Gravel is fine sub rounded to rounded chalk.		
4.00	S	N12				(0.85) 4.45	Firm light brown slightly sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk and coarse sub angular flint.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS19**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.36) 0.36	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.35	ES						Firm brown and orange brown sandy silty CLAY.		
1.00	D					(1.24)			
1.00	S	N9							
1.50	D					1.60			
							Firm light grey and light orange brown slightly sandy slightly gravelly silty CLAY. Gravel is coarse sub angular to sub rounded chalk and coarse sub angular flint.		
2.00	S	N9				(1.30)			
2.50	D					2.90			
3.00	S	N10				3.11	Firm light brown and light orange brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk.		
							Stiff light brown gravelly silty CLAY. Gravel is fine to coarse sub angular to sub rounded chalk.		
3.50	D					(1.34)			
4.00	S	N33					4.00 Becoming very stiff.		
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

BOREHOLE LOG

Project				BOREHOLE No
Land at Newbarn Lane, North Bersted, Bognor Regis				**WS20**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	02-08-16			
Contractor				Sheet
Nott Group				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.31)	Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable clay pockets, roots and rootlets. Gravel is coarse sub angular chalk.		
0.25	ES					0.31			
							Firm brown and orange brown sandy silty CLAY.		
0.55	ES								
1.00	D					(1.56)			
1.00	S	N10							
1.50	D								
						1.87			
						2.02	Firm light brown and light orange brown sandy slightly gravelly silty CLAY. Gravel is fine sub rounded chalk.		
2.00	S	N10					Firm light brown, orange brown and light grey slightly sandy silty CLAY.		
2.50	D								
						(1.83)			
3.00	S	N8							
3.50	D								
						3.85			
							Stiff light brown sandy gravelly silty CLAY. Gravel is medium to coarse sub rounded chalk and coarse angular flint.		
4.00	S	N20				(0.60)			
						4.45			

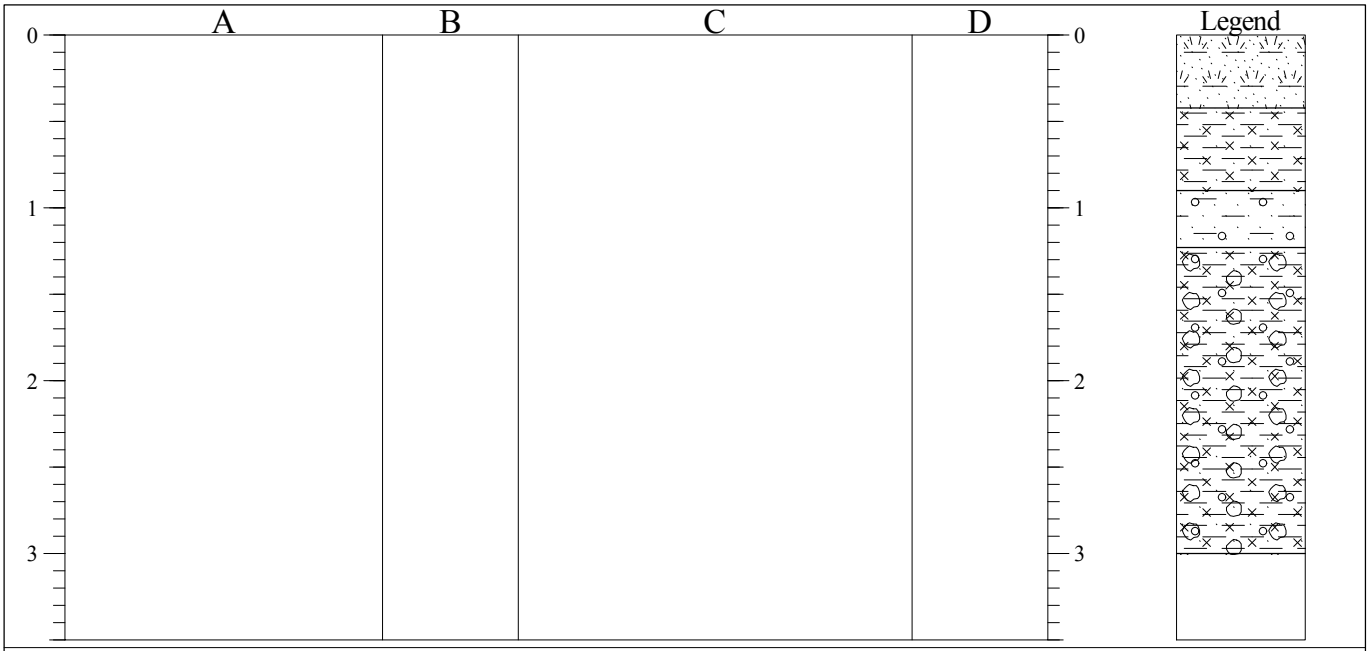
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client Landform Bognor Regis Limited	Method/ Plant Used Window Sample Rig	Logged By MC

AGS3 UK BH BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

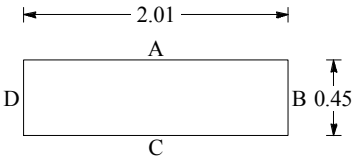
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.42		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.20	ES	
0.42-0.90		Firm medium strength brown and orange brown sandy silty CLAY.	0.50	ES	
			0.60	HSV	65kPa
0.90-1.23		Brown and orange brown very clayey gravelly fine grained SAND with frequent firm sandy silty CLAY pockets. Gravel is coarse sub angular to sub rounded chalk.	1.00	D	
1.23-3.00		Stiff high strength grey and orange brown slightly sandy to sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded chalk and coarse angular to sub angular flint. Cobbles are angular flint.	1.50	D	
			1.50	HSV	70kPa
			1.80	HSV	79kPa
			2.00	B	
			2.10	HSV	91kPa
			2.40	HSV	103kPa
			2.70	HSV	121kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

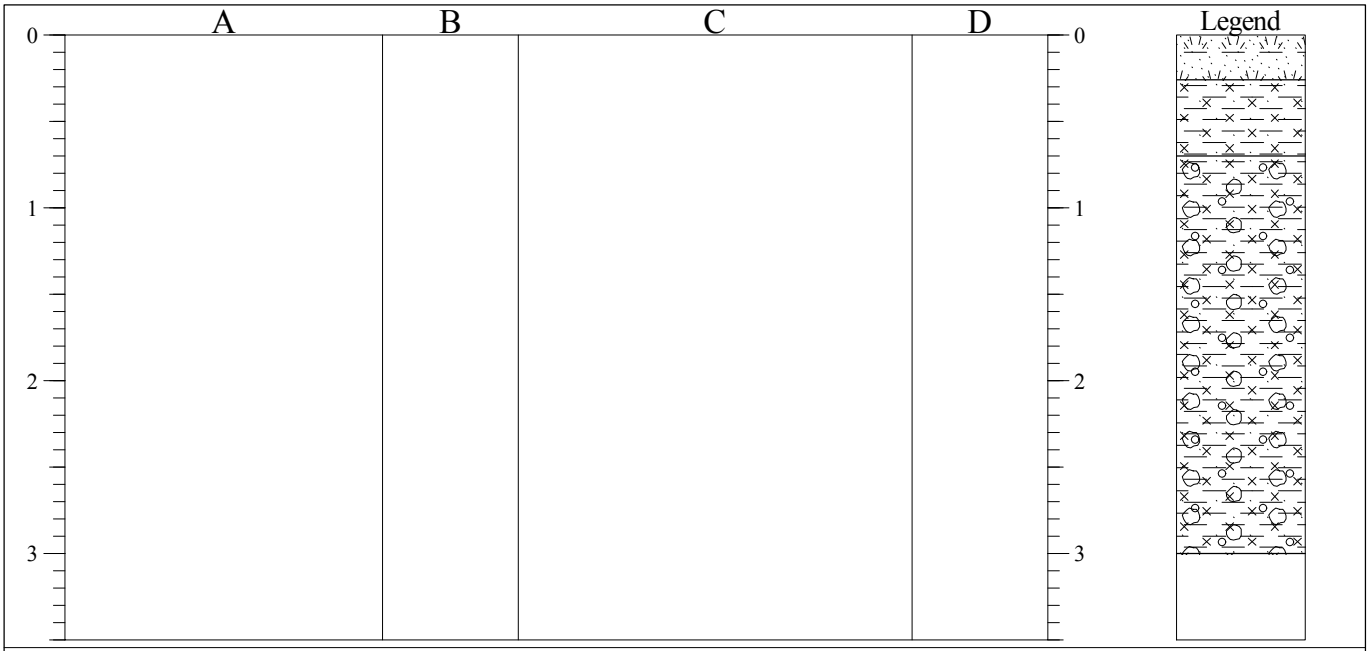
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

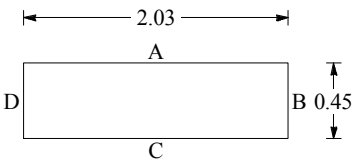
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.26		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.			
0.26-0.70		Firm medium strength brown and orange brown sandy silty CLAY.	0.25	ES	
			0.40	HSV	51kPa
			0.55	ES	
0.70-3.00		Firm medium strength grey and orange brown slightly sandy to sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded chalk and coarse angular to sub angular flint. Cobbles are angular flint.	0.70	HSV	61kPa
			1.00	B	
			1.00	HSV	70kPa
			1.30	HSV	70kPa
			1.50	D	
			1.60	HSV	71kPa
			1.90	HSV	73kPa
			2.00	B	
			2.20	HSV	73kPa
			2.50	D	
			2.50	HSV	74kPa
			2.80	HSV	73kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

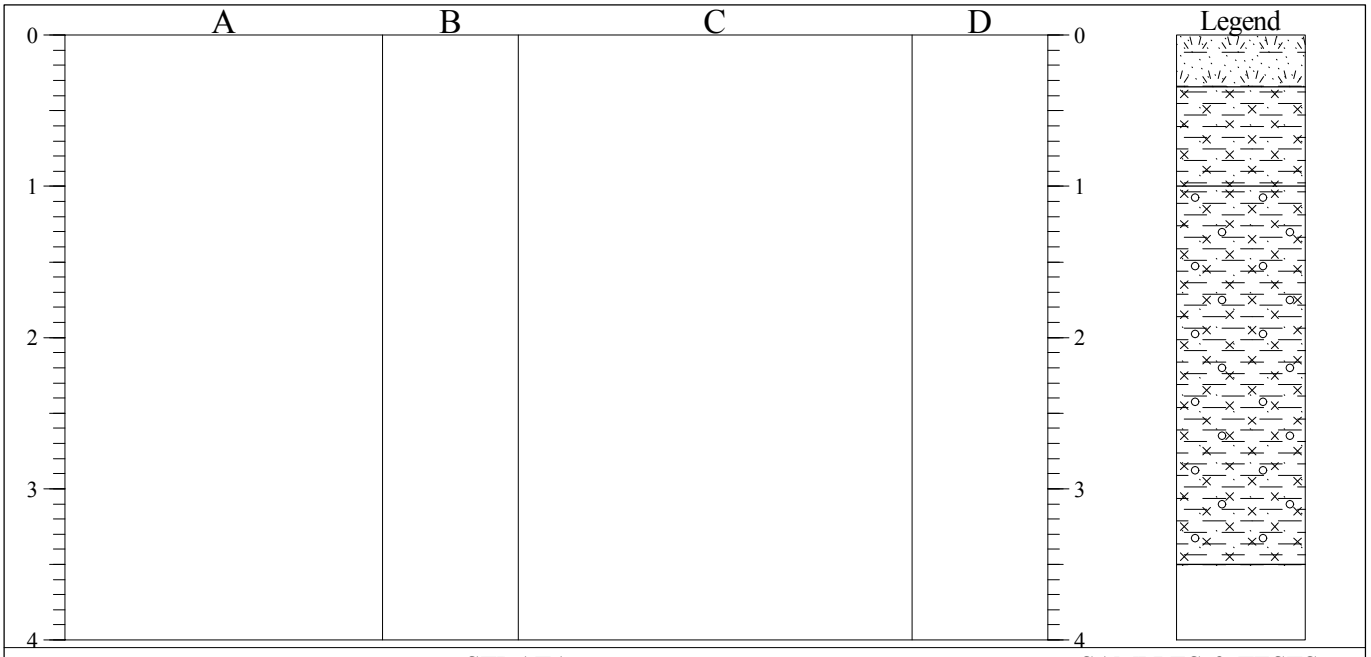
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

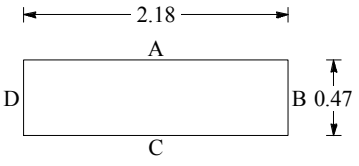
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP3**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.34		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.10	ES	
0.34-1.00		Firm medium strength brown and orange brown sandy silty CLAY.	0.50	D	
			0.55	ES	
			0.60	HSV	50kPa
			0.90	HSV	61kPa
1.00-3.50		Firm medium strength light grey and orange brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub rounded to rounded chalk and coarse sub angular flint.	1.00	B	
			1.20	HSV	63kPa
			1.50	D	
			1.50	HSV	64kPa
			1.80	HSV	67kPa
			2.00	B	
			2.10	HSV	68kPa
			2.40	HSV	70kPa
			2.50	D	
			2.70	HSV	72kPa
			3.00	D	
			3.00	HSV	72kPa
			3.30	HSV	74kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

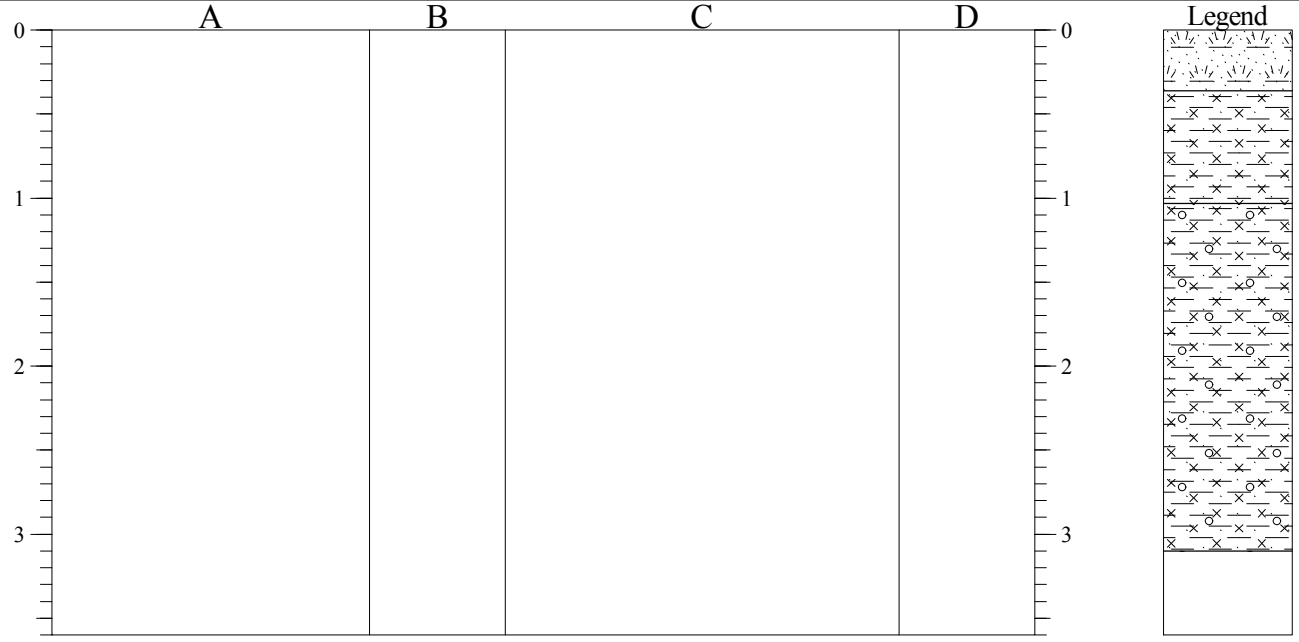
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:50	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

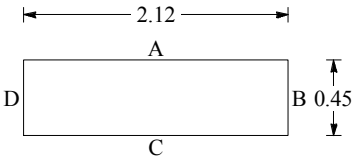
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP4**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.36		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.			
0.36-1.03		Firm medium strength brown and orange brown sandy silty CLAY.	0.30	ES	
			0.50	B	
			0.60	ES	
			0.60	HSV	47kPa
			0.90	HSV	60kPa
1.03-3.10		Firm medium strength light grey and orange brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub rounded to rounded chalk and coarse sub angular flint.	1.20	HSV	61kPa
			1.50	D	
			1.50	HSV	65kPa
			1.80	HSV	67kPa
			2.10	HSV	70kPa
			2.40	HSV	71kPa
			2.50	B	
			2.70	HSV	72kPa
			3.00	D	
			3.00	HSV	74kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

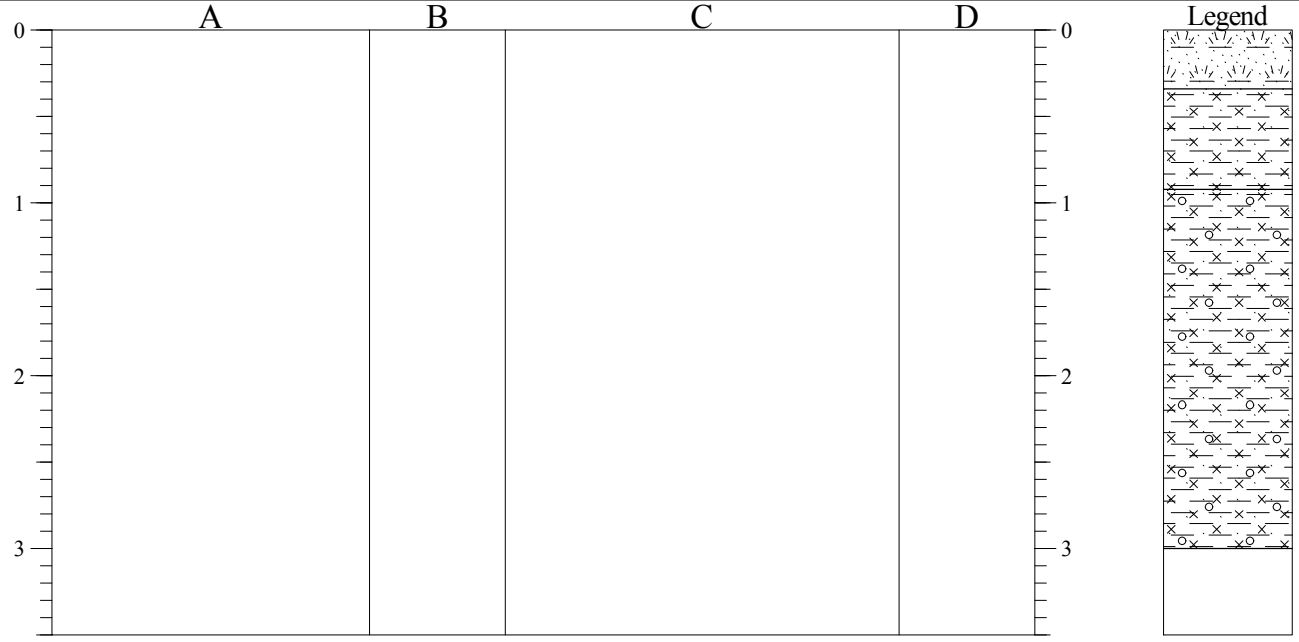
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:45	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

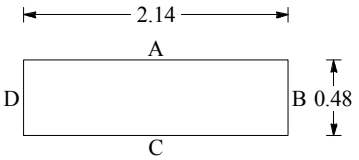
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP5**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.34		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.05	ES	
0.34-0.92		Firm medium strength brown sandy silty CLAY.	0.40	ES	
			0.50	D	
			0.60	HSV	50kPa
0.92-3.00		Firm medium strength light grey and orange brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub rounded to rounded chalk and coarse sub angular flint.	0.90	HSV	51kPa
			1.00	B	
			1.20	HSV	61kPa
			1.50	D	
			1.50	HSV	64kPa
			1.80	HSV	64kPa
			2.00	B	
			2.10	HSV	67kPa
			2.40	HSV	70kPa
			2.50	B	
			2.70	HSV	72kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

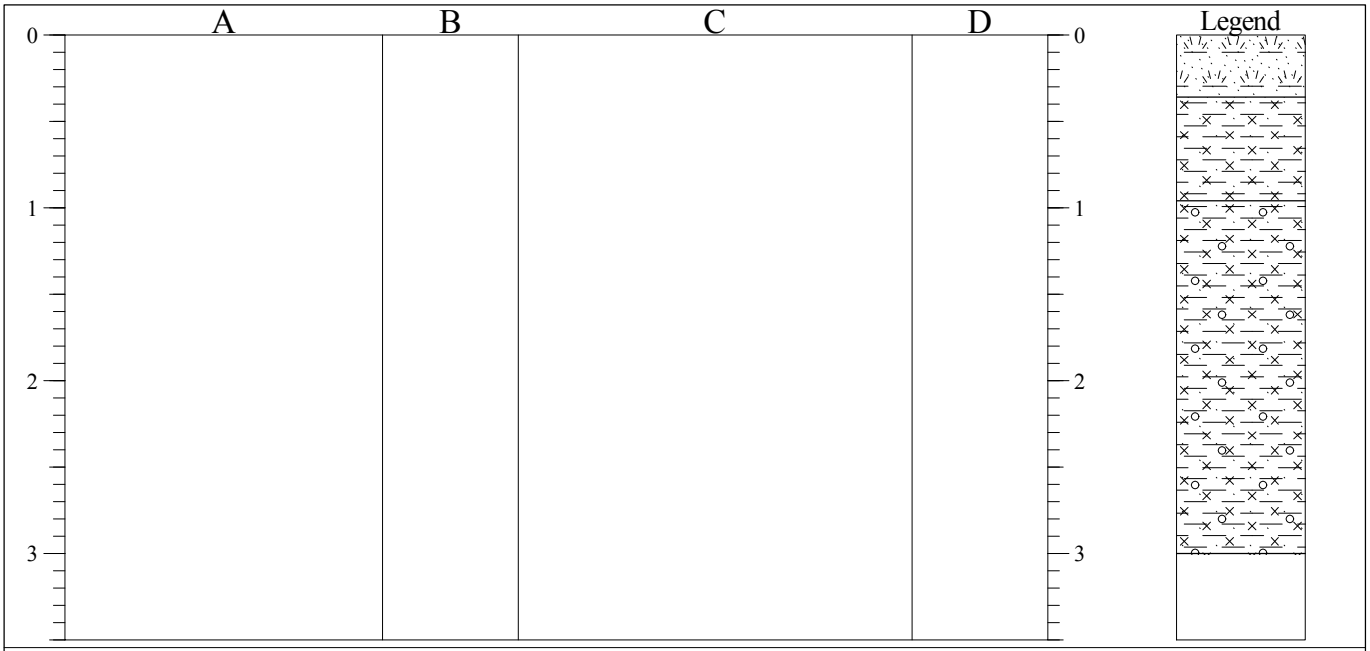
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

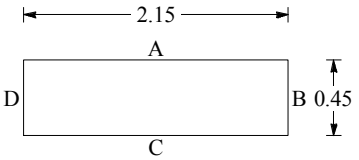
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP6**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.36		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.			
0.36-0.96		Firm medium strength brown sandy silty CLAY.	0.35	ES	
			0.50	D	
			0.60	ES	
			0.60	HSV	43kPa
			0.90	HSV	49kPa
0.96-3.00		Firm medium strength light grey and orange brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub rounded to rounded chalk and coarse sub angular flint.	1.00	B	
			1.20	HSV	57kPa
			1.50	D	
			1.50	HSV	64kPa
			1.80	HSV	67kPa
			2.00	B	
			2.10	HSV	68kPa
			2.40	HSV	73kPa
			2.50	D	
			2.70	HSV	74kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

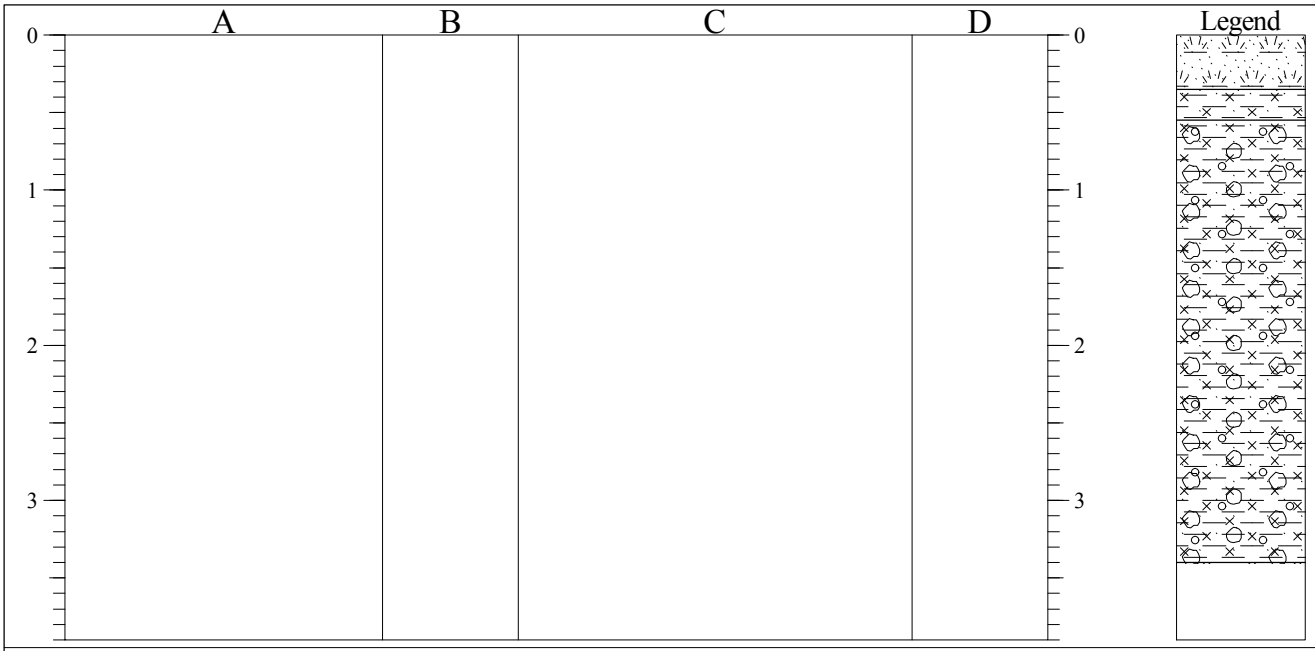
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

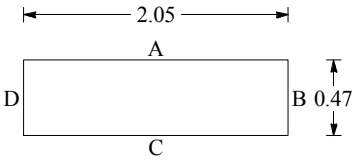
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				TP7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.35		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.15	ES	
0.35-0.55		Firm medium strength slightly sandy to sandy silty CLAY.	0.45	ES	
0.55-3.40		Firm medium strength light grey and orange brown slightly sandy to sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is medium sub rounded to rounded chalk and coarse angular flint. Cobbles are angular flint.	0.60	B	
			0.60	HSV	49kPa
			0.90	HSV	53kPa
			1.00	B	
			1.20	HSV	58kPa
			1.50	D	
			1.50	HSV	65kPa
			1.80	HSV	67kPa
			2.00	B	
			2.10	HSV	68kPa
			2.40	HSV	72kPa
			2.70	HSV	74kPa
		3.00 Becoming stiff high strength.	3.00	D	
			3.00	HSV	79kPa
			3.30	HSV	81kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

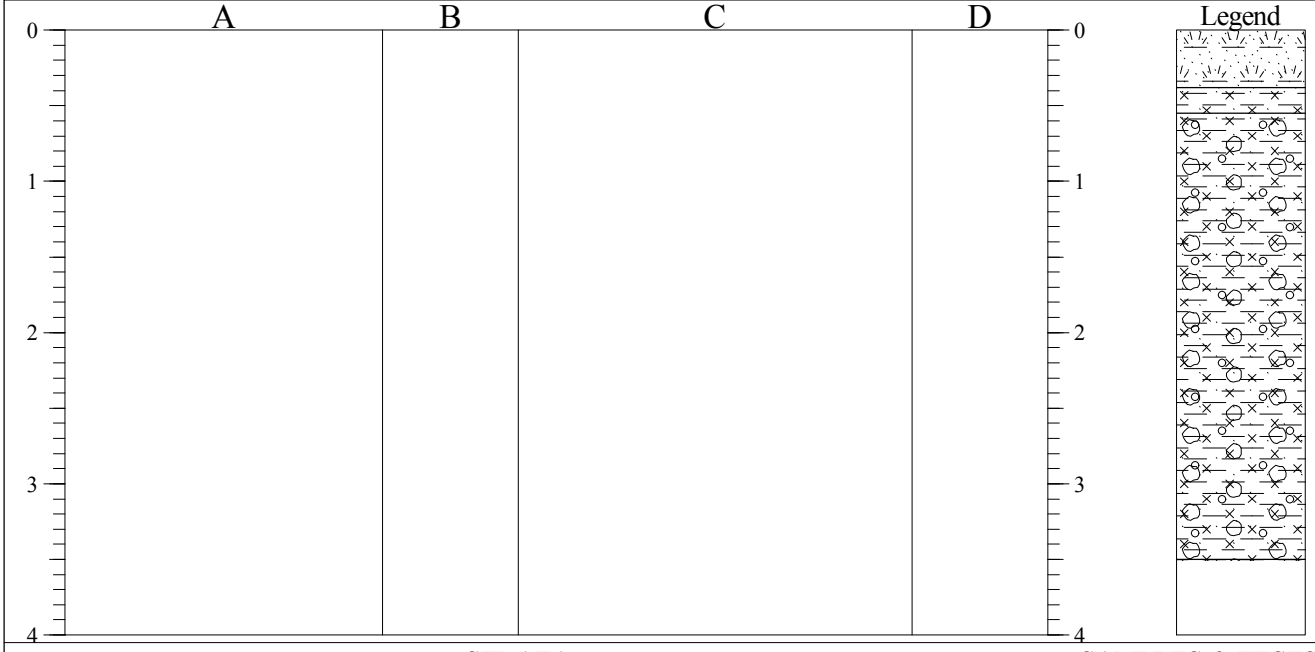
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:48.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

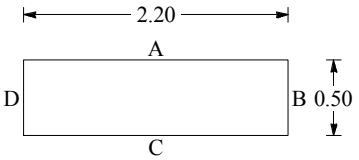
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP8**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.38		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.20	ES	
0.38-0.55		Firm medium strength brown sandy silty CLAY.	0.45	HSV	61kPa
0.55-3.50		Stiff high strength light grey and orange brown slightly sandy slightly gravelly to gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub angular to sub rounded chalk and coarse angular flint. Cobbles are angular flint.	0.50	ES	
			0.60	HSV	78kPa
			0.90	HSV	81kPa
			1.00	D	
			1.20	HSV	82kPa
			1.50	B	
			1.50	HSV	85kPa
			1.80	HSV	87kPa
			2.00	B	
			2.10	HSV	78kPa
			2.40	HSV	82kPa
			2.50	D	
			2.70	HSV	94kPa
			3.00	B	
			3.00	HSV	99kPa
			3.30	HSV	118kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

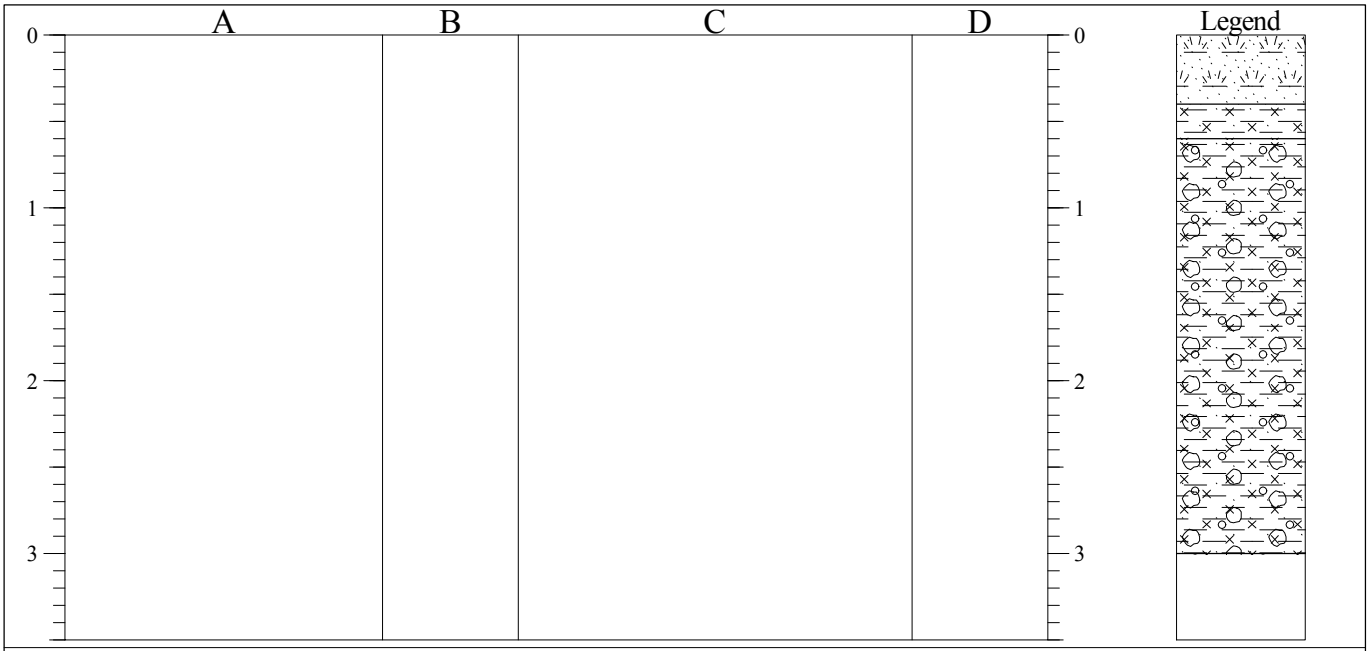
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:50	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

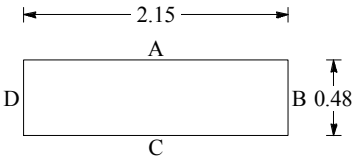
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				TP9
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.25	ES	
0.40-0.60		Firm medium strength brown sandy silty CLAY.	0.50	HSV	50kPa
0.60-3.00		Stiff high strength light grey and orange brown slightly sandy slightly gravelly to gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub angular to sub rounded chalk and coarse angular flint. Cobbles are angular flint.	0.60	ES	
			0.60	HSV	80kPa
			0.90	HSV	81kPa
			1.00	B	
			1.20	HSV	83kPa
			1.50	D	
			1.50	HSV	84kPa
			1.80	HSV	86kPa
			2.00	B	
			2.10	HSV	95kPa
			2.40	HSV	100kPa
			2.50	D	
			2.70	HSV	103kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

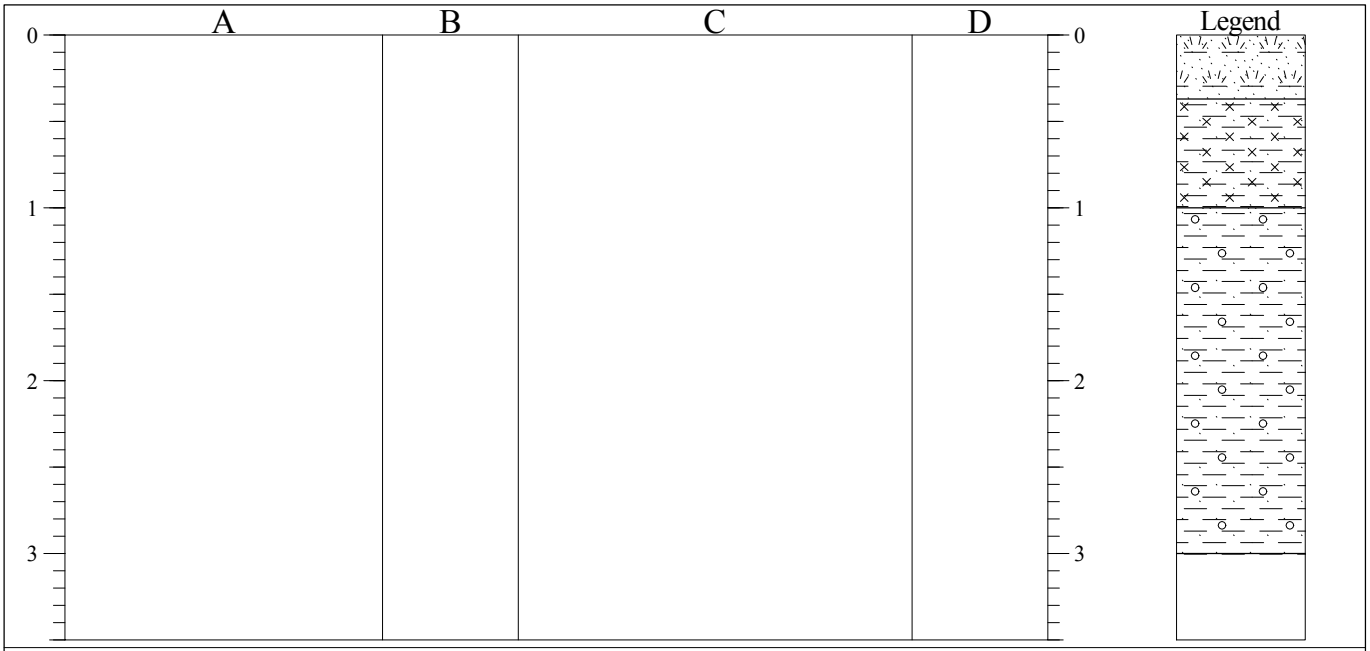
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

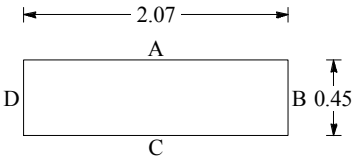
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP10**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	29-07-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.37		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.05	ES	
0.37-1.00		Firm brown and orange brown slightly sandy silty CLAY.	0.45	ES	
			0.60	HSV	76kPa
			0.90	HSV	80kPa
1.00-3.00		Stiff light grey, light brown and orange brown mottled slightly sandy gravelly CLAY. Gravel is fine to coarse sub angular chalk.	1.00	B	
			1.20	HSV	82kPa
			1.50	D	
			1.50	HSV	83kPa
			1.80	HSV	86kPa
			2.00	B	
			2.10	HSV	87kPa
			2.40	HSV	94kPa
			2.50	D	
			2.70	HSV	98kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

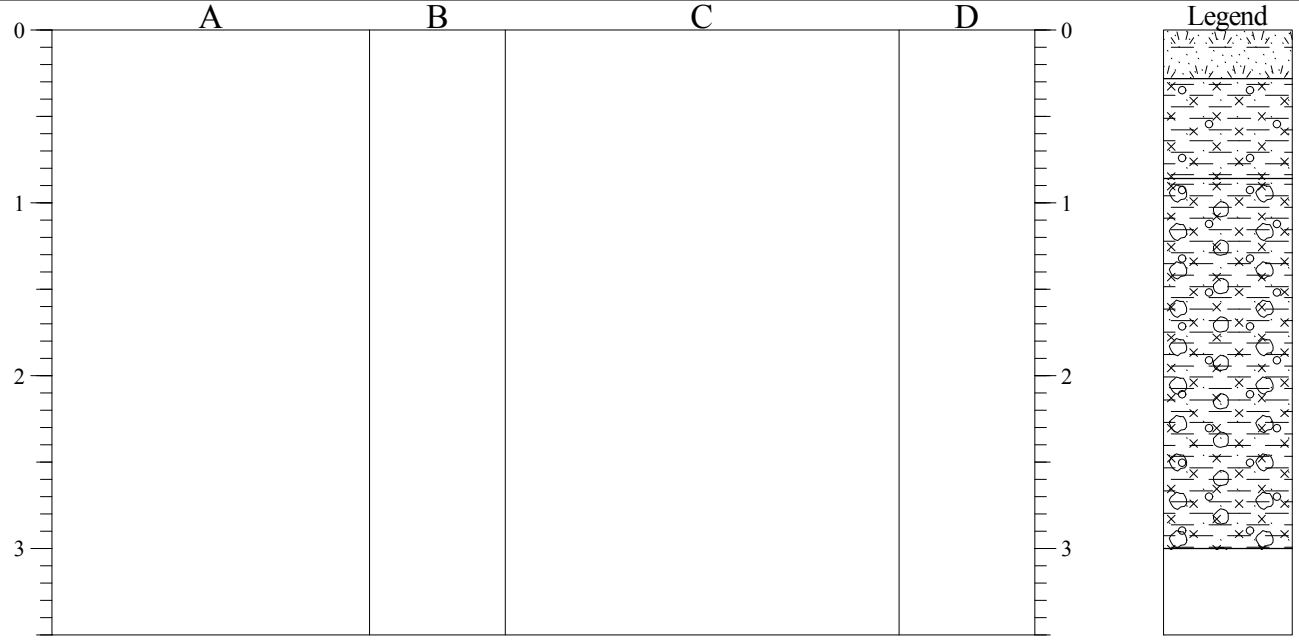
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

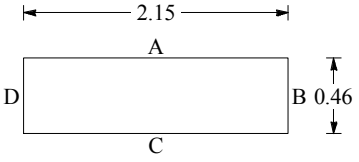
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				TP11
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.28		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.10	ES	
0.28-0.86		Firm medium strength brown sandy slightly gravelly silty CLAY. Gravel is fine to medium sub rounded to rounded chalk.	0.30	ES	
			0.60	HSV	49kPa
0.86-3.00		Firm medium strength dark orange brown and brown slightly sandy to sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded sub rounded to rounded chalk and coarse sub angular flint. Cobbles are angular flint.	0.90	HSV	55kPa
			1.00	B	
			1.20	HSV	61kPa
			1.50	D	
			1.50	HSV	63kPa
			1.80	HSV	65kPa
			2.00	B	
			2.10	HSV	67kPa
			2.40	HSV	70kPa
			2.50	D	
			2.70	HSV	72kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

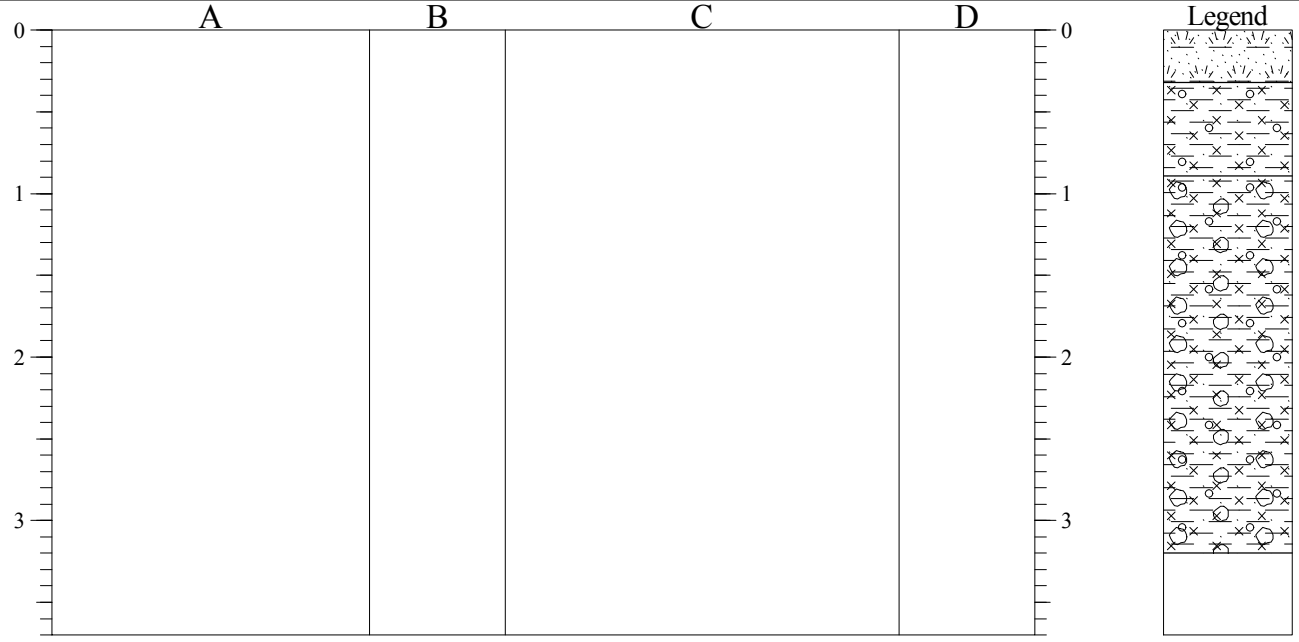
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

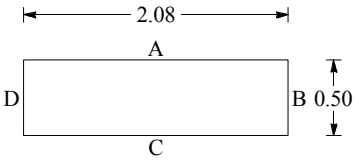
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP12**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.32		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.			
0.32-0.89		Firm medium strength brown sandy slightly gravelly silty CLAY. Gravel is fine to medium sub rounded to rounded chalk.	0.25	ES	
			0.55	ES	
			0.60	HSV	52kPa
0.89-3.20		Firm medium strength dark orange brown and brown slightly sandy to sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded sub rounded to rounded chalk and coarse sub angular flint. Cobbles are angular flint.	0.75	D	
			0.90	HSV	57kPa
			1.00	B	
			1.20	HSV	60kPa
			1.50	D	
			1.50	HSV	63kPa
			1.80	HSV	65kPa
			2.00	B	
			2.10	HSV	70kPa
			2.40	HSV	70kPa
			2.70	HSV	72kPa
			3.00	HSV	74kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

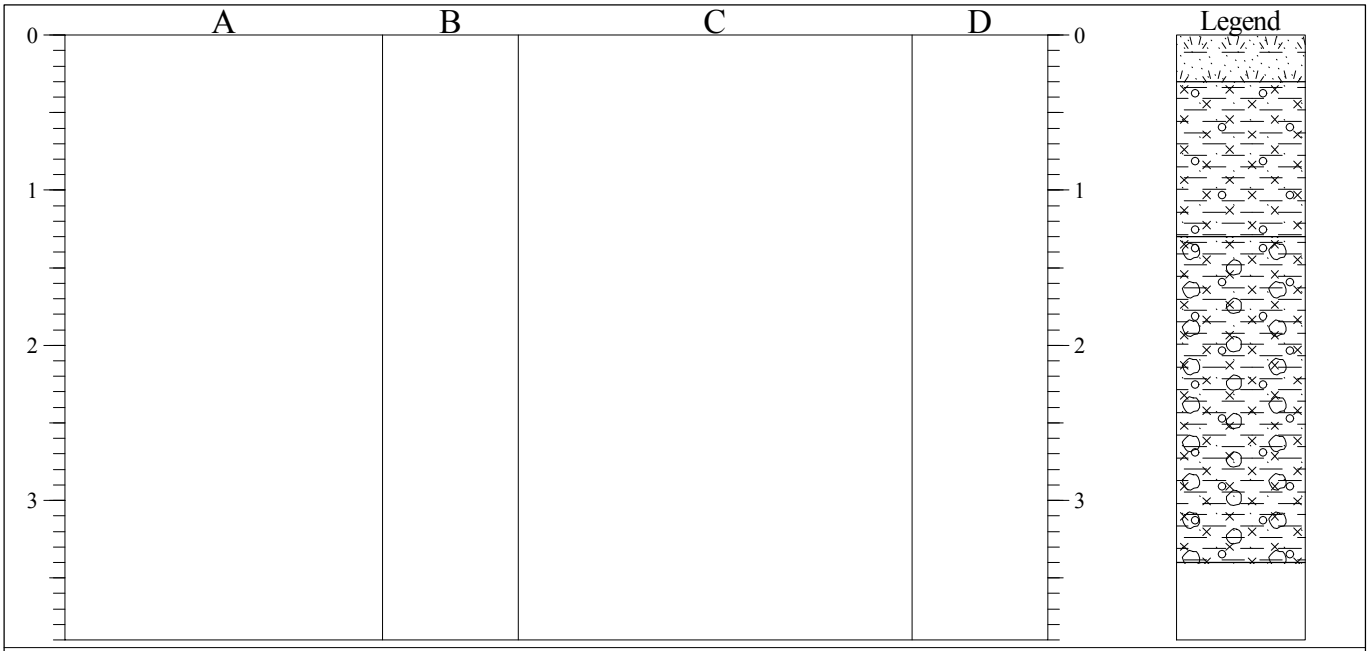
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:46.25	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

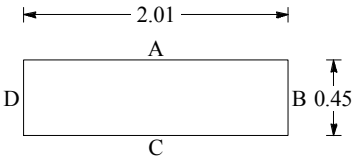
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP13**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.05	ES	
0.30-1.30		Firm medium strength brown slightly sandy slightly gravelly silty CLAY. Gravel is coarse sub angular flint.	0.40	ES	
			0.60	ES	
			0.60	HSV	54kPa
			0.90	HSV	57kPa
			1.00	B	
1.30-3.40		Stiff high strength light grey and orange brown slightly sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded chalk and coarse angular flint. Cobbles are angular flint.	1.20	HSV	67kPa
			1.50	D	
			1.50	HSV	83kPa
			1.80	HSV	85kPa
			2.00	B	
			2.10	HSV	90kPa
			2.40	HSV	91kPa
			2.50	D	
			2.70	HSV	102kPa
			3.00	B	
			3.00	HSV	104kPa
			3.30	HSV	110kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

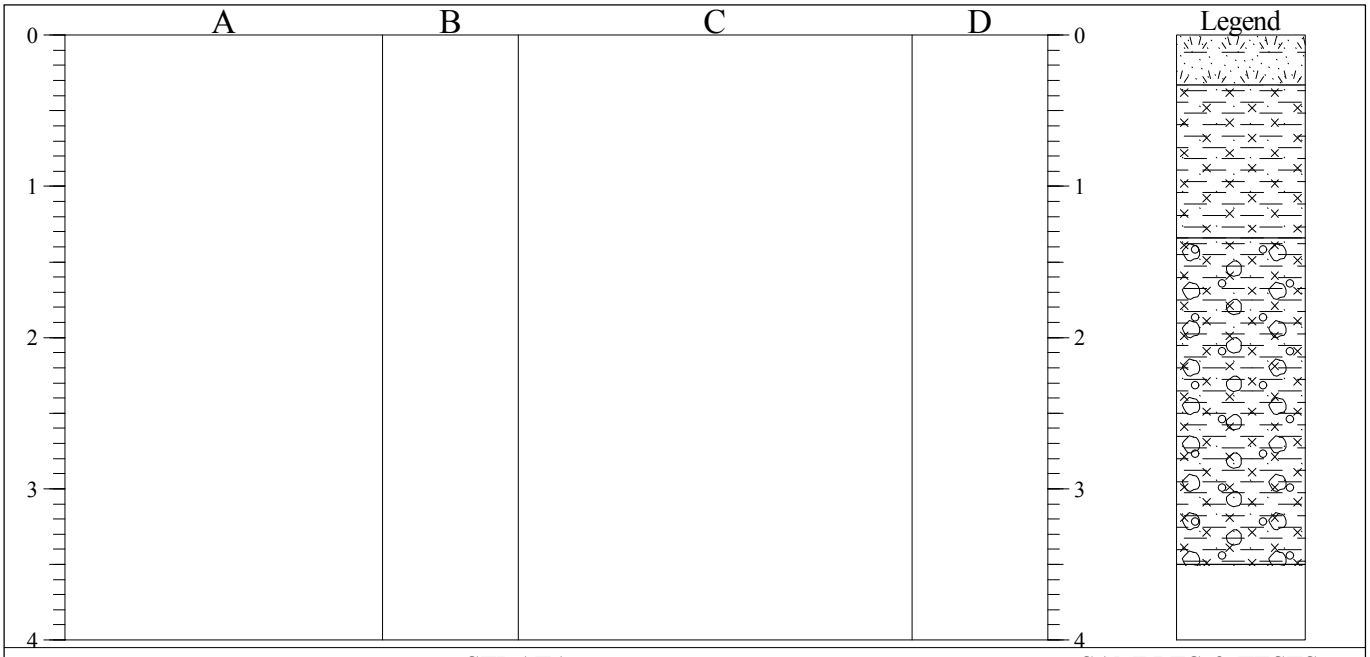
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:48.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

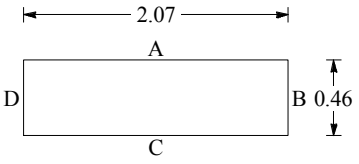
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP14**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.33		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.10	ES	
0.33-1.34		Firm medium strength brown sandy silty CLAY.	0.45	ES	
			0.60	HSV	54kPa
			0.90	HSV	57kPa
			1.00	B	
			1.20	HSV	67kPa
1.34-3.50		Stiff high strength light grey and orange brown slightly sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded chalk and coarse angular flint. Cobbles are angular flint.	1.50	D	
			1.50	HSV	79kPa
			1.80	HSV	83kPa
			2.00	B	
			2.10	HSV	89kPa
			2.40	HSV	101kPa
			2.50	D	
			2.70	HSV	102kPa
			3.00	B	
			3.00	HSV	110kPa
			3.30	HSV	117kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

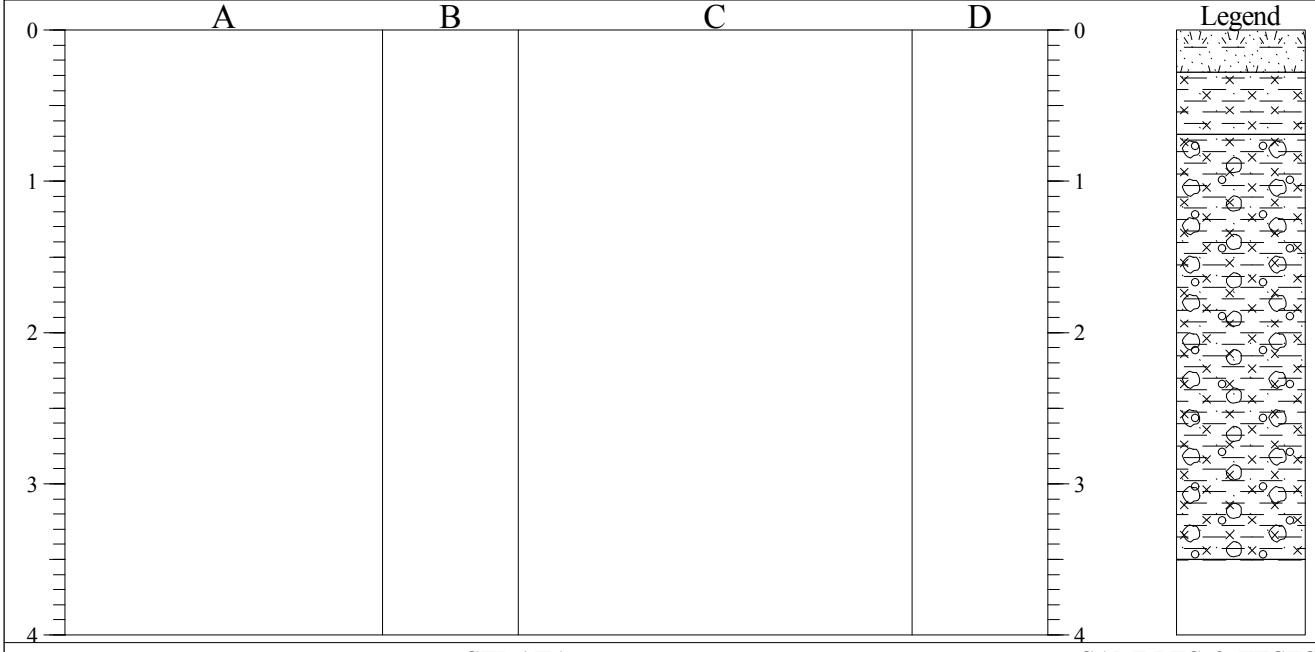
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:50	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

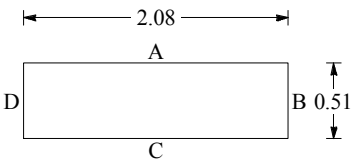
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				TP15
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.28		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.10	ES	
0.28-0.69		Firm medium strength brown sandy silty CLAY.	0.30	ES	
			0.60	ES	
0.69-3.50		Stiff high strength light grey and orange brown slightly sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded chalk and coarse angular flint. Cobbles are angular flint.	0.60	HSV	64kPa
			0.80	B	
			0.90	HSV	70kPa
			1.20	HSV	73kPa
			1.50	B	
			1.50	HSV	80kPa
			1.80	HSV	82kPa
			2.00	B	
			2.10	HSV	86kPa
			2.40	HSV	99kPa
			2.50	D	
			2.70	HSV	102kPa
			3.00	D	
			3.00	HSV	109kPa
			3.30	HSV	113kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

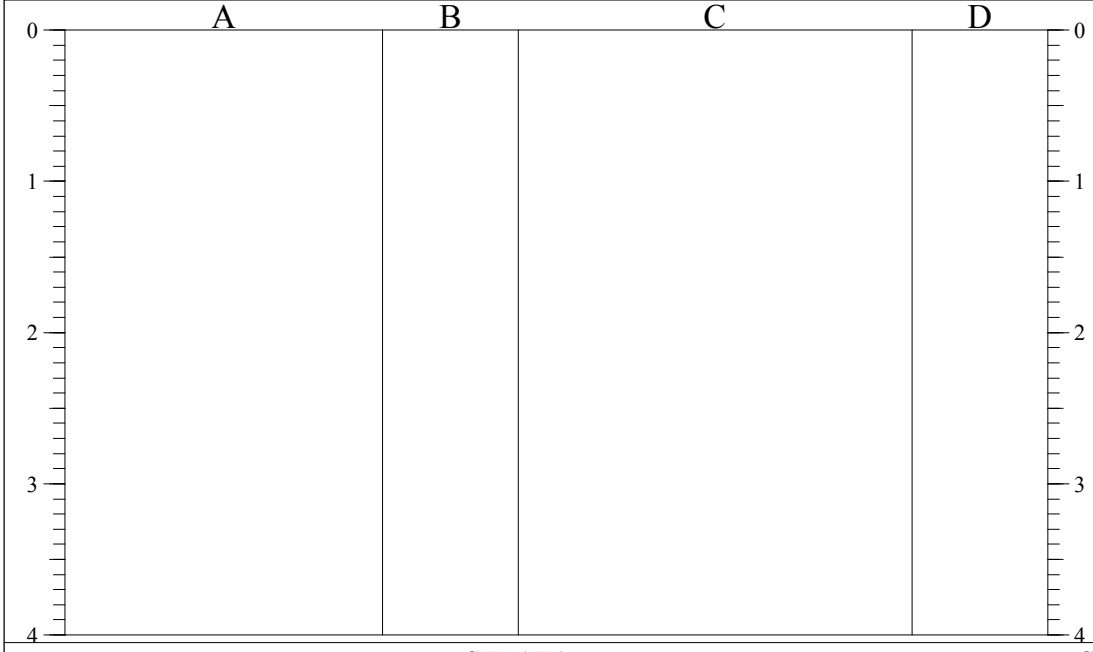
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:50	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

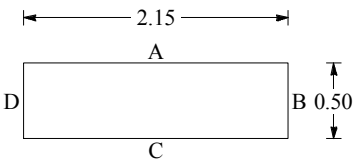
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP16**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.31		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.10	ES	
0.31-0.65		Firm medium strength brown sandy silty CLAY.	0.40	ES	
0.65-3.50		Stiff high strength light grey and orange brown slightly sandy slightly gravelly silty CLAY with occasional COBBLES. Gravel is fine to medium sub rounded to rounded chalk and coarse angular flint. Cobbles are angular flint.	0.60	HSV	61kPa
			0.90	HSV	71kPa
			1.00	B	
			1.20	HSV	75kPa
			1.50	HSV	80kPa
			1.80	HSV	85kPa
			2.00	B	
			2.10	HSV	86kPa
			2.40	HSV	95kPa
			2.70	HSV	100kPa
			3.00	B	
			3.00	HSV	105kPa
			3.30	HSV	109kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

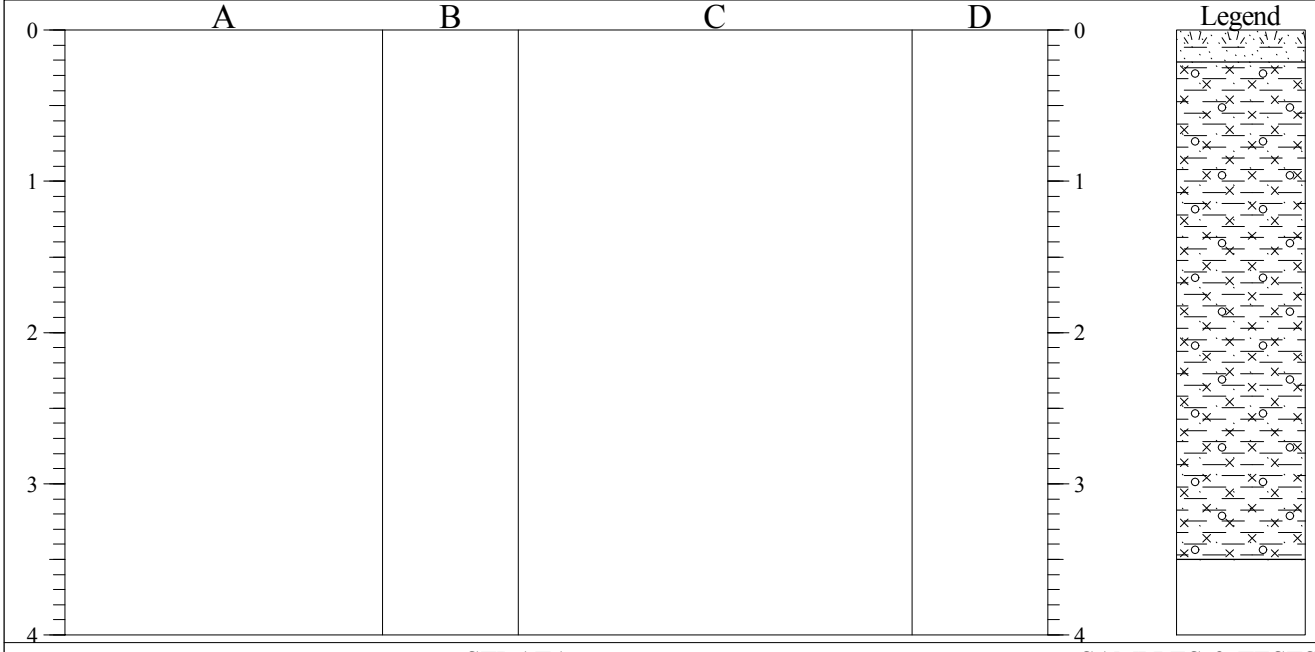
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:50	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

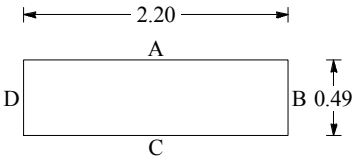
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				TP17
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.21		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.			
0.21-3.50		Firm medium strength brown and orange brown slightly sandy slighty gravelly silty CLAY. Gravel is coarse sub rounded chalk and coarse sub angular to sub rounded flint.	0.25	ES	
			0.50	ES	
			0.55	ES	
			0.60	HSV	50kPa
			0.90	HSV	55kPa
			1.20	B	
			1.20	HSV	61kPa
			1.50	D	
			1.50	HSV	61kPa
			1.80	HSV	63kPa
			2.00	B	
			2.10	HSV	66kPa
			2.40	HSV	68kPa
			2.50	D	
			2.70	HSV	69kPa
			3.00	B	
			3.00	HSV	70kPa
			3.30	HSV	72kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

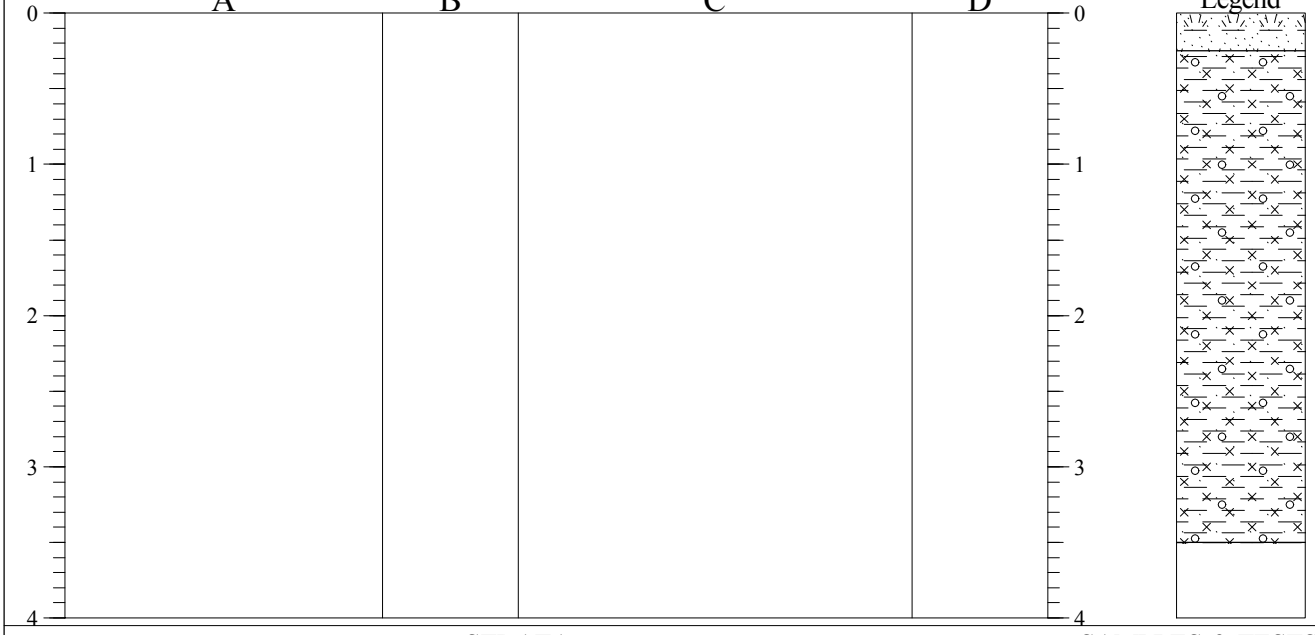
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:50	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

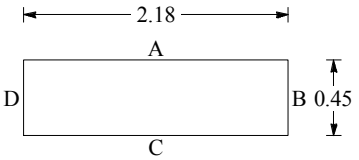
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP18**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.10	ES	
0.25-3.50		Firm medium strength brown and orange brown slightly sandy slighty gravelly silty CLAY. Gravel is coarse sub rounded chalk and coarse sub angular to sub rounded flint.	0.35	ES	
			0.60	HSV	48kPa
			0.90	HSV	53kPa
			1.20	HSV	57kPa
			1.40	B	
			1.50	HSV	61kPa
			1.80	HSV	62kPa
			2.00	B	
			2.10	HSV	65kPa
			2.40	HSV	68kPa
			2.50	D	
			2.70	HSV	70kPa
			3.00	D	
			3.00	HSV	71kPa
			3.30	HSV	74kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

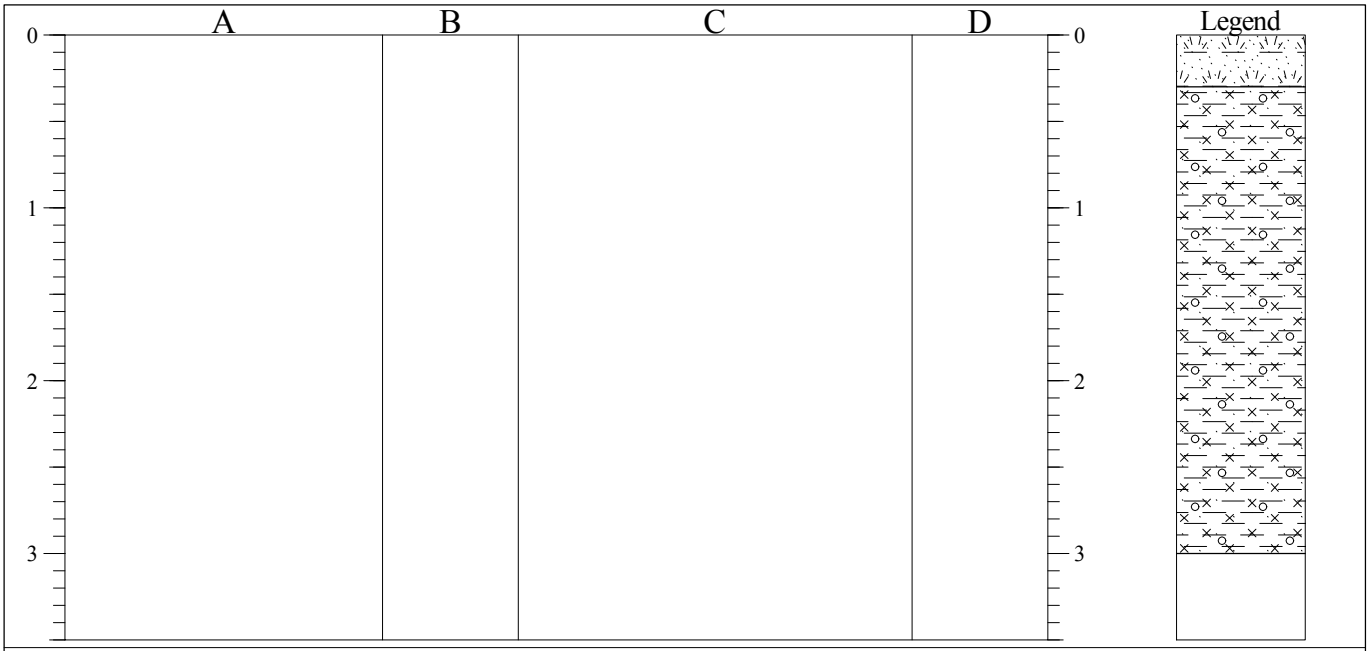
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:50	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

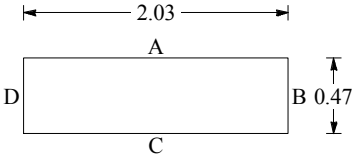
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP19**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.10	ES	
0.30-3.00		Firm medium strength orange brown and light grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk and coarse sub angular flint.	0.20	ES	
			0.60	HSV	55kPa
			0.90	B	
			0.90	HSV	57kPa
			1.20	HSV	69kPa
			1.50	B	
			1.50	HSV	73kPa
		1.80 Becoming stiff high strength.	1.80	HSV	80kPa
			2.10	HSV	87kPa
			2.40	HSV	90kPa
			2.50	B	
			2.70	HSV	100kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

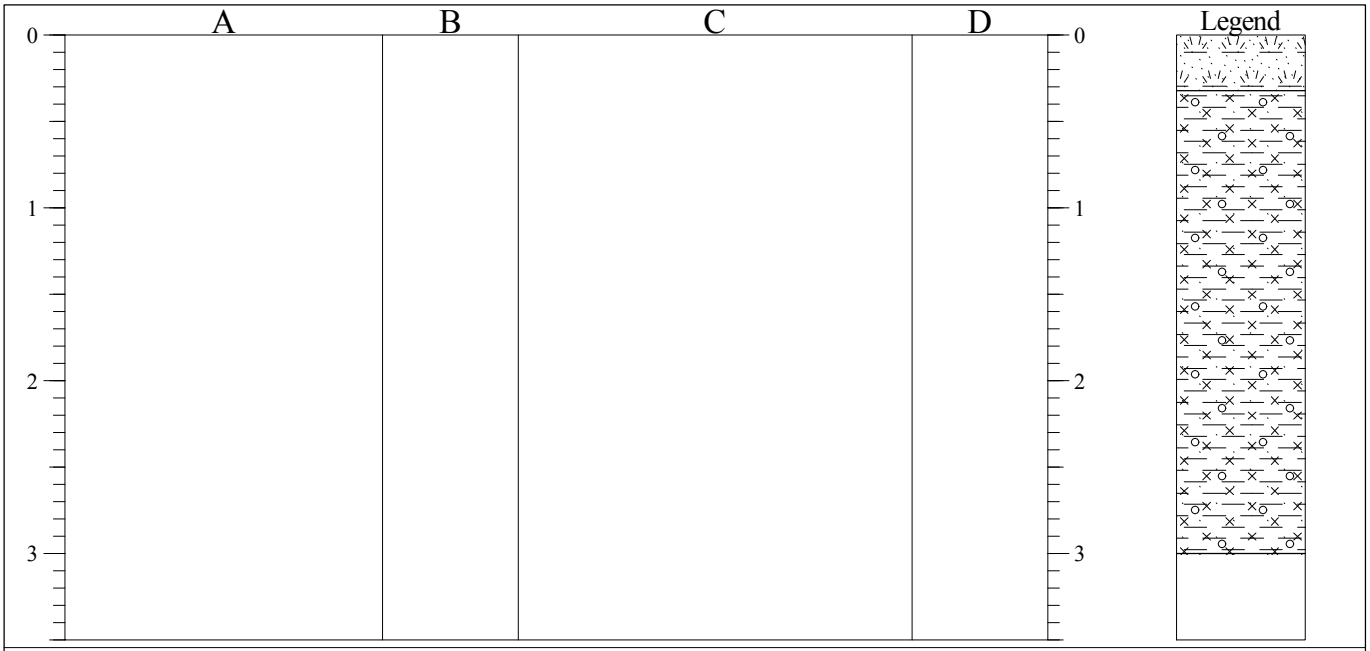
1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

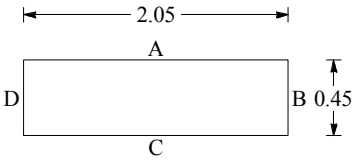
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Newbarn Lane, North Bersted, Bognor Regis				**TP20**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
72540	01-08-16			
Contractor				Sheet
Nott Group				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.32		Grass over brown very clayey gravelly fine grained SAND with occasional firm sandy friable CLAY pockets, roots and rootlets. Gravel is coarse sub angular chalk.	0.20	ES	
0.32-3.00		Firm medium strength orange brown and light grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub angular to sub rounded chalk and coarse sub angular flint.	0.60	ES	
			0.60	HSV	57kPa
			0.90	HSV	60kPa
			1.00	B	
			1.20	HSV	65kPa
		1.50 Becoming stiff high strength.	1.50	D	
			1.50	HSV	81kPa
			1.80	HSV	89kPa
			2.00	B	
			2.10	HSV	97kPa
			2.40	HSV	90kPa
			2.50	D	
			2.70	HSV	100kPa

Shoring/Support: None.
Stability: All sides noted to be stable.





GENERAL REMARKS

1. No groundwater encountered.
2. HSV = Hand shear vane test.

All dimensions in metres Scale 1:43.75	Client Landform Bognor Regis Limited	Method/ Plant Used JCB 2CX	Logged By MJH

AGS3 UK TP BOGNOR REGIS P2.GPJ GINT STD AGS 3_1.GDT 9/9/16

Appendix G CHEMICAL TESTING RESULTS – SOILS

Mark Hiatt
Nott Group
Unit L26
Hastingwood Industrial Park
Wood Lane
Birmingham
B24 9QR

e: mark.hiatt@nottgroup.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 16-24647

Project / Site name:	Land at Newbarn Lane, North Bersted, Bognor Regis	**Samples received on:**	05/08/2016
Your job number:	72540	**Samples instructed on:**	05/08/2016
Your order number:		**Analysis completed by:**	12/08/2016
Report Issue Number:	1	**Report issued on:**	12/08/2016
Samples Analysed:	19 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24647

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				612481	612482	612483	612484	612485
Sample Reference				WS1	WS1	WS2	WS3	WS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	0.50	0.60	1.00
Date Sampled				01/08/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	16	15	14	12
Total mass of sample received	kg	0.001	NONE	0.43	0.43	0.43	0.41	0.39
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
General Inorganics								
pH	pH Units	N/A	MCERTS	-	7.5	8.3	7.8	8.5
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.011	0.014	0.0086	0.0099
Total Sulphur	mg/kg	50	NONE	-	130	100	150	110
Total Sulphur	%	0.005	NONE	-	0.013	0.010	0.015	0.011
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.4	-	-	7.5	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	-	-	0.6	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	-	-	25	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	-	-	15	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	-	-	13	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	0.4	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	-	-	17	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	1.4	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	-	-	48	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24647

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612486	612487	612488	612489	612490
Sample Reference				WS5	WS5	WS6	WS7	WS8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.90	1.10	0.75	0.45
Date Sampled				01/08/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	17	12	12	12
Total mass of sample received	kg	0.001	NONE	0.39	0.42	0.46	0.52	0.39
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
General Inorganics								
pH	pH Units	N/A	MCERTS	-	8.4	8.7	8.5	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.015	0.0079	0.0081	-
Total Sulphur	mg/kg	50	NONE	-	84	89	110	-
Total Sulphur	%	0.005	NONE	-	0.008	0.009	0.011	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.7	-	-	-	8.7
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	-	-	-	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	-	-	-	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	-	-	-	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	-	-	-	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	-	-	-	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	-	-	-	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	-	-	-	49

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24647

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612491	612492	612493	612494	612495
Sample Reference				WS8	WS9	WS11	WS11	WS12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.70	0.30	0.70	1.00
Date Sampled				01/08/2016	02/08/2016	02/08/2016	02/08/2016	02/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	14	14	17	16
Total mass of sample received	kg	0.001	NONE	0.47	0.45	0.37	0.47	0.44
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
General Inorganics								
pH	pH Units	N/A	MCERTS	8.4	8.6	-	8.1	8.5
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.013	-	0.017	0.013
Total Sulphur	mg/kg	50	NONE	95	120	-	130	87
Total Sulphur	%	0.005	NONE	0.010	0.012	-	0.013	0.009
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	7.8	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	0.9	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	27	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	19	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	22	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	0.4	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	18	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	55	-	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24647

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612496	612497	612498	612499	
Sample Reference				WS14	WS16	CP1	CP1	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				1.50	1.00	1.00	3.00	
Date Sampled				02/08/2016	02/08/2016	01/08/2016	01/08/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	11	17	14	17	
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.46	0.57	
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	
General Inorganics								
pH	pH Units	N/A	MCERTS	8.7	8.5	8.5	8.8	
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.010	0.011	0.011	0.013	
Total Sulphur	mg/kg	50	NONE	110	96	110	160	
Total Sulphur	%	0.005	NONE	0.011	0.010	0.011	0.016	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24647

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
612481	WS1	None Supplied	0.10	Light brown loam and clay with vegetation.
612482	WS1	None Supplied	0.80	Light brown loam and clay with vegetation.
612483	WS2	None Supplied	0.50	Light brown loam and clay with vegetation.
612484	WS3	None Supplied	0.60	Light brown loam and clay with vegetation.
612485	WS4	None Supplied	1.00	Light brown loam and clay with vegetation.
612486	WS5	None Supplied	0.20	Light brown loam and clay with vegetation.
612487	WS5	None Supplied	0.90	Light brown loam and clay with vegetation.
612488	WS6	None Supplied	1.10	Light brown loam and clay with vegetation.
612489	WS7	None Supplied	0.75	Light brown loam and clay with vegetation.
612490	WS8	None Supplied	0.45	Light brown loam and clay with vegetation.
612491	WS8	None Supplied	1.00	Light brown loam and clay with vegetation.
612492	WS9	None Supplied	0.70	Light brown loam and clay with vegetation.
612493	WS11	None Supplied	0.30	Light brown loam and clay with vegetation.
612494	WS11	None Supplied	0.70	Light brown loam and clay with vegetation.
612495	WS12	None Supplied	1.00	Light brown loam and clay with vegetation.
612496	WS14	None Supplied	1.50	Grey clay and sand.
612497	WS16	None Supplied	1.00	Light brown loam and clay with vegetation.
612498	CP1	None Supplied	1.00	Light brown loam and clay with vegetation.
612499	CP1	None Supplied	3.00	Beige clay and sand with chalk.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24647

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Mark Hiatt
Nott Group
Unit L26
Hastingwood Industrial Park
Wood Lane
Birmingham
B24 9QR

e: mark.hiatt@nottgroup.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 16-24656

Replaces Analytical Report Number : 16-24656, issue no. 1

Project / Site name:	Land at Newbarn Lane, North Bersted, Bognor Regis	**Samples received on:**	05/08/2016
Your job number:	72540	**Samples instructed on:**	05/08/2016
Your order number:		**Analysis completed by:**	22/08/2016
Report Issue Number:	2	**Report issued on:**	22/08/2016
Samples Analysed:	30 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				612530	612531	612532	612533	612534
Sample Reference				TP1	TP1	TP2	TP2	TP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.25	0.55	0.10
Date Sampled				29/07/2016	29/07/2016	29/07/2016	29/07/2016	29/07/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	12	13	14	13
Total mass of sample received	kg	0.001	NONE	0.44	0.43	0.41	0.40	0.42
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
General Inorganics								
pH	pH Units	N/A	MCERTS	6.4	-	6.3	7.2	-
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	360	-	-	-	-
Total Sulphate as SO_4	%	0.005	MCERTS	0.036	-	-	-	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.011	-	-	-	-
Sulphide	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Total Sulphur	mg/kg	50	NONE	250	-	-	-	-
Total Sulphur	%	0.005	NONE	0.025	-	-	-	-
Organic Matter	%	0.1	MCERTS	2.2	-	1.6	1.6	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.3	9.0	7.0	7.9	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	74	-	73	71	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.81	-	0.82	0.70	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	1.4	1.1	1.0	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	24	21	21	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	12	14	13	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	14	21	15	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	0.4	0.5	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	18	17	16	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	-	31	30	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	53	49	48	44	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				612530	612531	612532	612533	612534
Sample Reference				TP1	TP1	TP2	TP2	TP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.25	0.55	0.10
Date Sampled				29/07/2016	29/07/2016	29/07/2016	29/07/2016	29/07/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	< 10

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612535	612536	612537	612538	612539
Sample Reference				TP4	TP4	TP5	TP5	TP6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.05	0.40	0.35
Date Sampled				29/07/2016	29/07/2016	29/07/2016	29/07/2016	29/07/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	13	-	15	15
Total mass of sample received	kg	0.001	NONE	0.39	0.43	-	0.42	0.43
Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	-	-
General Inorganics								
pH	pH Units	N/A	MCERTS	-	-	-	-	5.9
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	< 1
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	-	-	420
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	-	0.042
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	0.012
Sulphide	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Total Sulphur	mg/kg	50	NONE	-	-	-	-	260
Total Sulphur	%	0.005	NONE	-	-	-	-	0.026
Organic Matter	%	0.1	MCERTS	-	-	-	-	2.6
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	-	-	-	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	7.3	-	-	7.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	83
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	0.80
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.9	-	-	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	23	-	-	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	13	-	-	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	14	-	-	19
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	0.3	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	19	-	-	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	51	-	-	51

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612535	612536	612537	612538	612539
Sample Reference				TP4	TP4	TP5	TP5	TP6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.05	0.40	0.35
Date Sampled				29/07/2016	29/07/2016	29/07/2016	29/07/2016	29/07/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612540	612541	612542	612543	612544
Sample Reference				TP7	TP7	TP8	TP9	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.45	0.20	0.60	0.05
Date Sampled				29/07/2016	29/07/2016	29/07/2016	29/07/2016	29/07/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	-	15	17	15	10
Total mass of sample received	kg	0.001	NONE	-	0.39	0.43	0.41	0.38
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	-	6.7	-	-	7.4
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	< 1
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	-	-	710
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	-	0.071
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	0.018
Sulphide	mg/kg	1	MCERTS	-	-	-	-	5.5
Total Sulphur	mg/kg	50	NONE	-	-	-	-	620
Total Sulphur	%	0.005	NONE	-	-	-	-	0.062
Organic Matter	%	0.1	MCERTS	-	1.7	-	-	7.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	-	-	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	6.4	7.4	-	7.3
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	96	-	-	85
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.94	-	-	0.86
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.5	1.4	-	3.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	0.3
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	27	28	-	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	14	11	-	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	17	13	-	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	0.7	< 0.3	-	0.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	19	19	-	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	40	-	-	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	55	48	-	870

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612540	612541	612542	612543	612544
Sample Reference				TP7	TP7	TP8	TP9	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.45	0.20	0.60	0.05
Date Sampled				29/07/2016	29/07/2016	29/07/2016	29/07/2016	29/07/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612545	612546	612547	612548	612549
Sample Reference				TP10	TP11	TP11	TP12	TP13
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.45	0.10	0.30	0.25	0.05
Date Sampled				29/07/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	-
Moisture Content	%	N/A	NONE	13	13	14	13	-
Total mass of sample received	kg	0.001	NONE	0.41	0.39	0.40	0.39	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	8.2	-	8.3	-	-
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Sulphide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphur	mg/kg	50	NONE	-	-	-	-	-
Total Sulphur	%	0.005	NONE	-	-	-	-	-
Organic Matter	%	0.1	MCERTS	1.8	-	1.5	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.0	-	7.3	6.9	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	92	-	91	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.91	-	0.87	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	-	1.3	1.3	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	< 4.0	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	-	27	27	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	-	16	13	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	-	13	13	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	0.4	0.5	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	-	19	19	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.8	-	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	39	-	38	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	-	53	49	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612545	612546	612547	612548	612549
Sample Reference				TP10	TP11	TP11	TP12	TP13
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.45	0.10	0.30	0.25	0.05
Date Sampled				29/07/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612550	612551	612552	612553	612554
Sample Reference				TP13	TP14	TP15	TP15	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.45	0.10	0.30	0.40
Date Sampled				01/08/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	12	-	14	13
Total mass of sample received	kg	0.001	NONE	1.3	0.44	-	0.39	0.37
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	-
General Inorganics								
pH	pH Units	N/A	MCERTS	6.4	-	-	7.0	-
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	320	-	-	-	-
Total Sulphate as SO_4	%	0.005	MCERTS	0.032	-	-	-	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0081	-	-	-	-
Sulphide	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Total Sulphur	mg/kg	50	NONE	190	-	-	-	-
Total Sulphur	%	0.005	NONE	0.019	-	-	-	-
Organic Matter	%	0.1	MCERTS	1.9	-	-	1.1	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	-	-	12	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	73	-	-	98	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.82	-	-	1.3	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	-	-	1.1	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	-	-	34	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	-	-	16	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	-	-	14	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5	-	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	-	-	33	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	-	-	47	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	-	-	51	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612550	612551	612552	612553	612554
Sample Reference				TP13	TP14	TP15	TP15	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.45	0.10	0.30	0.40
Date Sampled				01/08/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	< 10

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612555	612556	612557	612558	612559
Sample Reference				TP17	TP17	TP18	TP19	TP20
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.55	0.35	0.10	0.60
Date Sampled				01/08/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	14	12	13	13
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.41	0.44	0.40
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	Not-detected	-
General Inorganics								
pH	pH Units	N/A	MCERTS	6.0	-	6.2	-	7.4
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	310	-	-
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	0.031	-	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.013	-	-
Sulphide	mg/kg	1	MCERTS	-	-	< 1.0	-	-
Total Sulphur	mg/kg	50	NONE	-	-	210	-	-
Total Sulphur	%	0.005	NONE	-	-	0.021	-	-
Organic Matter	%	0.1	MCERTS	2.5	-	2.2	-	1.7
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	< 1.60	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.6	7.9	9.0	-	8.9
Barium (aqua regia extractable)	mg/kg	1	MCERTS	63	-	63	-	71
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.63	-	0.73	-	0.77
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.8	0.8	-	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	< 4.0	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	27	22	-	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	16	17	-	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	12	18	-	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	0.5	0.4	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	18	16	-	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	-	31	-	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	48	45	-	47

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Reg

Lab Sample Number				612555	612556	612557	612558	612559
Sample Reference				TP17	TP17	TP18	TP19	TP20
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.55	0.35	0.10	0.60
Date Sampled				01/08/2016	01/08/2016	01/08/2016	01/08/2016	01/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
612530	TP1	None Supplied	0.20	Light brown loam and clay.
612531	TP1	None Supplied	0.50	Light brown loam and clay with vegetation.
612532	TP2	None Supplied	0.25	Light brown loam and clay.
612533	TP2	None Supplied	0.55	Light brown loam and clay with vegetation.
612534	TP3	None Supplied	0.10	Light brown loam and clay with vegetation.
612535	TP4	None Supplied	0.30	Light brown loam and clay with vegetation.
612536	TP4	None Supplied	0.60	Light brown loam and clay with vegetation.
612537	TP5	None Supplied	0.05	-
612538	TP5	None Supplied	0.40	Light brown loam and clay.
612539	TP6	None Supplied	0.35	Light brown loam and clay with vegetation.
612540	TP7	None Supplied	0.15	-
612541	TP7	None Supplied	0.45	Light brown loam and clay.
612542	TP8	None Supplied	0.20	Light brown loam and clay with vegetation.
612543	TP9	None Supplied	0.60	Light brown loam and clay with vegetation.
612544	TP10	None Supplied	0.05	Brown sandy loam.
612545	TP10	None Supplied	0.45	Light brown loam and clay.
612546	TP11	None Supplied	0.10	Light brown loam and clay with vegetation.
612547	TP11	None Supplied	0.30	Light brown loam and clay with vegetation.
612548	TP12	None Supplied	0.25	Light brown loam and clay.
612549	TP13	None Supplied	0.05	-
612550	TP13	None Supplied	0.60	Light brown loam and clay with vegetation.
612551	TP14	None Supplied	0.45	Light brown loam and clay with vegetation.
612552	TP15	None Supplied	0.10	-
612553	TP15	None Supplied	0.30	Light brown loam and clay with vegetation.
612554	TP16	None Supplied	0.40	Light brown loam and clay with vegetation.
612555	TP17	None Supplied	0.25	Light brown loam and clay with vegetation.
612556	TP17	None Supplied	0.55	Light brown loam and clay with vegetation.
612557	TP18	None Supplied	0.35	Brown loam and clay with vegetation.
612558	TP19	None Supplied	0.10	Brown loam and clay with vegetation.
612559	TP20	None Supplied	0.60	Brown loam and clay with vegetation.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	NONE

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24656

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Mark Hiatt
Nott Group
Unit L26
Hastingwood Industrial Park
Wood Lane
Birmingham
B24 9QR

e: mark.hiatt@nottgroup.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 16-24662

Project / Site name:	Lands at Newbarn Lane, North Bersted, Bognor Regis	**Samples received on:**	05/08/2016
Your job number:	72540	**Samples instructed on:**	05/08/2016
Your order number:		**Analysis completed by:**	12/08/2016
Report Issue Number:	1	**Report issued on:**	12/08/2016
Samples Analysed:	3 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-24662

Project / Site name: Lands at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				612589	612590	612591		
Sample Reference				TP13	TP15	TP17		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.40	0.60	0.50		
Date Sampled				01/08/2016	01/08/2016	01/08/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	13	15	13		
Total mass of sample received	kg	0.001	NONE	1.3	0.41	1.4		
General Inorganics								
pH	pH Units	N/A	MCERTS	8.0	7.5	7.4		
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	0.5	0.7		
Loss on Ignition @ 450°C	%	0.2	MCERTS	4.2	4.5	3.9		
Acid Neutralisation Capacity	+/- mol/kg	-100	NONE	0.37	0.38	0.38		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05		
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	< 1.6	< 1.6	< 1.6		
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Total BTEX	µg/kg	10	MCERTS	< 10	< 10	< 10		
Petroleum Hydrocarbons								
Mineral Oil (C10 - C40)	mg/kg	10	ISO 17025	< 10	< 10	< 10		
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007	< 0.007		

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24662

Project / Site name: Lands at Newbarn Lane, North Bersted, Bognor Regis

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
612589	TP13	None Supplied	0.40	Light brown loam and clay.
612590	TP15	None Supplied	0.60	Light brown loam and clay.
612591	TP17	None Supplied	0.50	Brown loam and clay.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24662

Project / Site name: Lands at Newbarn Lane, North Bersted, Bognor Regis

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Mineral Oil (Soil)	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Mark Hiatt
Nott Group
Unit L26
Hastingwood Industrial Park
Wood Lane
Birmingham
B24 9QR

e: mark.hiatt@nottgroup.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 16-24662

Replaces Analytical Report Number : 16-24662, issue no. 1

Project / Site name:	Lands at Newbarn Lane, North Bersted, Bognor Regis	**Samples received on:**	05/08/2016
Your job number:	72540	**Samples instructed on:**	05/08/2016
Your order number:		**Analysis completed by:**	12/08/2016
Report Issue Number:	2	**Report issued on:**	15/08/2016
Samples Analysed:	3 WAC samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**16-24662**						
					Client:	**NOTTGROUP**	
Location	**Lands at Newbarn Lane, North Bersted, Bognor Regis**						
Lab Reference (Sample Number)	612589				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	01/08/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP13						
Depth (m)	0.40						
Solid Waste Analysis							
TOC (%)**	0.7				3%	5%	6%
Loss on Ignition (%) **	4.2				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	8.0				--	>6	--
Acid Neutralisation Capacity (mol / kg)	0.37				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	-	-		-	0.5	2	25
Barium *	-	-		-	20	100	300
Cadmium *	-	-		-	0.04	1	5
Chromium *	-	-		-	0.5	10	70
Copper *	-	-		-	2	50	100
Mercury *	-	-		-	0.01	0.2	2
Molybdenum *	-	-		-	0.5	10	30
Nickel *	-	-		-	0.4	10	40
Lead *	-	-		-	0.5	10	50
Antimony *	-	-		-	0.06	0.7	5
Selenium *	-	-		-	0.1	0.5	7
Zinc *	-	-		-	4	50	200
Chloride *	-	-		-	800	4000	25000
Fluoride	-	-		-	10	150	500
Sulphate *	-	-		-	1000	20000	50000
TDS	-	-		-	4000	60000	100000
Phenol Index (Monhydric Phenols) *	-	-		-	1	-	-
DOC	-	-		-	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1	-					
Sample Mass (kg)	1.3						
Dry Matter (%)	87						
Moisture (%)	13						
Stage 1							
Volume Eluate L2 (litres)	-						
Filtered Eluate VE1 (litres)	-						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislation

*= UKAS accredited (liquid eluate analysis only)
** = MCERTS accrediited

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

ARUN DISTRICT COUNCIL BE/22/18/DOC

i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**16-24662**						
					Client:	**NOTTGROUP**	
Location	**Lands at Newbarn Lane, North Bersted, Bognor Regis**						
Lab Reference (Sample Number)	612590				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	01/08/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP15						
Depth (m)	0.60						
Solid Waste Analysis							
TOC (%)**	0.5				3%	5%	6%
Loss on Ignition (%) **	4.5				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	7.5				--	>6	--
Acid Neutralisation Capacity (mol / kg)	0.38				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	-	-		-	0.5	2	25
Barium *	-	-		-	20	100	300
Cadmium *	-	-		-	0.04	1	5
Chromium *	-	-		-	0.5	10	70
Copper *	-	-		-	2	50	100
Mercury *	-	-		-	0.01	0.2	2
Molybdenum *	-	-		-	0.5	10	30
Nickel *	-	-		-	0.4	10	40
Lead *	-	-		-	0.5	10	50
Antimony *	-	-		-	0.06	0.7	5
Selenium *	-	-		-	0.1	0.5	7
Zinc *	-	-		-	4	50	200
Chloride *	-	-		-	800	4000	25000
Fluoride	-	-		-	10	150	500
Sulphate *	-	-		-	1000	20000	50000
TDS	-	-		-	4000	60000	100000
Phenol Index (Monhydric Phenols) *	-	-		-	1	-	-
DOC	-	-		-	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1	-					
Sample Mass (kg)	0.41						
Dry Matter (%)	85						
Moisture (%)	15						
Stage 1							
Volume Eluate L2 (litres)	-						
Filtered Eluate VE1 (litres)	-						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislatior

*= UKAS accredited (liquid eluate analysis only)
** = MCERTS accrediited

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

ARUN DISTRICT COUNCIL BE/22/18/DOC

i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**16-24662**						
					Client:	**NOTTGROUP**	
Location	**Lands at Newbarn Lane, North Bersted, Bognor Regis**						
Lab Reference (Sample Number)	612591				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	01/08/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP17						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	0.7				3%	5%	6%
Loss on Ignition (%) **	3.9				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	7.4				--	>6	--
Acid Neutralisation Capacity (mol / kg)	0.38				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1 mg/l	8:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	-	-		-	0.5	2	25
Barium *	-	-		-	20	100	300
Cadmium *	-	-		-	0.04	1	5
Chromium *	-	-		-	0.5	10	70
Copper *	-	-		-	2	50	100
Mercury *	-	-		-	0.01	0.2	2
Molybdenum *	-	-		-	0.5	10	30
Nickel *	-	-		-	0.4	10	40
Lead *	-	-		-	0.5	10	50
Antimony *	-	-		-	0.06	0.7	5
Selenium *	-	-		-	0.1	0.5	7
Zinc *	-	-		-	4	50	200
Chloride *	-	-		-	800	4000	25000
Fluoride	-	-		-	10	150	500
Sulphate *	-	-		-	1000	20000	50000
TDS	-	-		-	4000	60000	100000
Phenol Index (Monhydric Phenols) *	-	-		-	1	-	-
DOC	-	-		-	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1	-					
Sample Mass (kg)	1.4						
Dry Matter (%)	87						
Moisture (%)	13						
Stage 1							
Volume Eluate L2 (litres)	-						
Filtered Eluate VE1 (litres)	-						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislation

*= UKAS accredited (liquid eluate analysis only)
** = MCERTS accrediited

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

ARUN DISTRICT COUNCIL BE/22/18/DOC

Analytical Report Number : 16-24662

Project / Site name: Lands at Newbarn Lane, North Bersted, Bognor Regis

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
612589	TP13	None Supplied	0.40	Light brown loam and clay.
612590	TP15	None Supplied	0.60	Light brown loam and clay.
612591	TP17	None Supplied	0.50	Brown loam and clay.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-24662

Project / Site name: Lands at Newbarn Lane, North Bersted, Bognor Regis

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Appendix H CHEMICAL TESTING RESULTS - GROUNDWATER'S

Mark Hiatt
Nott Group
Unit L26
Hastingwood Industrial Park
Wood Lane
Birmingham
B24 9QR

e: mark.hiatt@nottgroup.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 16-26717

Project / Site name:	Land at Newbarn Lane, North Bersted, Bognor Regis	**Samples received on:**	02/09/2016
Your job number:	72540	**Samples instructed on:**	02/09/2016
Your order number:		**Analysis completed by:**	06/09/2016
Report Issue Number:	1	**Report issued on:**	06/09/2016
Samples Analysed:	2 water samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-26717

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				623661	623662			
Sample Reference				CP1	CP2			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/08/2016	31/08/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.6	7.7			
Electrical Conductivity	µS/cm	10	NONE	810	680			
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Complex Cyanide	µg/l	10	NONE	< 10	< 10			
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Sulphate as SO_4	µg/l	45	ISO 17025	35700	62600			
Sulphide	µg/l	5	NONE	< 5.0	< 5.0			
Chloride	mg/l	0.15	ISO 17025	78	39			
Ammonium as NH_4	µg/l	15	ISO 17025	590	540			
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	1.70	4.50			
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16			

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-26717

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				623661	623662			
Sample Reference				CP1	CP2			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/08/2016	31/08/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.4	0.7			
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.26	0.91			
Barium (dissolved)	µg/l	0.06	ISO 17025	49	44			
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	0.6			
Boron (dissolved)	µg/l	10	ISO 17025	67	40			
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.02			
Calcium (dissolved)	mg/l	0.012	ISO 17025	100	120			
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0			
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Cobalt (dissolved)	µg/l	0.2	ISO 17025	0.6	4.0			
Copper (dissolved)	µg/l	0.5	ISO 17025	2.3	1.2			
Iron (dissolved)	mg/l	0.004	ISO 17025	< 0.004	0.017			
Lead (dissolved)	µg/l	0.2	ISO 17025	7.9	3.4			
Magnesium (dissolved)	mg/l	0.005	ISO 17025	6.8	7.7			
Manganese (dissolved)	µg/l	0.05	ISO 17025	36	210			
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	0.58			
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.84	1.3			
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.6	3.9			
Phosphorus (dissolved)	µg/l	20	ISO 17025	< 20.0	< 20.0			
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.7	3.1			
Selenium (dissolved)	µg/l	0.6	ISO 17025	2.3	1.6			
Sodium (dissolved)	mg/l	0.01	ISO 17025	84	40			
Tin (dissolved)	µg/l	0.2	ISO 17025	0.45	0.32			
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.3	< 0.2			
Zinc (dissolved)	µg/l	0.5	ISO 17025	25	46			

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-26717

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				623661	623662			
Sample Reference				CP1	CP2			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/08/2016	31/08/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0			
Petroleum Hydrocarbons								
Mineral Oil (C10 - C40)	µg/l	10	NONE	< 10.0	< 10.0			
Diesel Range Organics (C10 - C25)	µg/l	10	NONE	< 10	< 10			
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10			
TPH2 (C6 - C10)	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-26717

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				623661	623662			
Sample Reference				CP1	CP2			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/08/2016	31/08/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0			
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0			
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-26717

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Lab Sample Number				623661	623662			
Sample Reference				CP1	CP2			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/08/2016	31/08/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05			
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			

U/S = Unsuitable Sample I/S = Insufficient Sample

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-26717

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Complex cyanide in water	Determination of complex cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	NONE
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method	L031-PL	W	NONE
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Mineral Oil (Waters) C10 - C40	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L0102B-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE

ARUN DISTRICT COUNCIL BE/22/18/DOC
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-26717

Project / Site name: Land at Newbarn Lane, North Bersted, Bognor Regis

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon inlwater by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
TPH2 (Waters)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Appendix I GEOTECHNICAL TESTING RESULTS

TERRA TEK
SITE INVESTIGATION & LABORATORY SERVICES

Nott Group
Unit L26
Hastingwood Industrial Park
Wood Lane
Birmingham
B24 9QR
For the attention of Mark Hiatt

Report No: B20213
Issue No 01

LABORATORY TEST REPORT

Project Name	**LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS**		
Project Number	**B20213**	Date samples received	04/08/2016
Your Ref		Date written instructions received	04/08/2016
Purchase Order	72540	Date testing commenced	04/08/2016

Please find enclosed the results as summarised below

Figure / Table	Test Quantity	Description	ISO 17025 Accredited
1	~	Summary of Geotechnical Tests	See Table
2	4	Saturation of Moisture Content of Chalk	No
3 - 21	19	Atterberg Limit	Yes
22 - 26	5	Particle Size Distribution	Yes
27 - 31	5	Moisture Content / Dry Density Relationship	Yes
32 - 34	3	Moisture Condition Value	Yes
35 - 36	2	Unconsolidated Undrained Triaxial Compression	Yes

Remarks :

Issued by : Stephen Langman Date of Issue : 25/08/2016

Approved Signatories : S. Langman 25/08/2016

G Wilson (JMD/Laboratories Director), S Langman (Laboratory Coordinator)

Key to symbols used in this report
S/C : Testing was sub-contracted

Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.
The results reported relate to samples received in the laboratory only.
All results contained in this report are provisional unless signed by an approved signatory
This report should not be reproduced except in full without the written approval of the laboratory.
Under multisite accreditation the testing contained in this report may have been performed at another Terra Tek laboratory.
The enclosed results remain the property of Terra Tek Limited and we reserve the right to withdraw
our report if we have not received cleared funds in accordance with our standard terms and conditions
Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.
Feedback on the this report may be left via our website www.terratek.co.uk/contact-us

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 0126
25 YEARS 1990-2015

Moor Lane, Witton, Birmingham, B6 7HG
Tel: +44 (0)121 344 4838 Fax: +44 (0)121 356 3599
birmingham@terratek.co.uk
www.terratek.co.uk
Terra Tek Ltd is registered in Scotland No. 121594
Offices in Airdrie, Birmingham, Belfast and Chesham
Head Office : 62 Rochsolloch Road, Airdrie, ML6 9BG

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

Contract No B20213

Sample Identification							Atterberg limits						Density		Total Stress			
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage retained 425µm %	Atterberg Classification	Particle Density Mg/m³	Bulk Mg/m³	Dry Mg/m³	Shear Strength kPa	Apparent Cohesion C kPa	Angle of Shearing Resistance Phi	Other Tests
CP01	0.50		T	297928	Brown CLAY with some gravel. Gravel is fine to medium.	18	41	20	21	8	CI							
CP01	1.50		U	297951	Soft to firm light brown sandy CLAY with occasional fine to medium gravel.	19							2.12	1.78	58 60 62	54	2.4	
CP02	0.50		T	297930	Brown slightly sandy CLAY.	20	44	20	24	0	CI							
CP02	1.50		U	297952	Soft to light firm light brown sandy CLAY with much gravel of chalk and flint.	17							2.09	1.79	34 37 42	29	4.4	
CP03	1.95		T	297932	Brown slightly sandy CLAY with occasional gravel. Gravel is fine.	18	30	16	14	1	CL							

Notes: Opinions and interpretations are outside the scope of UKAS accreditation

Test details are given on the 'Notes on Laboratory Procedures' sheet

See individual report sheets

UKAS Accredited Test Y/N	Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y

Originator	Approved
ME	S. Langman 06/09/2016

SUMMARY OF GEOTECHNICAL TESTS

Figure 1

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

Contract No B20213

Sample Identification							Atterberg limits						Density		Total Stress			
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage retained 425µm %	Atterberg Classification	Particle Density Mg/m³	Bulk Mg/m³	Dry Mg/m³	Shear Strength kPa	Apparent Cohesion C kPa	Angle of Shearing Resistance Phi	Other Tests
TP04	0.50		B	297953														MCV
TP07	0.60		B	297954	Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.	16												PSD,2.5kg Compaction
TP13	1.00		B	297955	Light brown sandy SILT/CLAY with some gravel. Gravel is fine to coarse.	18												PSD,4.5kg Compaction
TP15	0.80		B	297956	Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.	15												PSD,2.5kg Compaction
TP16	1.00		B	297957														MCV
Notes: Opinions and interpretations are outside the scope of UKAS accreditation					UKAS Accredited Test Y/N	Test details are given on the 'Notes on Laboratory Procedures' sheet: Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	See individual report sheets

Originator	Approved
ME	S. Langman 06/09/2016

SUMMARY OF GEOTECHNICAL TESTS

Figure 1

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

Contract No B20213

Sample Identification							Atterberg limits						Density		Total Stress			
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage retained 425µm %	Atterberg Classification	Particle Density Mg/m³	Bulk Mg/m³	Dry Mg/m³	Shear Strength kPa	Apparent Cohesion C kPa	Angle of Shearing Resistance Phi	Other Tests
TP17	1.20		B	297958	Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine.	13												PSD,2.5kg Compaction
TP18	1.40		B	297959	Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.	16												PSD,4.5kg Compaction
TP19	0.90		B	297960														MCV
WS01	1.00		T	297934	Brown slightly sandy CLAY.	21	44	20	24	0	CI							
WS02	0.50		T	297935	Brown slightly sandy CLAY.	21	46	21	25	0	CI							
Notes	Opinions and interpretations are outside the scope of UKAS accreditation				UKAS Accredited Test Y/N	Test details are given on the 'Notes on Laboratory Procedures' sheet												See individual report sheets
						Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	

Originator	Approved
ME	S. Langman 06/09/2016

SUMMARY OF GEOTECHNICAL TESTS

Figure 1

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

Contract No B20213

Sample Identification							Atterberg limits						Density		Total Stress			
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage retained 425µm %	Atterberg Classification	Particle Density Mg/m³	Bulk Mg/m³	Dry Mg/m³	Shear Strength kPa	Apparent Cohesion C kPa	Angle of Shearing Resistance Phi	Other Tests
WS04	1.50		T	297936	Brown slightly sandy CLAY.	17	30	17	13	0	CL							
WS05	1.00		T	297937	Brown slightly sandy CLAY.	19	40	20	20	0	CI							
WS06	2.00		T	297938	Light brown mottled grey slightly sandy very silty CLAY.	17	25	16	9	0	CL							
WS07	1.20		T	297939	Brown slightly sandy CLAY.	15	28	16	12	0	CL							
WS08	0.75		T	297940	Brown slightly sandy CLAY.	22	40	20	20	0	CI							
Notes: Opinions and interpretations are outside the scope of UKAS accreditation					UKAS Accredited Test Y/N	Test details are given on the 'Notes on Laboratory Procedures' sheet												See individual report sheets
						Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	

Originator	Approved
ME	S. Langman 06/09/2016

SUMMARY OF GEOTECHNICAL TESTS

Figure 1

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

Contract No B20213

Sample Identification							Atterberg limits						Density		Total Stress			
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage retained 425µm %	Atterberg Classification	Particle Density Mg/m³	Bulk Mg/m³	Dry Mg/m³	Shear Strength kPa	Apparent Cohesion C kPa	Angle of Shearing Resistance Phi	Other Tests
WS09	0.70		T	297941	Brown very silty CLAY.	19	33	19	14	0	CL							
WS10	0.50		T	297942	Brown slightly sandy CLAY.	20	46	21	25	0	CI							
WS11	0.80		T	297943	Brown slightly sandy CLAY.	23	44	20	24	0	CI							
WS12	1.00		T	297944	Brown slightly sandy CLAY with some gravel. Gravel is fine to medium.	23	40	19	21	18	CI							
WS13	1.20		T	297945	Brown slightly sandy CLAY with occasional gravel. Gravel is fine to medium.	17	33	17	16	3	CL							
Notes	Opinions and interpretations are outside the scope of UKAS accreditation				UKAS Accredited Test Y/N	Test details are given on the 'Notes on Laboratory Procedures' sheet												See individual report sheets
						Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	

Originator	Approved
ME	S. Langman 06/09/2016

SUMMARY OF GEOTECHNICAL TESTS

Figure 1

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

Contract No B20213

Sample Identification							Atterberg limits						Density		Total Stress			
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage retained 425µm %	Atterberg Classification	Particle Density Mg/m³	Bulk Mg/m³	Dry Mg/m³	Shear Strength kPa	Apparent Cohesion C kPa	Angle of Shearing Resistance Phi	Other Tests
WS14	0.50		T	297946	Brown slightly sandy CLAY with occasional gravel. Gravel is fine to medium.	19	38	18	20	4	CI							
WS14	1.00		T	297947	Brown mottled grey slightly sandy CLAY with occasional gravel. Gravel is fine to medium.	13	27	15	12	4	CL							
WS15	1.00		T	297949	Light brown mottled grey slightly sandy CLAY with some gravel. Gravel is fine to medium.	15	26	16	10	15	CL							
WS15	1.50		T	297950	Light brown very silty CLAY with some gravel. Gravel is fine to medium.	20	22	12	10	6	CL							
Notes	Opinions and interpretations are outside the scope of UKAS accreditation				UKAS Accredited Test Y/N	Test details are given on the 'Notes on Laboratory Procedures' sheet												See individual report sheets
						Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	

Originator	Approved
ME	S. Langman 06/09/2016

SUMMARY OF GEOTECHNICAL TESTS

Figure 1

Sheet 6 of 6

TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

Contract No B20213

Hole ID	Sample	Depth (m)	Description	Moisture Content %	Bulk Density Mg/m³	Dry Density Mg/m³	Saturation Moisture Content %	Porosity %
CP01	297929	11.50	White Chalk	25	2.01	1.61	25	40
CP02	297931	13.50	White Chalk	23	2.03	1.64	24	39
CP03	297933	12.00	White Chalk	25	1.95	1.56	27	42
WS14	297948	3.90	White Chalk	24	1.97	1.59	26	41

Originator	Checked & Approved
PM	S. Langman 25/08/2016

SATURATION MOISTURE CONTENT OF CHALK
BS1377:Part2:1990:Clause 3.3

Figure 2

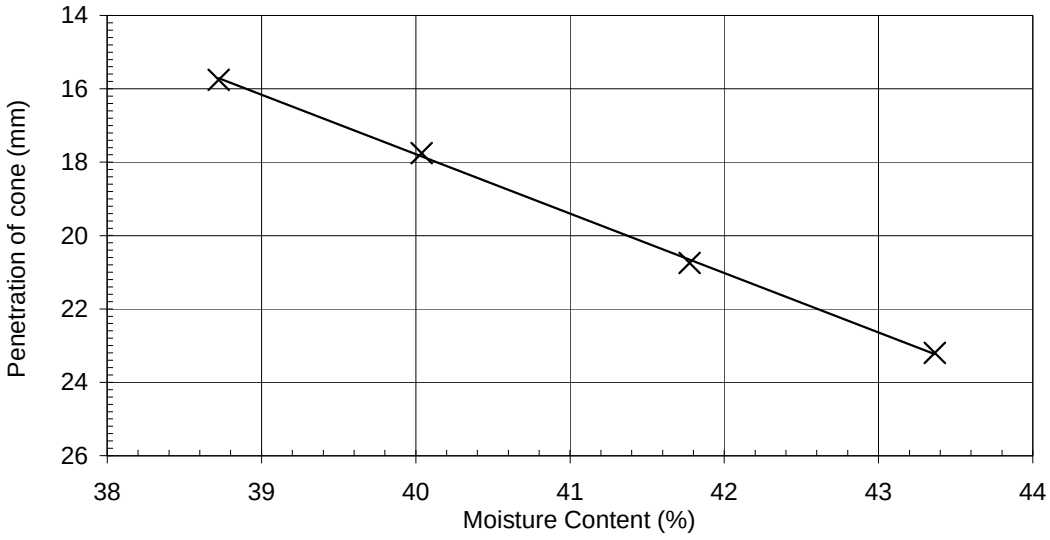
Sheet 1 of 1

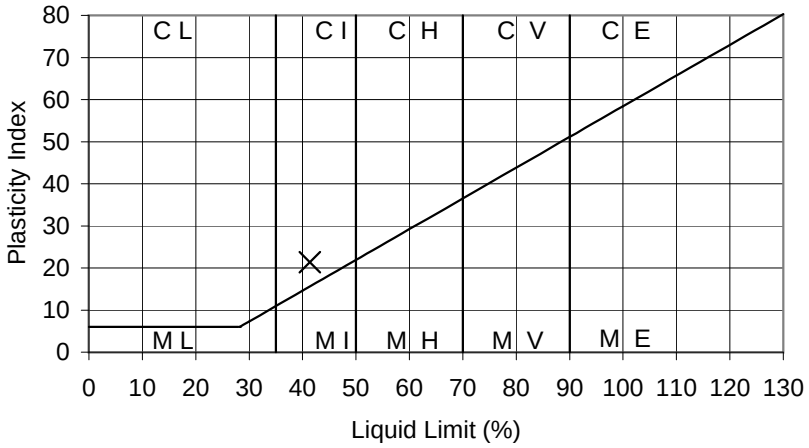
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	CP01
	Engineer		Sample Ref	
			Depth (m)	0.50
			Sample Type	T

Non Engineering Description : Brown CLAY with some gravel. Gravel is fine to medium.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	18	%
Percentage retained on 425µm sieve :	8	%
Liquid Limit :	41	%
Plastic Limit :	20	%
Plasticity Index :	21	
Equivalent moisture content of material passing 425µm sieve :	19	%
Liquidity Index :	-0.05	

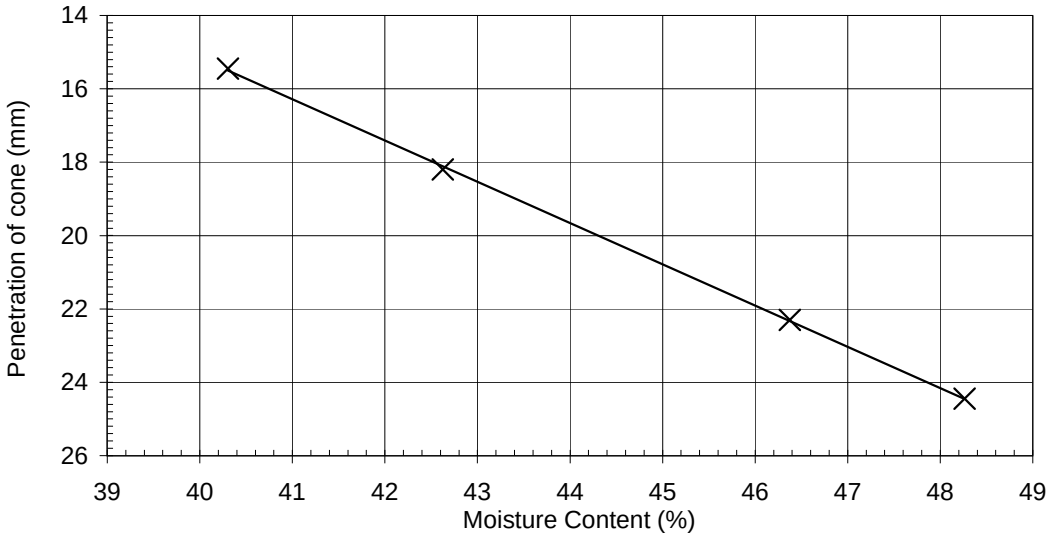
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 3**
KP	S. Langman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	TTk	Sheet 1 of 1

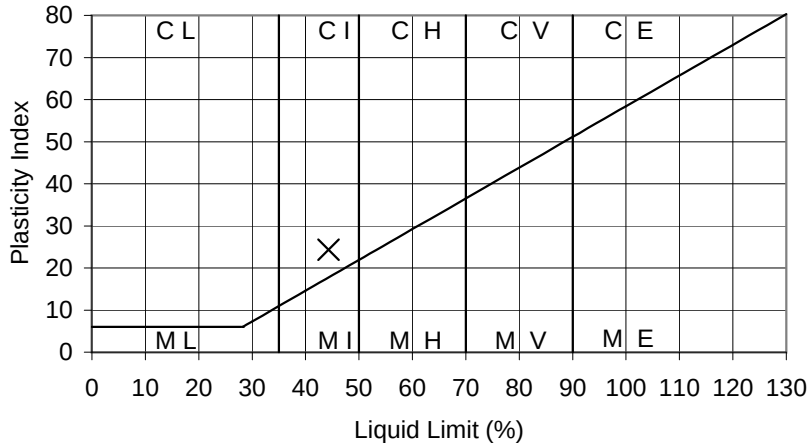
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	CP02
	Engineer		Sample Ref	
			Depth (m)	0.50
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	20	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	44	%
Plastic Limit :	20	%
Plasticity Index :	24	
Equivalent moisture content of material passing 425µm sieve :	20	%
Liquidity Index :	0.00	

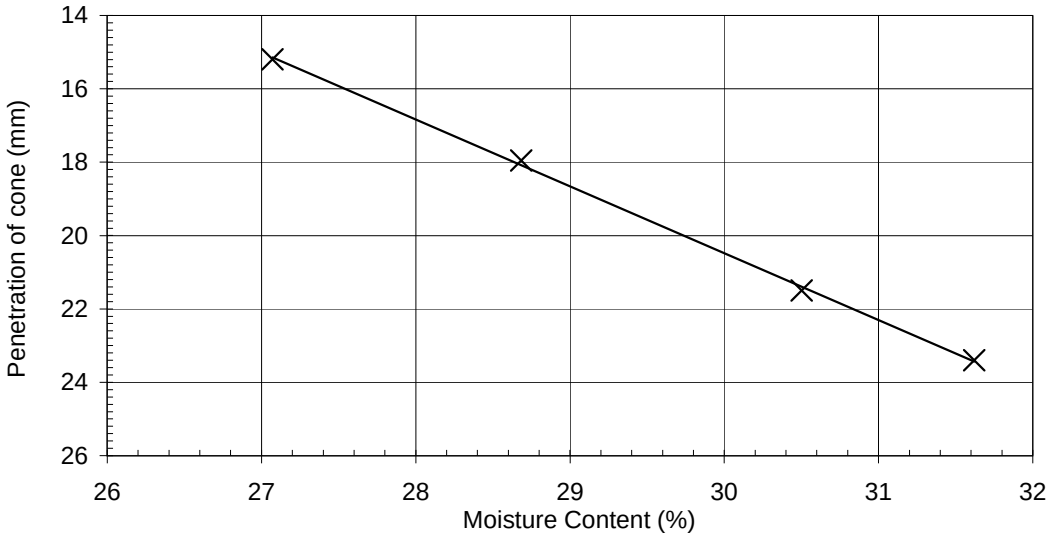
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 4**
KP/TE	S. Langman 25/08/2016		Sheet 1 of 1

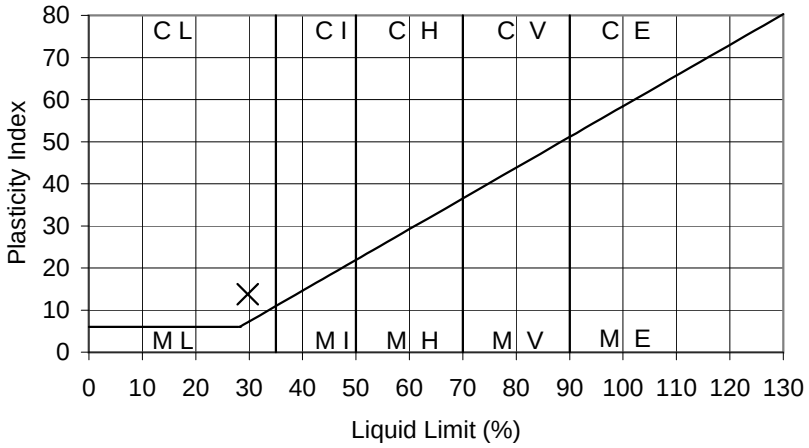
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	CP03
	Engineer		Sample Ref	
			Depth (m)	1.95
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY with occasional gravel. Gravel is fine.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	18	%
Percentage retained on 425µm sieve :	1	%
Liquid Limit :	30	%
Plastic Limit :	16	%
Plasticity Index :	14	
Equivalent moisture content of material passing 425µm sieve :	18	%
Liquidity Index :	0.14	

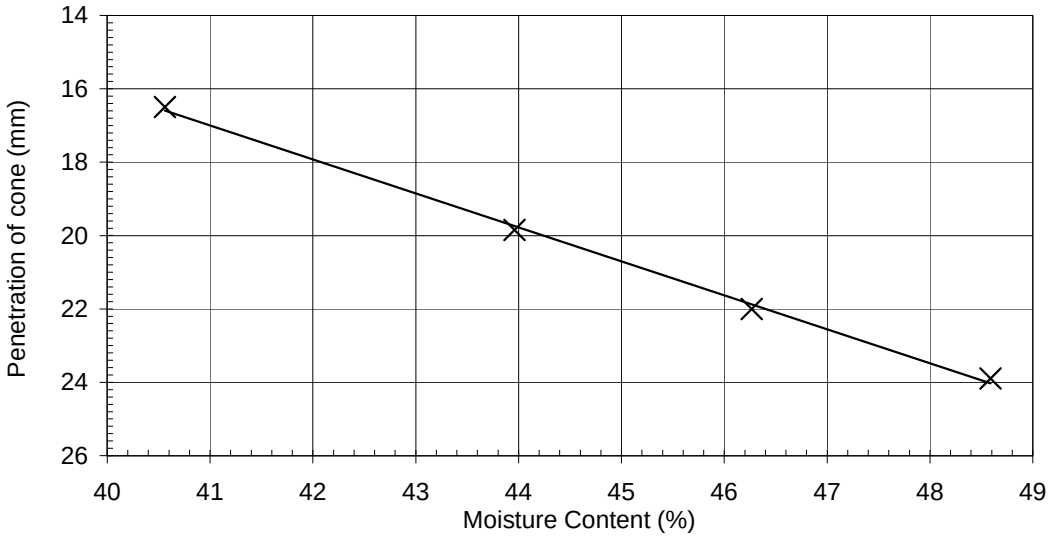
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 5**
TE	S. Longman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990		Sheet 1 of 1

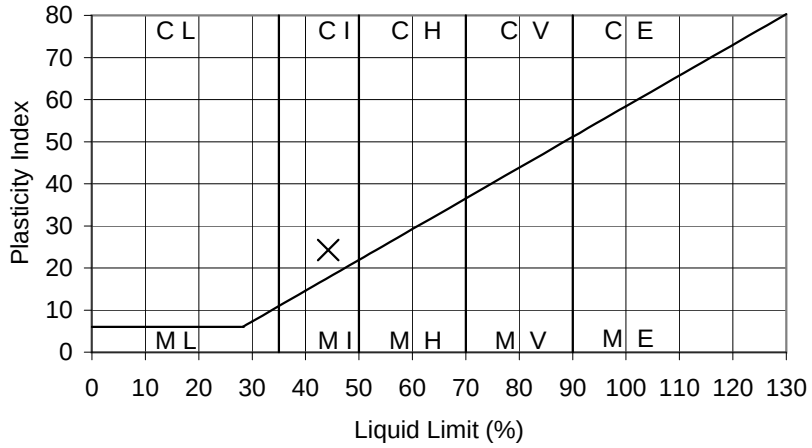
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS01
	Engineer		Sample Ref	
			Depth (m)	1.00
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	21 %
Percentage retained on 425µm sieve :	0 %
Liquid Limit :	44 %
Plastic Limit :	20 %
Plasticity Index :	24
Equivalent moisture content of material passing 425µm sieve :	21 %
Liquidity Index :	0.04

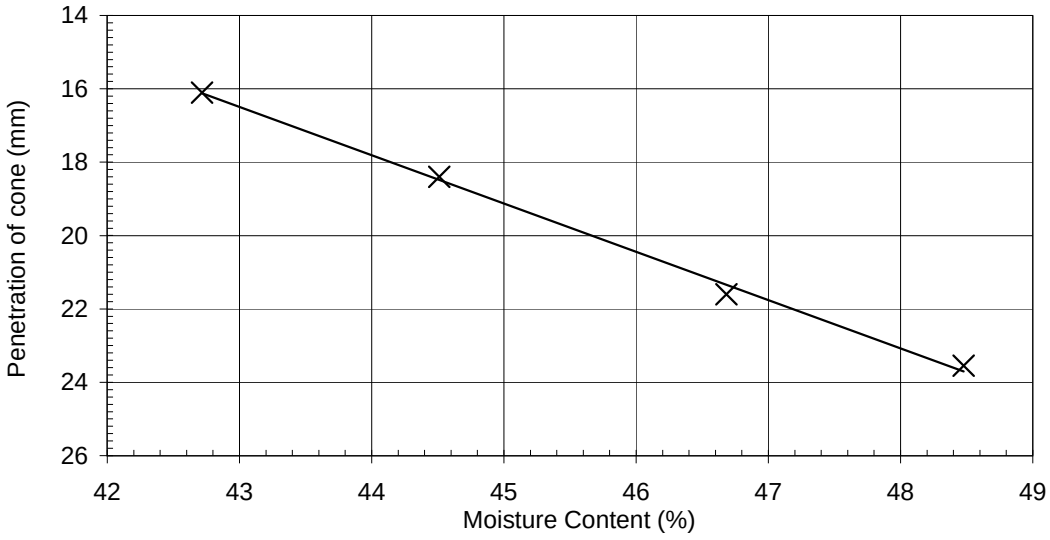
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990		**Figure 6**
KP/TE	S. Langman 25/08/2016			Sheet 1 of 1

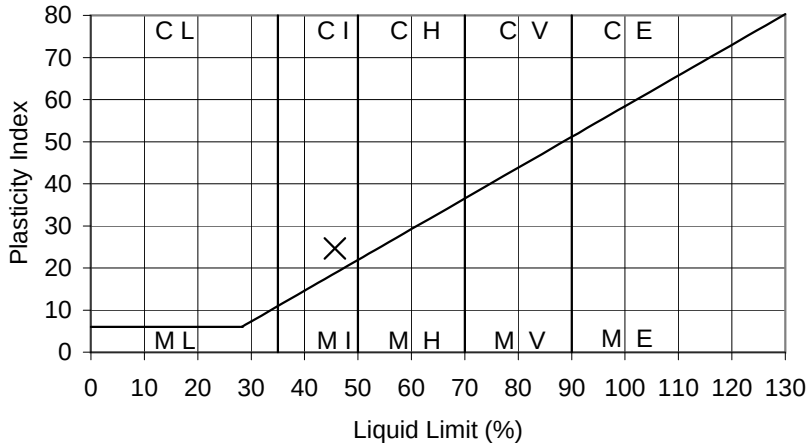
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS02
	Engineer		Sample Ref	
			Depth (m)	0.50
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	21	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	46	%
Plastic Limit :	21	%
Plasticity Index :	25	
Equivalent moisture content of material passing 425µm sieve :	21	%
Liquidity Index :	0.00	

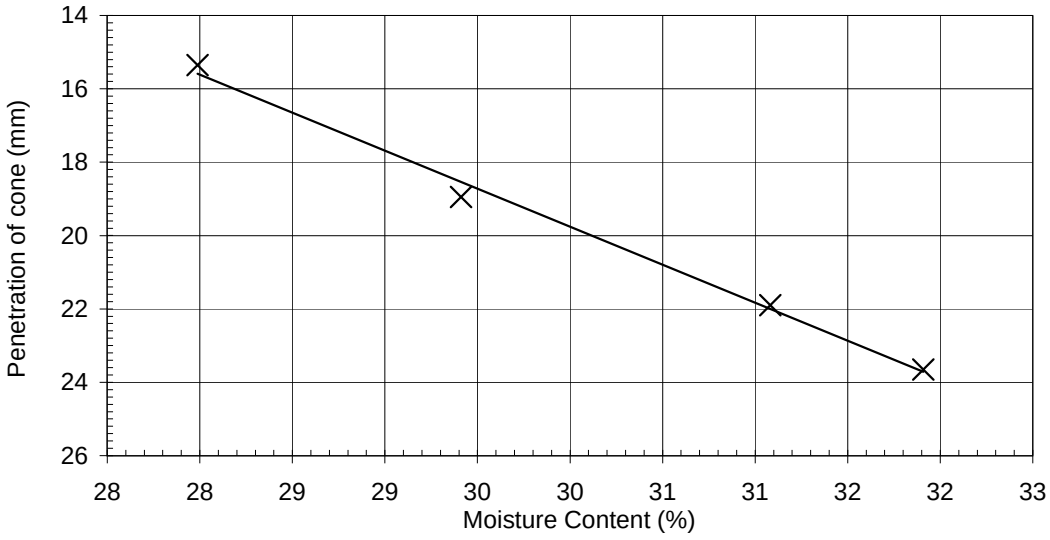
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 7**
KP/TE	S. Langman 25/08/2016		Sheet 1 of 1

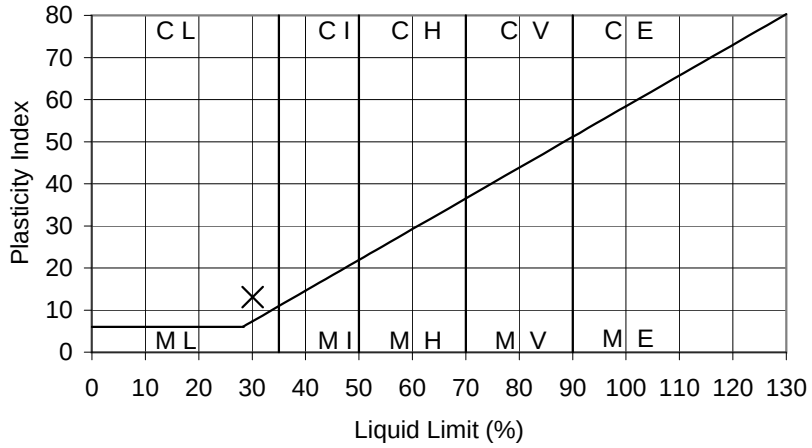
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS04
	Engineer		Sample Ref	
			Depth (m)	1.50
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	17	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	30	%
Plastic Limit :	17	%
Plasticity Index :	13	
Equivalent moisture content of material passing 425µm sieve :	17	%
Liquidity Index :	0.00	

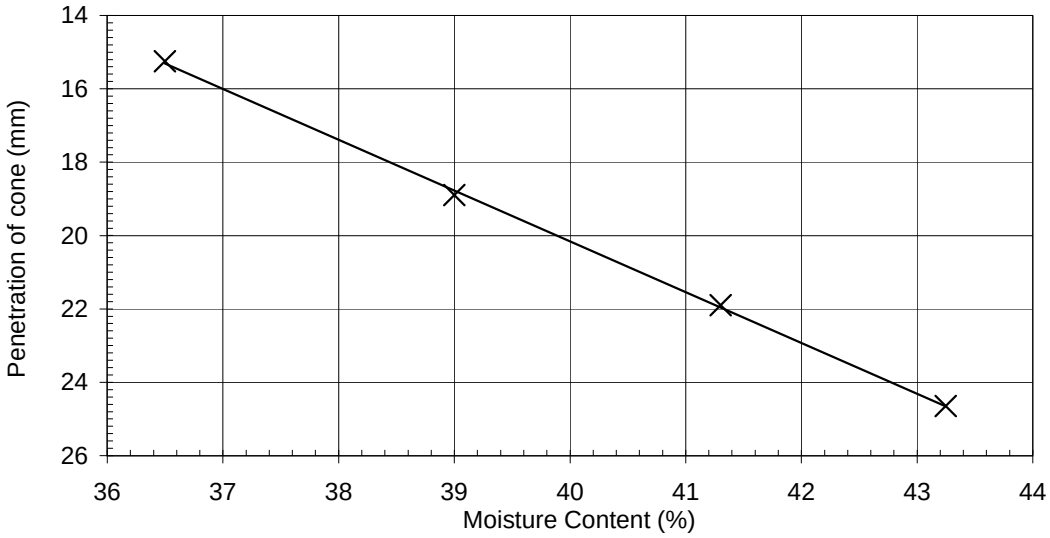
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 8**
TE/ME	S. Longman 25/08/2016		Sheet 1 of 1

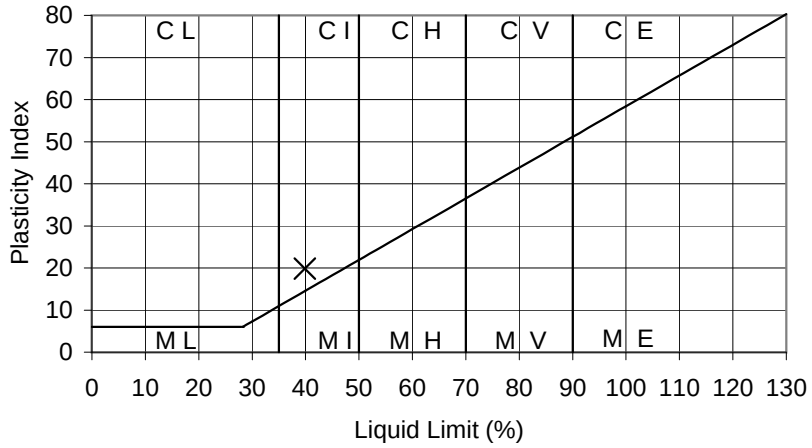
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS05
	Engineer		Sample Ref	
			Depth (m)	1.00
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	19	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	40	%
Plastic Limit :	20	%
Plasticity Index :	20	
Equivalent moisture content of material passing 425µm sieve :	19	%
Liquidity Index :	-0.05	

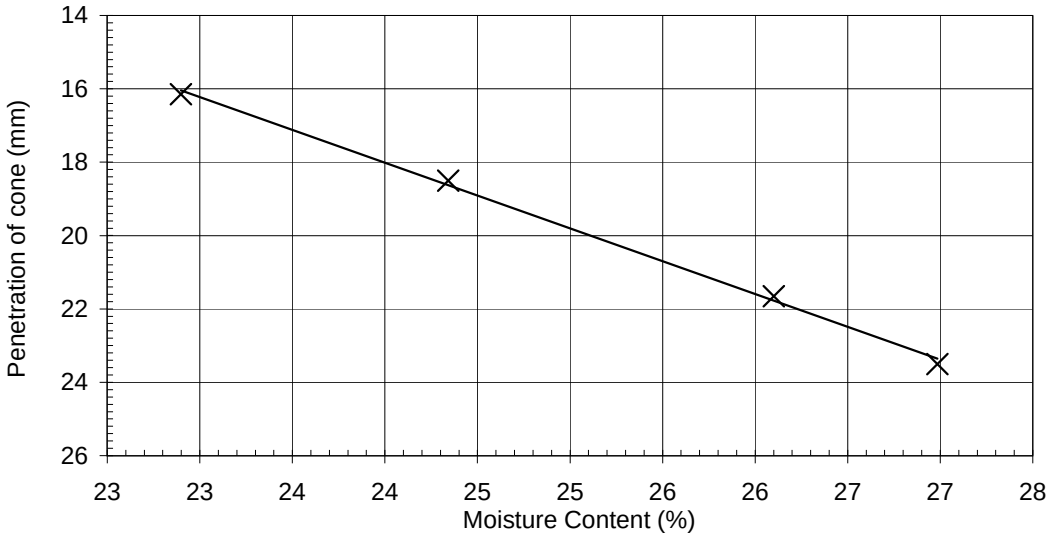
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 9**
TE	S. Longman 25/08/2016		Sheet 1 of 1

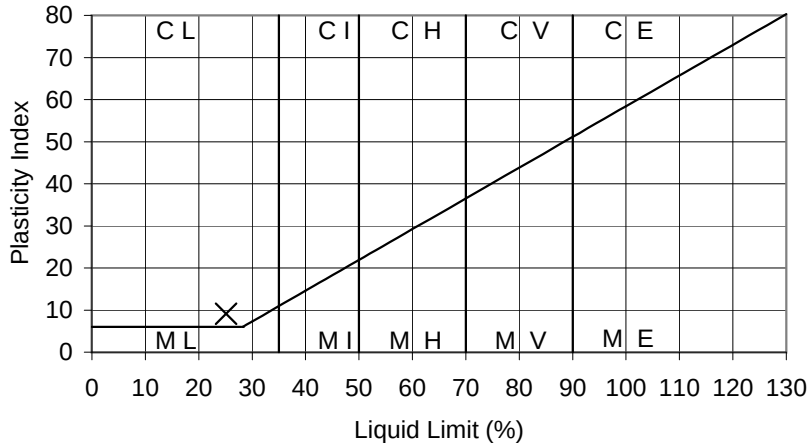
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS06
	Engineer		Sample Ref	
			Depth (m)	2.00
			Sample Type	T

Non Engineering Description : Light brown mottled grey slightly sandy very silty CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	17	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	25	%
Plastic Limit :	16	%
Plasticity Index :	9.0	
Equivalent moisture content of material passing 425µm sieve :	17	%
Liquidity Index :	0.11	

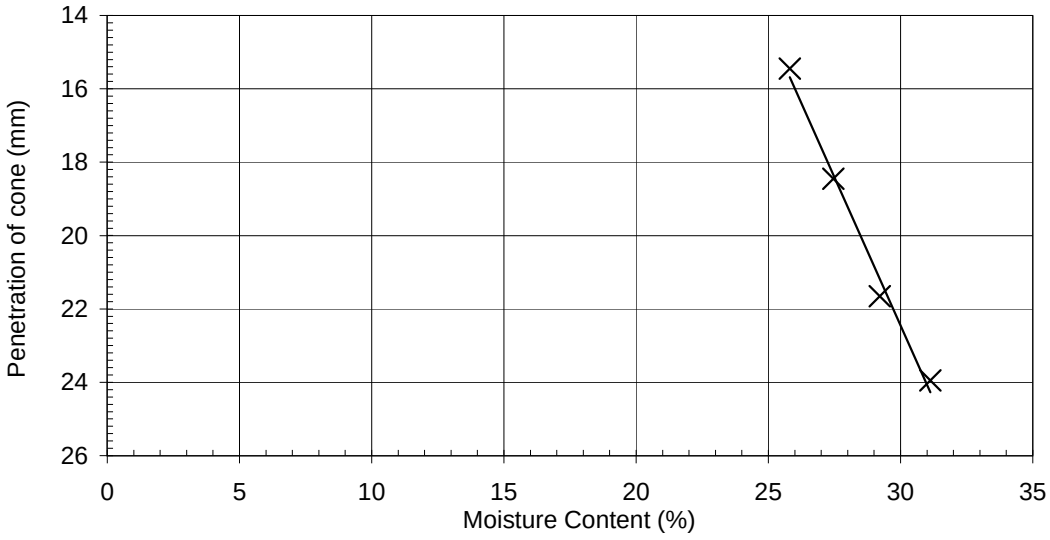
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 10**
TE/ME	S. Longman 25/08/2016		Sheet 1 of 1

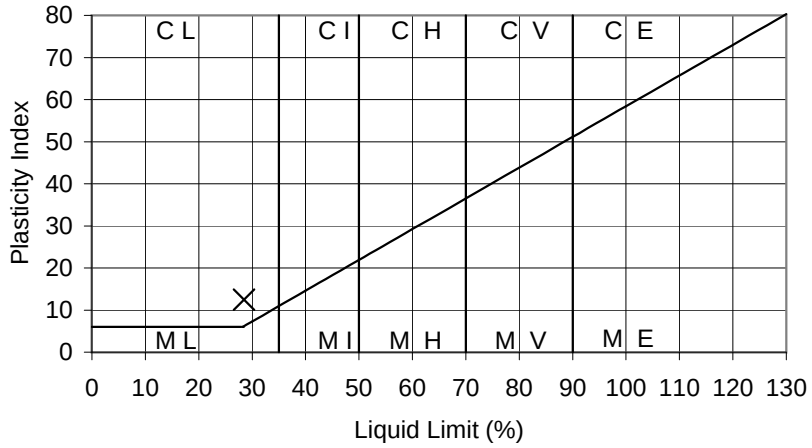
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS07
	Engineer		Sample Ref	
			Depth (m)	1.20
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	15	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	28	%
Plastic Limit :	16	%
Plasticity Index :	12	
Equivalent moisture content of material passing 425µm sieve :	15	%
Liquidity Index :	-0.08	

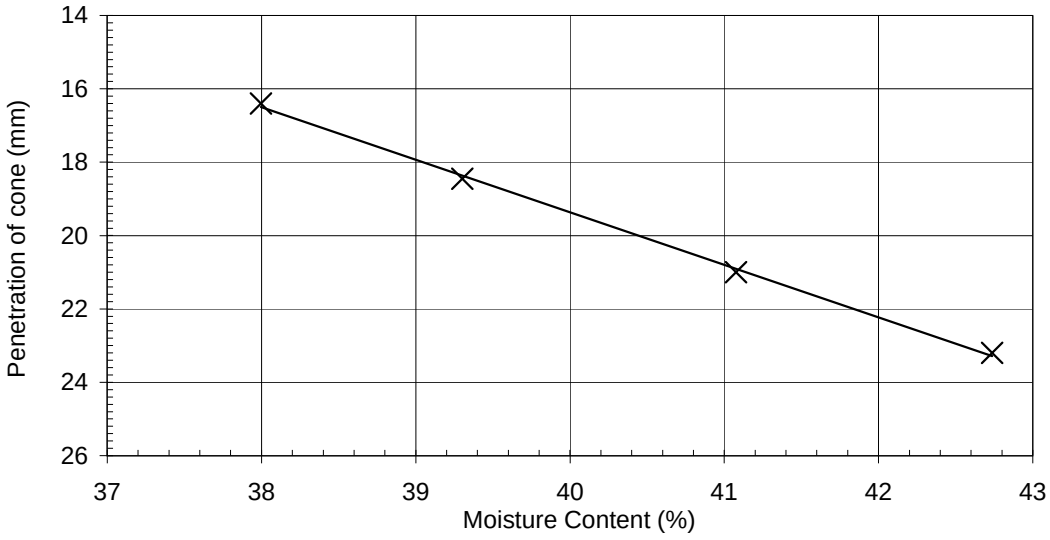
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 11**
TE	S. Langman 25/08/2016		Sheet 1 of 1

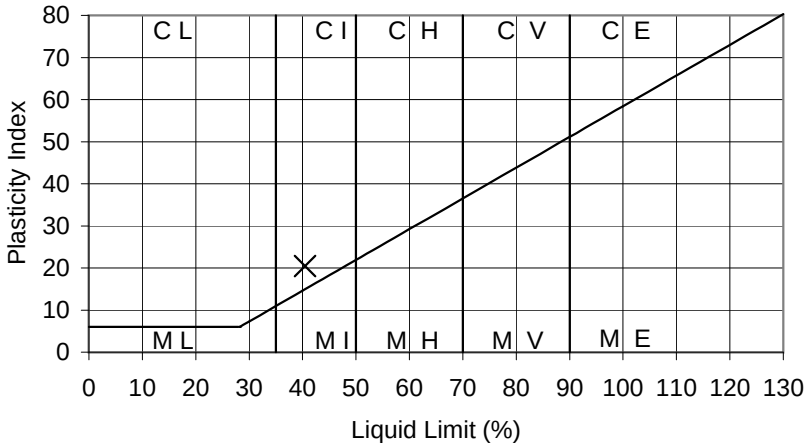
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS08
	Engineer		Sample Ref	
			Depth (m)	0.75
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	22	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	40	%
Plastic Limit :	20	%
Plasticity Index :	20	
Equivalent moisture content of material passing 425µm sieve :	22	%
Liquidity Index :	0.10	

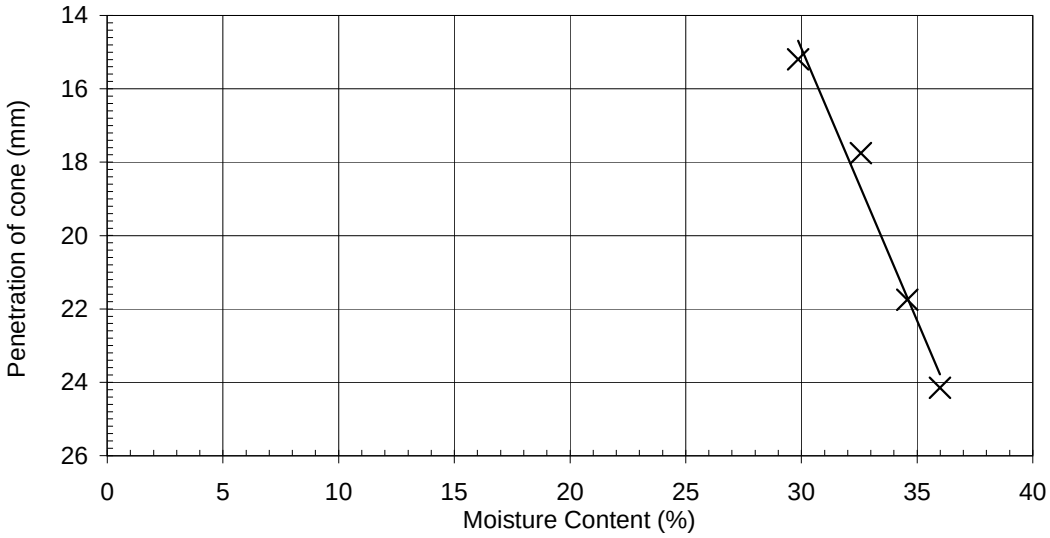
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 12**
TE/ME	S. Longman 25/08/2016		Sheet 1 of 1

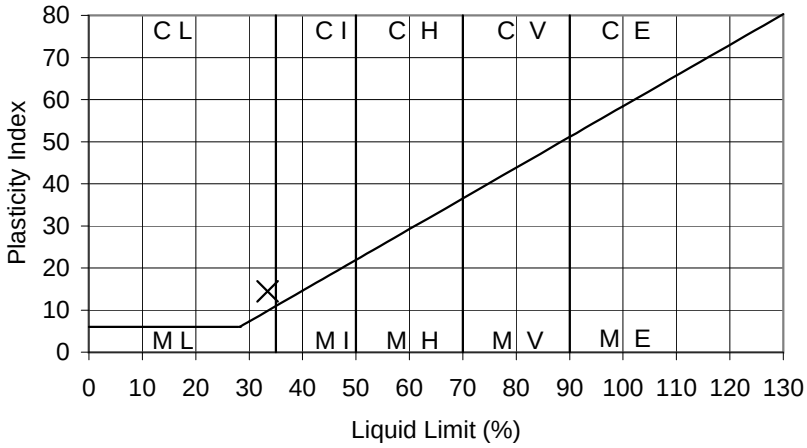
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS09
	Engineer		Sample Ref	
			Depth (m)	0.70
			Sample Type	T

Non Engineering Description : Brown very silty CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	19	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	33	%
Plastic Limit :	19	%
Plasticity Index :	14	
Equivalent moisture content of material passing 425µm sieve :	19	%
Liquidity Index :	0.00	

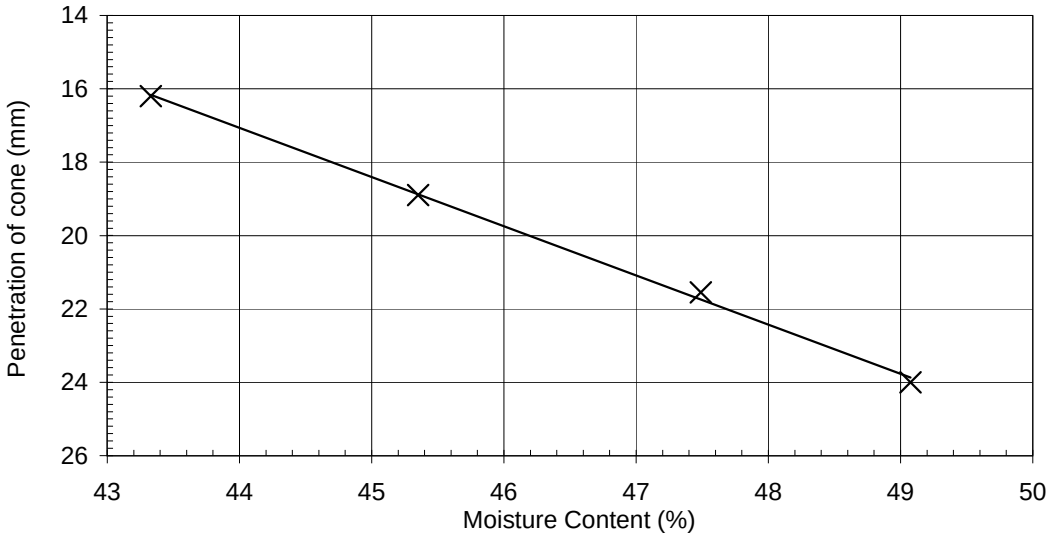
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 13**
KP/TE	S. Langman 25/08/2016		Sheet 1 of 1

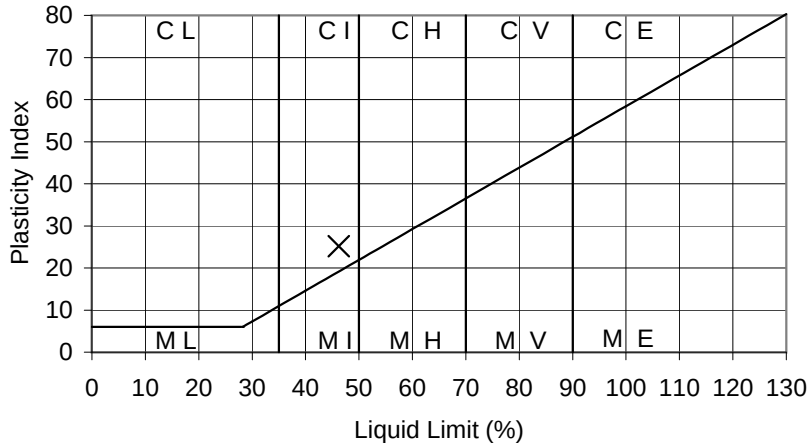
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS10
	Engineer		Sample Ref	
			Depth (m)	0.50
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	20	%
Percentage retained on 425µm sieve :	0	%
Liquid Limit :	46	%
Plastic Limit :	21	%
Plasticity Index :	25	
Equivalent moisture content of material passing 425µm sieve :	20	%
Liquidity Index :	-0.04	

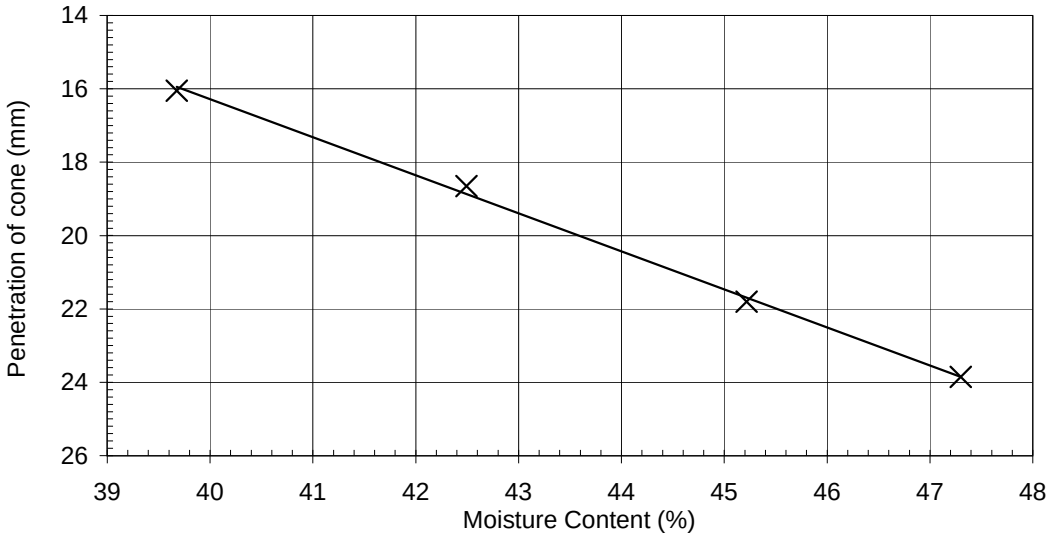
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	**Figure 14**
TE	S. Langman 25/08/2016		Sheet 1 of 1

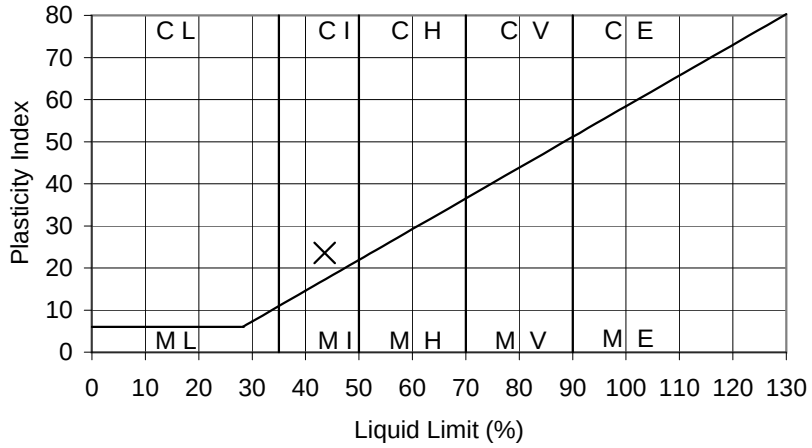
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS11
	Engineer		Sample Ref	
			Depth (m)	0.80
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	23 %
Percentage retained on 425µm sieve :	0 %
Liquid Limit :	44 %
Plastic Limit :	20 %
Plasticity Index :	24
Equivalent moisture content of material passing 425µm sieve :	23 %
Liquidity Index :	0.13

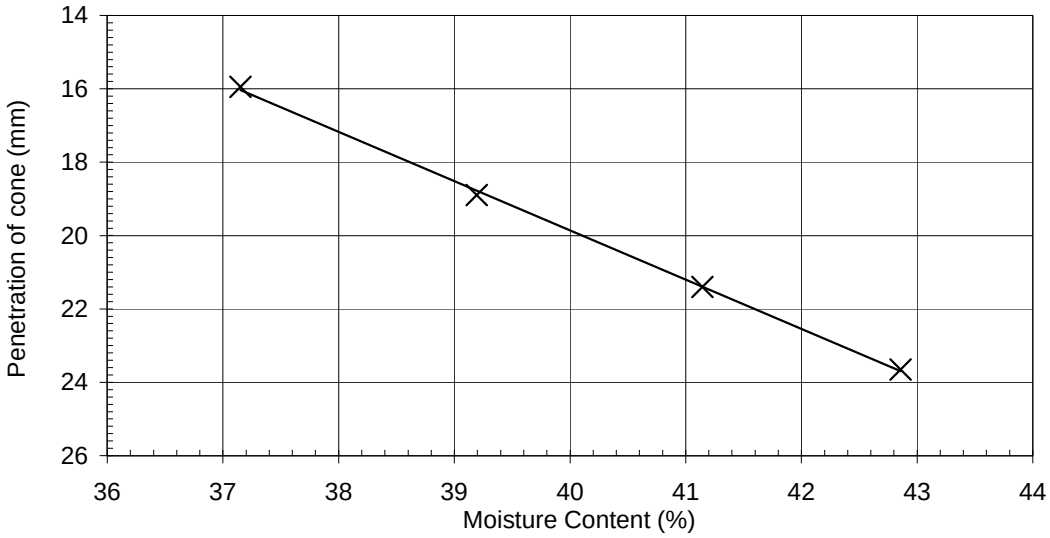
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 15**
KP/TE	S. Longman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	TTk	Sheet 1 of 1

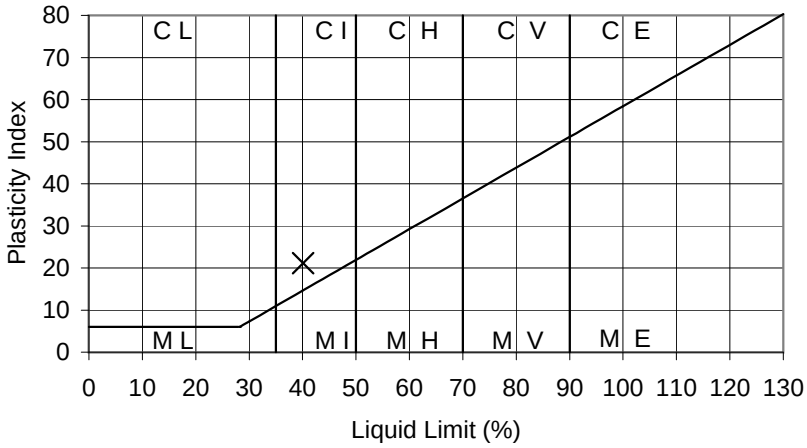
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS12
	Engineer		Sample Ref	
			Depth (m)	1.00
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY with some gravel. Gravel is fine to medium.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	23 %
Percentage retained on 425µm sieve :	18 %
Liquid Limit :	40 %
Plastic Limit :	19 %
Plasticity Index :	21
Equivalent moisture content of material passing 425µm sieve :	28 %
Liquidity Index :	0.43

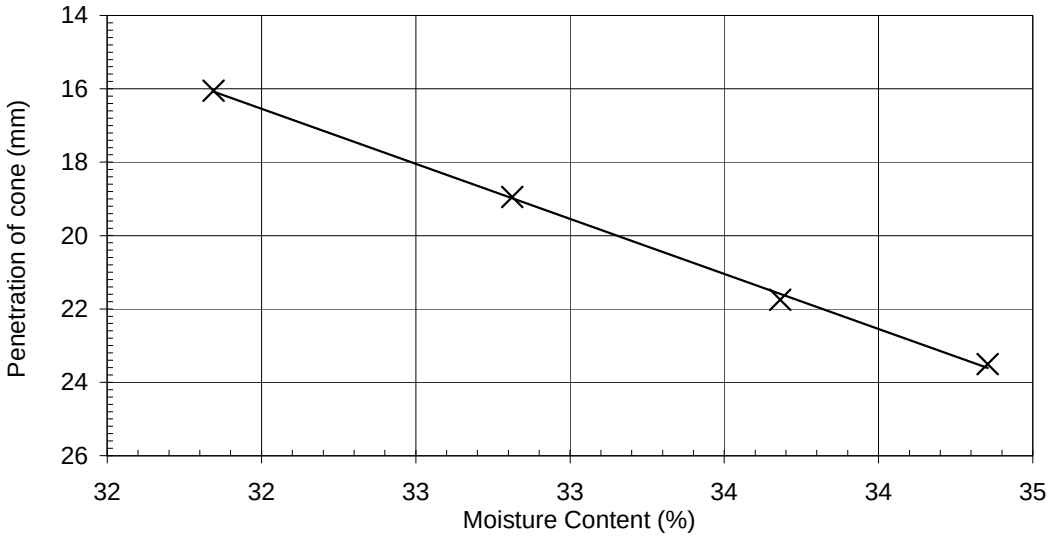
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 16**
KP/TE	S. Longman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	TTk	Sheet 1 of 1

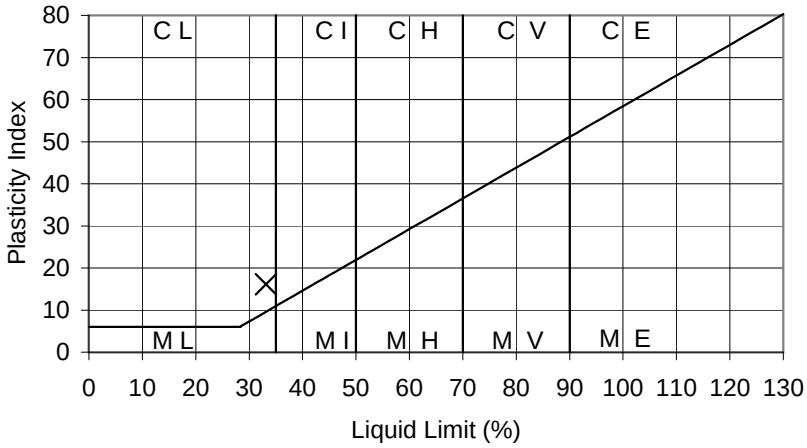
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS13
	Engineer		Sample Ref	
			Depth (m)	1.20
			Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY with occasional gravel. Gravel is fine to medium.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	17 %
Percentage retained on 425µm sieve :	3 %
Liquid Limit :	33 %
Plastic Limit :	17 %
Plasticity Index :	16
Equivalent moisture content of material passing 425µm sieve :	17 %
Liquidity Index :	0.00

Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 17**
KP/TE	S. Langman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	TTk	Sheet 1 of 1

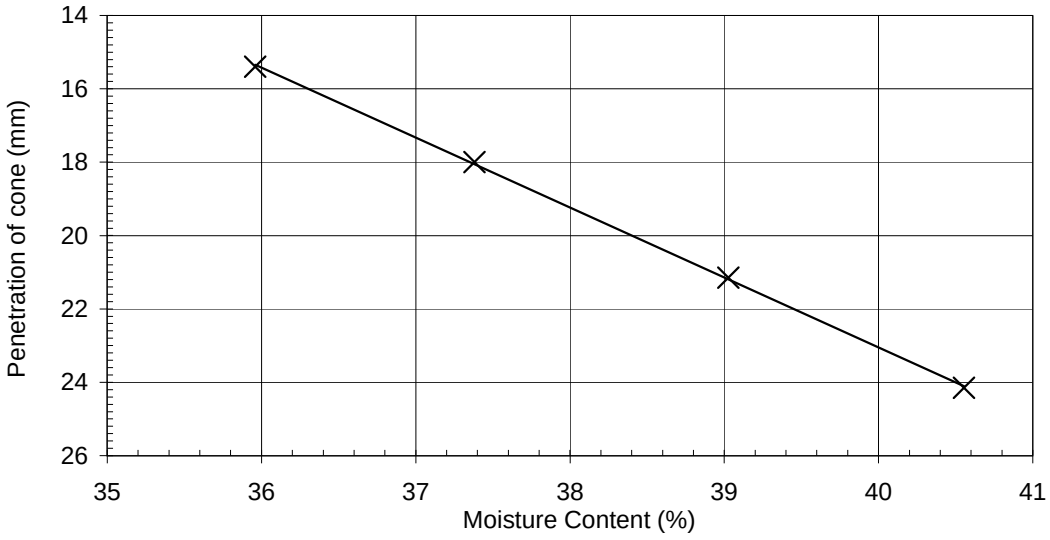
ARUN DISTRICT COUNCIL BE/22/18/DOC

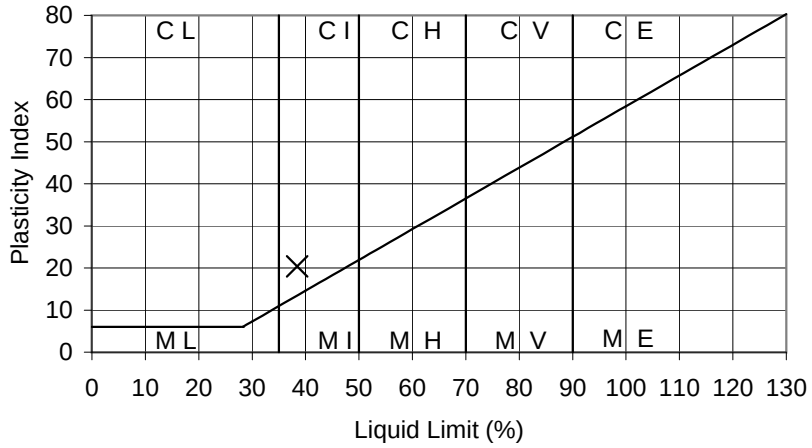
TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
Client	Nott Group	Hole ID	WS14
Engineer		Sample Ref	
		Depth (m)	0.50
		Sample Type	T

Non Engineering Description : Brown slightly sandy CLAY with occasional gravel. Gravel is fine to medium.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	19	%
Percentage retained on 425µm sieve :	4	%
Liquid Limit :	38	%
Plastic Limit :	18	%
Plasticity Index :	20	
Equivalent moisture content of material passing 425µm sieve :	20	%
Liquidity Index :	0.10	

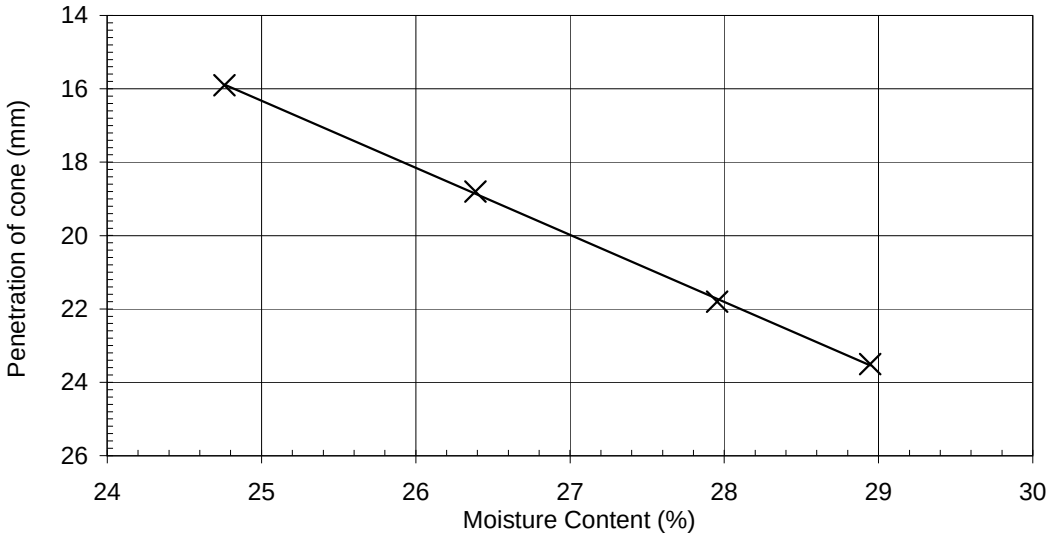
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 18**
TE	S. Longman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990		Sheet 1 of 1

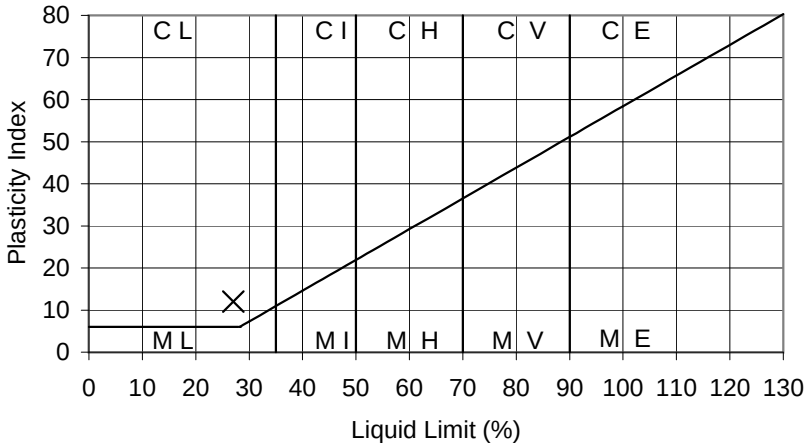
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS14
	Engineer		Sample Ref	
			Depth (m)	1.00
			Sample Type	T

Non Engineering Description : Brown mottled grey slightly sandy CLAY with occasional gravel. Gravel is fine to medium.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	13	%
Percentage retained on 425µm sieve :	4	%
Liquid Limit :	27	%
Plastic Limit :	15	%
Plasticity Index :	12	
Equivalent moisture content of material passing 425µm sieve :	14	%
Liquidity Index :	-0.08	

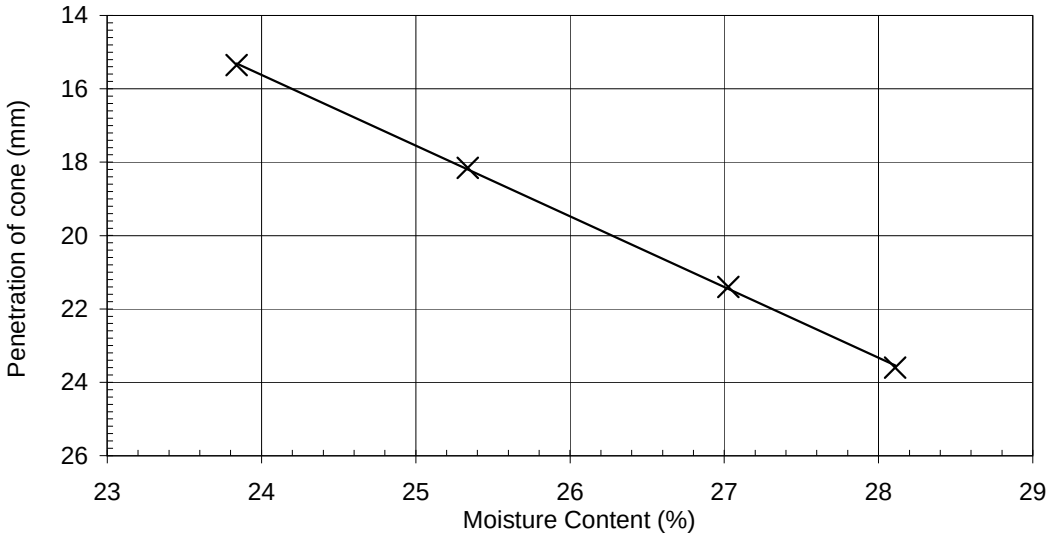
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 19**
KP/TE	S. Longman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990		Sheet 1 of 1

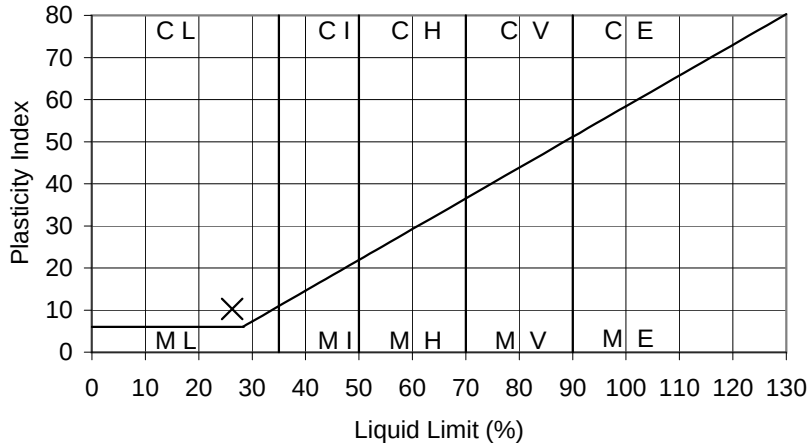
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS15
	Engineer		Sample Ref	
			Depth (m)	1.00
			Sample Type	T

Non Engineering Description : Light brown mottled grey slightly sandy CLAY with some gravel. Gravel is fine to medium.

Preparation : Sample washed and air dried





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	15	%
Percentage retained on 425µm sieve :	15	%
Liquid Limit :	26	%
Plastic Limit :	16	%
Plasticity Index :	10	
Equivalent moisture content of material passing 425µm sieve :	18	%
Liquidity Index :	0.20	

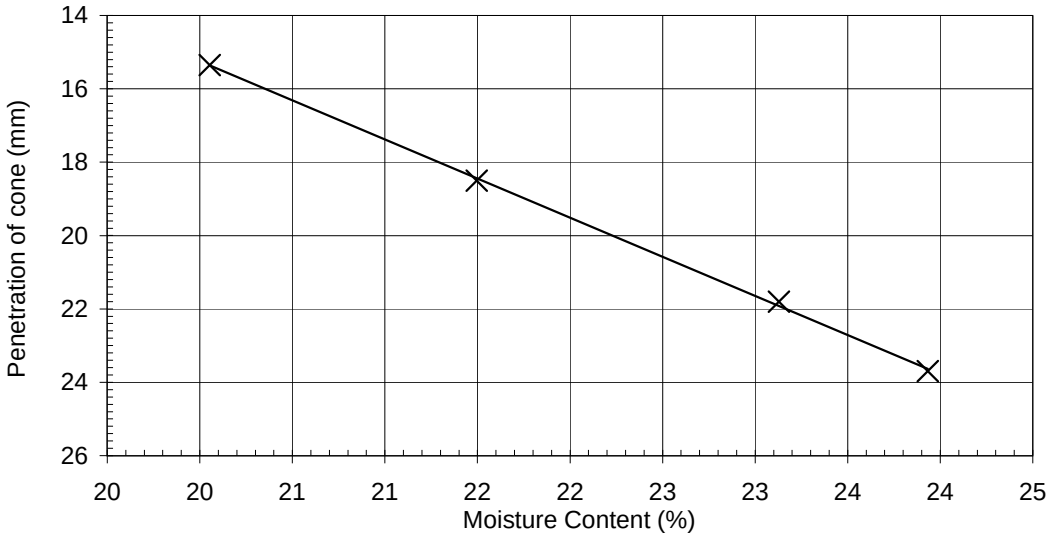
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 20**
TE	S. Langman 25/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990		Sheet 1 of 1

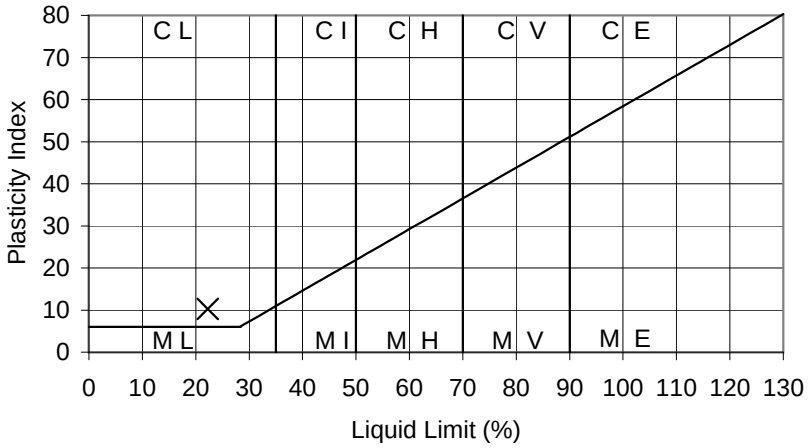
ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No.**	**B20213**
	Client	Nott Group	Hole ID	WS15
	Engineer		Sample Ref	
			Depth (m)	1.50
			Sample Type	T

Non Engineering Description : Light brown very silty CLAY with some gravel. Gravel is fine to medium.

Preparation : Sample as received





Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	20	%
Percentage retained on 425µm sieve :	6	%
Liquid Limit :	22	%
Plastic Limit :	12	%
Plasticity Index :	10	
Equivalent moisture content of material passing 425µm sieve :	21	%
Liquidity Index :	0.90	

Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index**		**Figure 21**
TE	S. Langman 26/08/2016	BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990		Sheet 1 of 1

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP07
Engineer		Sample Ref	
		Depth (m)	0.60
		Sample Type	B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	99
10.0 mm	99
6.30 mm	99
5.00 mm	99
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	97
425 µm	97
300 µm	96
212 µm	96
150 µm	94
63 µm	86
20 µm	53
6 µm	31
2 µm	20

Non Engineering Description

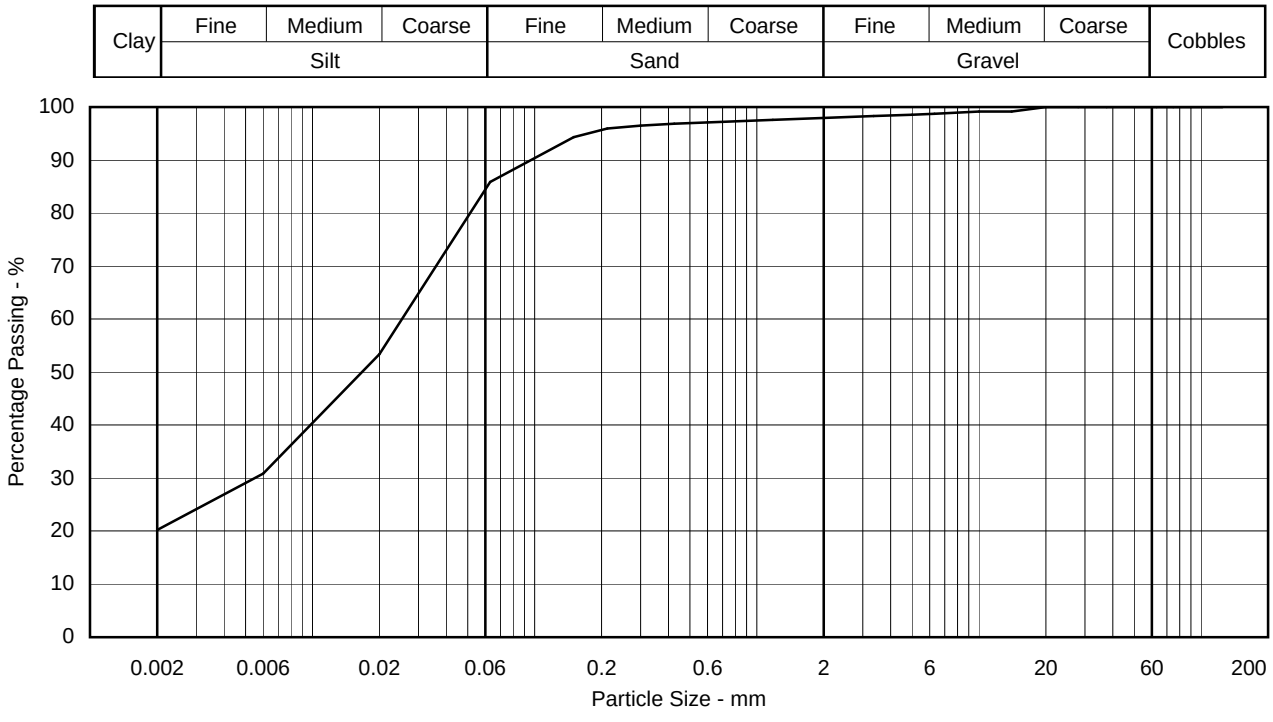
Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.

Sample Proportions - %	
Cobbles	0.0
Gravel	2.0
Sand	14.4
Silt	63.4
Clay	20.2

Particle Diameter - mm	
D100	20
D60	0.025
D10	
Uniformity Coefficient	N/A

Notes

Sedimentation sample not pre-treated



Originator	Checked & Approved
LG/PM	S. Longman 25/08/2016

PARTICLE SIZE DISTRIBUTION

BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette

Figure 22

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP13
Engineer		Sample Ref	
		Depth (m)	1.00
		Sample Type	B

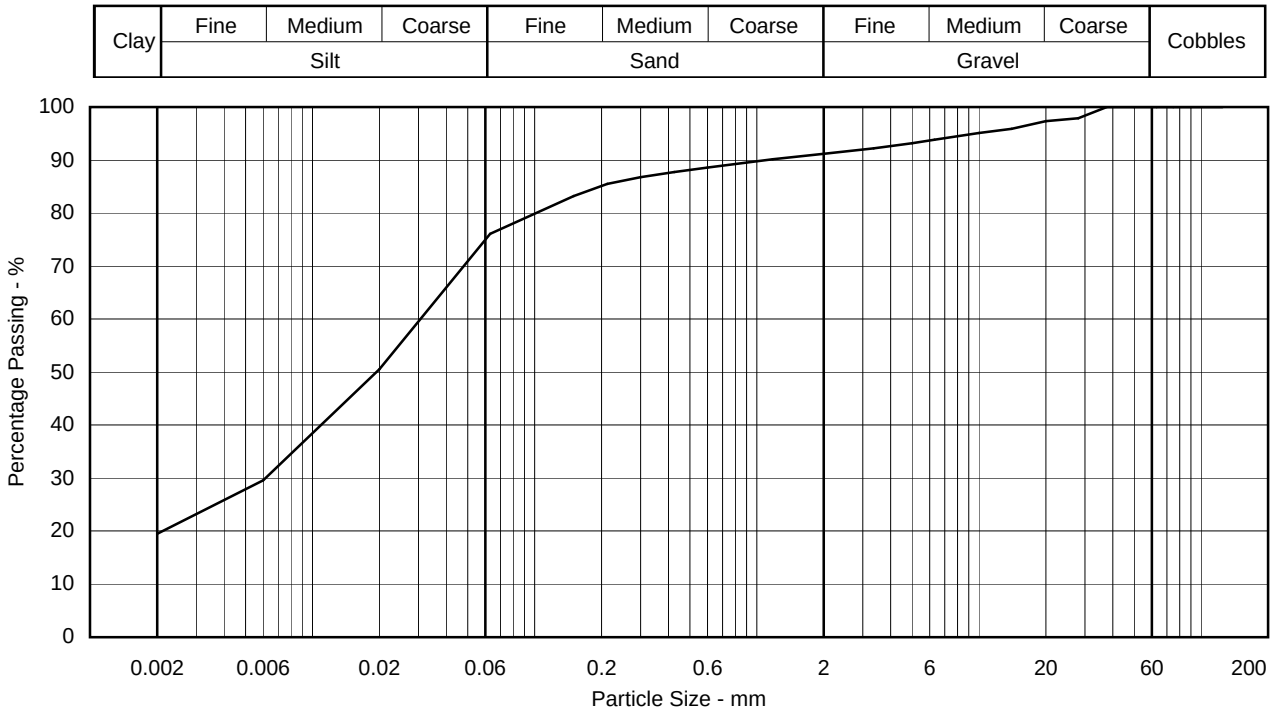
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	98
20.0 mm	97
14.0 mm	96
10.0 mm	95
6.30 mm	94
5.00 mm	93
3.35 mm	92
2.00 mm	91
1.18 mm	90
600 µm	89
425 µm	88
300 µm	87
212 µm	86
150 µm	83
63 µm	76
20 µm	51
6 µm	30
2 µm	19

Non Engineering Description
Light brown sandy SILT/CLAY with some gravel. Gravel is fine to coarse.

Sample Proportions - %	
Cobbles	0.0
Gravel	8.8
Sand	16.9
Silt	54.9
Clay	19.4

Particle Diameter - mm	
D100	38
D60	0.031
D10	
Uniformity Coefficient	N/A

Notes
Sedimentation sample not pre-treated



Originator	Checked & Approved
LG	S. Longman 25/08/2016

PARTICLE SIZE DISTRIBUTION
BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette

Figure 23

TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP15
Engineer		Sample Ref	
		Depth (m)	0.80
		Sample Type	B

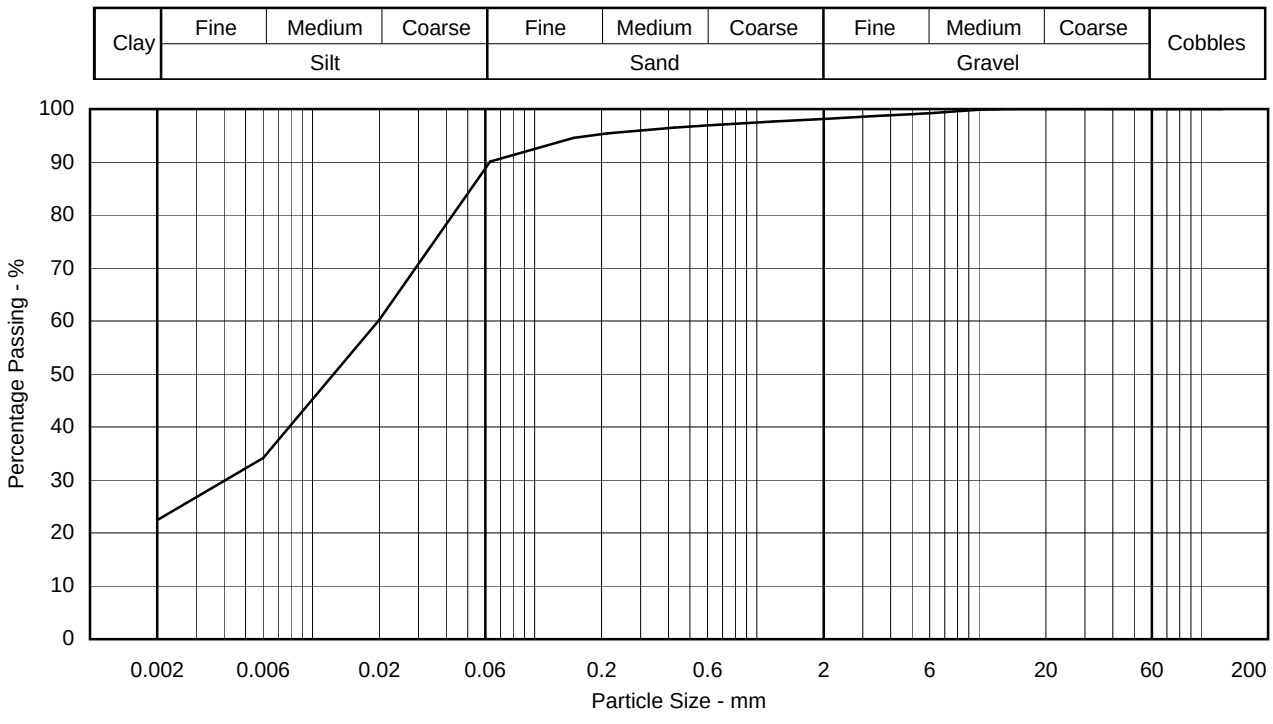
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	98
1.18 mm	98
600 µm	97
425 µm	96
300 µm	96
212 µm	95
150 µm	95
63 µm	90
20 µm	60
6 µm	34
2 µm	22

Non Engineering Description
Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.

Sample Proportions - %	
Cobbles	0.0
Gravel	1.8
Sand	10.1
Silt	65.6
Clay	22.4

Particle Diameter - mm	
D100	14
D60	0.020
D10	
Uniformity Coefficient	N/A

Notes
Sedimentation sample not pre-treated



Originator	Checked & Approved
LG	S. Longman 25/08/2016

PARTICLE SIZE DISTRIBUTION
BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette

Figure 24

Version 059 - 24/06/2013
1260 - PSD TP17 01.20 B - B20213-297958.xls : Sample ID 29795

TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP17
Engineer		Sample Ref	
		Depth (m)	1.20
		Sample Type	B

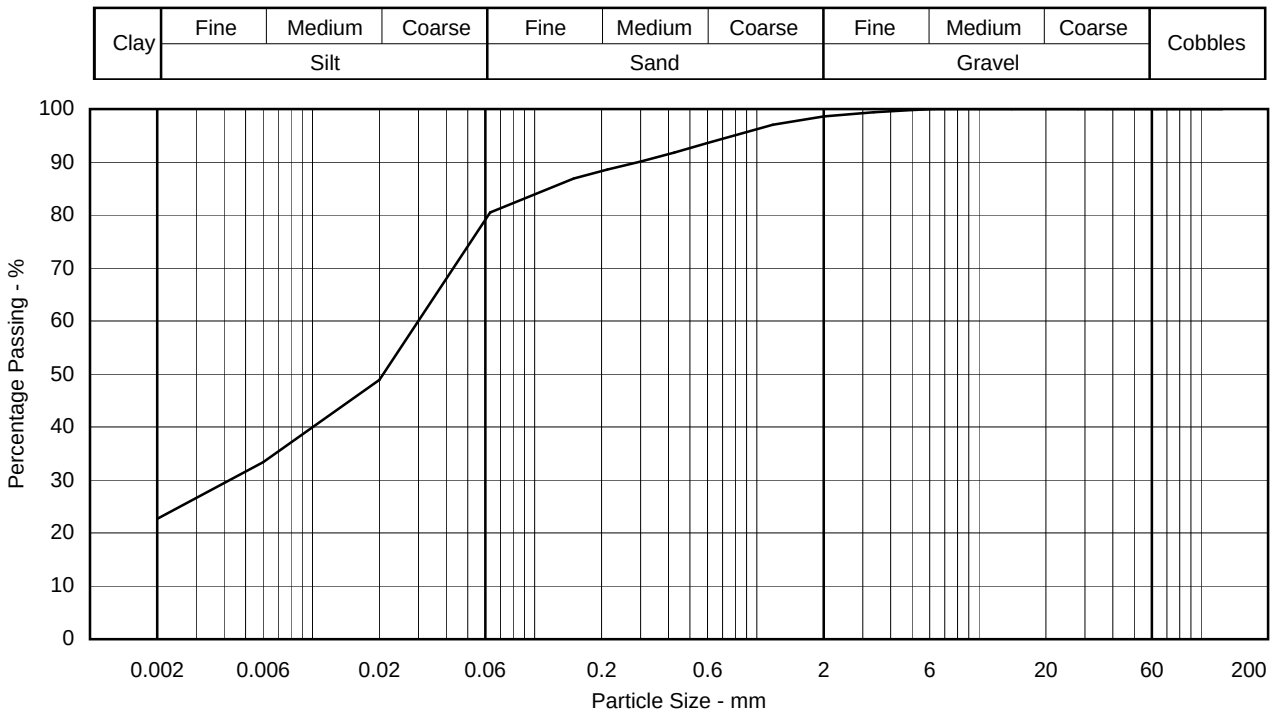
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	97
600 µm	94
425 µm	92
300 µm	90
212 µm	89
150 µm	87
63 µm	80
20 µm	49
6 µm	33
2 µm	23

Non Engineering Description
Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine.

Sample Proportions - %	
Cobbles	0.0
Gravel	1.4
Sand	20.3
Silt	55.6
Clay	22.6

Particle Diameter - mm	
D100	6.3
D60	0.030
D10	
Uniformity Coefficient	N/A

Notes
Sedimentation sample not pre-treated



Originator	Checked & Approved
LG	S. Longman 25/08/2016

PARTICLE SIZE DISTRIBUTION
BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette

Figure 25

Moor Lane, Witton, Birmingham, B6 7HG
Lab Project No B20213 : 25/08/2016 17:38:56

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP18
Engineer		Sample Ref	
		Depth (m)	1.40
		Sample Type	B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	99
5.00 mm	99
3.35 mm	98
2.00 mm	97
1.18 mm	95
600 µm	92
425 µm	90
300 µm	88
212 µm	85
150 µm	83
63 µm	76
20 µm	51
6 µm	36
2 µm	25

Non Engineering Description

Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.

Sample Proportions - %

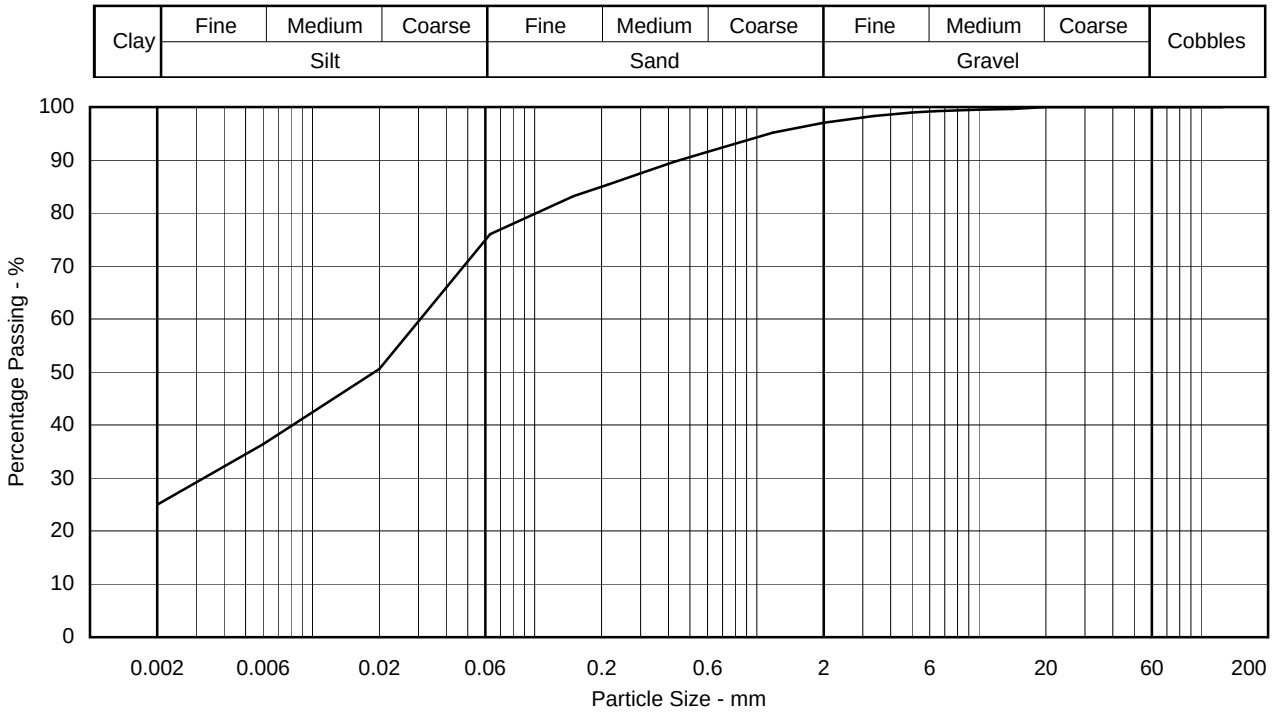
Cobbles	0.0
Gravel	2.9
Sand	22.8
Silt	49.3
Clay	25.0

Particle Diameter - mm

D100	20
D60	0.031
D10	
Uniformity Coefficient	N/A

Notes

Sedimentation sample not pre-treated



Originator	Checked & Approved
LG	S. Longman 25/08/2016

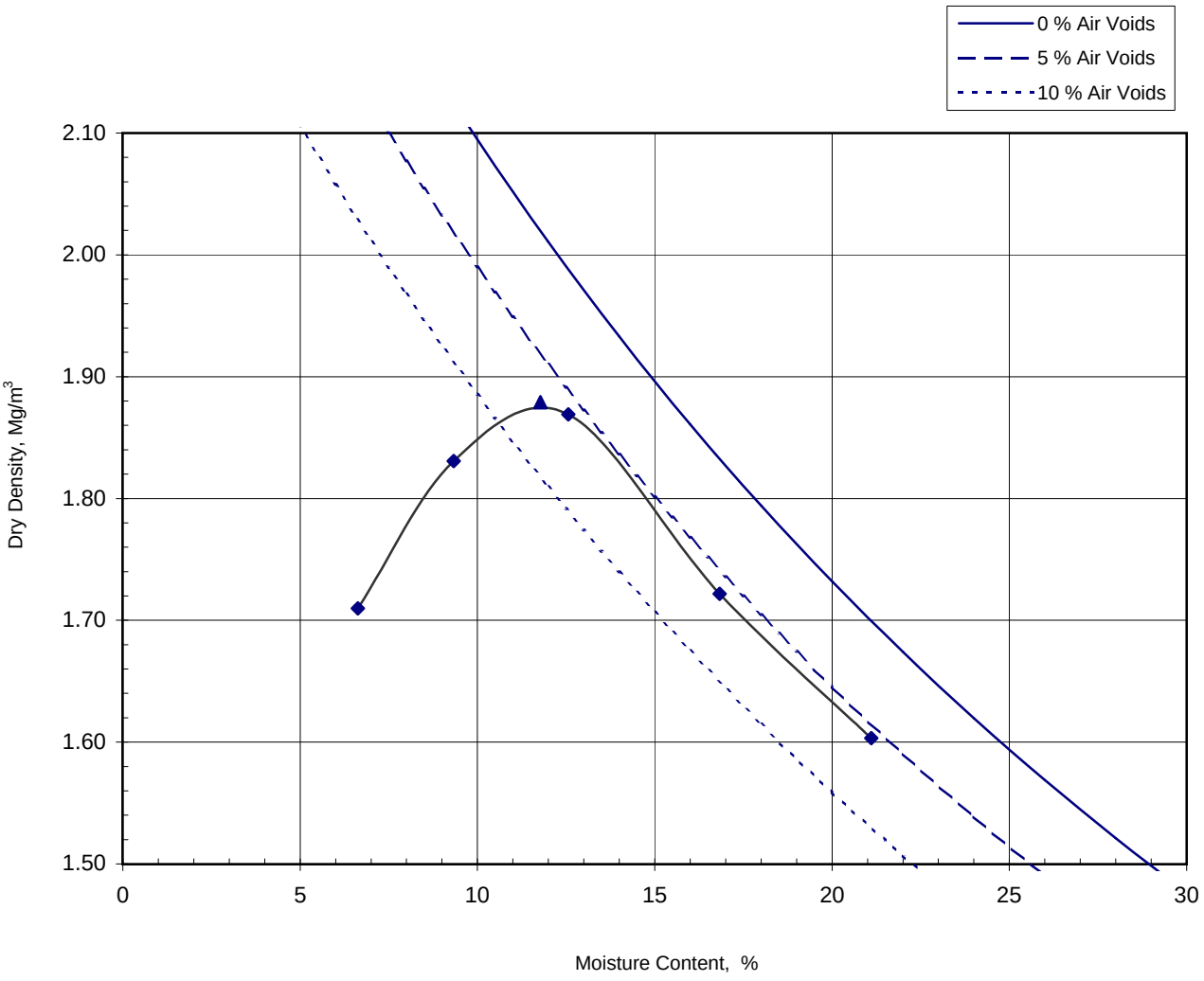
PARTICLE SIZE DISTRIBUTION

BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette

Figure 26

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP07
Engineer		Sample Ref	
		Depth (m)	0.60
		Sample Type	B



Non Engineering Description		Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.
Preparation		Air dried
Test Method		2.5kg Rammer for soils with particles up to medium-gravel size
Samples Used		Single
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Natural Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.88
Optimum Moisture Content	%	11.8

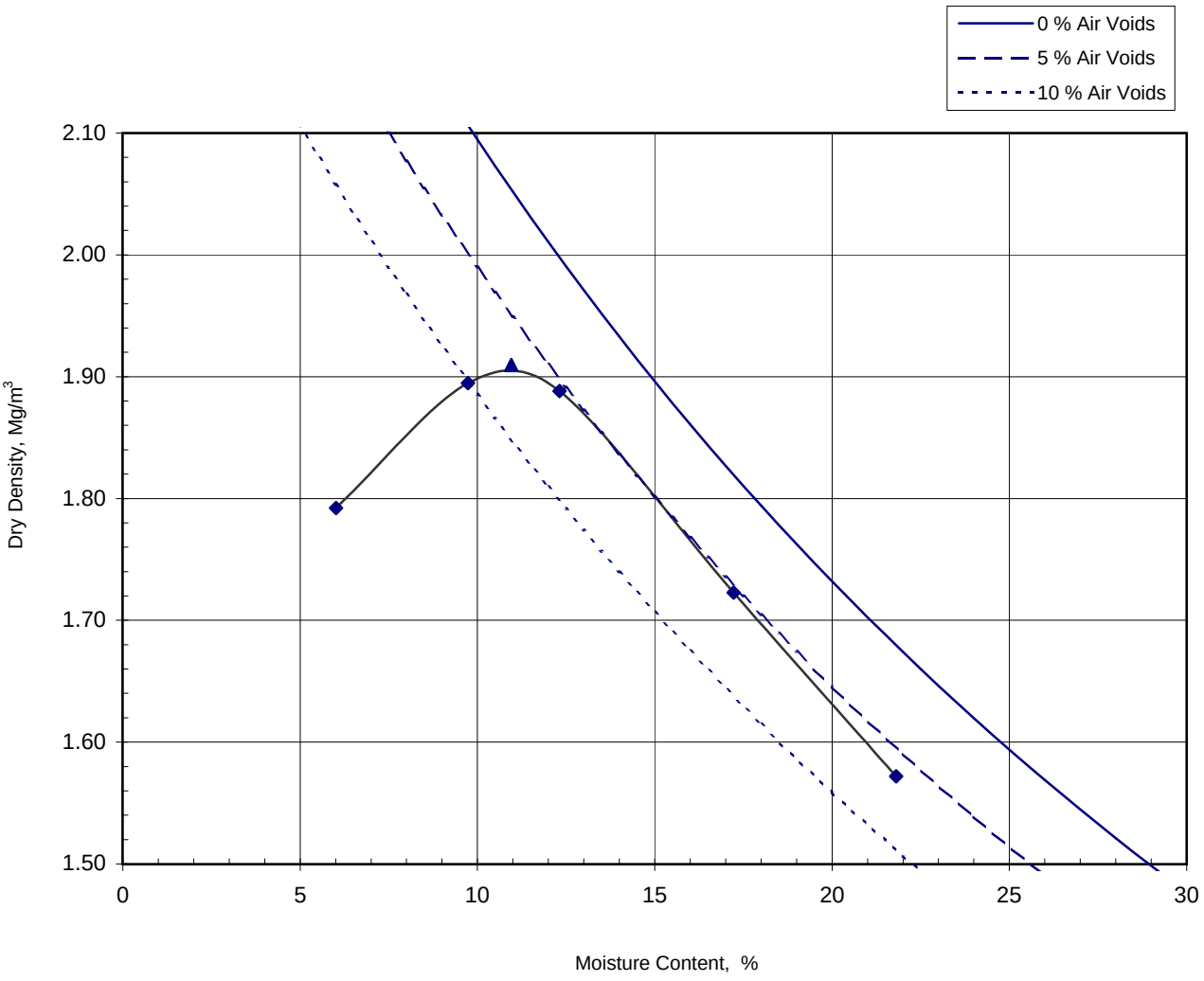
Originator	Checked & Approved
KP/ME	S. Langman 06/09/2016

Moisture Content / Dry Density Relationship
BS1377:Part 4:1990 Clause 3.3

Figure 27

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP13
Engineer		Sample Ref	
		Depth (m)	1.00
		Sample Type	B



Non Engineering Description		Light brown sandy SILT/CLAY with some gravel. Gravel is fine to coarse.
Preparation		Air dried
Test Method		4.5kg Rammer for soils with particles up to medium-gravel size
Samples Used		Single
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Natural Moisture Content	%	18
Maximum Dry Density	Mg/m³	1.91
Optimum Moisture Content	%	11.0

Originator	Checked & Approved
KP/ME	S. Langman 06/09/2016

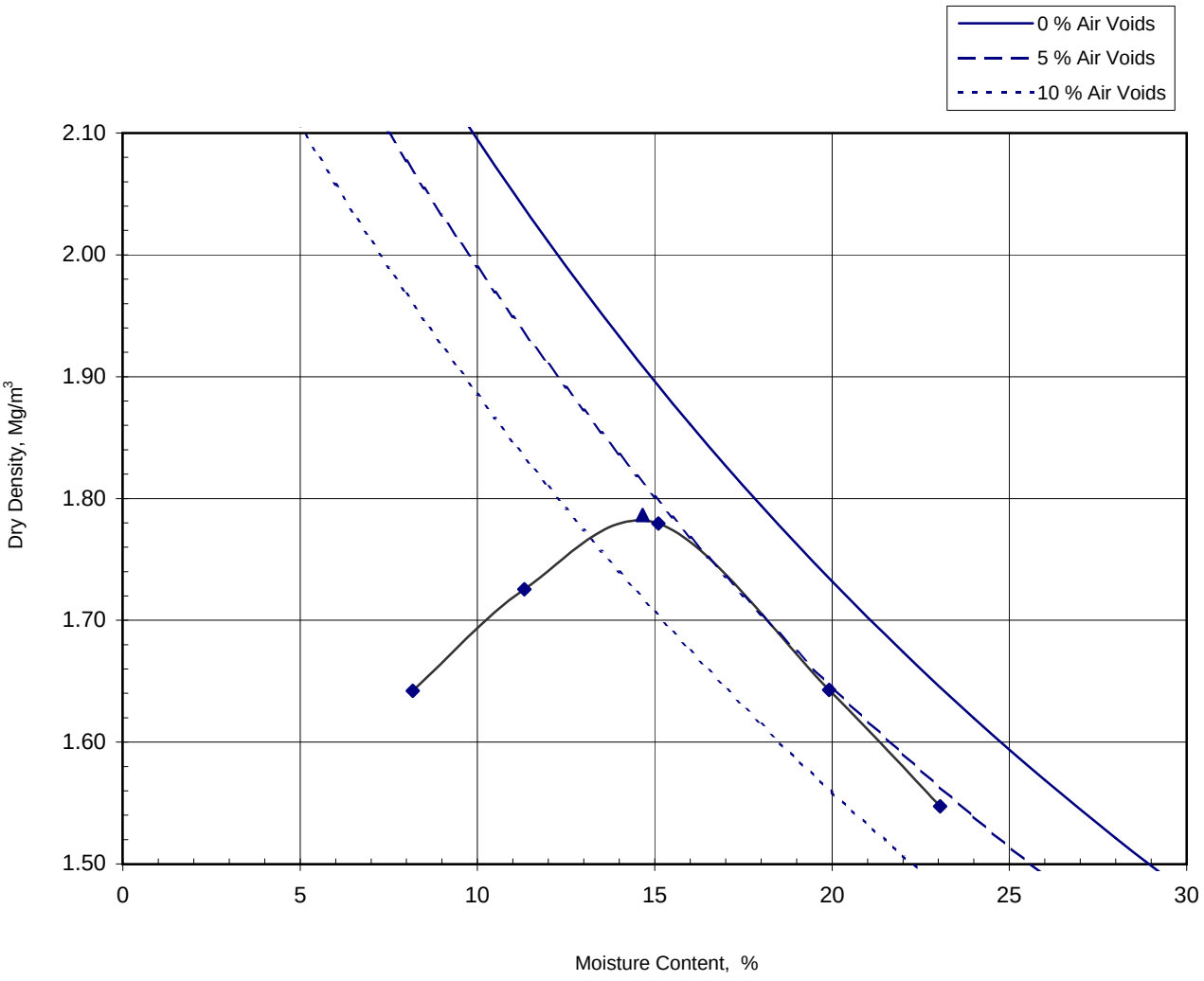
Moisture Content / Dry Density Relationship
BS1377:Part 4:1990 Clause 3.5

Figure 28

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP15
Engineer		Sample Ref	
		Depth (m)	0.80
		Sample Type	B



Non Engineering Description		Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.
Preparation		Air dried
Test Method		2.5kg Rammer for soils with particles up to medium-gravel size
Samples Used		Single
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Natural Moisture Content	%	15
Maximum Dry Density	Mg/m³	1.79
Optimum Moisture Content	%	14.7

Originator	Checked & Approved
NS/ME	S. Langman 06/09/2016

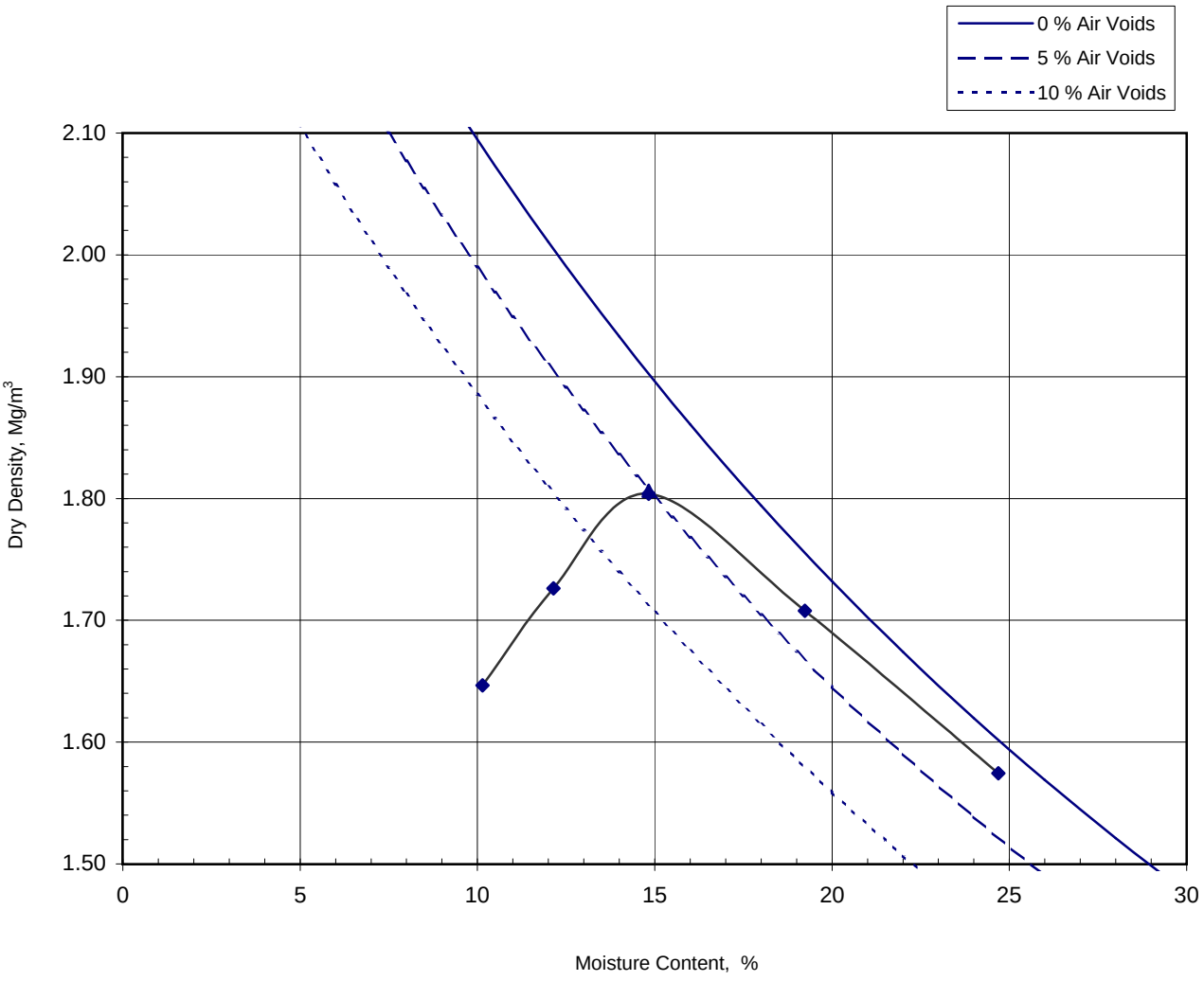
Moisture Content / Dry Density Relationship
BS1377:Part 4:1990 Clause 3.3

Figure 29

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP17
Engineer		Sample Ref	
		Depth (m)	1.20
		Sample Type	B



Non Engineering Description		Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine.
Preparation		Air dried
Test Method		2.5kg Rammer for soils with particles up to medium-gravel size
Samples Used		Single
Mass Retained on 37.5 mm Sieve	%	-
Mass Retained on 20.0 mm Sieve	%	-
Particle Density - Assumed	Mg/m³	2.65
Natural Moisture Content	%	13
Maximum Dry Density	Mg/m³	1.81
Optimum Moisture Content	%	14.8

Originator	Checked & Approved
NS/ME	S. Langman 06/09/2016

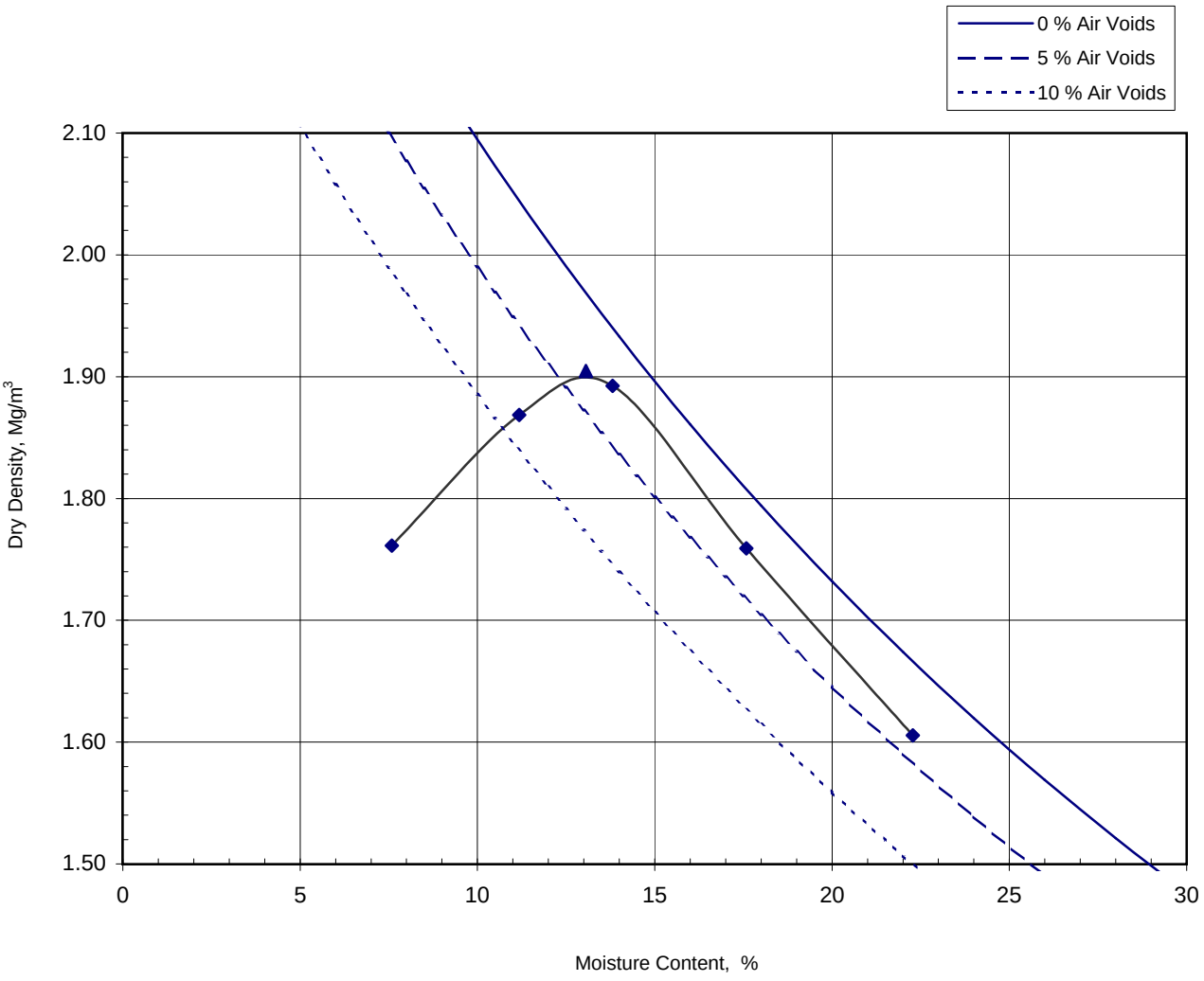
Moisture Content / Dry Density Relationship
BS1377:Part 4:1990 Clause 3.3

Figure 30

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	TP18
Engineer		Sample Ref	
		Depth (m)	1.40
		Sample Type	B



Non Engineering Description		Light brown sandy SILT/CLAY with occasional gravel. Gravel is fine to medium.
Preparation		Air dried
Test Method		4.5kg Rammer for soils with particles up to medium-gravel size
Samples Used		Single
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Natural Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.90
Optimum Moisture Content	%	13.1

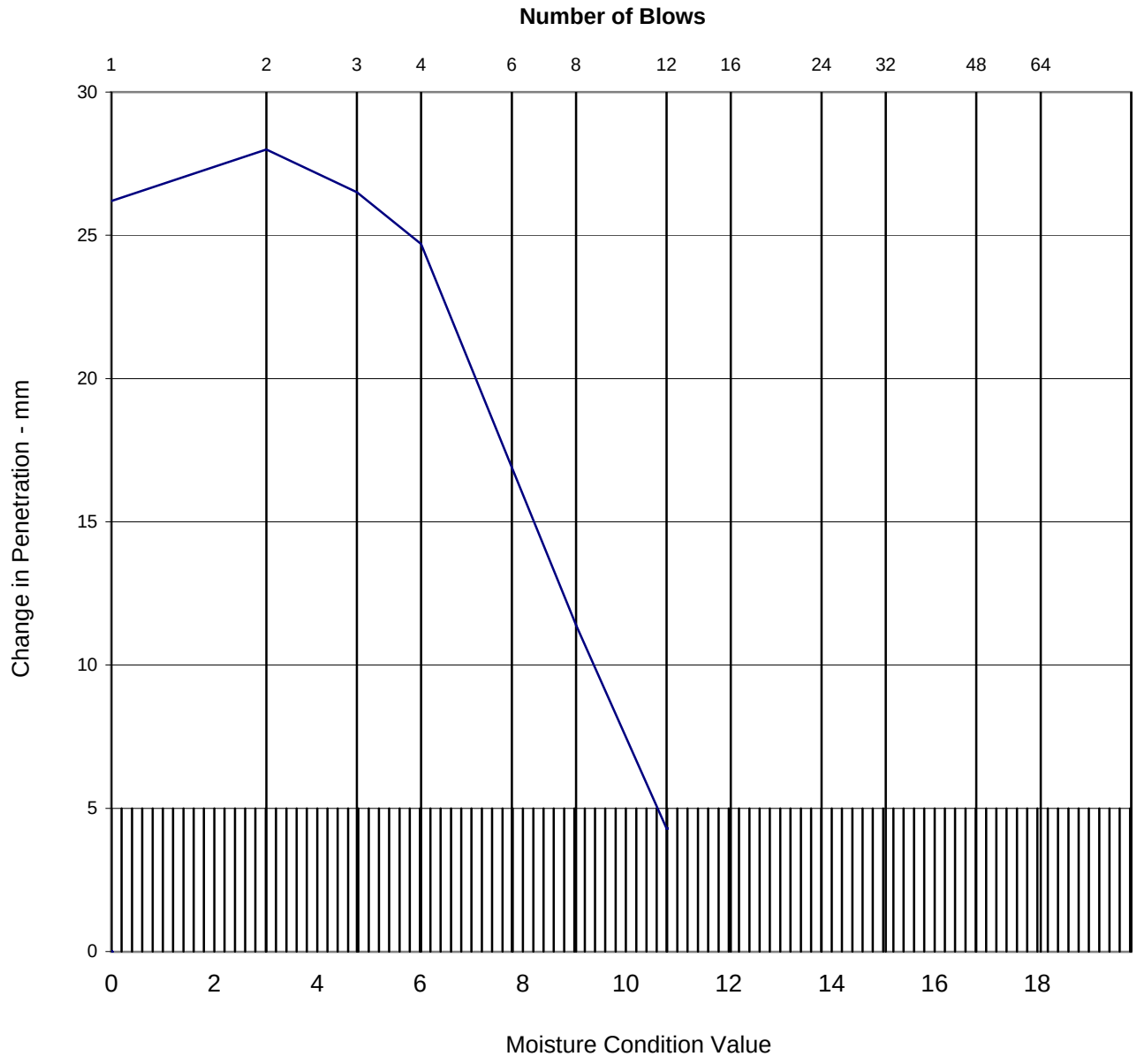
Originator	Checked & Approved
NS/ME	S. Langman 06/09/2016

Moisture Content / Dry Density Relationship
BS1377:Part 4:1990 Clause 3.5

Figure 31

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole ID	TP04
Engineer		Sample Ref	
		Depth (m)	0.50
		Sample Type	B



Non Engineering Description		Brown slightly sandy CLAY with occasional gravel.Gravel is fine to medium.
Determination No		1
Moisture Condition Value		10.7
Moisture Content	%	21
Method of determining MCV		Best-fit line
Mass retained on 20mm sieve	%	0.0
Notes		

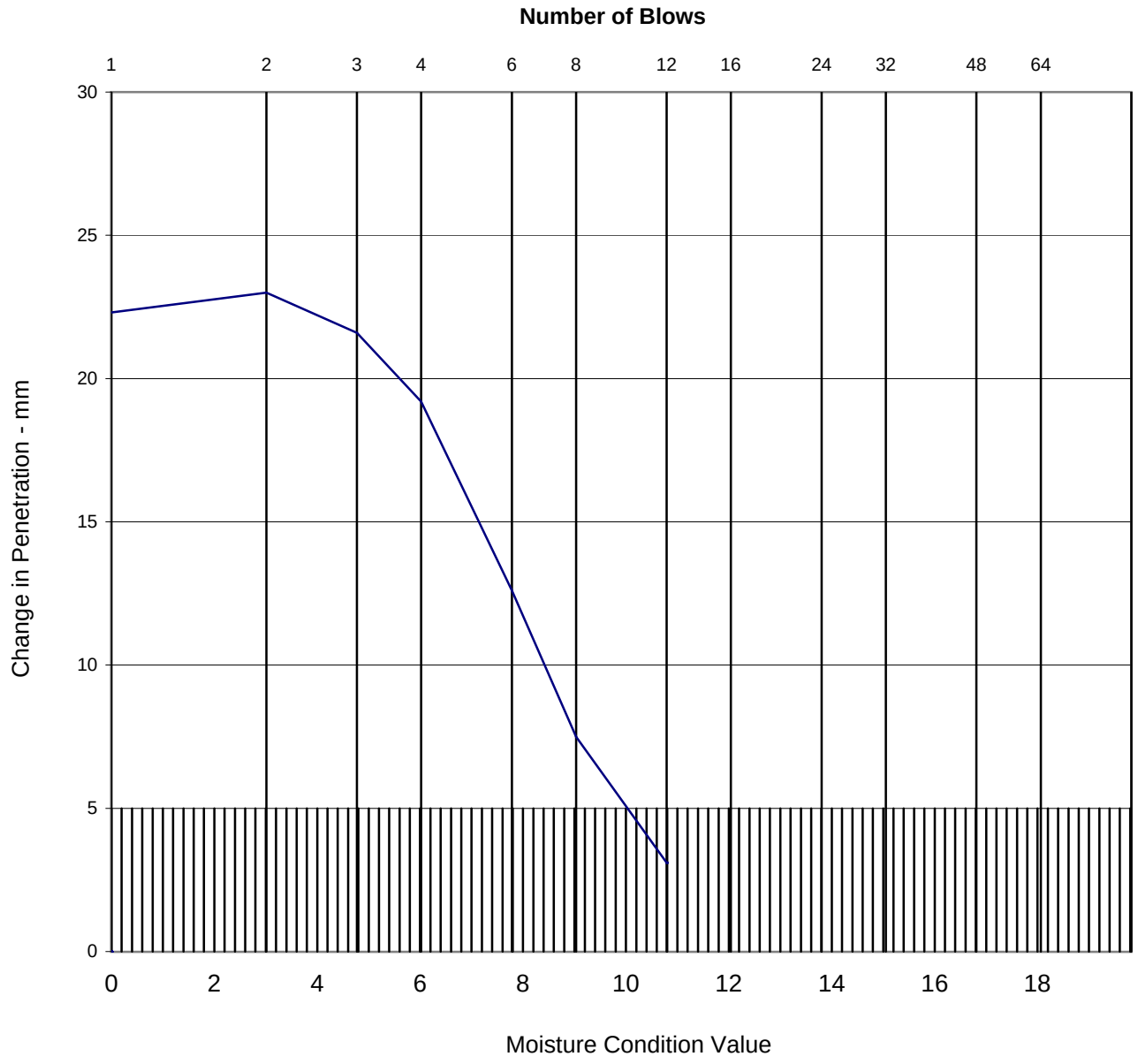
Originator	Checked & Approved
TE	S. Langran 25/08/2016

MOISTURE CONDITION VALUE
BS1377:Part 4:1990 Clause 5.4

Figure 32

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole ID	TP16
Engineer		Sample Ref	
		Depth (m)	1.00
		Sample Type	B



Non Engineering Description		Brown sligthly sandy very silty CLAY with occasional gravel.Gravel is fine to medium.
Determination No		1
Moisture Condition Value		10.1
Moisture Content	%	18
Method of determining MCV		Best-fit line
Mass retained on 20mm sieve	%	0.0
Notes		

Originator	Checked & Approved
TE/ME	S. Langran 25/08/2016

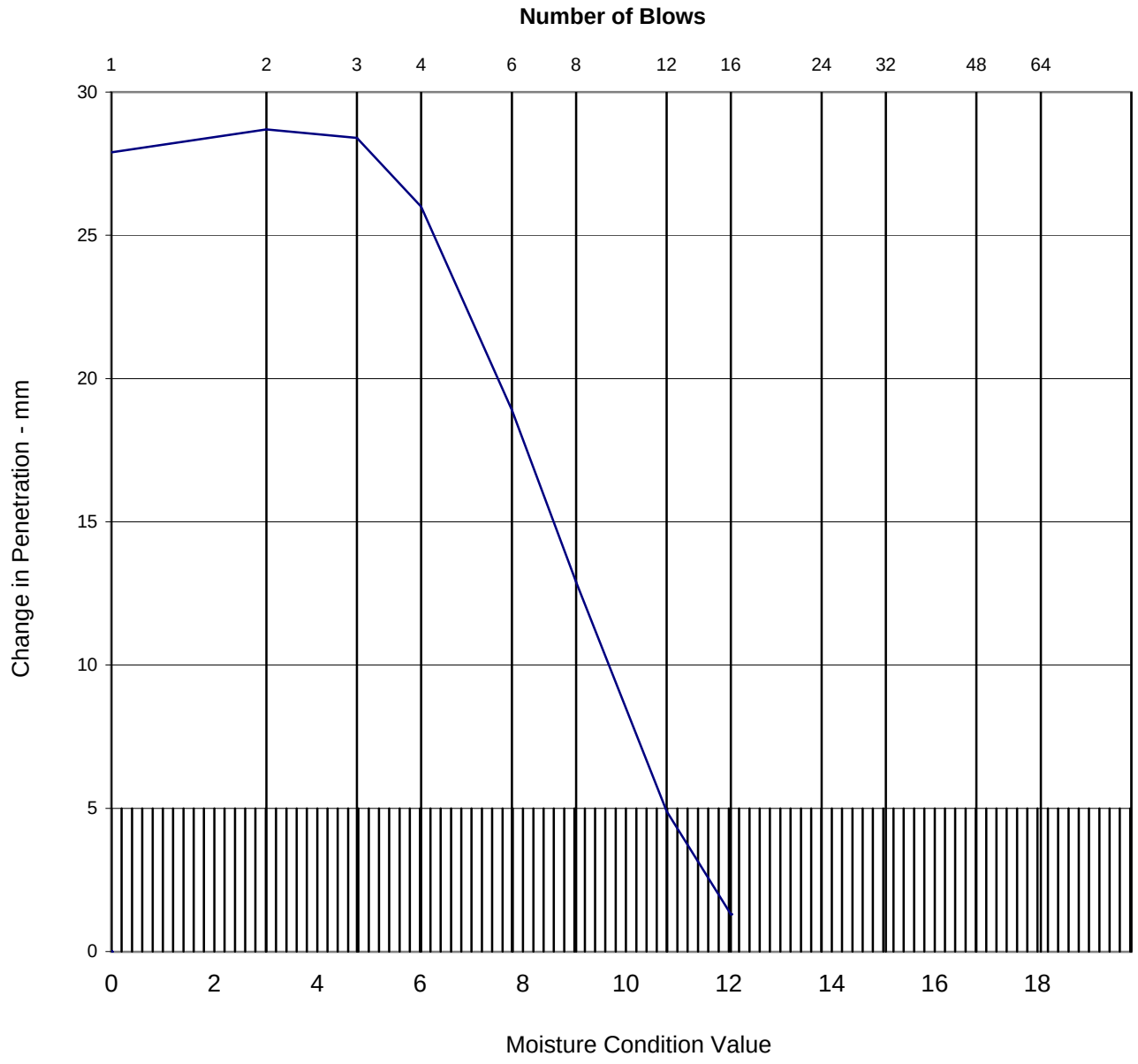
MOISTURE CONDITION VALUE

BS1377:Part 4:1990 Clause 5.4

Figure 33

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole ID	TP19
Engineer		Sample Ref	
		Depth (m)	0.90
		Sample Type	B



Non Engineering Description		Brown slightly sandy very silty CLAY.
Determination No		1
Moisture Condition Value		10.9
Moisture Content	%	22
Method of determining MCV		Best-fit line
Mass retained on 20mm sieve	%	0.0
Notes		

Originator	Checked & Approved
TE/ME	S. Langran 25/08/2016

MOISTURE CONDITION VALUE
BS1377:Part 4:1990 Clause 5.4

Figure 34

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site: LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS

Client: Nott Group

Engineer:

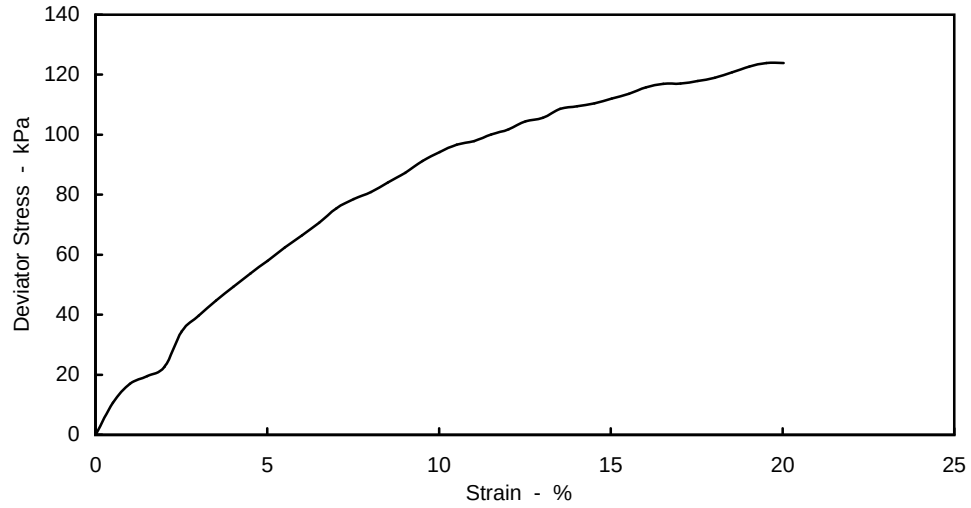
Contract No. B20213

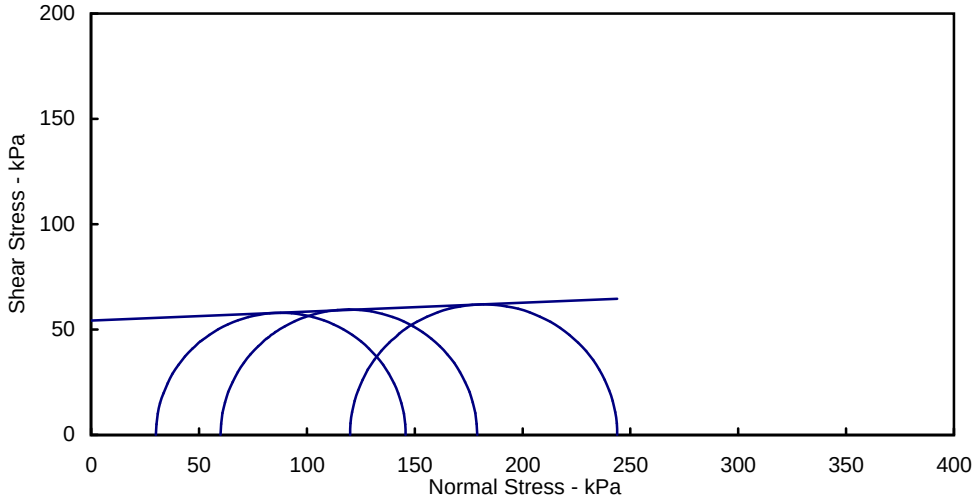
Hole: CP01
Sample Ref:
Depth (m): 1.50
Sample Type: U

Sample Details				
Sample Condition		Undisturbed		
Height	mm	199.7		
Diameter	mm	104.2		
Moisture Content	%	19		
Bulk Density	Mg/m³	2.12		
Dry Density	Mg/m³	1.79		
Test Details	**Stage**	**1**	**2**	**3**
Membrane Thickness	mm	0.20	0.20	0.20
Membrane Correction	kPa	0.62	0.68	0.72
Rate of Axial Displacement	%/min	2.00	2.00	2.00
Cell Pressure	kPa	30	60	120
Strain at Failure	%	16.0	18.0	19.5
Maximum Deviator Stress	kPa	116	119	124
Shear Strength	kPa	58	60	62
Mode of Failure			Plastic	
Non Engineering Description		Soft to firm light brown sandy CLAY with occasional fine to medium gravel.		

Comments
Undisturbed specimen taken 100mm below top of tube

Shear Strength Parameters		
C	54	kPa
Phi	2.4	°





Originator	Checked & Approved
NS/ME	S. Langman 25/08/2016

UNCONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL COMPRESSION

BS 1377 : Part 7 : 1990 Clause 9

Figure 35

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	CP01
Engineer		Sample Ref	
		Depth (m)	1.50
		Sample Type	U





Originator	Checked & Approved
NS/ME	S. Langran 25/08/2016

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Figure 35

Moor Lane, Witton, Birmingham, B6 7HG
Lab Project No B20213

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS
Client	Nott Group
Engineer	

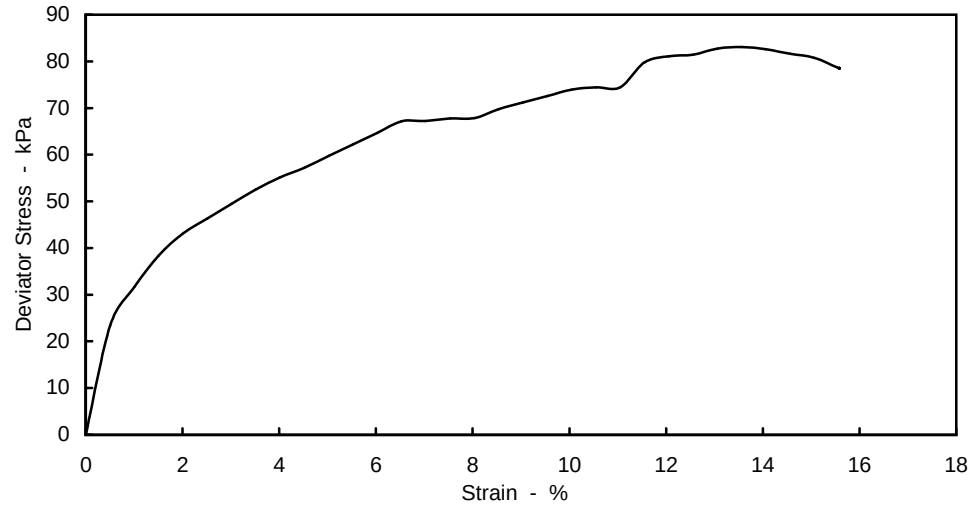
Contract No. **B20213**

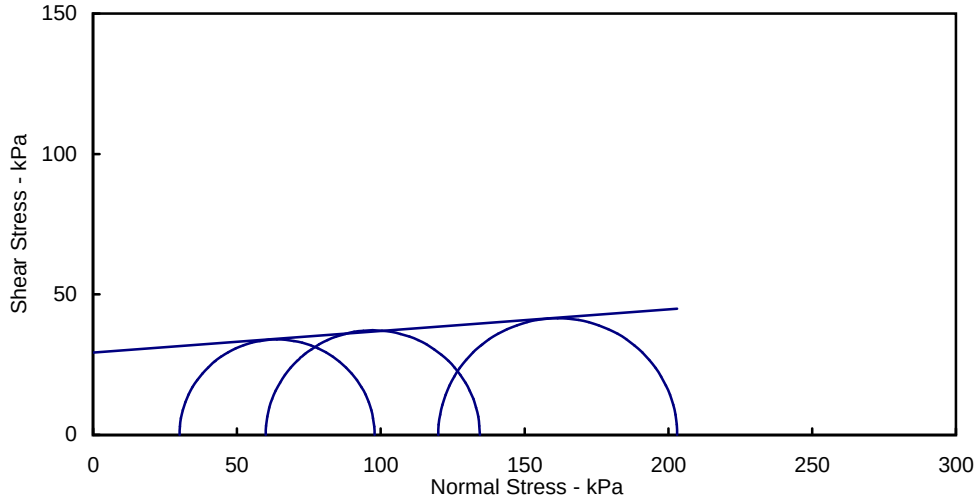
Hole	CP02
Sample Ref	
Depth (m)	1.50
Sample Type	U

Sample Details				
Sample Condition		Undisturbed		
Height	mm	199.1		
Diameter	mm	103.6		
Moisture Content	%	17		
Bulk Density	Mg/m³	2.09		
Dry Density	Mg/m³	1.79		
Test Details	**Stage**	**1**	**2**	**3**
Membrane Thickness	mm	0.20	0.20	0.20
Membrane Correction	kPa	0.37	0.47	0.55
Rate of Axial Displacement	%/min	2.01	2.01	2.01
Cell Pressure	kPa	30	60	120
Strain at Failure	%	8.0	11.1	13.6
Maximum Deviator Stress	kPa	68	74	83
Shear Strength	kPa	34	37	42
Mode of Failure		Compound		
Non Engineering Description		Soft to firm light brown sandy CLAY with much gravel of chalk and flint. Gravel is fine to coarse.		

Comments
Undisturbed specimen taken 100mm below top of tube

Shear Strength Parameters		
C	29	kPa
Phi	4.4	°





Originator	Checked & Approved
NS/ME	S. Langman 25/08/2016

UNCONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL COMPRESSION

BS 1377 : Part 7 : 1990 Clause 9

Figure 36

ARUN DISTRICT COUNCIL BE/22/18/DOC

TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site	LAND AT NEWBARN LANE, NORTH BERSTED, BOGNOR REGIS	**Contract No**	**B20213**
Client	Nott Group	Hole	CP02
Engineer		Sample Ref	
		Depth (m)	1.50
		Sample Type	U





Originator	Checked & Approved
NS/ME	S. Langran 25/08/2016

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Figure 36

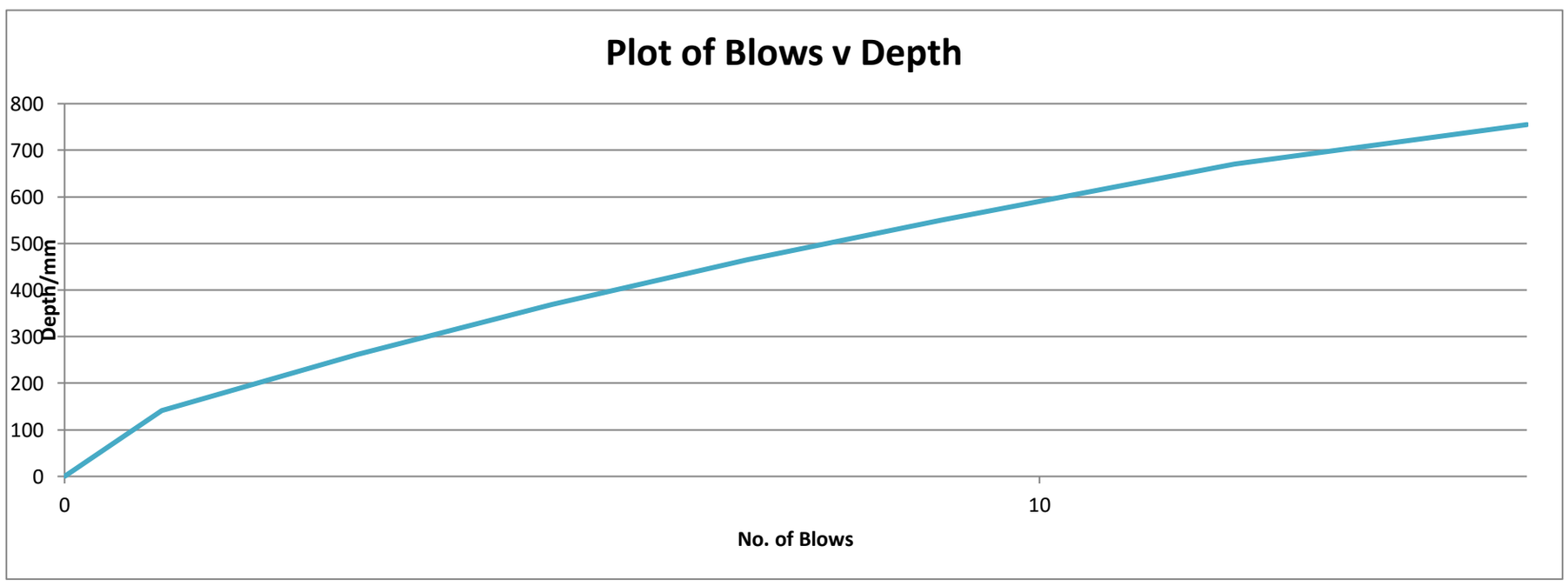
Moor Lane, Witton, Birmingham, B6 7HG
Lab Project No B20213

Appendix J IN-SITU DYNAMIC CONE PENETROMETER TESTING RESULTS

Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP1
Date: 31/08/2016

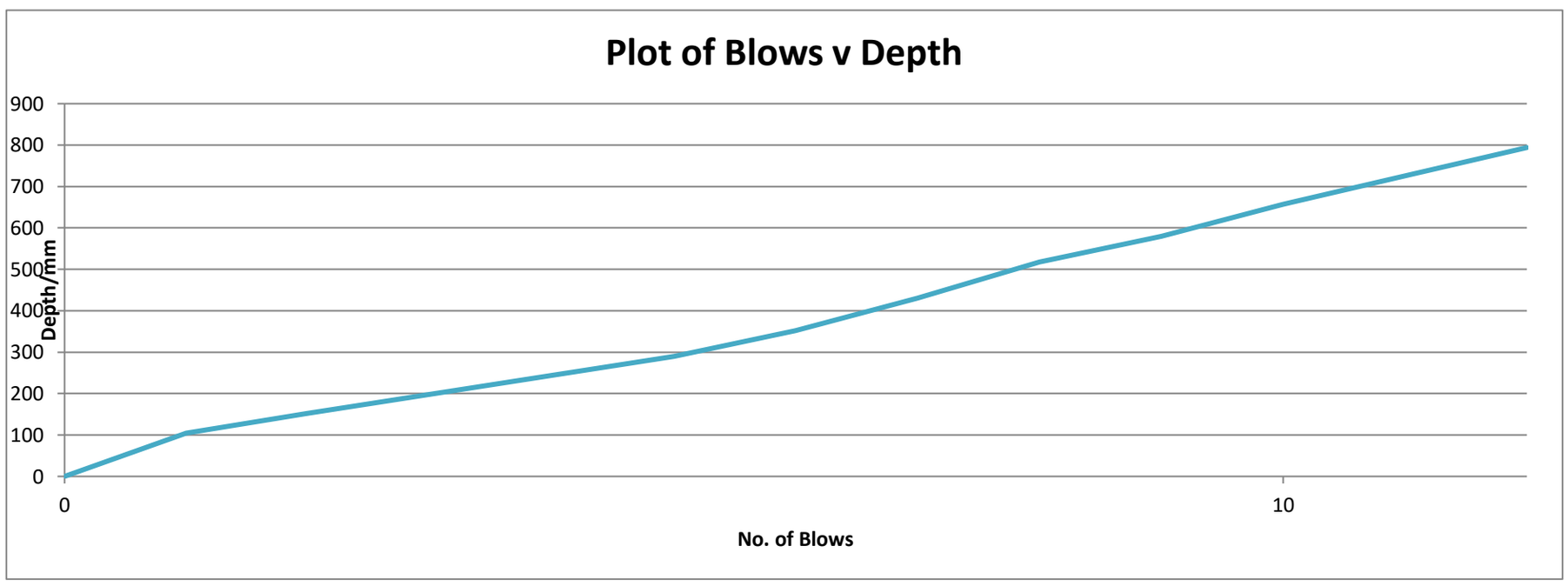
Title	DCP1				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	1	1	1
100	200	1	2	1	1
200	300	2	4	2	3.5
300	400	4	6	2	3.5
400	500	6	8	2	3.5
500	600	8	10	2	3.5
600	700	10	13	3	6



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP2
Date: 31/08/2016

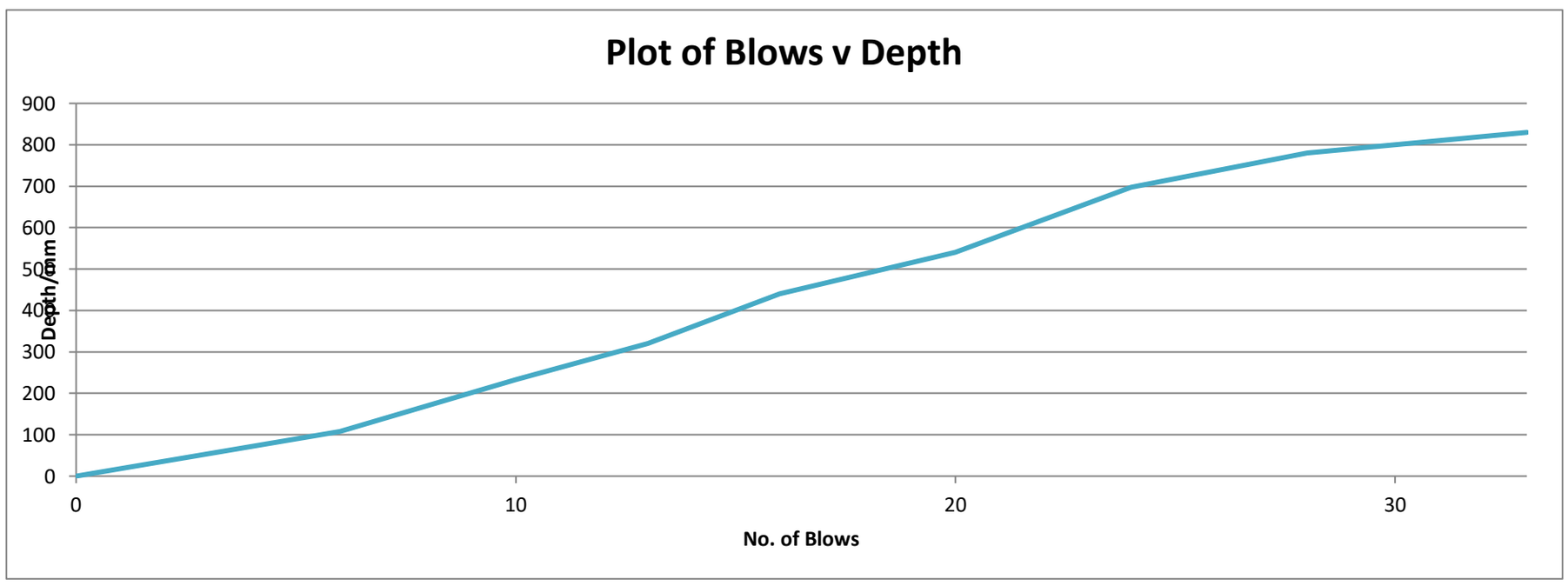
Title	DCP2				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	1	1	1
100	200	1	3	2	3.5
200	300	3	5	2	3.5
300	400	5	7	2	3.5
400	500	7	8	1	1
500	600	8	9	1	1
600	700	9	11	2	3.5



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP3
Date: 31/08/2016

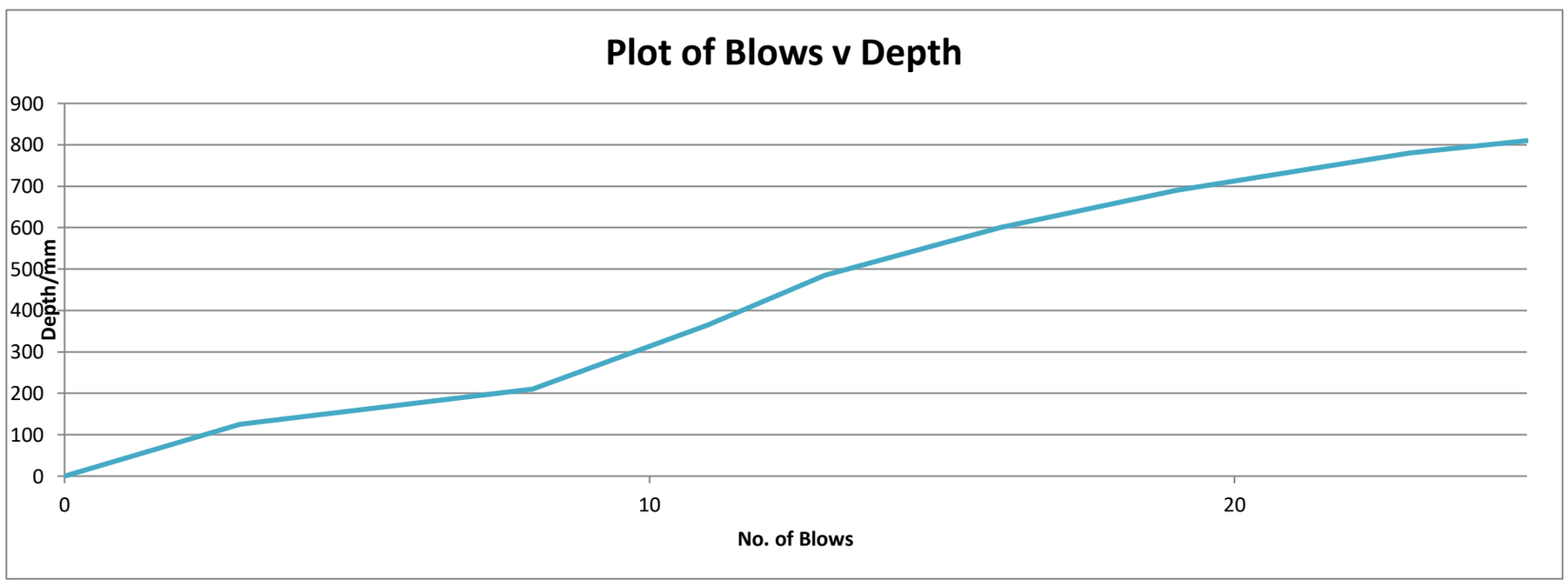
Title	DCP3				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	6	6	16
100	200	6	9	3	6
200	300	9	12	3	6
300	400	12	15	3	6
400	500	15	18	3	6
500	600	18	22	4	10
600	700	22	24	2	3.5
700	800	24	30	6	16
800	900	30	40	10	25



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP4
Date: 31/08/2016

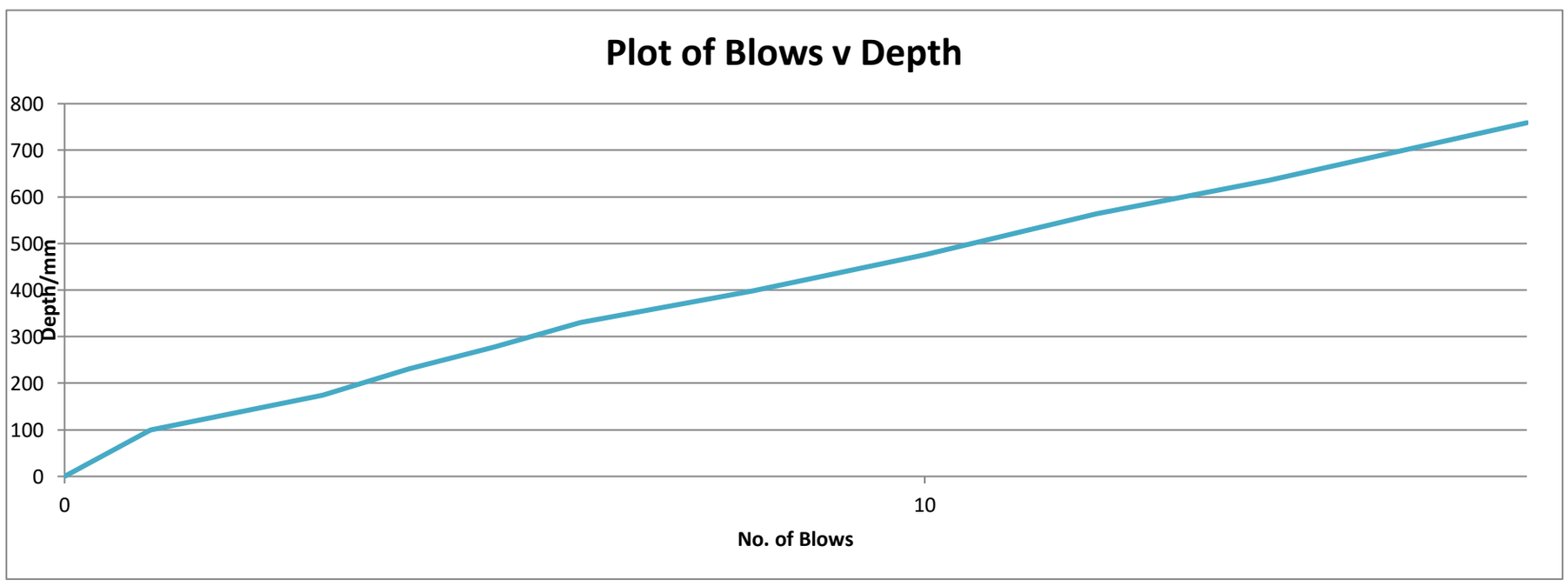
Title	DCP4				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	2	2	3.5
100	200	2	7	5	13
200	300	7	10	3	6
300	400	10	12	2	3.5
400	500	12	13	1	1
500	600	13	16	3	6
600	700	16	19	3	6
700	800	19	24	5	13
800	900	24	34	10	25



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP5
Date: 31/08/2016

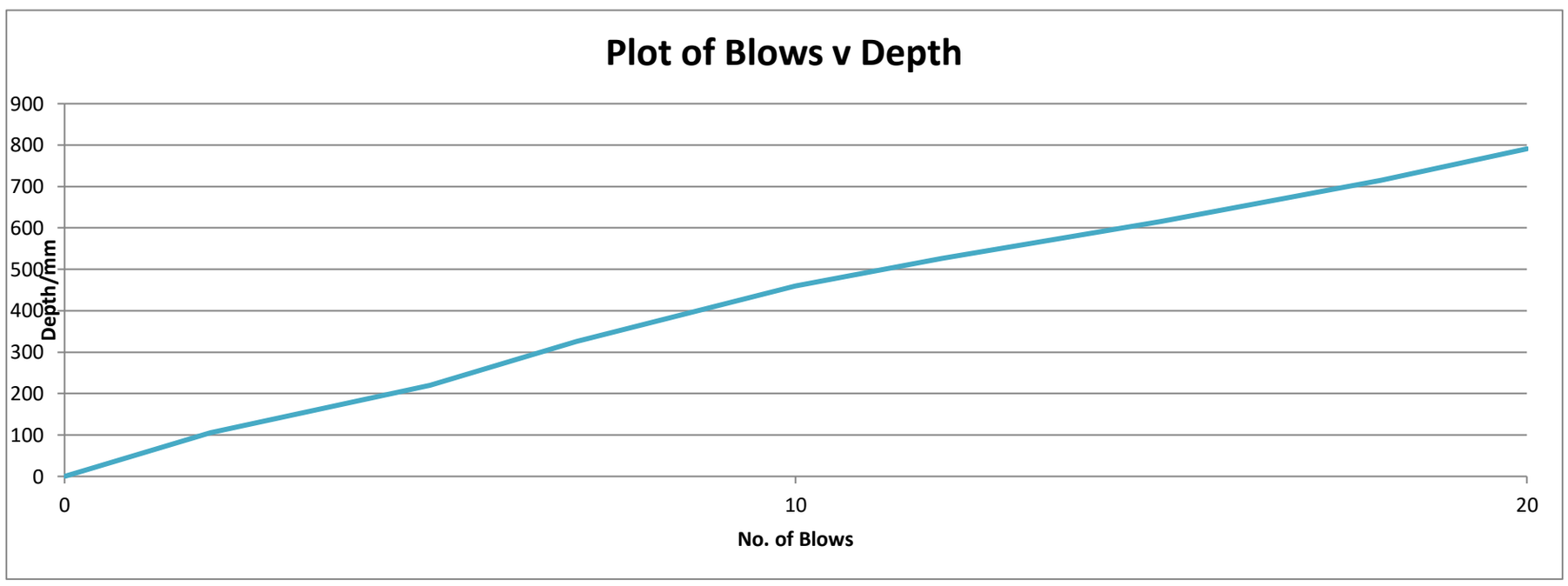
Title	DCP5				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	1	1	1
100	200	1	3	2	3.5
200	300	3	5	2	3.5
300	400	5	8	3	6
400	500	8	11	3	6
500	600	11	13	2	3.5
600	700	13	16	3	6



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP6
Date: 31/08/2016

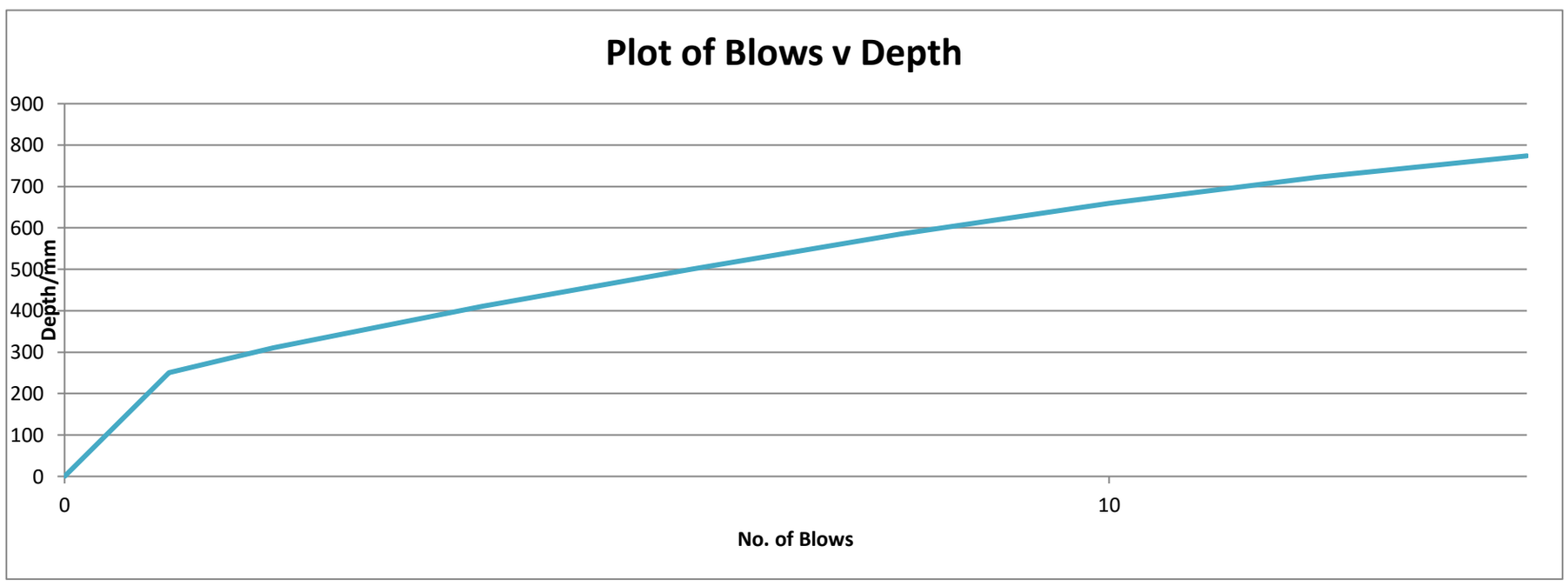
Title	DCP6				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	2	2	3.5
100	200	2	4	2	3.5
200	300	4	7	3	6
300	400	7	9	2	3.5
400	500	9	11	2	3.5
500	600	11	14	3	6
600	700	14	18	4	10



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP7
Date: 31/08/2016

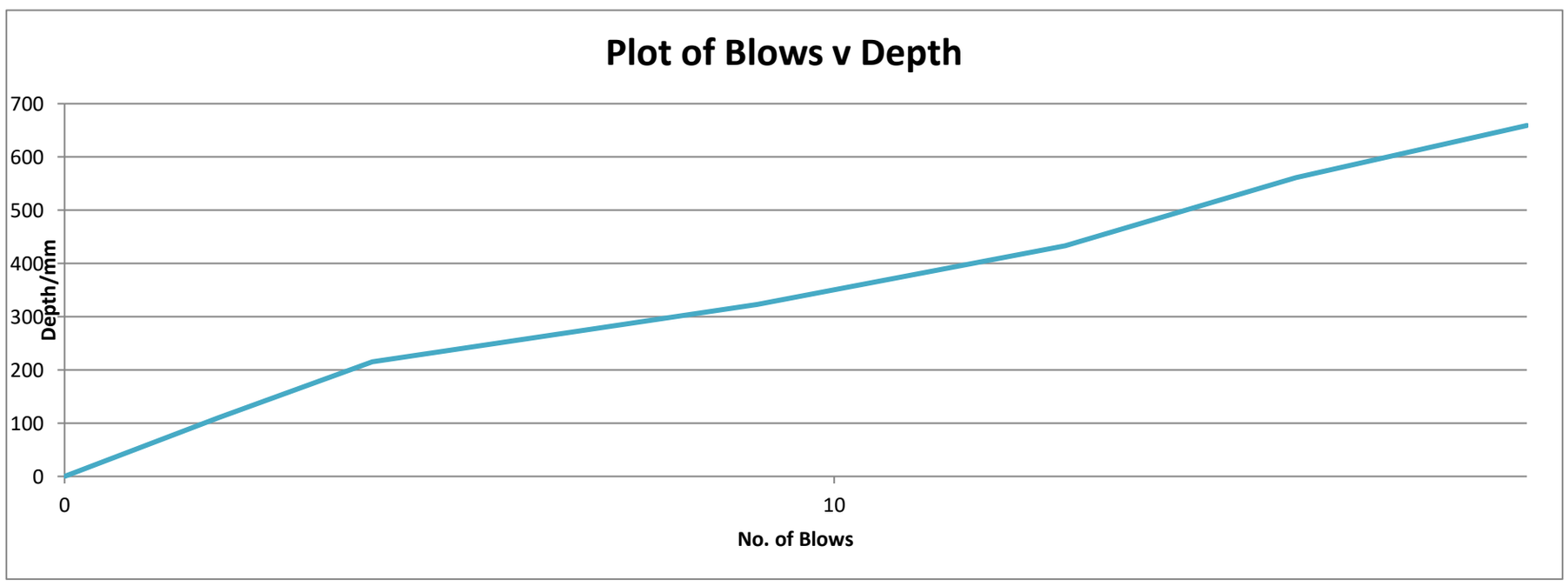
Title	DCP7				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	0	0	0.5
100	200	0	1	1	1
200	300	1	2	1	1
300	400	2	4	2	3.5
400	500	4	6	2	3.5
500	600	6	8	2	3.5
600	700	8	11	3	6



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP8
Date: 31/08/2016

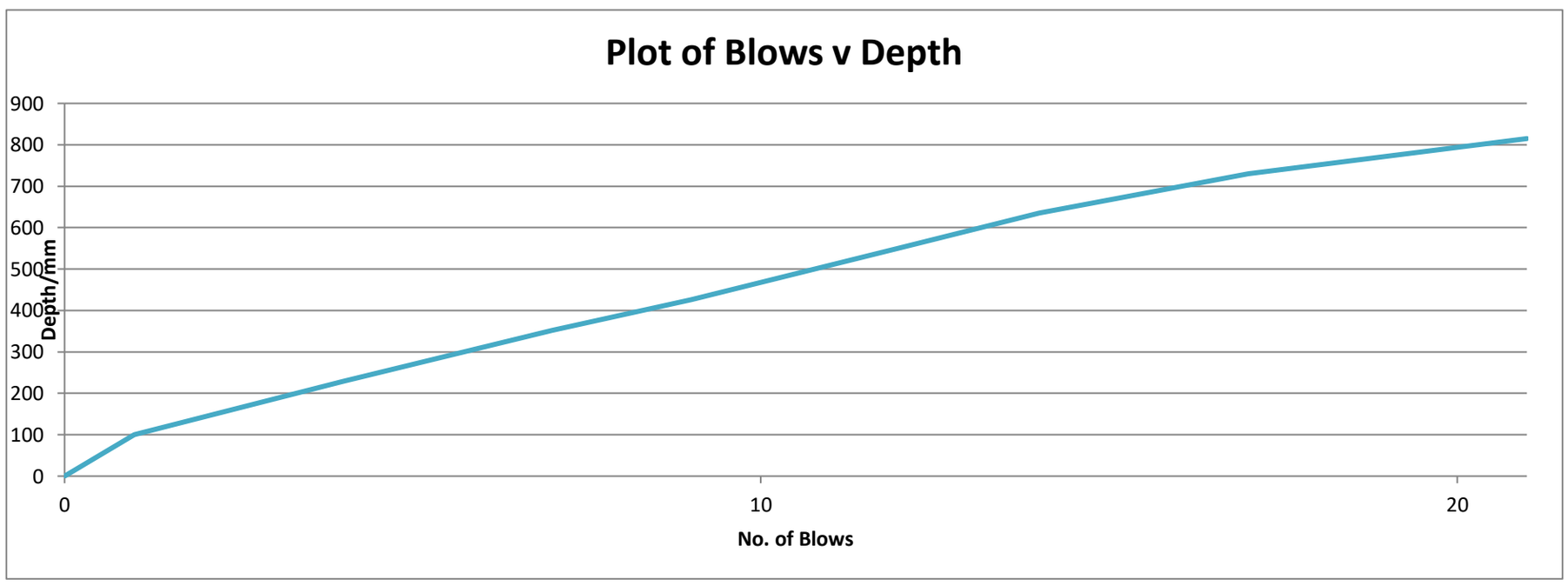
Title	DCP8				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	2	2	3.5
100	200	2	4	2	3.5
200	300	4	8	4	10
300	400	8	12	4	10
400	500	12	15	3	6
500	600	15	17	2	3.5



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP9
Date: 31/08/2016

Title	DCP9				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	1	1	1
100	200	1	3	2	3.5
200	300	3	6	3	6
300	400	6	8	2	3.5
400	500	8	11	3	6
500	600	11	13	2	3.5
600	700	13	16	3	6
700	800	16	20	4	10
800	900	20	27	7	18



Dynamic Cone Penetration Test (DCPT) for Subgrade Assessment

Project No: 72540
Site: Newbarn Lane
Test Location: DCP10
Date: 31/08/2016

Title	DCP10				
start (mm bgl)	finish (mm bgl)	start	finish	DCP Blows	CBR %
0	100	0	1	1	1
100	200	1	3	2	3.5
200	300	3	4	1	1
300	400	4	6	2	3.5
400	500	6	8	2	3.5
500	600	8	11	3	6
600	700	11	15	4	10

