Geo-Environmental

DESK STUDY & GROUND INVESTIGATION REPORT
for
BOORLEY GREEN, WINCHESTER ROAD,
HAMPSHIRE, SO32 2UA
on behalf of
ASHILL DEVELOPMENTS, MACDONALD HOTELS,
MA BOTLEY AND SOUTHERN & REGIONAL DEVELOPMENTS



Report:	**DESK STUDY & GROUND INVESTIGATION REPORT**
Site:	**BOORLEY GREEN, WINCHESTER ROAD, HAMPSHIRE, SO32 2UA**
Client:	**ASHILL DEVELOPMENTS, MACDONALD HOTELS, MA BOTLEY AND SOUTHERN & REGIONAL DEVELOPMENTS**
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EXECUTIVE SUMMARY		
Site Details	Site Address	Boorley Green, Winchester Road, Hampshire, SO32 3UA
	National Grid Reference	SU 51005 14952.
	Site Description	The site encompassed 76 hectares formed of the grounds of the Macdonald Botley Park Golf Course, Braxells Farm and land to the west of Maddoxford Farm.
	Form of Development	The masterplan for the site includes developing approximately 45 hectares of the site with 1400 new homes, a school and other commercial uses.
Phase 1 Desk Study	Geology	According to information published by the BGS the site was anticipated to be underlain by soils of the River Terrace Deposits, Wittering Formation and London Clay.
	Hydrogeology	The solid geology beneath the site is classified as both a Secondary A aquifer and Unproductive Strata. The site is outside of any SPZ and no potable abstractions wells were located within 2000m.
	Hydrology	Two large man-made ponds were located on the central portion of the site. The northern and eastern boundaries of the site were demarcated by Ford Lake, a tributary of the River Hamble. The Desk Study identified the northern and eastern boundaries of the site to occupy both Zone 2 and Zone 3 floodplains.
	History	Historically, the site comprised agricultural land prior to being developed with the current hotel and golf in the late 1980s.
	Environmental Sensitivity	The site is not indicated to be within a Site of Special Scientific Interest or any other designated environmentally protected area likely to effect the development.
	Radon	The site is within an area where radon protection measures are not required.
	Ground Gas	Although no existing or historic landfills were identified,. An historic gravel pit was recorded on the map extracts, which could be a potential source of ground gas. Furthermore, a Minerals Safeguarding Report produced by White Young Green and anecdotal evidence from the present owner of Maddoxford Farm indicated a possible deeper area of Made Ground associated with mineral extraction.
Encountered Conditions	Scope of works	To undertake a comprehensive combined geotechnical and environmental desk study and ground investigation. 200 exploratory positions were undertaken by means of windowless sampling, trial pitting and cable percussive techniques.
	Ground Conditions	The anticipated ground conditions (River Terrace Deposits, Wittering Formation, London Clay Formation) were encountered beneath a veneer of Topsoil. Some deeper areas of Made Ground were encountered associated with a screening bund to the east of the driving range and an area of infilled mineral workings.
	Groundwater	Groundwater strikes were recorded in the exploratory holes drilled nearest to the northern and eastern boundaries. Groundwater was also encountered in the majority of positions within the southern part of the site, which was lower lying.
	Ground gases	Gas monitoring is on-going, but with the exception of carbon dioxide exceeding 5% in one standpipe (remote from any known sources) on one occasion no significant ground gas concentrations had been recorded during the first four visits.
	Soakage	Soakage testing across the site recorded Infiltration rates ranging between $1.7x10^{-6}$m/s and $2.8x10^{-5}$m/s.

Engineering Considerations	Foundations	The soils beneath the site were indicated to range between non – shrinkable and high volume change potential. Therefore, minimum foundation depths of between 0.70m and 1.00m are likely to be applicable. Where trees and shrinkable soils are present, foundation depths will require calculation in accordance with the NHBC Standards, Chapter 4.2. Heave protection measures are likely to be required in some areas. A piled foundation solution may be more cost effective where foundation depths are calculated to be in excess of 2.50m on account of trees. For the more cohesive natural soils, a net allowable bearing pressure of 125kPa has been calculated and should ensure settlements of less than 25mm. An increased net allowable bearing pressure of 200kPa was calculated for the granular soils.
	Ground Floor Slabs	The ground conditions across the site vary from high volume change potential clays to non-shrinkable granular deposits. However, even in areas of the more granular soils, there is the potential for an overlying superficial band of more cohesive soils. On this basis, it is recommended that suspended ground floor slabs be adopted throughout the development.
	Excavations	Shallow excavations are likely to remain relatively stable in the short term. Where any deeper pockets of Made Ground are encountered, these may be prone to instability and collapse, and some form of temporary support may be required. Longer deeper excavations into the more granular soils are likely to become unstable, and will therefore require either battering to a safe angle or some form of temporary support. All excavations taken beneath the water table are likely to become highly unstable, and require the use of dewatering and temporary support measures.
	Pavements	CBR values of between 1% and 10% were recommended. Some of the formation soils are considered frost susceptible.
	Soakaways	Soakaways are unlikely to work effectively in the parts of the site underlain by more cohesive soils, but could be utilised in areas of the site underlain by more granular soils. It is likely that a combination of conventional soakaways and some degree of on-site storage will be required, e.g. using swales, detention basins and/or aquacell type storage. Groundwater depths were variable across the site and in some areas, storage capacity could be restricted due to groundwater, e.g. lower lying areas and close to the adjacent river. If any of the current site drains in to the river, there may be some scope for extending the riparian rights to cover the new development.
	Sub-surface concrete	Soils classified as DS2, AC-2 and therefore precautions are required. However, it may be possible to zone the site once phase boundaries have been finalised.
Environmental Considerations	Human Health	Based on the results of the GQRA, generally remedial measures are not required to protect human health of end users of adjacent land users. The exception was WS375, within the infilled former mineral extraction area. Some further investigation may be required in the region of WS375 in order to determine the lateral and vertical extent of any impacted Made Ground. It appears to be an isolated occurrence and given the depth it may not require any further remedial action if it falls beneath a house or road. However, should it be within a proposed garden area, some remedial measures may be required such as a cover system.
	Groundwater	The groundwater analysis has indicated mildly elevated concentrations

		of TPH at the locations of BH207 and BH210. Further, sampling and analysis to together with regulatory consultation is recommended.
	Plant Uptake	Remedial measures to protect plants from phytotoxic effects are not considered necessary.
	Ground Gases	Ground gas monitoring is still on-going. However, based on the results of the monitoring to date and the findings of the desk study, gas protection measures are unlikely to be required.
	Radon Gas	Radon protection measures are not required.
	Building Materials	It is the presumption for brownfield sites is that barrier pipe is required. However, the results of the chemical analysis indicate that with the exception of the result from WS375, all results were below the relevant thresholds and therefore standard pipework may be suitable for the site. It is recommended that the results of this investigation be presented to the water utility company as soon as reasonably practical in order to confirm the pipe material.
	Re-use of Material	Where it is planned to re-use excavated soils within the development a Materials Management Plan should be developed.
	Waste Disposal	The majority of arisings generated from the site are likely to be suitable for disposal at an inert landfill. However, where soils are to be disposed of off-site the results of the chemical analysis should be provided to the proposed landfill site for confirmation of the classification and it may be necessary to undertake Waste Acceptance Criteria (WAC) analysis.

Further Action:

- **Further investigation required around the location of WS375 in order to assess the lateral and vertical extent of impacted Made Ground.**
- **The water utility company should be consulted regarding the specification for water supply pipes.**
- **Gas protection measures should be reviewed upon completion of the gas monitoring.**
- **Further groundwater sampling and analysis recommended together with Environment Agency consultation.**
- **Material Management Plan required for re-use of arisings on site.**

This Executive Summary is intended to provide a brief summary of the main findings and conclusions of the investigation. For detailed information, the reader is referred to the main report (GE9523/GIR/JT/Oct13).

1.0 INTRODUCTION

1.1 General

Geo-Environmental Services Limited, 'Geo-Environmental', was instructed by PJH Development Consultancy Services on behalf the collective client Ashill Developments, Macdonald Hotels, MA Botley and Southern & Regional Developments to undertake an investigation of the geotechnical and environmental factors pertaining to the proposed development at Boorley Green, Winchester Road, Hampshire, SO32 3UA (Figure 1). The centre of the site was located at National Grid Reference SU 51005 14952.

1.2 Form of Development

A major new development is proposed on the subject site, including c. 1400 new dwellings together with private and communal gardens, a school, community facilities including structures and sports pitches, public open space and allotments. The Master plan for the site is shown on Figure 2.

1.3 Objectives

The investigation was undertaken to support assessment for the key development elements as described in Section 1.2, including:

- Foundation assessment and preliminary design
- Geotechnical assessment and materials testing for earthworks
- Soakage testing
- Pavement design
- Sub-surface concrete design
- Ground stability
- Soft ground engineering solutions
- Ground gas hazard assessment
- Ground contamination assessment

In terms of the geo-environmental investigation, a desk study was undertaken as part of the Master Planning and Environmental Impact Assessment process. This desk study has been reviewed and developed herein in the form of a conceptual site model and a Preliminary Risk Assessment (PRA) in accordance with CLR11. The data from the ground investigation (Phase II) stage were then to form the basis of a subsequent Tier 1 Generic Quantitative Risk Assessment (GQRA) and clarification of the conceptual site model. The objective of the risk assessments was to evaluate the risks posed to the proposed redevelopment, adjacent land uses, and the wider environment, in the context of the existing planning regime.

1.4 Standards

Where practicable, the ground investigation and subsequent environmental assessments were undertaken in accordance with the following documents and guidance:

- British Standards Institute - Code of Practice for Site Investigations (BS5930:1999).
- British Standards Institute - Code of Practice for the Characterisation and Remediation from Ground Gas in Affected Developments (BS8485:2007).
- British Standards Institute - Eurocode 7 – Geotechnical Design - Parts 1 & 2 (BS EN1997-1:2004 & BS EN1997-2:2007).
- British Standards Institute - Investigation of Potentially Contaminated Sites - Code of Practice (BS10175:2011).
- British Standards Institute - Soils for Civil Engineering Purposes (BS1377:1990).
- Building Research Establishment - The Performance of Building Materials in Contaminated Land (BRE255) (1994).
- Building Research Establishment – Soakaway Design (Digest 365) (1991).
- Construction Industry Research and Information Association - Assessing risks posed by hazardous ground gases to buildings (C665) (2007).
- Department for Communities and Local Government - National Planning Policy Framework (2012).
- Department for Environment Food and Rural Affairs and Environment Agency - Model Procedures for the Management of Contaminated Land (CLR11) (2004).
- Department of Environment - Industry Profiles (1995 - 1996).
- Environment Agency - Guidance for waste destined for disposal in landfills (2006).
- Environment Agency - Guidance on Requirements for Land Contamination Reports (2005).
- National House Building Council, Environment Agency & Chartered Institute of Environmental Health - Guidance for the Safe Development of Housing on Land Affected by Contamination (R&D Publication 66) (2008).
- National House Building Council - Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present (10627-R01[04]) (2007).
- National House Building Council – Standards, Chapter 4.1 Land Quality - Managing Ground Conditions (1999).

1.5 Conditions

This report does not purport to be a “Geotechnical Design Report” as defined in Clause 2.8 of Eurocode 7 (Geotechnical Design BS EN 1997-1:2004) and some of the data used to support this preliminary geotechnical assessment may not be fully compliant with that design code. It is considered possible that further detailed ground investigations could be required to facilitate the detailed geotechnical design process and should be carried out on a structure specific basis if necessary.

The data collected from the investigations have been used to provide an interpretation of the environmental conditions pertaining to the site. The recommendations and opinions expressed in this report are based on the data obtained. Geo-Environmental takes no responsibility for conditions that either have not been revealed in the available records, or that occurs between or under points of physical investigation. Whilst every effort has been made to interpret the conditions, such information is only indicative and liability cannot be accepted for its accuracy.

It should be noted that in particular the concentrations and levels of mobile liquid and gaseous materials are likely to vary with time. The results obtained may therefore only be representative of the conditions at the time of sampling. This report should not be taken as any guarantee that a site is free of hazardous or potentially contaminative materials.

Information contained in this report is intended for the use of the Client, and Geo-Environmental can take no responsibility for the use of this information by any party for uses other than that described in this report. Geo-Environmental makes no warranty or representation whatsoever expressed or implied with respect to the use of this information by any third party. However, it is acknowledged that the Client upon grant of planning permission, intends to dispose of all or part of the site(s), it is a condition of the appointment that Geo-Environmental must, at the appropriate time enter into an agreement for the assignment of full rights to copy and use together with full benefits of our work to whomsoever the Client chooses and this will be to more than one company at no cost to the Client. The benefits include any PI insurance cover or collateral warranty. Geo-Environmental does not indemnify the Client or any third parties against any dispute or claim arising from any finding or other result of this investigation report or any consequential losses.

Assessment criteria or other parameters developed for the evaluation of contamination on this site are based on a number of assumptions regarding exposure and toxicology, and exposure to contaminants and levels of adverse effects may therefore vary. Whilst every care and expertise has been employed in the development of such criteria, no liability is accepted in this respect. Other criteria or guidance on the development of assessment criteria may be published in the future, and no liability is accepted in this respect.

2.0 DESK STUDY

A Phase 1 Desk Study was undertaken for the site by Southern Testing Laboratories Limited in February 2012. A summary of the findings of the Phase I Desk Study are presented in the following section. A copy of the combined Phase 1 and Preliminary Phase 2 Investigation Report (ref: J10856) is presented in Appendix A. Comments made in the following section regarding possible ground conditions on the site are based purely on the desk study.

2.1 Site Walkover Survey

A site walkover survey was undertaken by a representative of Southern Testing Laboratories Limited during December 2011.

The site comprised the grounds of the Botley Park Hotel Golf & Spa and a limited number of fields owned by Maddoxford Farm. Botley Park Hotel was situated approximately centrally on the western boundary of the site. The hotel grounds included an eighteen-hole golf course and associated driving range to the north-west, with the farm contributing several parcels of pasture-land situated to the south-east.

The ground surface over the eighteen-hole golf course undulated significantly across the site. However, in general, the golf course sloped gently towards a small wooded valley that bounded the site to the north and east. Anecdotal evidence supplied by the on-site staff suggested that the existing landscape of the golf course was constructed using imported sand and drainage materials. For full details of specific site topography reference should be made to the survey drawings appended.

A small stream (Ford Lake) was observed within the small wooded valley. The stream contained less than 1m of water at the time of the walkover survey. The base of the stream bed ranged between 2m and 6m lower than the ground level of the adjoining golf course.

Mature and semi-mature deciduous trees bounded the site to the north and east and also lined the majority of the fairways of the golf course. Several small copses of mixed deciduous trees were also situated across site.

Two man-made lakes were situated to the east-south-east of the hotel and appeared to be fed by a series of ditches running from the central eastern portion the site.

Braxells Farm was situated to the north-west of the Hotel. Braxells Farm comprised a single storey timber-built building consisting of several separate commercial businesses, a farmhouse with associated private gardens and two pasture fields. The farmhouse was a two-storey brick-built building situated to the south of the commercial building.

A green-keepers yard and associated barn were observed to the immediate north of Braxells Farm. The barn was used for the storage and maintenance of machinery associated with maintenance of the fairways and greens. A yard, mostly covered with concrete hard-standing, was situated to the east of the barn and was used for parking larger agricultural machinery, storage and as a machinery wash-down area. The wash-down area was concrete covered and bunded; an associated interceptor was located adjacent to the yard to the north. A visual inspection identified potential asbestos containing materials in the form of cement sheeting on the roof of the barn. Furthermore, on the south of the yard, a plastic, internally bunded fuel/oil tank was situated adjacent to an external metal hazardous chemical storage unit.

A driving range was located immediately north of the green-keepers yard. The majority of the driving range consisted of a relatively flat and level grass and covered area approximately 270m by 140m. The associated 'tee-off' area comprised a wood and metal structure located on the south-west of the driving range. The eastern boundary of the driving range comprised an earth bank approximately 2-3m in height which separated the driving range from the adjacent fairway. A smaller earth bank was also situated on the south eastern corner of the driving range and was in use as a raised driving range platform.

The Maddoxford Farm parcel was situated to the south and south-east of the golf course and was in use as pasture land at the time of the site walkover, and subsequent ground investigation. The fields were generally flat and fell gently away to the east toward Maddoxford farm.

The surrounding area was mostly open field networks to the north and east with residential developments to the south and south-west.

During the site investigation undertaken in September 2013, Geo-Environmental observed no significant changes to the site or land uses to those described above.

2.2 Historic Data

Historic maps dating back to 1868 were obtained as part of the Desk Study. A summary of the apparent key features noted on the map extracts both on-site and off-site are presented in Table 2.1

Date	On-Site	Off-Site
1868	The site was mostly indicated to comprise agricultural fields with an area of woodland (Bushydeans Copse) situated on the central western portion. Braxells Farm and Little Braxells Farm were located on the north western and north eastern boundaries, respectively. The northern and eastern boundaries are demarcated by a stream (labelled as Ford Lake). The western portion of the site was bounded by a road.	The surrounding area was mostly agricultural fields and woodland with Maddoxford Farm labelled to the immediate south-east of the site.
1895	Little Braxells Farm was no longer present or labelled.	No significant changes noted since the previous map edition.
1908 - 1910	No significant changes since the previous map edition.	Some minor residential development was shown to the south of the site. A gravel pit was labelled to the immediate east of Ford Lake off of the south eastern portion of the site.
1957	Minimal extensions and additions to the buildings at Braxells Farm were shown. Bushydeans Copse was no longer shown.	Further residential development was noted to the south and south-west.
1967 - 1968	Further development and expansion of Braxells Farm was shown. A building commensurate in size and location to the green-keeper's barn was shown from this date.	The gravel pit to the south-east of the site was no longer shown.
1985 - 1989	No significant changes since the previous map edition.	Further residential development was noted to the south and south-west.
2002	The site was developed broadly commensurate with the present day	Few significant changes noted since the previous map edition.

	Boorley Park Hotel. A driving range was shown on the north-west of the site. Two large ponds were present to the east-south-east of the hotel complex. Braxells Farm appeared reduced in extent, commensurate with present day.	
2011	No significant changes since the previous map edition.	Few significant changes noted since the previous map edition.

Table 2.1 Summary of Historical Map extracts

2.3 Geology

British Geological Survey mapping indicated the solid geology of the majority of the site to comprise the Wittering Formation. An inlier of the London Clay Formation was shown to cross the site approximately centrally from east to west. Furthermore, River Terrace Deposits were noted along the eastern portion of the site.

The rivers of southern England, including the River Hamble, River Itchen and Solent tributaries, have been subject to several changes of level since the last ice age. One result has been the formation of a complex series of **River Terrace Deposits**. The deposits are generally found at an elevation close to or higher than that of the existing rivers and generally comprise sand and flint or chert gravel of varying degrees of coarseness.

The **Wittering Formation** comprises mainly brown grey laminated sandy clay and clayey sand with beds of green to brown glauconitic sand. Lignite beds can be present towards the base of the formation.

In the Hampshire area, the **London Clay Formation** varies in composition and can comprise firm to very stiff silty clay, silty sand, interbedded silt, sand and clay. The granular strata are often water bearing. Occasional concretions of mudstone can also be present. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay and precautions against sulphate attack to concrete are sometimes required.

For further details of the anticipated geological sequence, reference should be made to the Phase 1 Desk study appended.

2.4 Hydrogeology

Aquifers

With reference to information obtained from the Environment Agency the following aquifer designations were identified on site:

Deposit Type	Geological Formation	Aquifer Designation
Superficial	River Terrace Deposits	Secondary 'A'
Bedrock	Wittering Formation	Secondary 'A'
	London Clay Formation	Unproductive Strata

Table 2.2 Summary of Aquifer Designations

Secondary 'A' aquifers comprise permeable layers which are 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.

Unproductive Strata comprise rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Source Protection Zones

The Environment Agency website indicated that the site is not situated within a Source Protection Zone (SPZ). An SPZ is a protection zone placed around a well or borehole that supplies groundwater of potable quality.

Licensed Groundwater Abstractions

No licensed groundwater abstractions were reported within 1000m of the site as part of the Desk Study. There were no potable abstractions recorded within a 2000m radius of the site.

2.5 Hydrology

Surface Water Features

A number of surface water features were identified on site. Two large man-made ponds were located on the central portion of the site. The northern and eastern boundaries of the site were demarcated by Ford Lake, a tributary of the River Hamble to the south-east. Smaller surface water features (secondary and tertiary rivers) were also indicated on the central and north western portion of the site. A small portion of the north western tertiary river was culverted.

One of the central secondary/tertiary rivers on the central portion of the site joined the large ponds and was commensurate in shape and location to the ditches observed during the site walkover.

Flood Risk

The Desk Study identified the northern and eastern boundaries of the site to occupy both Zone 2 and Zone 3 floodplains.

A Zone 2 floodplain estimates the annual probability of flooding from rivers as one in one thousand (0.1%) or greater, but less than 1%.

A Zone 3 floodplain estimates the annual probability of flooding from rivers as one in one hundred (1%) or greater.

Licensed Surface Water Abstractions

Two licenced surface water abstractions were identified on site as part of the Desk Study. The abstractions are both related to the golf course's irrigation system and were centred within the large ponds.

Licensed Discharge Consents to Surface Water

Five licensed discharge consents to surface waters were recorded within a 250m radius of the site boundary as part of the Desk Study. Details of the discharge consents are summarised below:

3	0.0	On Site	450720, 114800	Address: Botley Park Hotel & Country Club, Botley Park Hotel & Country Club, Botley, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P11555 Permit Version: 1	Receiving Water: Saline Estuary Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 21/6/1991 Effective Date: 21/6/1991 Revocation Date: -
4	3.0	W	451630, 114470	Address: Maddoxford Farm, Maddoxford Farm, Botley, Hampshire Effluent Type: Unspecified Permit Number: H01199 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 15/4/1965 Effective Date: 15/4/1965 Revocation Date: -
5	5.0	NE	451340, 115160	Address: Hill Farm, Hill Farm, Botley Hampshire Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: H01825 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 17/1/1964 Effective Date: 17/1/1964 Revocation Date: 4/11/1992
6	8.0	E	451370, 115090	Address: Hill Farm House, Hill Farm House, Botley Hampshire Effluent Type: Sewage Discharges - Unspecified - Not Water Company Permit Number: H01824 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 17/1/1964 Effective Date: 17/1/1964 Revocation Date: -
7	40.0	SW	451620, 114410	Address: Maddoxford Farm House, Maddoxford Farm House, Botley Hampshire Effluent Type: Sewage Discharges - Unspecified - Not Water Company Permit Number: H01343 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 15/4/1965 Effective Date: 15/4/1965 Revocation Date: 31/3/1997

2.6 Sensitive Land Uses

A search of environmentally sensitive land uses including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar Sites, World Heritage Sites, Environmentally Sensitive Areas, Areas of Outstanding Natural Beauty (AONB), National Parks, Nitrate Sensitive Areas (NSA), and Nitrate Vulnerable Zones (NVZ) were undertaken as part of the Desk Study.

No such land use designations were identified within a 1km radius of the site boundary. However, recent updates to the Environment Agency mapping indicate the site to be within a Eutrophic NVZ. This is an agricultural land designation and is not considered to affect any proposed residential development.

2.7 Radon

With reference to the Desk Study the site is indicated to be in an area where radon protection measures are not required.

2.8 Ground Gases

A search of historic and authorised landfill sites, waste treatment, transfer and disposal sites was undertaken as part of the Desk Study. Such sites may form an artificial source of ground gases, such as carbon dioxide and methane, where wastes are buried or disposed of to landfill.

No such landfill sites were identified within a 500m radius of the site.

Although no existing or historic landfills were identified, ground gas may also be generated from certain types of Made Ground under certain conditions. An historic gravel pit was also indicated on historic map extracts, which could be a potential source of ground gas.

It should be noted that a Minerals Safeguarding Report (ref. A074069) was prepared for the site by WYG in January 2013. The details contained in the WYG report were not available to Southern Testing Laboratories Ltd at the time of compiling their combined Phase 1 and Preliminary Phase 2 Report. The findings of the WYG report indicated an area of previous mineral consent on the Maddoxford Farm parcel on the south-east of the site. Anecdotal evidence supplied by the owner of Maddoxford Farm, indicated that a portion of the mineral consent are on the Maddoxford Farm parcel had been quarried and subsequently infilled. This potential contamination source is of such significance that it has been incorporated into the remainder of the report. A copy of the Mineral Safeguarding Report is included in Appendix A.

2.9 Environmental Data

Searches of other various environmental databases were made as part of the Desk Study, including historic Integrated Pollution Control (IPC) Authorisations, Part A (1) and Integrated Pollution Prevention and Control (IPPC) Authorised Activities, Water Industry Referrals, Red List Discharge Consents, List 1 and 2 Dangerous Substances Inventory Sites, Part A (2) and Part B Activities and Enforcements, registered radioactive substances, COMAH sites, explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS) sites and planning permissions for sites involving hazardous substances, pollution incidents, potentially contaminative land uses, and fuel station registers.

The following records of potentially contaminative industrial land uses within a 250m radius of the site boundary were encountered as part of the Desk Study.

ID	Distance	Direction	Company	Address	Activity	Category
1	0.0	On Site	Giraffe Embroidery Ltd	Braxells Farm, Winchester Road, Botley, Southampton, SO32 2BX	Textiles, Fabrics, Silk and Machinery	Industrial Products
2	0.0	On Site	Electricity Sub Station	SO32	Electrical Features	Infrastructure and Facilities
3A	15.0	S	Gas Governor	SO32	Gas Features	Infrastructure and Facilities
4A	16.0	S	Gas Governor Station	SO32	Gas Features	Infrastructure and Facilities
5	16.0	SW	Electricity Sub Station	SO32	Electrical Features	Infrastructure and Facilities
6	43.0	E	M D J Newell	Maddoxford Farm, Maddoxford Lane, Botley, Southampton, SO32 2DB	Livestock Farming	Farming
7B	51.0	W	Longacre Saddlery	Long Acre House, Winchester Road, Botley, Southampton, SO32 2DH	Hobby, Sports and Pastime Products	Consumer Products
8B	51.0	W	Longacre Feeds	Long Acre House, Winchester Road, Botley, Southampton, SO32 2DH	Animal Feeds, Pet Foods, Hay and Straw	Foodstuffs
9	64.0	SW	Electricity Sub Station	SO32	Electrical Features	Infrastructure and Facilities
10	154.0	S	Gas Valve Company	SO32	Gas Features	Infrastructure and Facilities
11	171.0	NE	Aero Antiques	Durley Airstrip, Netherhill, Botley, Southampton, SO32 2BP	Aviation Engineers	Engineering Services

The Desk Study recorded two pollution incidents within a 250m radius of the site, as summarised below:

ID	Distance	Direction	NGR	Details	
1	0.0	On Site	450754, 114866	Incident Date: 21/2/2003 Incident Identification: 138534 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Food and Drink	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	10.0	W	450338, 115341	Incident Date: 14/1/2002 Incident Identification: 52195 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

No other such sites were recorded as part of the Desk Study within a 250m radius of the site.

Underground High Pressure Oil & Gas Pipelines

The Desk Study identified two high pressure fuel (Esso) pipelines running along the south-east of the site. Furthermore, field boundary markers for a high-pressure gas main (Scotia Gas) were also observed on the south-east of the site during the site walkover.

2.10 Geotechnical Data

The Desk Study indicated that no coal mining areas or brine affected areas were present within 75m of the site boundary.

Table 2.3 summarises the geotechnical ground stability hazards identified by the BGS for the site. The summary provides the highest risk potential identified within 50m of the site.

Hazard	Designation
Shallow Mining	Negligible
Collapsible Ground	Very Low
Compressible Ground	Moderate
Ground Dissolution	Negligible
Landslide	Very Low
Running Sand	Low
Swelling Clay	Moderate

Table 2.3 Summary of BGS Geological Hazards

2.11 Generic Contamination

The site has a history of rural and agricultural land use and was located within a rural/agricultural area. A number of potentially contaminative land uses were identified both on site and in the surrounding area. Table 2.4 has been compiled using information published by the joint EA and NHBC R&D publication 66, which provides a summary of industrial profiles published by the former DoE (now part of DEFRA).

Location/Land Use	Potential Contaminants
Former & current land uses (Braxells Farm)	Metals, asbestos, poly-aromatic hydrocarbons (PAH), hydrocarbons, pesticides
Green keepers yard (fuel tank & machinery maintenance)	Made Ground, hydrocarbons
Driving range	Imported Made Ground used for construction and landscaping
Golf course	Imported Made Ground used for construction and landscaping
Rural fields (Maddoxford Farm & Braxells Farm)	Pesticides
Fuel pipelines	Hydrocarbons

Location/Land Use	Potential Contaminants
Former quarry	Imported Made Ground
Former gravel pit (off-site)	Ground gases (elevated methane and carbon dioxide; reduced oxygen)

Table 2.4 Summary of Potential Contaminants

2.12 Previous Ground Investigations

Southern Testing Laboratories Limited were not aware of any previous investigations which may have been undertaken on the site prior to their January 2012 preliminary Phase 2 investigation at the site.

In summary, the following scope of works was undertaken by Southern Testing Laboratories Limited:

- Seventeen 3.0m-4.5m deep window sampler boreholes with regular in situ testing and sampling.
- Three falling head soakage tests to obtain indicative infiltration rates for soakaway potential.
- A series of Dynamic Cone Penetrometer (DCP) tests, equivalent to CBR testing, undertaken across the site.

A general, the findings of Southern Testing Laboratories Limited's Preliminary Phase 2 investigation comprised:

Foundations
- A preliminary allowable bearing capacity of 100kPa was suggested for all natural geology and soil types encountered on site.
- The sandy clay soils were indicated to be medium volume change potential and clay soils were suggested to be high volume change potential, as defined by NHBC Standards, Chapter 4.2.

Soakage
- Preliminary falling head soakage tests indicated poor infiltration rates in the sandy soils – full scale soakage testing in accordance with BRE 365 was recommended.

Pavements
- The results of the DCP tests undertaken in natural soils indicated the following equivalent CBR ranges: 1.6% - 2.2% (clay), 3.6% - 5.5% (sandy clay) and 7.0% - 7.9% (sand).

Contamination
- No significant evidence of contamination was encountered during the preliminary Phase 2 investigation. However, limited evidence of soil contamination, in the form of benzo(a)pyrene, was identified within the mound adjacent to the green keeper's yard and also beneath a parking area associated with Braxells Farm.

3.0 PRELIMINARY RISK ASSESSMENT

Based on the findings of the desk study and any subsequent data that has emerged since the publication of Southern Testing Laboratories Limited's combined Phase 1 and Preliminary Phase 2, the following sections summarise the anticipated geotechnical and environmental factors likely to impact the site.

3.1 Geotechnical Factors

The following factors that might impact the geotechnical condition of the site were:

- The possible presence of shrinkable soils on the site, which may affect foundation design and construction.
- The presence of shallow groundwater and/or perched water beneath the site.
- The presence of laterally and vertically variable strata.
- The presence of materials for excavation and suitability for re-use in earthworks.
- The presence of deep Made Ground which could impact foundation (housing and road) design and construction.

3.2 Preliminary Environmental Conceptual Site Model & Risk Assessment

3.2.1 Methodology

A Preliminary Risk Assessment (PRA) and Conceptual Site Model (CSM) have been prepared in accordance with CLR11 based on information obtained as part of the Desk Study. Possible risks associated with potential sources of contamination and sensitive receptors identified have been qualitatively assessed following a source-pathway-receptor (pollutant linkage) approach in accordance with current UK protocols.

A risk may only exist where a plausible pollutant linkage is present, and where the quantity or concentration of a contaminant is sufficient so as to pose harm. Under the statutory definition, "Contamination" may only strictly exist where contaminants pose a risk of harm to a receptor. Risk may be defined as a function of the likelihood and severity of any adverse effects arising from contamination. The risk classification has been assessed in accordance with CIRIA C552 (Rudland *et al*., 2001). A summary of how the risks are derived and their definitions are presented in Tables 3.1 and 3.2.

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low Likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

Table 3.1 Risk Ratings Matrix

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

Table 3.2 Risk Rating Definitions

3.2.2 Summary of Plausible Sources

Possible sources of contamination identified or discounted as part of the Desk Study are summarised in Table 3.3.

Source	Description	Contaminants
Former & current land uses (Braxells Farm)	Background chemical quality of near surface soils	Possible elevated metals, organic and inorganic contaminants, and pesticides
Green keepers yard (fuel tank & machinery maintenance)	Potential spillages of hydrocarbon based materials (fuels, lubricants, etc.)	Possible elevated metals, organic and inorganic contaminants
Driving range	Background chemical quality of imported landscaping soils	Possible elevated metals, organic and inorganic contaminants
Golf course	Background chemical quality of imported landscaping soils	Possible elevated metals, organic and inorganic contaminants
Rural fields (Maddoxford Farm & Braxells Farm)	Chemical quality of near surface soils due to the potential addition of agricultural chemicals	Pesticides
Fuel pipelines	Potential leakages from fuel pipelines crossing the site	Organic contaminants (hydrocarbons)
Former on-site quarry	Background chemical quality of imported infill soils & migration of artificially generated ground gases on to site.	Possible elevated metals, organic and inorganic contaminants. Possible elevated methane, carbon dioxide, volatile organic compounds (VOCs); reduced oxygen
Former off-site gravel pit	Migration of artificially generated ground gases on to site.	Possible elevated methane, carbon dioxide, volatile organic compounds (VOCs); reduced oxygen

Table 3.3 Possible Sources of Contamination

Table 3.4 further summarises the sources of potential contamination prior to the qualitative risk assessment.

Grouped Sources	Individual Sources
Background chemical quality of near surface soils and Made Ground including possible elevated metals, organic and inorganic contaminants, and pesticides	Former & current land uses (Braxells Farm) Driving range Golf course Rural fields (Maddoxford Farm & Braxells Farm) Former on-site quarry
Background chemical quality of near surface soils - Green keepers yard (fuel tank & machinery maintenance)	Green keepers yard (fuel tank & machinery maintenance)
Background chemical quality of near surface soils and groundwater - Fuel pipelines	Fuel pipelines
Ground gases	Infilled off-site gravel pit Former on-site quarry Fuel pipelines

Table 3.4 Grouped Sources of Contamination

3.2.3 Summary of Plausible Pathways

The plausible pathways are summarised in Table 3.5.

Pathway	Description
Direct Contact	Soil, dust and vegetable ingestion, dermal contact and dust inhalation.
Soil Gas Inhalation	Inhalation of soil gas both inside and outside of buildings.
Vertical & Lateral Migration	Contaminant movement both vertically through leaching/gravity and horizontally along preferential pathways or with groundwater.
Root Uptake	Uptake of soil and waterborne contaminants by plants.
Chemical Attack	Attack of buried plastics and concrete by aggressive ground conditions.

Table 3.5 Possible Contamination Pathways

3.2.4 Summary of Plausible receptors

Potential receptors associated with the site and its development, identified or otherwise discounted, are summarised in Table 3.6.

Receptor	Description	Comments	Plausible
End Users	Residential end users of the proposed redevelopment	The proposed redevelopment includes private and communal gardens and areas of soft landscaping	***Yes***
Adjacent Land Users	Sensitive land uses identified within the immediate vicinity	Adjacent land uses are predominantly residential	***Yes***
Soft Landscaping	Areas of planting including lawns, shrubs, trees, etc.	Areas of soft landscaping are proposed as part of the redevelopment	***Yes***
Water Supply Pipes	Plastics for potable water supply pipes may be laid in contact with contaminated soils	Significant depths of Made Ground are expected	***Yes***
Building Materials	Buried concrete for foundations etc. may be laid in contact with contaminated soils	Significant depths of Made Ground are expected	***Yes***
Groundwater	Controlled waters contained within the aquifer(s) beneath the site	The majority of the site lies upon a Secondary 'A' aquifer, outside of any SPZ	***Yes***
Surface Water	Controlled waters within lakes, rivers, and ponds, etc., or coastal waters	Two ponds present centrally on site; two small rivers watercourses present on site; northern and eastern boundaries demarked by the River Hamble	***Yes***
Sensitive Land Uses	Sensitive land uses or designations identified on site or in the vicinity	With the exception of an agricultural land designation (Eutrophic NVZ), no such land uses were identified within 1km of the site as part of the desk study	***No***

Table 3.6 Possible Receptors of Contamination

Site workers involved in the preparation and construction of the development have not been considered in this assessment as the Principal Contractor is duty bound under the current CDM Regulations to undertake their own risk assessments with respect to their employees and develop safe systems of work.

Whilst the above sources and receptors have been identified, Table 3.7 summarises the identified plausible pollution linkages and a qualitative assessment of the risks based on the Desk Study research:

Potential Source/media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
Near surface soils & Made Ground/soil	End users	Direct contact	Likely	Mild	Moderate to Low Future residents are likely to come into contact with soils via direct contact in the private garden or tracked back in to the home. The consequence is likely to be mild.
	Adjacent land users	Direct contact	Low	Mild	Low There is a low likelihood of adjacent site users coming into contact with affected soils. The consequence is likely to be mild.
	Soft Landscaping	Root uptake	Likely	Minor	Low Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Likely	Mild	Moderate to Low Water supply pipes are likely to come into contact with soils though significant contamination is not anticipated. The consequence is likely to be mild.
	Buildings and infrastructure	Chemical attack	Likely	Minor	Low Foundations and utilities will be placed within soils. However, the consequence is anticipated to be minor.
	Groundwater	Vertical migration	Likely	Minor	Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. However, the soils are unlikely to be significantly impacted by mobile contamination. The risk of soils impacting the groundwater is considered to be low.
	Surface Water	Lateral migration	Likely	Minor	Low Surface water is present on and adjacent to the site. However, the soils are unlikely to be significantly impacted by mobile contamination. The risk of lateral migration is considered to be low.
Green keeper's yard/soil	End users	Direct contact	Likely	Medium	Moderate Future residents of properties in this area are likely to come into contact with soils via direct contact in the private garden or home. Potential for localised hotspots of contaminants
	Adjacent land users	Direct contact	Low	Mild	Low

Potential Source/media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
					There is a low likelihood of adjacent site users coming into contact with affected soils.
	Soft Landscaping	Root uptake	Likely	Minor	Low Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Likely	Medium	Moderate Water supply pipes are likely to come into contact with soils. Localised hot spots of hydrocarbons possible in green keeper's compound.
	Buildings and infrastructure	Chemical attack	Likely	Minor	Low Foundations and utilities will be placed within soils. However, the consequence is anticipated to be minor.
	Groundwater	Vertical migration	Likely	Mild	Moderate to Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. Some localised concentrations of hydrocarbons may be anticipated in this area. However, the permeability of the underlying soils is relatively low.
	Surface Water	Lateral migration	Likely	Mild	Moderate to Low Surface water is present on and adjacent to the site. Some localised concentrations of hydrocarbons may be anticipated in this area. However, permeability of soils is relatively low.
Fuel pipelines/soil	End users	Direct contact/ Soil Gas Inhalation	Likely	Mild	Moderate to Low Future residents of properties in this area are likely to come into contact with soils via direct contact in the private garden or home. The consequence is likely to be mild.
	Adjacent land users	Direct contact	Low	Mild	Low There is a low likelihood of adjacent site users coming into contact with any impacted soils.
	Soft Landscaping	Root uptake	Likely	Minor	Low Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Likely	Mild	Moderate to Low Water supply pipes are likely to come into contact with impacted soils depending upon depth of installation and extent of soil impact.
	Buildings and infrastructure	Chemical attack	Likely	Minor	Low Foundations and utilities will be

Potential Source/media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
					placed within soils. However, the consequence is anticipated to be minor.
	Groundwater	Vertical migration	Likely	Mild	Moderate to Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. However, the soils are unlikely to be significantly impacted by mobile contamination.
	Surface Water	Lateral migration	Likely	Mild	Moderate to Low Surface water is present on and adjacent to the site. However, the soils are unlikely to be significantly impacted by mobile contamination. The risk of lateral migration is considered to be moderate to low.
Fuel pipelines/ groundwater	End users	Direct contact	Unlikely	Mild	Very Low There is a low likelihood of future residents coming into contact with groundwater via direct contact in the private garden or home. The consequence is likely to be mild.
	Adjacent land users	Direct contact	Unlikely	Mild	Very Low There is a low likelihood of adjacent site users coming into contact with affected groundwater. The consequence is likely to be mild.
	Soft Landscaping	Root uptake	Unlikely	Minor	Very Low Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Unlikely	Mild	Very Low Water supply pipes are unlikely to come into contact with any impacted groundwater due to their shallow depth of installation.
	Buildings and infrastructure	Chemical attack	Unlikely	Minor	Very Low Foundations and utilities are unlikely to be placed within the horizon of potentially impacted groundwater and the consequence is anticipated to be minor.
	Groundwater	Vertical & lateral migration	Likely	Mild	Moderate to Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. Some localised concentrations of hydrocarbons may be possible in this area. However, the permeability of the underlying soils is relatively low.
	Surface Water	Lateral migration	Likely	Mild	Moderate to Low

Potential Source/media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
					Surface water is present on and adjacent to the site. Some localised concentrations of hydrocarbons may be possible in this area. However, permeability of soils is relatively low.
Infilled quarries (on-site & off-site)/ ground gas	End users	Inhalation	Low	Mild	Low There is a low likelihood of future residents coming into contact with ground gases. The consequence is likely to be mild.
	Adjacent land users	Inhalation	Low	Mild	Low There is a low likelihood of adjacent site users coming into contact with ground gases. The consequence is likely to be mild.
	Soft Landscaping	Root uptake	Unlikely	Minor	Very Low Root uptake of ground gas is unlikely for plants with any consequence likely to be minor.
	Water supply pipes	n/a	n/a	n/a	n/a
	Buildings and infrastructure	Vertical & Lateral Migration	Unlikely	Severe	Moderate to Low Accumulations of methane beneath floor slabs and within poor ventilated spaces could result in explosions. However, migration of methane is unlikely
	Groundwater	n/a	n/a	n/a	n/a
	Surface Water	n/a	n/a	n/a	n/a

Table 3.7 Plausible Pollutant Linkages & Qualitative Risk Assessment

3.3 Preliminary Risk Assessment Summary

The PRA and CSM developed from the information gathered as part of the desk study process has identified several plausible pollutant linkages that exist in relation to the proposed redevelopment of the site. However, the preliminary risk rating for each linkage has been classified as moderate to low, low or very low, and as such the site is considered overall as low risk.

4.0 GROUND INVESTIGATION

4.1 Scope of Works

In summary, the following scope of works for the intrusive investigation was agreed with the Client's Representative. The investigation was undertaken over a three week period during September 2013.

- Marking out and surveying exploratory hole locations.
- 15No. full scale BRE 365 soakage tests in trial pits.
- 21 days windowless sampling to depths of up to 4mbgl, or maximum achievable depth (c.175No.).
- Installation of 5No. 35mm ground gas and water monitoring standpipes within the window sampler boreholes.
- 10 No. 150mm diameter cable percussion boreholes with regular in-situ testing and sampling to a depth of 15m.
- Installation of 10No. 50mm diameter 4m deep ground gas and water monitoring standpipes.
- Installation of two GasClam (in-well continuous gas samplers) for a week in any areas identified to have a higher ground gas potential (the ground gas potential is generally considered very low, but should any specific source be encountered the ground gas generation potential could be increased locally).
- 6No. return ground gas and groundwater monitoring (and sampling during the initial visit) over a 2 month period. This is based on a high sensitivity end use and generally very low ground gas potential.
- 5 days undertaking Dynamic Cone Penetration Tests (approximately 100No. depending on ground conditions).
- An allowance for geotechnical testing to support geotechnical assessments relating to foundation construction, earthworks, pavement design, concrete specification and the like.
- Analysis of 90No. samples of soil for a suite of commonly occurring brownfield contaminants.
- Analysis of 30No. samples of soil for speciated TPH with RBCA banding.
- 20No. pesticide suites on soil samples.
- Screening for asbestos fibres/fragments on 90No. soil samples.
- Analysis of 10No. groundwater samples recovered from the standpipes for a suite of commonly occurring brownfield contaminants.
- The provision of detailed interpretative report including reviewing and incorporating previous phases of ground investigation, records and sections of the encountered conditions, an assessment of geotechnical parameters in terms of the proposed construction and a detailed assessment of environmental issues pertaining to the site and its redevelopment.

4.2 Investigation Strategy

The Desk Study and Preliminary Risk Assessment identified near surface soils, groundwater and ground gases as potential contamination sources. The exploratory holes were located to target individual potential sources of contamination and to provide broad coverage across the proposed development area. The following tables summarise the strategy of the environmental (Table 4.1) and geotechnical (Table 4.2) investigations.

Environmental Area of Concern	Investigation	Positions
Former & current land uses (Braxells Farm)	Windowless sampler borehole drilled within area of previously identified hot-spot	WS367
Green keeper's yard	Windowless sampler borehole with groundwater/ground gas monitoring standpipe installed adjacent to the tank	WS365
	Windowless sampler borehole drilled within the shed	WS366
Driving range	Windowless sampler boreholes drilled along spine of the driving range bund with regular sampling	WS212 - WS215
Golf course	Windowless sampler boreholes and cable percussive boreholes situated across the golf course with regular sampling and laboratory analysis	BH201 - BH205 & BH207 - BH209 & WS216 - WS329 & WS335 - WS337, WS341 - WS344
Rural fields (Maddoxford and Braxells Farm)	*Braxells Farm* - Windowless sampler boreholes and cable percussive boreholes situated across the rural fields with regular sampling and laboratory analysis	BH206 & WS367 - WS370
	Maddoxford Farm - Windowless sampler boreholes and cable percussive boreholes situated across the rural fields with regular sampling and laboratory analysis	BH210 & WS330 - WS334, WS338 - WS340, WS345 - WS364, WS371 - WS375
Fuel pipelines	*Groundwater* - Boreholes drilled on either side of the pipelines with groundwater/ground gas monitoring standpipes installed	BH207 & BH210
	Soil - Boreholes drilled on either side of the pipelines with regular sampling and laboratory analysis. Boreholes were located outside of the no-dig exclusion easement.	BH207 & WS334, WS335, WS337, WS338, WS341, WS343, WS353, WS354, WS358, WS359, WS361, WS362
Former on-site quarry	*Ground Gases* - Boreholes drilled within and adjacent to the area of historic mineral extraction with groundwater/ground gas monitoring standpipes installed within selected boreholes and a GasClam used to monitor ground gas concentrations	BH207 & WS333, WS371, WS372
	Soil - Boreholes drilled within and adjacent to the area of historic mineral extraction with regular sampling and laboratory analysis	BH207 & WS330 - WS333, WS371 - WS375
Former off-site quarry	Borehole with a groundwater/ground gas monitoring standpipe installed at nearest exploratory location to this off-site feature	BH210

Table 4.1 Summary of Environmental Investigation Strategy

Geotechnical Area of Concern	Investigation	Positions
Areas of proposed new building	Boreholes and trial pits under/near areas of the proposed buildings, coupled with sampling and laboratory analysis	All
Groundwater level	Standpipes installed within window sampler and cable percussive boreholes across the site with regular return monitoring visits	BH201 - BH210 & WS205, WS293, WS333, WS348, WS365, WS371, WS372
Pumping main structures	Boreholes drilled to 15m in proximity to proposed structures with regular sampling, in situ testing and appropriate geotechnical testing	BH203 & BH207
Drainage	Full scale soakage test in accordance with BRE 365 undertaken in trial pits and preliminary falling head soakage tests within window sampler boreholes	TP1 - TP15 & WS201, WS206, WS234, WS241, WS246, WS265, WS274, WS278, WS283, WS297, WS300, WS302, WS305, WS330, WS340, WS342, WS345, WS363, WS368, WS369
Earthworks	Trial pits to obtain appropriate bulk samples for earthworks suitability testing	TP101, TP103, TP105, TP107, TP109, TP111, TP113, TP115
New hardstandings	Dynamic Cone Penetrometer Tests undertaken to provide equivalent CBR values for the subgrade	BH204, BH205, BH207, BH209 & TP104, TP106, TP107, TP108, TP109, TP110, TP112, TP113, TP114, TP115, WS205, WS207, WS208, WS210, WS211, WS217, WS219 - WS221, WS223 -WS225, WS227, WS229, WS230, WS232, WS234 - WS238, WS240, WS241, WS244 - WS246, WS248 - WS251, WS253 - WS255, WS258, WS261, WS262, WS264 - WS276, WS268 - WS274, WS276, WS277, WS279 - WS286, WS288, WS290 - WS293, WS298 - WS300, WS301 - WS303, WS305, WS306, WS309, WS314, WS315, WS317 - WS320, WS322, WS325 - WS329, WS336, WS338 - WS342, WS344, WS345, WS347, WS350, WS352, WS353, WS355, WS356, WS358, WS361, WS364

Table 4.2 Summary of Geotechnical Investigation Strategy

4.3 Geotechnical Testing & Rationale

Table 4.3 summarised the geotechnical laboratory testing undertaken in order to assess the geotechnical properties of the soils to aid foundation design and concrete specification.

Geotechnical Test	Rationale
Undrained Triaxial Testing	U100 samples obtained from the boreholes were scheduled for undrained triaxial testing in order to provide the geotechnical parameters for pile designs
Oedometer Test	An oedometer test was undertaken on a U100 sample from BH203 in order to assess the consolidation and swelling properties of the London Clay in an area where a deep pumping station structure is proposed
Compaction Testing	Compaction tests undertaken on soils from each of the encountered formations in order to assess properties and suitability for earthworks
Atterberg Limit	Assess volume change potential of more cohesive soil to aid the design of foundations
pH & Sulphate	Assess aggressivity of soil to building materials.
Particle Size Distribution	Assess soil grading to aid fill classification for earthworks

Table 4.3: Summary of Geotechnical Investigation Strategy

4.4 Geochemical Testing & Rationale

In order to assess the general chemical quality of the strata encountered, samples of soils recovered from the exploratory holes were submitted for analysis for a range of potential contaminants selected on the basis of the findings of the desk study and supported by the joint National House Building Council (NHBC), Environment Agency (EA) and Chartered Institute of Environmental Health (CIEH) publication, '*Guidance for the Safe Development of Housing on Land Affected by Contamination*' (2008).

Soil samples were placed into plastic containers for general inorganic analysis and into amber jars for organic analysis. Samples were stored in temperature controlled conditions from sampling until receipt at the laboratory from which time sample preparation and storage was determined by testing requirements and in line with the laboratory's protocols.

Stratum	Suite	No. of Samples Anlaysed
Topsoil	GESL/3 (heavy metals, inorganics, TPH, speciated PAH and asbestos screen.	64
	Speciated TPH with RBCA Banding	18
	Pesticides	20
	BS3882 Topsoil Suite	5
Made Ground	GESL/3 (heavy metals, inorganics, TPH, speciated PAH and asbestos screen.	15
	Speciated TPH with RBCA Banding	10
Natural Soils	GESL/3 (heavy metals, inorganics, TPH, speciated PAH and asbestos screen.	9
	Speciated TPH with RBCA Banding	2

Table 4.4: Summary of Geochemical Testing

In addition to the chemical analysis undertaken on the soil samples, groundwater samples obtained from the standpipes were also scheduled for laboratory analysis for a broad range of potential contaminants of concern. Due to some standpipes being dry, only seven samples were analysed.

4.5 Surveying & Utility Clearance

A specialist survey company was commissioned to survey each exploratory hole location to record X, Y and Z data referenced to the National Grid. In addition, any position in close proximity to one of the major services crossing the site (gas/oil pipelines, water mains and drainage) was further scanned for services and or the nearby service was traced to ensure the position was clear for excavation. Fisher German, were also contacted and visited the site to witness the locations of any exploratory holes within close proximity to the oil and gas pipelines prior to their excavation.

4.6 Ground Gas and Groundwater Monitoring

Six return monitoring visits were planned at weekly intervals in order to record ground gas concentrations in the standpipes installed the boreholes, together with the depth of any water. During the first monitoring visit the borehole standpipes that contained groundwater were purged and groundwater samples obtained for laboratory analysis. A GasClam was installed in borehole WS333 during the second visit and subsequently moved to BH210 during the third monitoring visit before being recovered during the fourth visit.

At the time of preparing this report four of the six visits had been completed.

5.0 ENCOUNTERED CONDITIONS

A factual record of the conditions encountered during the physical investigation of the site is presented in the following sections. The exploratory hole locations are shown on Figure 3.

The physical ground investigation works were undertaken during September 2013. Laboratory testing was undertaken by a UKAS and MCERTs accredited laboratory.

Unless stated otherwise, all depths are reported as metres below ground level (mbgl).

5.1 Soils

The investigation confirmed the anticipated ground conditions of River Terrace Deposits, Wittering Formation and London Clay Formation, beneath a thin mantle of Topsoil and variable thickness of Made Ground.

Topsoil was encountered within all locations to depths of between 0.15mbgl and 0.45mbgl and generally comprised dark brown sandy silt, sandy clay and clayey sand with occasional gravel.

Generally, the natural geology was encountered immediately beneath the Topsoil, though limited thicknesses of Made Ground were encountered across the golf course and appeared to be reworked soils used to profile the fairways. Tees and Greens were not investigated during this investigation due to the golf course remaining open, however it is anticipated that these will be artificial features built in accordance with normal golf course construction practices. At the north western end of the site there were two areas of deeper Made Ground which were associated with a screening bund on the eastern side of the driving range, and an artificial mound to the east of the green keeper's compound. The bund was found to comprise silty clay, silty sand, clayey sand and chalk with varying proportions of gravel composed of flint. The Made Ground of the bund was also noted to contain entrained brick and concrete ranging between gravel and cobble size. The mound to the east of the green keeper's compound identified a 5.10m thickness of Made Ground composed of clayey sand and sandy clay with varying proportions of gravel comprising brick and flint.

A deeper area of Made Ground was also identified at the western end of the site associated with an area of former mineral extraction. Boreholes in this area identified Made Ground to a maximum depth of 2.00mbgl (WS374). The Made Ground in this area comprised sandy gravelly clay, clayey sand, sand clay, and sand and gravel. The exception was WS275 where some plastic sheeting and carbonaceous fragments were recorded within the Made Ground.

River Terrace Deposits were encountered at the south-eastern end of the site and generally comprised a superficial horizon of low to high strength sandy clay, with varying proportions of flint gravel. This in turn was underlain by medium dense to dense gravel. The gravel was composed of fine to coarse sub-angular to sub-rounded flint.

The soils of the Wittering Formation were generally encountered beneath the Topsoil and any Made Ground beneath the northern, southern and eastern parts of the site. The Wittering Formation was also encountered beneath the River Terrace Deposits in the south-eastern part of the site. The Wittering Formation generally comprised a variable thickness of medium to high strength silty or sandy clay underlain by medium dense to very dense silty fine sand. Occasional thin lignite bands were also present within the more cohesive parts of the Wittering Formation. The thickness of the Wittering Formation exceeded 2m throughout the central spine of the site, along the northern and north-eastern boundaries.

Soils that most closely resembled London Clay Formation were encountered in the north-west, west and parts of the centre of the site. The clays of the London Clay Formation and Wittering Formation were difficult to distinguish as lithologically they were very similar. Therefore, for the purposes of this report the more cohesive soils encountered beneath the north-west of the site have been classified as London Clay Formation on account of their similar geotechnical results. Regardless, the engineering properties of the London Clay Formation and cohesive parts of the Wittering Formation across the development area are similar.

For further details of the ground conditions encountered, reference should be made to the exploratory hole logs and lines of section presented in Appendix B and Figure 4, respectively.

5.2 In-situ Testing

5.2.1 Standard Penetration Tests

Standard Penetrations Tests were undertaken in order to assess the relative density/consistency of the soils encountered.

The inferred geotechnical properties for the solid geology based on correlations by Stroud and Butler1975, Bowles 1982,Terzaghi and Peck 1948, and Peck, Hansen and Thirburn 1974are presented in Table 5.1.

Stratum	Equivalent SPT N Value Range	Correlation	Strength Parameters	
			Cu (kPa)	Phi (degrees)
Cohesive Terrace Deposits	9-12	Terzaghi & Peck	50	0
Granular River Terrace Deposits	26-31	Peck, Hansen, Thorburn	N/A	35-36
Cohesive Wittering Formation	6-26	Terzaghi & Peck	40-170	0
Granular Wittering Formation	18-58	Peck, Hansen, Thorburn	0	33-38
London Clay Formation	11-32	Terzaghi & Peck	50-144	0

Table 5.1: Summary of Soil Strength Parameters

Stratum	Equivalent SPT N Value Range	Correlations	Settlement/Consolidation	
			Young's Modulus (MPa)	Coefficient of Volume Change (m^2/MN)
Cohesive Terrace Deposits	9-12	Stroud & Butler	N/A	0.25
Granular River Terrace Deposits	26-31	Bowles	17-18	N/A
Cohesive Wittering Formation	6-26	Stroud & Butler	N/A	0.07-0.20
Granular Wittering Formation	18-58	Bowles	16-25	N/A
London Clay Formation	11-32	Stroud & Butler	N/A	0.03-0.10

Table 5.2: Summary of Settlement & Consolidation Parameters

Plots of SPT N values vs level (mAOD) and depth (mBGL) are presented in Figures 5 and 6 respectively.

5.2.2 Dynamic Cone Penetrometer Probes

Dynamic cone penetrometer equipment was used to obtain equivalent CBR vs depth profiles across the proposed development area. The DCPs were undertaken adjacent to windowless sampler, trial pit or cable percussion positions and were referenced accordingly. The results of the 100 DCP tests are summarised in Table 5.3.

Stratum	CBR %
Made Ground	6-49%
River Terrace Deposits	4-31%
Cohesive Wittering Formation	2-53%
Granular Wittering Formation	4-101%
London Clay	4-55%

Table 5.3: Summary of DCP Results

For further details of the results reference should be made to the DCP Layer Strength Analysis Report in Appendix C.

5.2.3 Soakage Testing

Full scale soakage tests in accordance with BRE Digest 365 were undertaken in TP101-TP115 at a depth of 3.00mbgl within the various strata encountered. Each test was performed three times except in the rare instances where no recordable head loss was recorded during the first "run". Table 5.4 summarises the findings:

Stratum	Infiltration Rates (m/s)	Trial Pits
River Terrace Deposits	$2.8x10^{-5}$	TP114
Cohesive Wittering Formation	$1.9x10^{-6}$ – $7.5 x 10^{-6}$	TP101, TP102, TP103,TP106, TP107, TP109, TP111, TP112, TP115
Granular Wittering Formation	$1.3x10^{-5}$ – $2 x10^{-5}$	TP104, TP105, TP108
London Clay Formation	$3.3x10^{-6}$ (No result calculated for TP113 – too slow)	TP110 & TP113

Table 5.4: Summary of Soil Infiltration Tests at 3mbgl

Adjacent to each of the above locations a separate shallow trial pit (1mbgl) was excavated in order to undertake a separate full scale soakage test in accordance with BRE Digest 365. These tests were also undertaken three times at each location. The results are summarised in Table 5.5.

Stratum	Infiltration Rates (m/s)	Trial Pits
River Terrace Deposits	$7.7x10^{-6}$	TP114
Cohesive Wittering Formation	$1.8x10^{-6}$ – $7.7x10^{-6}$, (No result calculated for TP101 – too slow)	TP101, TP102, TP103, TP104, TP106, TP107, TP109, TP111, TP112, TP115
Granular Wittering Formation	$1.4x10^{-5}$– $2 x10^{-5}$	TP105, TP108,
London Clay Formation	$1.7x10^{-6}$ – $8.4x10^{-6}$	TP110 & TP113

Table 5.5: Summary of Soil Infiltration Tests at 1mbgl

In addition, falling head permeability tests were undertaken in a series of boreholes, as summarised in Table 5.6.

Position	Preliminary Infiltration Rate (m/s)	Geological Stratum
WS201	$3.2 x 10^{-6}$	London Clay Formation
WS206	$6.9 x 10^{-6}$	Wittering Formation (Sand & Clay bands)
WS234	$2.5 x 10^{-5}$	Wittering Formation (Sand)
WS241	$1.2 x 10^{-5}$	Wittering Formation (Sand)
WS246	$9.3 x 10^{-6}$	Wittering Formation (Sand & Clay bands)
WS265	$9.1 x 10^{-6}$	Wittering Formation (Clay)
WS268	Insufficient drop in head (20mm over 60mins)	London Clay Formation
WS269	$6.0 x 10^{-6}$	London Clay Formation
WS274	$7.1 x 10^{-6}$	Wittering Formation (Sand & Clay bands)
WS278	$6.5 x 10^{-6}$	London Clay Formation
WS283	$9.1 x 10^{-6}$	Wittering Formation (Sand)
WS297	$5.4 x 10^{-6}$	London Clay Formation
WS300	$7.5 x 10^{-6}$	London Clay Formation
WS302	$9.8 x 10^{-6}$	Wittering Formation (Sand)
WS305	$5.9 x 10^{-5}$	Wittering Formation (Sand & Clay bands)
WS330	$4.0 x 10^{-6}$	Wittering Formation (Sand)
WS340	$5.6 x 10^{-6}$	River Terrace Deposits
WS342	$9.8 x 10^{-6}$	Wittering Formation (Sand)
WS345	$2.0 x 10^{-5}$	Wittering Formation (Sand)
WS363	$8.4 x 10^{-6}$	Wittering Formation (Sand)

Table 5.6: Preliminary Infiltration Rates (Falling Head Soakage Tests)

For further details, reference should be made to the results presented in Appendix D.

5.3 Groundwater

Groundwater was encountered in some of the exploratory holes during the fieldwork. The locations of exploratory holes where groundwater was recorded during drilling are presented below, and highlighted in blue. In general, groundwater strikes were recorded in the exploratory holes drilled nearest to the northern and eastern boundaries i.e. those positions nearest to the River Hamble. Groundwater was also encountered in the majority of positions within the southern part of the site which was lower lying.



The figure below details the boreholes where groundwater was encountered at a depth shallower than 2mbgl.



In addition, post fieldwork monitoring within wells installed in each cable percussion borehole and in selected windowless sampler boreholes is presented in Table 5.7.

Location	Groundwater depth (m bgl)			
	03/10/2013	10/10/2013	17/10/2013	24/10/2013
BH201	3.45	3.45	3.56	3.60
BH202	Dry	Dry	Dry	Dry
BH203	0.88	0.89	0.74	0.64
BH204	2.72	2.78	2.70	2.64
BH205	Dry	Dry	Dry	Dry
BH206	2.30	2.40	2.19	2.07
BH207	3.19	3.20	3.18	3.13
BH208	Dry	4.01	Dry	Dry
BH209	Dry	Dry	Dry	Dry
BH210	3.72	3.80	3.80	-
WS205	Dry	Dry	1.09	Dry
WS293	0.60	Dry	1.42	1.35
WS333	Dry	3.15	-	3.15
WS348	1.42	1.50	1.43	1.36
WS365	2.75	1.04	1.09	1.05

Table 5.7: Groundwater depths recorded in standpipes

The monitoring results are presented in Appendix E.

Groundwater monitoring within wells installed in the boreholes, and referenced as elevations (m AOD), has indicated a hydraulic gradient falling from west to east or southeast, i.e. in general accordance with surface water flow across the site and towards the River Hamble.

It should be noted that changes in groundwater levels do occur for a number of reasons including effects and variations in drainage. Such fluctuations may only be recorded by the measurement of the groundwater level within a standpipe or piezometer installed within appropriate response zones. Changes in groundwater level can have a direct effect on excavation stability and the more cohesive soils can soften under rising or high groundwater levels.

5.4 Ground Gases

Ground gas monitoring was undertaken as part of the investigation. The monitoring undertaken comprised spot sampling/measurement within thirteen standpipes on six occasions and a period of continuous gas monitoring using an in-well probe (GasClam) within WS333 and BH210.

To date, four of the monitoring visits have been completed. The atmospheric pressure during the visits has ranged between 1003mb and 1022mb. No detectable methane concentrations have been identified in any of the wells. Carbon dioxide concentrations ranged between 0.0% and 5.4%, although 5% was only exceeded in WS205 on one occasion. Oxygen concentrations ranged between 7.7% and 21.3%, with the minimum oxygen concentration in BH205. Flow rates have ranged between 0.0l/hr and 2.2l/hr.

Continuous gas monitoring was undertaken in WS333 during the second and third week and in BH210 over the third to fourth week. These locations were agreed with the Local Authority's Environmental Health Officer based on the Conceptual Model for the site. The continuous monitoring was undertaken using a GasClam in-well probe to take a measurement at one hour intervals over a period of a week. This enabled the recovery of gas concentrations and related data over a period of changing atmospheric conditions.

The continuous monitoring undertaken in WS333 and BH210 recorded no detectable concentrations of methane and a maximum carbon dioxide concentration of 2.6%. Oxygen concentrations were generally within the range of 15.1% and 20.4%. Atmospheric pressures over the monitoring period fluctuated between 989mb and 1017mb. Plots of key data from the continuous monitoring are presented as Figures 9 and 10.

Fluctuations in atmospheric and borehole pressures can result in significant variances in the gas concentrations detected. Current best practice looks wherever possible not only to target low pressure, i.e. <1000mb, but also periods of rapidly falling pressure as this can also facilitate the release of key hazardous gases. The dataset indicated that monitoring from both positions included times of rapid falls in atmospheric pressure. Thus the monitoring period included atmospheric conditions which best practice indicates should be targeted.

Carbon dioxide concentrations in WS333 remained steady at 1% during the monitoring period. In BH210 the carbon dioxide concentrations were shown to increase with falling pressure, albeit not to any harmful extent.

Oxygen concentrations within both locations rose and fell with pressure trends. The lowest oxygen concentrations were recorded at the time of the lowest pressures and thus the highest concentrations of carbon dioxide.

The results from the continuous gas monitoring appear to indicate that hazardous gas concentrations are sensitive to atmospheric pressure, with possible pressure pumping occurring such that gas concentrations appear to pulse in the ground.

The implications of the gas monitoring data are considered in Section 6 of this report.

For further details, reference should be made to the land gas assessment sheet and GasClam datasets in Appendix E

5.5 Obstructions

No obstructions were encountered during the intrusive investigation. However, the some windowless sampler boreholes terminated prematurely within more dense granular soils.

5.6 Soil Geochemical Analysis

A summary of the geochemical test results undertaken on the soil samples is presented for principal strata types in Tables 5.8 (Topsoil), 5.9 (Made Ground) and 5.10 (Natural Soils).

Determinand	Minimum (mg/kg)	Maximum (mg/kg)
Arsenic	5.1	62.7
Cadmium	<1	<1
Chromium	9.5	44.2
Lead	7.9	142.1
Mercury	<0.5	0.9
Nickel	1.9	13.2
Copper	4.3	58.8
Zinc	5.3	108
Selenium	0.5	10.6
Chromium VI	<2	<2
Barium	12.0	368.8
Beryllium	<1	<1
Vanadium	15.1	70.0
Naphthalene	<0.1	0.1
Acenapthylene	<0.1	0.1
Acenapthene	<0.1	0.2
Fluorene	<0.1	0.1
Phenanthene	0.2	0.8
Anthracene	<0.1	0.2
Fluoranthene	<0.1	1.0
Pyrene	<0.1	0.9
Benz(a)anthracene	<0.1	0.7
Chrysene	<0.1	0.8
Benzo(b)fluoranthene	<0.1	0.8
Benzo(k)fluoranthene	<0.1	0.6
Benzo(a)pyrene	<0.1	0.7
Indeno(123-cd)pyrene	<0.1	0.7
Dibenz(ah)anthracene	<0.1	0.2
Benzo(ghi)perylene	<0.1	0.5
Phenol	1.3	7.6
TPH	7.0	23.8

Table 5.8: Summary of Geochemical Test Results for Topsoil

Determinand	Minimum (mg/kg)	Maximum (mg/kg)
Arsenic	10.9	
Cadmium	<0.5	<5
Chromium	6.6	37.0
Lead	6.2	527.6
Mercury	<0.5	<0.5
Nickel	5.8	11.4
Copper	3.5	13.8
Zinc	22.9	128.7
Selenium	<0.5	9.4
Chromium VI	<2	<2
Barium	15.4	3.4
Beryllium	<1	59.8
Vanadium	11.9	61.2
Naphthalene	<0.1	3.6
Acenapthylene	<0.1	1.6
Acenapthene	<0.1	4.3
Fluorene	<0.1	3.1
Phenanthene	<0.1	22.1
Anthracene	<0.1	7.9
Fluoranthene	<0.1	35.3
Pyrene	<0.1	29.1
Benz(a)anthracene	<0.1	18.8
Chrysene	<0.1	19.0
Benzo(b)fluoranthene	<0.1	16.7
Benzo(k)fluoranthene	<0.1	16.0
Benzo(a)pyrene	<0.1	18.9
Indeno(123-cd)pyrene	<0.1	14.1
Dibenz(ah)anthracene	<0.1	3.4
Benzo(ghi)perylene	<0.1	13.4
Phenol	<1	1.2
TPH	<5	44.2

Table 5.9: Summary of Geochemical Test Results for Made Ground

Determinand	Minimum (mg/kg)	Maximum (mg/kg)
Arsenic	<5-	14.4
Cadmium	<0.5	<0.5
Chromium	11.2	51.4
Lead	7.8	45.1
Mercury	<0.5	<0.5
Nickel	7.8	8.6
Copper	2.8	16.5
Zinc	4.9	64.4
Selenium	<0.5	6.8
Chromium VI	<2	<2
Barium	14.4	53.1
Beryllium	<1	<1
Vanadium	18.1	68.4
Naphthalene	<0.1	<0.1
Acenapthylene	<0.1	<0.1
Acenapthene	<0.1	<0.1
Fluorene	<0.1	<0.1
Phenanthene	<0.1	<0.1
Anthracene	<0.1	<0.1
Fluoranthene	<0.1	0.2
Pyrene	<0.1	0.2
Benz(a)anthracene	<0.1	0.1
Chrysene	<0.1	0.2
Benzo(b)fluoranthene	<0.1	0.3
Benzo(k)fluoranthene	<0.1	0.4
Benzo(a)pyrene	<0.1	0.3
Indeno(123-cd)pyrene	<0.1	0.4
Dibenz(ah)anthracene	<0.1	0.2
Benzo(ghi)perylene	<0.1	0.4
Phenol	<1	0.2
TPH	<5	6.7

Table 5.10: Summary of Geochemical Test Results for Natural Soils

5.7 Groundwater Geochemical Analysis

A summary of the geochemical test results undertaken on groundwater samples is presented in Table 5.11.

Determinand	Minimum (ug/l)	Maximum (ug/l)
Arsenic	<5	<5
Cadmium	<1	<1
Chromium	<5	<5
Lead	<1	<1
Mercury	<0.1	<0.1
Nickel	1	10
Copper	<5	10
Zinc	6	39
Selenium	<5	95
Barium	7	82
Beryllium	<5	<5
Vanadium	<5	<5
Naphthalene	0.12	0.27
Acenapthylene	0.01	0.04
Acenapthene	0.01	0.02
Fluorene	0.03	0.06
Phenanthene	0.10	0.22
Anthracene	0.04	0.10
Fluoranthene	0.06	0.13
Pyrene	0.04	0.09
Benz(a)anthracene	<0.01	0.04
Chrysene	<0.01	0.06
Benzo(b)fluoranthene	<0.01	0.05
Benzo(k)fluoranthene	<0.01	0.02
Benzo(a)pyrene	<0.01	0.02
Indeno(123-cd)pyrene	<0.01	0.03
Dibenz(ah)anthracene	<0.01	0.00
Benzo(ghi)perylene	<0.01	0.05
Phenol	<0.5	<0.5
TPH	130	2106

Table 5.11: Summary of Geochemical Test Results for Groundwater

For full details of the chemical test results reference should be made to the laboratory report in Appendix F.

5.8 Geotechnical Testing

Soil samples were selected for geotechnical testing depending on the proposed end use of the given area. The main elements of geotechnical testing were:

- Strength/stiffness profiling (in-situ testing)
- Pavement design (CBR value, classification)
- Material classification for earthworks
- Foundations (incl. settlement and soft ground engineering)
- Aggressive ground conditions

The results of the geotechnical testing are separated and presented in Table 5.12-5.16 into the key strata encountered, i.e. River Terrace Deposits, Wittering Formation, London Clay Formation. The geotechnical properties for the Wittering Formation and River Terrace Deposits are further divided between more granular and cohesive deposits.

Characteristic/Parameter	Laboratory Value
Plasticity Index (%)	17 – 40
Modified Plasticity Index (%)	9 – 36
Volume Change Potential [NHBC]	None to medium (*en masse Medium)*
Water Content (%)	12 – 22
pH	7.0 – 7.7
Water soluble sulphate (g/ℓ)	0.13 – 0.45

Table 5.12: Geotechnical test results for Cohesive River Terrace Deposits
NOTE: Values are given for the full data range and should be reassessed for individual development or construction areas.

Characteristic/Parameter	Laboratory Value
Plasticity Index (%)	15 – 22
Modified Plasticity Index (%)	5 – 7
Volume Change Potential [NHBC]	None
Water Content (%)	10 – 14
pH	7.0
Water soluble sulphate (g/ℓ)	0.02

Table 5.13: Geotechnical test results for Granular River Terrace Deposits
NOTE: Values are given for the full data range and should be reassessed for individual development or construction areas

Characteristic/Parameter	Laboratory Value
Plasticity Index (%)	9 - 58
Modified Plasticity Index (%)	9 - 58
Volume Change Potential [NHBC]	None to High (*en masse Medium*)
Water Content (%)	12 - 47
pH	7.0 – 7.7
Water soluble sulphate (g/ℓ)	0.07 - 0.78
Undrained shear strength (kN/m^2) [from triaxial tests]	47 - 156
Bulk Density (Mg/m^3)	1.70 - 2.09
Dry Density (Mg/m^3)	1.26 - 1.73
Maximum Dry Density (Mg/m^3)	1.61 - 1.80 (1.38)*
Optimum Water Content (%)	16 - 22 (34)*

Table 5.14: Geotechnical test results for Cohesive Wittering Formation
NOTE: Values are given for the full data range and should be reassessed for individual development or construction areas
*Anomalous result from TP111

Characteristic/Parameter	Laboratory Value
pH	7.0 – 7.5
Water soluble sulphate (g/ℓ)	0.11 - 0.49
Maximum Dry Density (Mg/m^3)	1.61
Optimum Water Content (%)	20

Table 5.15: Geotechnical test results for Granular Wittering Formation
NOTE: Values are given for the full data range and should be reassessed for individual development or construction areas

Characteristic/Parameter	Laboratory Value
Plasticity Index (%)	39 - 62
Modified Plasticity Index (%)	39 - 62
Volume Change Potential [NHBC]	Medium to High (*en masse High*)
Water Content (%)	22 - 38
pH	7.2 - 7.7
Water soluble sulphate (g/ℓ)	0.14 - 0.97
Undrained shear strength (kN/m^2) [from triaxial tests]	51 - 191
Coefficient of Compressibility (m^2/MN)	0.021 - 0.133
Coefficient of Consolidation (m^2/yr)	1.02 - 2.08
Bulk Density (Mg/m^3)	1.87 - 2.02
Dry Density (Mg/m^3)	1.40 - 1.66
Maximum Dry Density (Mg/m^3)	1.80
Optimum Water Content (%)	17

Table 5.16: Geotechnical test results for London Clay Formation
NOTE: Values are given for the full data range and should be reassessed for individual development or construction areas

For full details of the geotechnical test results reference should be made to the laboratory report in Appendix G.

6.0 ENGINEERING CONSIDERATIONS

Although it is likely that the development will progress in a number of phases, the geotechnical assessment of the development areas has been indicatively zoned on the basis of the ground conditions and foundation recommendations. The site has been divided into four zones and is based on the ground conditions encountered in the top 2m. In some areas of the site, near surface clays are underlain at depth by more granular soils and for any detailed foundation design reference should be made to the exploratory hole records and associated geotechnical results.

- Potential Deeper Made Ground (excluding tees and greens)
- Cohesive River Terrace Deposits & Wittering Formation (Medium Volume Change Potential)
- Granular Wittering Formation & River Terrace Deposits (Non Shrinkable)
- London Clay Formation (High Volume Change Potential)

These zones are identified on Figure 11. However, it should be noted that Figure 11 does not take account of significantly higher foundation loadings and thus where more heavily loaded foundations are required an alternative such as piled foundations may be more appropriate.

6.1 Foundations

6.1.1 Cohesive River Terrace Deposits & Wittering Formation

Based on the ground and groundwater conditions encountered in the exploratory holes, shallow foundations are considered suitable for use on firm to stiff soils of the River Terrace Deposits and Wittering Formation. On the basis of the information gathered from the ground investigation, a net allowable bearing capacity of 125kPa has been calculated for these soils in order to maintain settlements within tolerable limits. Foundations should be no less than 450mm in width.

Geotechnical laboratory testing has shown the more cohesive parts of the Wittering Formation to range between non-shrinkable and high volume change potential whilst the River Terrace Deposits ranged between non-shrinkable and medium volume change potential. This may give an opportunity to further sub-divide the 'foundation zones' into areas for the various volume change potentials although at this stage it is recommended that the medium volume change potential is assumed for these strata at this stage.

This could be reviewed on a plot specific basis if data exist for that plot or zone of plots. Thus it is recommended that shallow foundations terminate within the firm to very stiff cohesive soil of the River Terrace Deposits or Wittering Formation at a minimum depth of 0.9m bgl. Foundations should pass through disturbed ground, and the like, or any root zones and terminate wholly within the River Terrace Deposits/Wittering Formation. Within the zone of moisture demand of any current, proposed or recently felled trees foundation depths should be deepened in accordance with the NHBC Standards, Chapter 4.2. Where calculated foundation depths exceed 1.50m on account of trees, heave precaution measures will be required in accordance with the NHBC Standards. Where calculated foundation depths exceed 2.50m, they will be required to be designed by a structural engineer. Alternatively, piled foundations may be more appropriate in such circumstances.

Should foundations span both cohesive and non-cohesive parts of the formations, provision should be made for reinforcement of the foundations across the transition zone.

The shallow foundation zones have considered the presence and depth of groundwater based on available monitoring data. On this basis, it is unlikely that groundwater would be encountered in

foundation excavations. However, as stated previously, groundwater levels do change over time and so verification may be required prior to construction. It is considered that minor ingress, e.g. seepages, could be controlled by sump pumping or similar. Heavier inflow may require alternative drainage, groundwater control or foundations to be used.

Foundation excavations should be concreted or blinded as soon after excavation as possible. Where concreting could take place the following day it is recommended that excavations are not taken to full depth overnight and that the final 0.5m of cover is only removed immediately prior to concreting.

6.1.2 London Clay Formation

Based on the ground and groundwater conditions encountered in the exploratory holes, shallow foundations are considered suitable for use on firm to stiff soils of the London Clay Formation. On the basis of the information gathered from the ground investigation, a net allowable bearing capacity of 125kPa has been calculated for these soils in order to maintain settlements within tolerable limits. Foundations should be no less than 450mm in width.

Geotechnical laboratory testing has shown the London Clay Formation to range between medium and high volume change potential. However, en masse it is recommended that the London Clay Formation is classified as High volume change potential. On this basis, a minimum foundation depth of 1.0m bgl is recommended. Foundations should pass through disturbed ground, and the like, or any root zones and terminate wholly within the London Clay. Within the zone of moisture demand of any current, proposed or recently felled trees foundation depths should be deepened in accordance with the NHBC Standards, Chapter 4.2. Where calculated foundation depths exceed 1.50m on account of trees, heave precaution measures will be required in accordance with the NHBC Standards. Where calculated foundation depths exceed 2.50m, they will be required to be designed by a structural engineer. Alternatively, piled foundations may be more appropriate in such circumstances.

The shallow foundation zones have considered the presence and depth of groundwater based on available monitoring data. On this basis, it is unlikely that groundwater would be encountered in foundation excavations. However, as stated previously, groundwater levels do change over time and so verification may be required prior to construction. It is considered that minor ingress, e.g. seepages, could be controlled by sump pumping or similar. Heavier inflow may require alternative drainage, groundwater control or foundations to be used.

Foundation excavations should be concreted or blinded as soon after excavation as possible. Where concreting could take place the following day it is recommended that excavations are not taken to full depth overnight and that the final 0.5m of cover is only removed immediately prior to concreting.

6.1.3 Granular River Terrace Deposits & Wittering Formation

Based on the ground and groundwater conditions encountered in the exploratory holes, shallow foundations are considered suitable for use on medium dense to dense granular soils of the River Terrace Deposits and Wittering Formation. On the basis of the information gathered from the ground investigation, a net allowable bearing capacity of 200kPa has been calculated for these soils in order to maintain settlements within tolerable limits. Foundations should be no less than 450mm in width.

Based on the geotechnical laboratory the granular soils may be deemed non-shrinkable in accordance with the NHBC Standards, Chapter 4.2. On this basis, a minimum foundation depth of 0.70m bgl is recommended. Foundations should pass through disturbed ground, and the like, or any superficially more clayey soils and terminate wholly within the granular River Terrace Deposits and Wittering Formation.

The shallow foundation zones have considered the presence and depth of groundwater based on available monitoring data. On this basis, it is unlikely that groundwater would be encountered in foundation excavations. However, as stated previously, groundwater levels do change over time and so verification may be required prior to construction. It is considered that minor ingress, e.g. seepages, could be controlled by sump pumping or similar. Heavier inflow may require alternative drainage, groundwater control or foundations to be used.

Foundation excavations should be concreted or blinded as soon after excavation as possible. Where concreting could take place the following day it is recommended that excavations are not taken to full depth overnight and that the final 0.5m of cover is only removed immediately prior to concreting.

6.2 Ground Floor Slabs

The ground conditions across the site vary from high volume change potential clays to non-shrinkable granular deposits. However, even in areas of the more granular soils, there is the potential for an overlying superficial band of more cohesive soils. On this basis, it is recommended that suspended ground floor slabs be adopted throughout the development.

6.3 Piled Foundations

In some areas of the proposed development calculated foundation depths on account of trees and shrinkable soils may be such that an alternative foundation solution is required. Based on the ground and groundwater conditions, piled foundations are likely to be the preferred alternative.

The construction of a piled foundation is a specialist job and the advice of a reputable local contractor familiar with the type of ground and groundwater conditions encountered on this site should be sought prior to finalising the design. The actual working load for proposed piles will depend on the particular type of pile and method of installation adopted.

Piles should be taken at least five times the pile diameter into the founding strata. The construction of piles on the site could create vertical migration pathways and as such any piling solution on this site should take due account of the contamination assessment and the findings thereof.

6.3.1 London Clay Formation

Preliminary load capacities calculated for varying diameters of bored piles taken into the London Clay Formation are given in Table 6.1. The design should be used for preliminary purposes only as the actual working load is dependent on the type of pile and method of installation.

Pile Type	Diameter (mm)	Depth (mbgl)	Working Load (kN)
Bored	300	10	100
	450	10	170
	600	10	250
Bored	300	12	140
	450	12	230
	600	12	330

Table 6.1 – Preliminary Working Loads for Piles in London Clay Formation

These working loads have been calculated on the basis of the ground and groundwater conditions encountered within the boreholes where London Clay Formation was encountered from near ground level and assume the following:

- The contribution to the working load through the upper 3m of ground has been ignored.
- A factor of safety of 3 was used on the skin friction and end bearing working loads respectively. (At this stage an EC7 compliant pile design was not possible as the actions on any new structures were unavailable.

Piles may require sleeving or some alternative form of heave protection measures in order to prevent uplift forces developing on the pile shaft. Ground beams and pile caps should have heave protection measures detailed in accordance with the NHBC Standards.

The bearing values given are applicable to single vertically loaded piles. Where groups of piles are to be constructed, the bearing value of each individual pile should be reduced by a factor of 0.8 and a calculation made to check for the factor of safety against block failure.

6.3.2 Wittering Formation

Preliminary load capacities calculated for varying diameters of CFA piles taken through cohesive Wittering Formation and into the granular Wittering Formation at depth are given in Table 6.2. The design should be used for preliminary purposes only as the actual working load is dependent on the type of pile and method of installation.

Pile Type	Diameter (mm)	Depth (mbgl)	Working Load (kN)
CFA	300	10	120
	450	10	250
	600	10	400
CFA	300	12	180
	450	12	340
	600	12	520

Table 6.2 – Preliminary Working Loads for Piles in Wittering Formation

These working loads have been calculated on the basis of the ground and groundwater conditions encountered within BH202, BH205, BH209 and assume the following:

- The contribution to the working load through the upper 3m of ground has been ignored.

- A factor of safety of 3 was used on the skin friction and end bearing working loads respectively.

Piles may require sleeving or some alternative form of heave protection measures in order to prevent uplift forces developing on the pile shaft. Ground beams and pile caps should have heave protection measures detailed in accordance with the NHBC Standards.

The bearing values given are applicable to single vertically loaded piles. Where groups of piles are to be constructed, the bearing value of each individual piles

The piling contractor should be aware that the boreholes within the Wittering Formation were cased in order to prevent collapse as drilling progressed.

6.4 Excavations

Shallow excavations within any Made Ground are likely to remain relatively stable in the short term. Where any deeper pockets of Made Ground are encountered, these may be prone to instability and collapse, and some form of temporary support may be required.

Both shallow and deeper excavations into the more cohesive soils should remain relatively stable in the short to medium term.

Shallow excavations within the more granular natural soils should remain relatively stable in the short term, though some localised spalling may be anticipated. Longer deeper excavations are likely to become unstable, and will therefore require either battering to a safe angle or some form of temporary support.

All excavations taken beneath the water table are likely to become highly unstable, and require the use of dewatering and temporary support measures.

The need for man entry into excavations should where possible be designed out. However, where this cannot be achieved a full risk assessment should be undertaken and man entry only permitted in accordance with an approved risk assessment, method statement and safe system of work.

6.5 Pavements

Table 6.3 summarises the design CBR values that would be prudent for near surface soils together with their frost susceptibility based on the results of the DCP tests together with reference to Table C1 of the Transport and Road Research Report 1132, 1984. The values assume average construction conditions and a low groundwater table. The values given may require revision if the works are undertaken during wetter periods of the year when poor construction conditions are likely.

Stratum	CBR %	Frost Susceptible
Made Ground	1%	Yes
River Terrace Deposits	3%	Yes
Cohesive Wittering Formation	3%	Yes
Granular Wittering Formation	10%	Yes
London Clay Formation	3%	No

Table 6.3: Summary of DCP Results

It is recommended that the formation level be proof rolled and any soft zones excavated and replaced with suitably compacted engineered granular or chalk fill.

Any hard spots in the formation level such as old foundations may induce reflective cracking in the pavement and allowance should be made for removing any slabs or other hard spots etc. that may be present.

6.6 Sub-Surface Concrete

The results of the Sulphate and pH analyses fell into Class DS1 and DS2 of BRE Special Digest 1. ACEC classes of AC-1 and AC2 were recorded based on the pH results. Based on these results, it would be prudent to assume Class DS-2 and AC2 for design purposes. The advice of this publication should be taken for the design and specification of all sub-surface concrete. It should be noted it may be possible to zone the site once phase boundaries have been established.

6.7 Soakaways

Soakage testing has been undertaken across the site by various means as summarised in section 5.2.3.

The results indicate the soakage potential in parts of the site is likely to be extremely poor and these correspond to the areas underlain by London Clay Formation. Poor soakage was also recorded beneath parts of the site underlain by deeper areas of cohesive Wittering Formation, although there may be the potential in these areas to construct deeper soakaways. Elsewhere, the results were variable and it is likely that a combination of conventional soakaways and some degree of on-site storage will be required, e.g. using swales, detention basins and/or aquacell type storage. Groundwater depths were variable across the site and in some areas, storage capacity could be restricted due to groundwater, e.g. lower lying areas and close to the adjacent river.

In addition, to the use of the solutions above, if any of the current site drains in to the river, there may be some scope for extending the riparian rights to cover the new development (at least in part).

A summary of the soakage test results is presented in Figures 12 and 13.

7.0 QUANTITATIVE RISK ASSESSMENT

7.1 Introduction

A Generic Quantitative Risk Assessment (GQRA) has been undertaken in accordance with CLR11. A GQRA may involve either direct comparison of soil and ground gas results with generic assessment criteria appropriate to the SPR linkage being assessed or comparison following statistical analysis depending on whether a targeted or non-targeted sampling strategy was adopted.

7.2 Human Health

7.2.1 End Users

The presence of a possible contaminant does not necessarily imply that a site or area is contaminated or that there is any unacceptable risk to human health. A Generic Quantitative Risk Assessment has been undertaken in accordance with CLR11, in order to evaluate any unacceptable risks posed to human health with respect to the proposed use of the site. It should be noted that this assessment is protective of the chronic long-term effects of contaminants, which is also likely to be protective of any possible immediate acute effects.

A quantitative risk assessment has been undertaken by comparing the results of the laboratory chemical testing of shallow soils against Site Specific Assessment Criteria (SSAC) generated using the Contaminated Land Exposure Assessment (CLEA) model v1.06 published by the Environment Agency, or against Generic Assessment Criteria (GAC) for a residential end use with plant uptake (private gardens).

The assumptions made as part of the CLEA v1.06 calculations for a residential end use with plant uptake are presented in Table 7.1.

Assumptions for SSAC Calculation (CLEA v1.06 Software)

	Assumptions			**Comments**
Land Use	Residential with home grown produce			Commensurate with proposed redevelopment.
Receptor	Female (res)			A conservative assumption using the most sensitive possible receptor.
Receptor Age	1 to 6			Critical receptor age from birth to age 6.
Building	Semi-Detached House			A conservative assumption of the private residences proposed.
Soil Type	Silt loam	pH 7.0	SOM 1.0%	Based on an average of the chemical laboratory results.
Exposure Pathways	Oral	Direct soil & dust ingestion; consumption of home grown produce; soil attached to home grown produce		Default setting for land use.
	Dermal	Indoor & outdoor		Default setting for land use.
	Inhalation	Indoor & outdoor dust & vapour		Default setting for land use.
Occupancy	days/year	hours/day (indoors)	hour/day (outdoors)	Default settings for the critical receptor.
	180 - 365	19 - 23	1	

Table 7.1: Parameters used in CLEA Model V1.06 to derive SSAC

Statistical analysis of the data set has been undertaken in accordance with guidance contained in the CIEH/CL:AIRE report 'Comparing Soil Contamination Data with a Critical Concentration' (May 2008). If the contamination status of the soils is considered in a planning context, the null hypothesis tested by the analysis is whether the true mean concentration is equal to or greater than the critical concentration for a given determinand, with the critical concentration being the relevant SSAC or GAC (the soil screening value) for that determinand in the context of the intended end use of the site. If the analysis shows that the true mean concentration is less than the critical concentration the null hypothesis can be rejected. The guidance recommends that for the null hypothesis to be rejected the analysis should show that there is a 95% (or higher) likelihood that the true mean concentration is below the critical concentration. Where this is the case the site is considered to be acceptable for the planned end use without the requirement for remediation.

The guidance also provides an outlier test (Grubb's Test) which is undertaken prior to the statistical analysis in order to establish whether there are any anomalous results which could be 'hotspots'. Such results can be removed from the dataset prior to the statistical analysis, but only where there is evidence to support this from the conceptual site model.

The Grubb's Test revealed a number of 'outliers' although in each case the outlier occurred where the majority of results for a particular determinand were below the laboratory detection limit. In most cases, the outlier was less than the appropriate GAC and there was insufficient evidence to remove the result from the dataset. One exception occurred with respect to the dataset for the Made Ground. This dataset revealed an outlier for each of the speciated polycyclic aromatic hydrocarbons within WS375 at a depth of 0.50m. The sample description for the Made Ground at this location was different to the Made Ground in the adjoining borehole positions and included carbonaceous fragments and plastic sheeting. The borehole was located within the infilled area associated with the former mineral abstraction.

In the statistical analysis, 'non detects' (results less than the laboratory detection limit) were entered as a discrete value set at half the laboratory detection limit.

The statistical analysis summary sheets and CLEA Model printouts are included in Appendix H The results of the statistical analysis are summarised in Tables 7.2 to 7.4.

7.2.1.1 Topsoil

Determinand	Measured Range	Sample Mean (mg/kg)	Soil Screening Value (mg/kg)	Upper Confidence Limit (mg/kg)	Evidence Level (%)	Reject null hypothesis?
Arsenic	5.1-62.7	7.6	32	11.7	**100%**	Yes
Cadmium	<1	0.3	5.2	0.3	**100%**	Yes
Chromium	9.5-44.2	20.9	3001	24.6	**100%**	Yes
Lead	7.9-142.1	33.8	450	47.9	**100%**	Yes
Mercury	<0.5-0.9	0.3	169	0.3	**100%**	Yes
Nickel	1.9-13.2	6.0	1270	7.3	**100%**	Yes
Copper	4.3-58.8	11.9	5200	16.3	**100%**	Yes
Zinc	5.3-108	40.8	19400	50.0	**100%**	Yes
Selenium	0.5-10.6	1.9	350	3.1	**100%**	Yes
Chromium VI	<2	1.0	48.9	1.0	**100%**	Yes
Barium	12.0-368.8	37.4	1330	61.7	**100%**	Yes
Beryllium	<1	0.5	41.2	0.5	**100%**	Yes
Vanadium	15.1-70.0	31.5	107	36.9	**100%**	Yes
Naphthalene	<0.1-0.1	0.1	1.5	0.1	**100%**	Yes
Acenapthylene	<0.1-0.1	0.1	169	0.1	**100%**	Yes
Acenapthene	<0.1-0.2	0.1	207	0.1	**100%**	Yes
Fluorene	<0.1-0.1	0.1	164	0.1	**100%**	Yes
Phenanthene	0.2-0.8	0.1	91.6	0.1	**100%**	Yes
Anthracene	<0.1-0.2	0.1	2250	0.1	**100%**	Yes
Fluoranthene	<0.1-1.0	0.1	257	0.2	**100%**	Yes
Pyrene	<0.1-0.9	0.1	563	0.2	**100%**	Yes
Benz(a)anthracene	<0.1-0.7	0.1	2.99	0.1	**100%**	Yes
Chrysene	<0.1-0.8	0.1	5.99	0.2	**100%**	Yes
Benzo(b)fluoranthene	<0.1-0.8	0.1	5.54	0.2	**100%**	Yes
Benzo(k)fluoranthene	<0.1-0.6	0.1	8.49	0.2	**100%**	Yes
Benzo(a)pyrene	<0.1-0.7	0.1	0.82	0.1	**100%**	Yes
Indeno(123-cd)pyrene	<0.1-0.7	0.1	3.18	0.2	**100%**	Yes
Dibenz(ah)anthracene	<0.1-0.2	0.1	0.76	0.1	**100%**	Yes
Benzo(ghi)perylene	<0.1-0.5	0.1	43.8	0.1	**100%**	Yes
Phenol	1.3-7.6	0.8	188	1.3	**100%**	Yes
TPH*	7.0-23.8	3.2	50	5.4	**100%**	Yes

**No SGV or GAC for TPH – In-house screening threshold value adopted.*

Table 7.2: Summary of Results of Statistical Analysis for Topsoil

The Grubb's Test revealed a number of 'outliers' although in each case the outlier occurred where the majority of results for a particular determinand were below the laboratory detection limit. In all cases, the outlier was less than the appropriate GAC.

The statistical analysis has found that for all of the determinands tested, the null hypothesis can be rejected with 100% confidence.

Laboratory testing for the presence of asbestos has not recorded asbestos within any of the samples.

Targeted testing was also undertaken on the Topsoil for Pesticides, a potential contaminant of concern associated with the land use. The results revealed all results to be below the laboratory detection limits

Targeted testing for speciated hydrocarbons with RBCA banding did not identify any concentrations of concern.

7.2.1.2 Made Ground

Determinand	Measured Range	Sample Mean (mg/kg)	Soil Screening Value (mg/kg)	Upper Confidence Limit (mg/kg)	Evidence Level (%)	Reject null hypothesis?
Arsenic	10.9	6.7	32	7.8	**100%**	Yes
Cadmium	<0.5	0.3	5.2	0.3	**100%**	Yes
Chromium	6.6-37.0	21.8	3001	26.1	**100%**	Yes
Lead	6.2-527.6	66.0	450	213.3	**99%**	Yes
Mercury	<0.5	0.3	169	0.3	**100%**	Yes
Nickel	5.8-11.4	8.2	1270	8.9	**100%**	Yes
Copper	3.5-13.8	9.4	5200	10.9	**100%**	Yes
Zinc	22.9-128.7	54.6	19400	89.7	**100%**	Yes
Selenium	<0.5-9.4	1.9	350	5.1	**100%**	Yes
Chromium VI	<2	1.0	48.9	1.0	**100%**	Yes
Barium	15.4-3.4	37.1	1330	42.7	**100%**	Yes
Beryllium	<1-59.8	0.5	41.2	0.5	**100%**	Yes
Vanadium	11.9-61.2	32.9	107	39.7	**100%**	Yes
Naphthalene	<0.1-3.6	0.29	1.5	1.33	**96%**	Yes
Acenapthylene	<0.1-1.6	0.15	169	0.61	**100%**	Yes
Acenapthene	<0.1-4.3	0.33	207	1.57	**100%**	Yes
Fluorene	<0.1-3.1	0.25	164	1.13	**100%**	Yes
Phenanthene	<0.1-22.1	1.59	91.6	8.00	**100%**	Yes
Anthracene	<0.1-7.9	0.58	2250	2.86	**100%**	Yes
Fluoranthene	<0.1-35.3	2.56	257	12.77	**100%**	Yes
Pyrene	<0.1-29.1	2.12	563	10.54	**100%**	Yes
Benz(a)anthracene	<0.1-18.8	1.38	2.99	6.81	**62%**	No
Chrysene	<0.1-19.0	1.41	5.99	6.91	**93%**	Yes
Benzo(b)fluoranthene	<0.1-16.7	1.26	5.54	6.08	**95%**	Yes
Benzo(k)fluoranthene	<0.1-16.0	1.22	8.49	5.83	**98%**	Yes
Benzo(a)pyrene	<0.1-18.9	1.39	0.82	6.85	**0%**	No
Indeno(123-cd)pyrene	<0.1-14.1	1.07	3.18	5.12	**84%**	No
Dibenz(ah)anthracene	<0.1-3.4	0.30	0.76	1.28	**80%**	No
Benzo(ghi)perylene	<0.1-13.4	1.03	43.8	4.88	**100%**	Yes
Phenol	<1-1.2	0.6	188	0.8	**100%**	Yes
TPH*	<5-44.2	5.7	50	19.7	**99%**	Yes

**No SGV or GAC for TPH – In-house screening threshold value adopted.*

Table 7.3: Summary of Results of Statistical Analysis for Made Ground

The Grubb's Test revealed an 'outliers' for PAH within the sample from WS375 at a depth of 0.50m. Unlike all the other descriptions for the Made Ground, it was specifically noted that the Made Ground at this location contained carbonaceous fragments which is likely to be the source of the polyaromatic hydrocarbons.

Removing this result from the data set and re-running the statistics revealed that the null hypothesis could be rejected with greater than 95 % confidence for each determinand.

Based on the results, some further investigation may be required in the region of WS375 in order to determine the lateral and vertical extent of any impacted Made Ground. It appears to be an isolated occurrence and given the depth it may not require any further remedial action if it falls beneath a house or road. However, should it be within a proposed garden area, some remedial measures may be required such as a cover system.

The targeted speciated hydrocarbon analysis with RBCA banding only encountered one sample where elevated concentrations were encountered, and this was the same sample as that recorded to contain elevated PAH concentrations. Therefore, the recommendations given above would also apply in this case.

Laboratory testing for the presence of asbestos has not recorded asbestos within any of the samples.

7.2.1.3 Natural Soils

Determinand	Measured Range	Sample Mean (mg/kg)	Soil Screening Value (mg/kg)	Upper Confidence Limit (mg/kg)	Evidence Level (%)	Reject null hypothesis?
Arsenic	<5-14.4	8.9	32	11.0	**100%**	Yes
Cadmium	<0.5	0.3	5.2	0.3	**100%**	Yes
Chromium	11.2-51.4	26.7	3001	33.4	**100%**	Yes
Lead	7.8-45.1	21.7	450	28.5	**100%**	Yes
Mercury	<0.5	0.3	169	0.3	**100%**	Yes
Nickel	7.8-8.6	6.3	1270	7.2	**100%**	Yes
Copper	2.8-16.5	9.2	5200	11.0	**100%**	Yes
Zinc	4.9-64.4	39.8	19400	46.9	**100%**	Yes
Selenium	<0.5-6.8	2.2	350	5.1	**100%**	Yes
Chromium VI	<2	1.0	48.9	1.0	**100%**	Yes
Barium	14.4-53.1	32.1	1330	38.7	**100%**	Yes
Beryllium	<1	0.5	41.2	0.5	**100%**	Yes
Vanadium	18.1-68.4	39.3	107	48.0	**100%**	Yes
Naphthalene	<0.1	0.1	1.5	0.1	**100%**	Yes
Acenapthylene	<0.1	0.1	169	0.1	**100%**	Yes
Acenapthene	<0.1	0.1	207	0.1	**100%**	Yes
Fluorene	<0.1	0.1	164	0.1	**100%**	Yes
Phenanthene	<0.1	0.1	91.6	0.1	**100%**	Yes
Anthracene	<0.1	0.1	2250	0.1	**100%**	Yes
Fluoranthene	<0.1-0.2	0.1	257	0.1	**100%**	Yes
Pyrene	<0.1-0.2	0.1	563	0.1	**100%**	Yes
Benz(a)anthracene	<0.1-0.1	0.1	2.99	0.1	**100%**	No
Chrysene	<0.1-0.2	0.1	5.99	0.1	**100%**	Yes
Benzo(b)fluoranthene	<0.1-0.3	0.1	5.54	0.2	**100%**	Yes
Benzo(k)fluoranthene	<0.1-0.4	0.1	8.49	0.3	**100%**	Yes
Benzo(a)pyrene	<0.1-0.3	0.1	0.82	0.2	**100%**	Yes
Indeno(123-cd)pyrene	<0.1-0.4	0.1	3.18	0.2	**100%**	Yes
Dibenz(ah)anthracene	<0.1-0.2	0.1	0.76	0.1	**100%**	Yes
Benzo(ghi)perylene	<0.1-0.4	0.1	43.8	0.3	**100%**	Yes
Phenol	<1-1.2	0.4	188	1.4	**100%**	Yes
TPH*	<5-6.7	3.0	50	5.0	**100%**	Yes

**No SGV or GAC for TPH – In-house screening threshold value adopted.*

Table 7.4: Summary of Results of Statistical Analysis for Natural Soils

The Grubb's Test revealed a number of 'outliers' although in each case the outlier occurred where the majority of results for a particular determinand were below the laboratory detection limit. In all cases, the outlier was less than the appropriate GAC.

The statistical analysis has found that for all of the determinands tested, the null hypothesis can be rejected with 100% confidence.

Targeted testing for speciated hydrocarbons with RBCA banding did not identify any concentrations of concern. This included samples tested from adjacent to the above ground storage tank in the green keeper's yard.

Laboratory testing for the presence of asbestos has not recorded asbestos within any of the samples.

Whilst with the exception of the results from WS375 no significant evidence of contamination has been identified, a discovery strategy should be employed on site. In addition, post demolition of any structures and removal of floor slabs or subsurface structures the formation should be visually inspected by the Environmental Consultant and if deemed necessary further sampling and chemical analysis undertaken.

7.2.2 Adjacent Land Users

No evidence of any significant impact on the soil quality was revealed by the laboratory testing and therefore no significant pollutant linkage is considered to exist which would warrant remedial action to protect adjacent land users from soil based contamination within the subject site.

However, it is recommended that dust suppression techniques, e.g. damping down exposed soils, are employed during the demolition and construction phases on site in order to minimise the potential for airborne migration of specific hazards and to manage potential nuisance issues for adjacent land users.

7.3 Plant Uptake

Inter Departmental Committee for the Redevelopment of Contaminated Land (ICRCL) publication 70/90 entitled '*Notes on the Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing*' (1990) provides assessment criteria for a number of potentially phytotoxic contaminants in terms of new planting. Given that a suitable averaging area for soft landscaping may vary considerably between the root zones of grasses to that of a juvenile immature tree, no appropriate averaging area was applicable to this assessment. Therefore, the results of the chemical analysis were evaluated for this SPR linkage singularly.

The results of the chemical analysis for determinands known to pose a potential phytotoxic risk to plant growth are summarised in Table 7.5, together with the respective adopted Generic Assessment Criteria (GAC) for plant growth.

Determinand	Phytotoxicity GAC Value (mg/kg)	In excess of GAC?
Zinc	1000	No
Cadmium	50	No
Copper	250	No
Arsenic	1000	No

Table 7.5: Summary of Potential Phytotoxicity for Soft Landscaping

Therefore, remedial measures to protect plants from phytotoxic effects are not considered necessary.

In addition to the above, five topsoil samples from the proposed sports pitch areas were analysed for a BS3882: 2007 topsoil suite in order to assess textural classification and nutrient levels.

The results indicated the texture of the soil sample to be compliant with the grading required for Multipurpose Topsoil. A few results showed some minor deficiencies in nutrients and organic matter, however it is likely that this could be easily rectified if deemed necessary by the application of fertilisers.

7.4 Water Supply Pipes

The current guidance on selection of materials for water supply pipes to be laid in contaminated land is contained in UKWIR Report 10/WM/03/02 (re-issued 2010). However, the guidance is not mandatory and there has been concerns raised by various industry technical associations regarding the document and the methodologies proposed.

Although there are concerns regarding the document, in lieu of any further guidance in the first instance the results of this investigation have been compared with the proposed thresholds published in UKWIR Table 3.1.

The presumption in the guidance is that barrier pipe will be adopted for any brownfield site. However, the results of the chemical analysis indicate that with the exception of the result from WS375, all results were below the relevant thresholds and therefore standard pipework may be suitable for the site.

It is recommended that the results of this investigation be presented to the water utility company as soon as reasonably practical in order to confirm the pipe material.

As a matter of good practice, and to maximise the protection to utilities, it is recommended that clean, granular backfill is used in service runs and that marker tapes are used for all buried services.

7.5 Groundwater

The site was underlain by both Secondary A Aquifers (River Terrace Deposits & Wittering Formation) and unproductive strata (London Clay Formation). The site was not in a designated Source Protection Zone and there were no potable abstractions within 2000m of the site boundary. However, the site was bound to the north and east by a tributary of the River Hamble and on this basis groundwater results have been compared in the first instance to Freshwater Environmental Quality Standards.

The results of the inorganic analysis were all below the relevant Environmental Quality Standards (EQSs). In terms of the organic analysis there is no single Freshwater EQS for TPH, but there is an EQS for toluene which is 50ug/l. Toluene would be present in Aromatic hydrocarbon band C7-C8 if speciated analysis was undertaken. The TPH results generally ranged between 130ug/l and 269ug/l, though concentrations of 1047ug/l and 2106ug/l were recorded within samples recovered from BH207 and BH210.

The concentrations of TPH recorded in BH207 and BH210 are higher than anticipated based on the land use and location of the standpipes and likely hydraulic gradient. The soil geochemical analysis only revealed one slightly elevated TPH concentration at the location of WS375, which was drilled in an area that had been infilled following mineral extraction. Although WS375 is not located too far distant from either BH207 or BH210, it appears to be down hydraulic gradient and as such it is unlikely that any more elevated TPH concentrations within the area around WS375 would be impacting groundwater concentrations at the locations of BH207 and BH210. BH207

and BH210 were both relatively close to the fuel pipelines, and this is a potential source. Given the results encountered, it is recommended that a further three rounds of groundwater sampling and analysis be undertaken in order to provide a trend. In addition, the sampling suite should be revised to include speciated TPH with RBCA Banding together with Benzene, Toluene, Ethylbenzene and Xylene. It would also be prudent to sample the water courses both up and downstream of the site in order to assess whether any off-site migration is occurring.

In addition, the Environment Agency should be consulted regarding the results and whether any further groundwater risk assessment is required.

7.6 Ground Gases

Potential ground gases from Made Ground were identified by the Desk Study and as such six gas monitoring visits were programmed during October and November 2013. At the time of preparing this report, four of the six visits had been completed.

Recommendations on acceptable gas levels recorded in the ground beneath or adjacent to buildings are given in a variety of publications. For the purpose of this assessment, the results have been evaluated in terms of CIRIA C665 [2007], BS8485 [2007] and NHBC 10627-R01 (04) [2007].

The gas assessment considers the impact of gas at pressure in the ground, since a low concentration coupled with a high flow could present a greater hazard than a high concentration with little or no flow. On the basis of the gas data collected and the gas assessment presented in Appendix F, it is considered that the site's gassing regime is preliminarily representative of Characteristic Situation 1 (BS8485 and CIRIA) and Green (NHBC). This will be confirmed upon completion of the monitoring programme, but given the results to date and conceptual site model this is unlikely to change. On this basis, gas protection measures are unlikely to be required.

7.7 Radon

Radon Protection measures are not required for any new structures at this site.

7.8 Environmental Assessment Conclusions

The results of the GQRA confirm that potential contaminants in the soil pose a very low risk to the human health of end users and adjacent site users. Only one area of concern was identified at the location of WS375, which depending on the proposals for the area may require some localised remedial measures.

The concentrations of potential phytotoxic contaminants in the soil pose no significant risk to plants.

No significant evidence of organic contamination which could impact water supply pipes has been recorded. PPE water supply may be acceptable subject to consultation with the water utility company.

Some localised marginally elevated TPH concentrations have been recorded in the groundwater at the southern end of the site. Further monitoring and sampling is recommended together with consultation with the Environment Agency.

The land gas monitoring programme is on-going however, based on the CSM and results to date gas protection measures are unlikely to be required. Marginally elevated carbon dioxide concentrations have been recorded in the standpipe installed in WS205 (on the driving range), but these have not been repeated and no potential sources have been identified in that area.

8.0 REFINED CONCEPTUAL SITE MODEL

8.1 General

The initial conceptual site model identified potential risks to human health, adjacent land users, vegetation, groundwater, surface water, building infrastructure, and water supply pipes from potential contaminants in the near surface soils. A risk to human health and infrastructure was also identified from ground gases from any Made Ground.

8.2 Sources

Based on the site investigation data and available geochemical test results no exceedances of site specific assessment criteria were identified in either the Topsoil or natural soils. Within the Made Ground, several minor exceedances for PAH were identified at the location of WS375 and one mildly elevated Lead concentration in WS214.

8.3 Pathways

When considering the final end use of the site the following pathways for human health are viable:

Pathway	Description
Direct Contact	Soil, dust and vegetable ingestion, dermal contact and dust inhalation
Soil Gas Inhalation	Inhalation of soil gas both inside and outside of buildings
Vertical & Lateral Migration	Contaminant movement both vertically through leaching/gravity and horizontally along preferential pathways or with groundwater.
Root Uptake	Uptake of soil and waterborne contaminants by plants
Chemical Attack	Attack of buried plastics and concrete by aggressive ground conditions.

Table 8.1: Plausible Pathways

8.4 Receptors

In terms of human health receptors the geochemical test data were assessed against SSAC for a residential end use with plant uptake.

The site was underlain by Secondary A aquifers and Unproductive strata and was outside any SPZ. No groundwater abstractions were identified within 1000m (>2000m for potable water abstractions).

The development would require the laying of new water supply pipes within the near surface soils.

The site was bound to the north and south by a tributary of the River Hamble.

Parts of the development will be landscaped and contain soft planting areas.

8.5 Risk Evaluation of the Proposed Development

The following evaluation of risk is based upon the current proposed development comprising 1400 new homes. The proposals also include a school and sports pitches.

8.5.1 Risk to Human Health: Soils/Ground Gases

The results of the GQRA indicate the soils pose a **Low** risk with respect to human health of both end users and adjacent site users. Therefore, no remedial measures are considered necessary for the majority of the site. A cover system may be required locally around the position of WS375, but this will be dependent on the land use in that area.

With the exception of mildly elevated carbon dioxide concentrations on one occasion at the location of WS205, no significant concentrations of land gases have been encountered to date and based on the CSM are unlikely to be encountered during the remaining two monitoring visits. The site is therefore considered **Low** risk in this respect.

8.5.2 Risk to Groundwater: Soils

The groundwater analysis has indicated mildly elevated concentrations of TPH at the locations of BH207 and BH210. Further, sampling and analysis to together with regulatory consultation is recommended. Therefore, the risk to groundwater is considered to be **Low to Moderate.**

8.5.3 Risk to Building Materials & Services: Soils

The results of the chemical testing classified the soils as DS2 and AC-2 with respect to aggressive ground conditions. Therefore the site is considered **Low to Moderate** risk with respect to buried concrete.

With the exception of the results from WS375, no significant evidence of organic contaminants that could attack water supply pipes placed in the ground have been encountered. Therefore, although the presumption for brownfield sites is that a barrier pipe should be adopted, the water utility company should be consulted regarding the findings of this investigation and the specification for the water pipes. The site is considered **Low** risk.

The refined conceptual site model is presented in Table 8.2.

Potential Source/media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
Near surface soils & Made Ground/soil	End users	Direct contact	Likely	Minor	Low Future residents are likely to come into contact with soils via direct contact in the private garden or home. The consequence is likely to be minor.
	Adjacent land users	Direct contact	Low	Minor	Very Low There is a low likelihood of adjacent site users coming into contact with affected soils. The consequence is likely to be minor.
	Soft Landscaping	Root uptake	Likely	Minor	Low Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Likely	Minor	Low Water supply pipes are likely to come into contact with soils though significant contamination has not been identified.
	Buildings and infrastructure	Chemical attack	Likely	Mild	Moderate to Low Foundations and utilities will be placed within soils. Concrete to be designed in accordance with Class DS2 and ACEC Class AC2.
	Groundwater	Vertical migration	Likely	Minor	Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. However, no significant evidence of soil contamination encountered.
	Surface Water	Lateral migration	Likely	Minor	Low Surface water is present on and adjacent to the site. However, no significant evidence of soil contamination encountered.
Green keeper's yard/soil	End users	Direct contact	Likely	Minor	Low Future residents are likely to come into contact with soils via direct contact in the private garden or home. The consequence is likely to be minor.
	Adjacent land users	Direct contact	Low	Minor	Very Low There is a low likelihood of adjacent site users coming into contact with affected soils. The consequence is likely to be minor.
	Soft Landscaping	Root uptake	Likely	Minor	Low

					Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Likely	Minor	Low Water supply pipes are likely to come into contact with soils though significant contamination has not been identified.
	Buildings and infrastructure	Chemical attack	Likely	Minor	Low Foundations and utilities will be placed within soils. However, the consequence is anticipated to be minor.
	Groundwater	Vertical migration	Likely	Minor	Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. However, no significant evidence of soil contamination encountered.
	Surface Water	Lateral migration	Likely	Minor	Low Surface water is present on and adjacent to the site. However, no significant evidence of soil contamination encountered.
Fuel pipelines/soil	End users	Direct contact	Likely	Minor	Low Future residents are likely to come into contact with soils via direct contact in the private garden or home. The consequence is likely to be minor.
	Adjacent land users	Direct contact	Low	Mild	Low There is a low likelihood of adjacent site users coming into contact with any impacted soils.
	Soft Landscaping	Root uptake	Likely	Minor	Low Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Likely	Minor	Low Water supply pipes are likely to come into contact with soils though significant contamination has not been identified.
	Buildings and infrastructure	Chemical attack	Likely	Mild	Moderate to Low Foundations and utilities will be placed within soils. Concrete to be designed in accordance with Class DS2 and ACEC Class AC2.
	Groundwater	Vertical migration	Likely	Minor	Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. However, no significant evidence of soil contamination encountered.
	Surface Water	Lateral	Likely	Minor	Low

		migration			Surface water is present on and adjacent to the site. However, no significant evidence of soil contamination encountered.
Fuel pipelines/ groundwater	End users	Direct contact	Unlikely	Mild	Very Low There is a low likelihood of future residents coming into contact with groundwater via direct contact in the private garden or home. The consequence is likely to be mild.
	Adjacent land users	Direct contact	Unlikely	Mild	Very Low There is a low likelihood of adjacent site users coming into contact with affected groundwater. The consequence is likely to be mild.
	Soft Landscaping	Root uptake	Unlikely	Minor	Very Low Root uptake is likely for plants but any consequence is likely to be minor.
	Water supply pipes	Chemical attack	Unlikely	Mild	Very Low Water supply pipes are unlikely to come into contact with any impacted groundwater due to their shallow depth of installation.
	Buildings and infrastructure	Chemical attack	Unlikely	Minor	Very Low Foundations and utilities are unlikely to be placed within the horizon of potentially impacted groundwater and the consequence is anticipated to be minor.
	Groundwater	Vertical & lateral migration	Likely	Mild	Moderate to Low Groundwater is likely to be at depths of between 1-4mbgl beneath the majority of the site. Marginally elevated concentrations of hydrocarbons recorded within the groundwater samples from standpipes nearest to the pipelines.
	Surface Water	Lateral migration	Likely	Mild	Moderate to Low Surface water is present on and adjacent to the site. Marginally elevated concentrations of hydrocarbons recorded within the groundwater samples from standpipes nearest to the pipelines.
Infilled quarries (on-site & off-site)/ ground gas	End users	Inhalation	Low	Mild	Low There is a low likelihood of future residents coming into contact with ground gases. The consequence is likely to be mild.
	Adjacent land users	Inhalation	Low	Mild	Low There is a low likelihood of adjacent site users coming into contact with ground gases. The consequence is likely to be mild.

	Soft Landscaping	Root uptake	Unlikely	Minor	Very Low Root uptake of ground gas is unlikely for plants with any consequence likely to be minor.
	Water supply pipes	n/a	n/a	n/a	n/a
	Buildings and infrastructure	Vertical & Lateral Migration	Unlikely	Minor	Very Low Accumulations of methane beneath floor slabs and within poor ventilated spaces could result in explosions. However, no methane has been identified to date.
	Groundwater	n/a	n/a	n/a	n/a
	Surface Water	n/a	n/a	n/a	n/a

Table 8.2: Refined Conceptual Site Model

8.6 Waste

8.6.1 Reuse of Material

In accordance with CL:AIRE Code of Practice (2011) materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded by the holder'.

The Code of Practice therefore allows soils to be reused on site where the following criteria are met:

- Pollution of the environment and harm to human health is prevented in reusing the excavated materials
- The material are suitable for use (without any further processing)
- There is certainty of use and
- The quantity that is absolutely necessary (and no more) is used

In order to comply with the Code of Practice, a material management plan that confirms the above criteria are met has to be prepared. The material management plan must be reviewed by a 'Qualified Person' who then issues a declaration to the Environment Agency. Geo-Environmental can provide this service should it be required.

Where materials do not meet the required criteria, it may be possible to treat them under an environmental permit so that they made be re-used on site.

8.6.2 Reuse of Waste

Where material is discarded as waste, it may still be possible to reuse the waste on site under a standard rules environmental permit or a U1 waste exemption. However, strict limits on the volumes that can be reused apply in these cases.

8.6.3 Disposal to Landfill

Under current legislation, where wastes are to be disposed of to landfill they may depending on their classification require pre-treated. Pre-treatment shall comprise a chemical, physical (including sorting), thermal or biological process. The pre-treatment is required to change the characteristics of the waste, reduce its volume, reduce its hazardous nature, and facilitate its handling and enhance its recovery.

8.6.4 Waste Acceptance

The following information has been provided with respect to the disposal of arisings generated as part of the proposed development.

The majority of arisings generated from the site are likely to be suitable for disposal at an inert landfill. However, where soils are to be disposed of off-site the results of the chemical analysis should be provided to the proposed landfill site for confirmation of the classification and it may be necessary to undertake Waste Acceptance Criteria (WAC) analysis.

8.7 Discovery Strategy

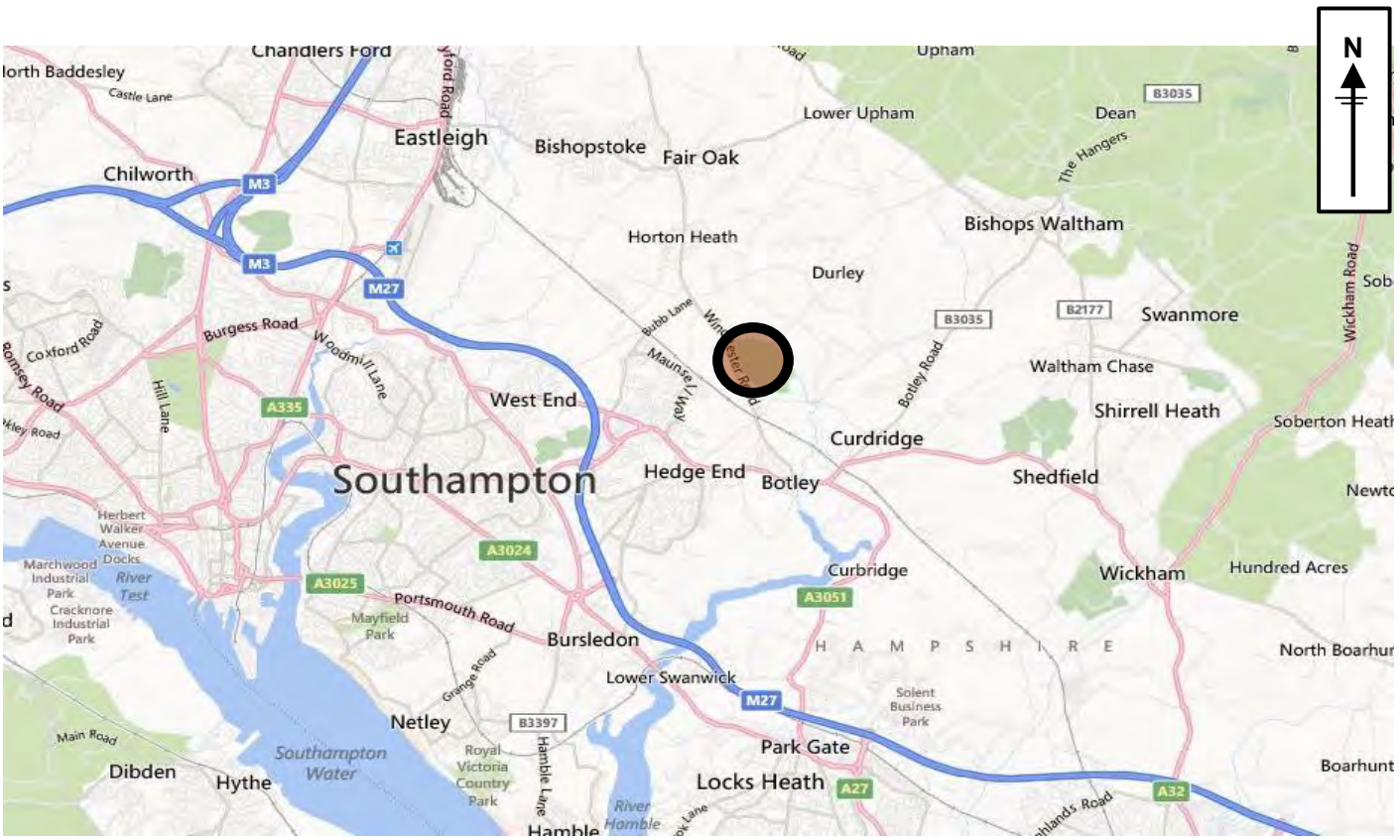
Whilst an investigation has been undertaken on the site, it remains possible that unexpected soil conditions may be encountered during the process of any site demolition, clearance and construction.

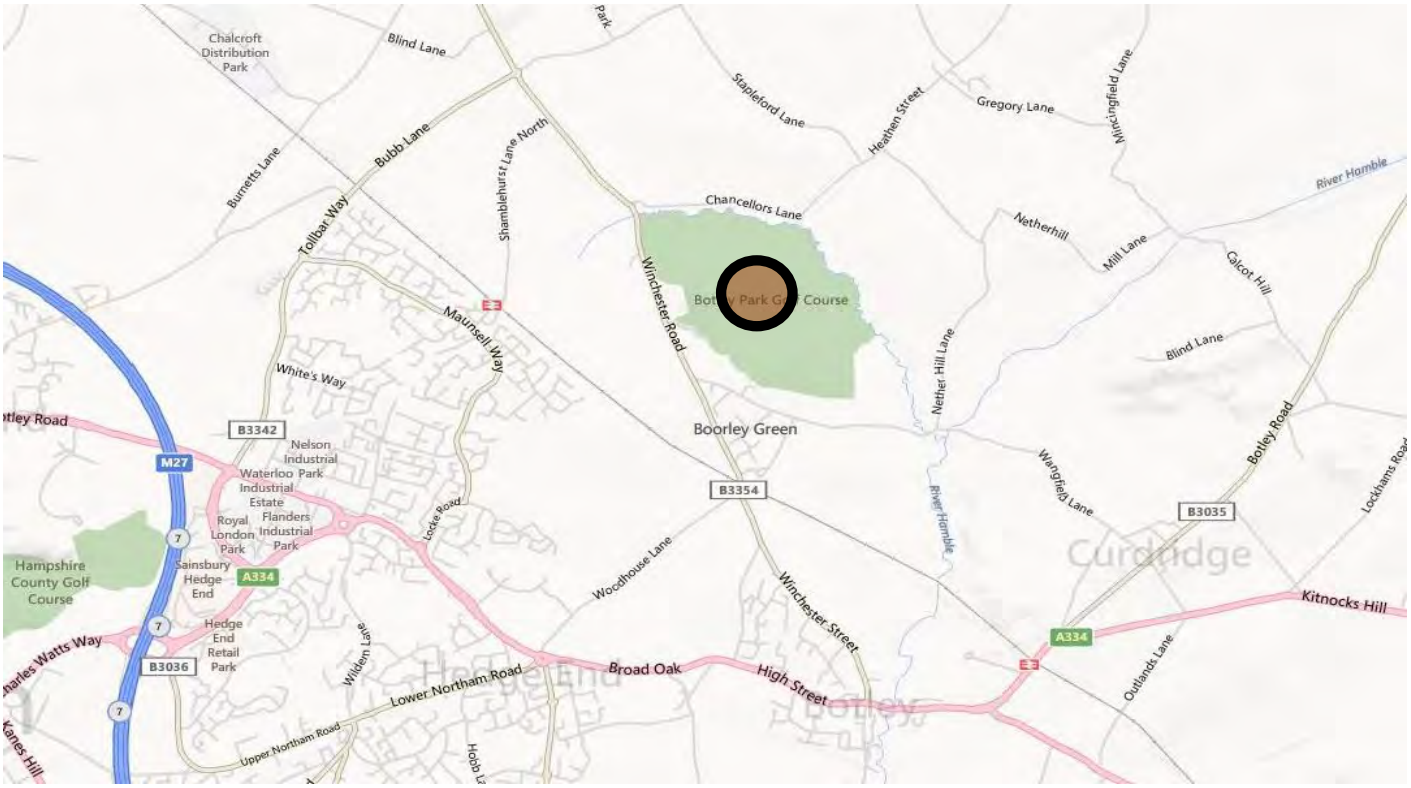
Examples may include oily pockets within the soil, pockets of cement boarding or fibrous materials within the soil, black ashy materials, soils exhibiting strong odours, brightly coloured materials and former structures or brickwork.

Should previously undiscovered contamination be encountered during construction by the ground workers, this should be reported to the Site Manager immediately in order that any necessary inspection may be made. Records should be kept and samples submitted for analysis where conditions encountered are not as anticipated. The results of any such testing should be sent to the authorities for consultation.

A copy of the discovery strategy should be lodged on site and provisions made to ensure that all workers are made aware of their responsibility to observe, report and act on any potentially suspicious or contaminated materials they may encounter.

FIGURES



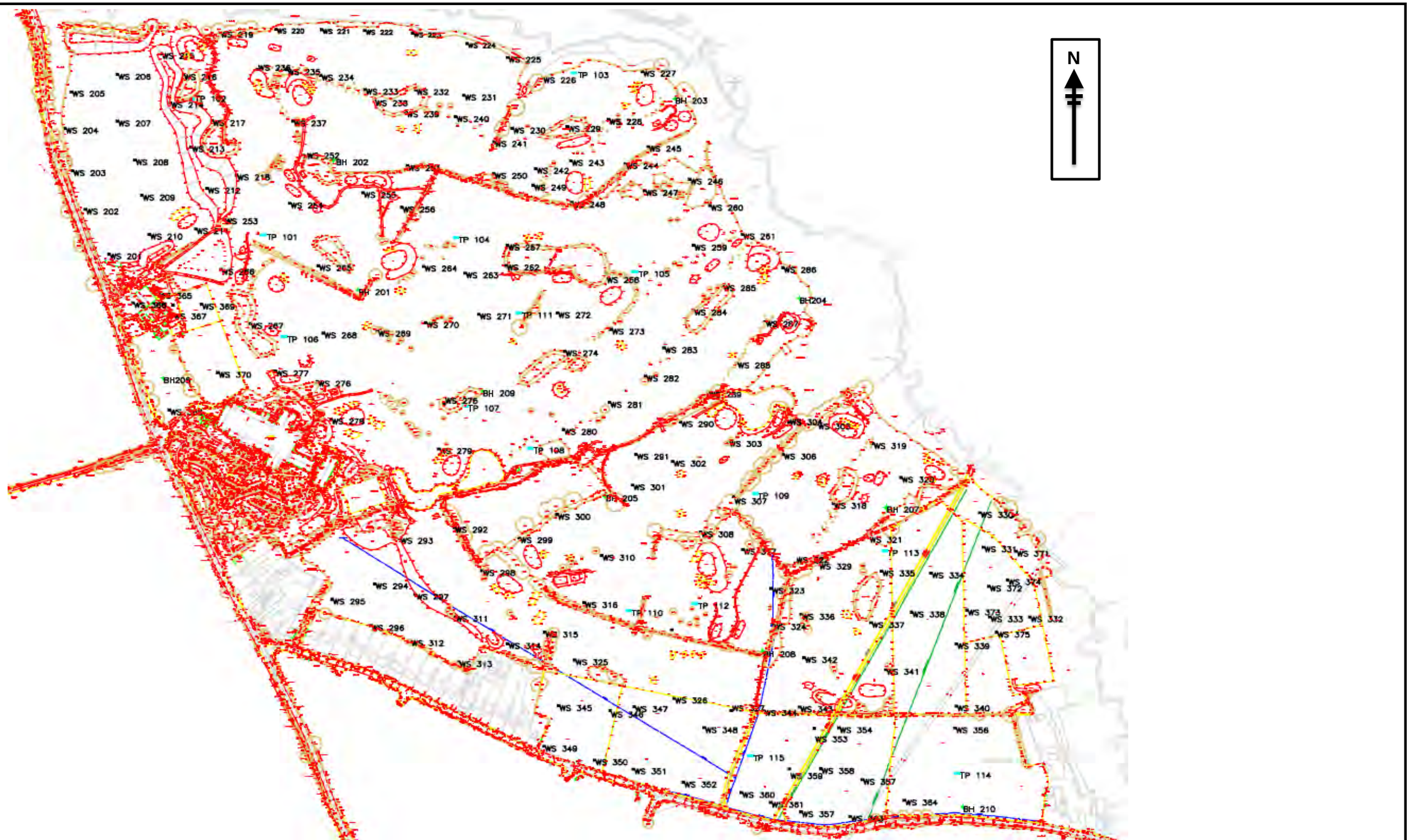


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Address:	Boorley Green, Winchester Road, Hampshire			**Date:**	Sept-2013	**Revision:**	v1
				Drawn:	JK		
Grid Ref:	SU 50978 15011	**Scale:**	Not to Scale	**Ref:**	GE9523		
Client:	MA Botley Ltd			**Figure:**	1		

Geo-Environmental

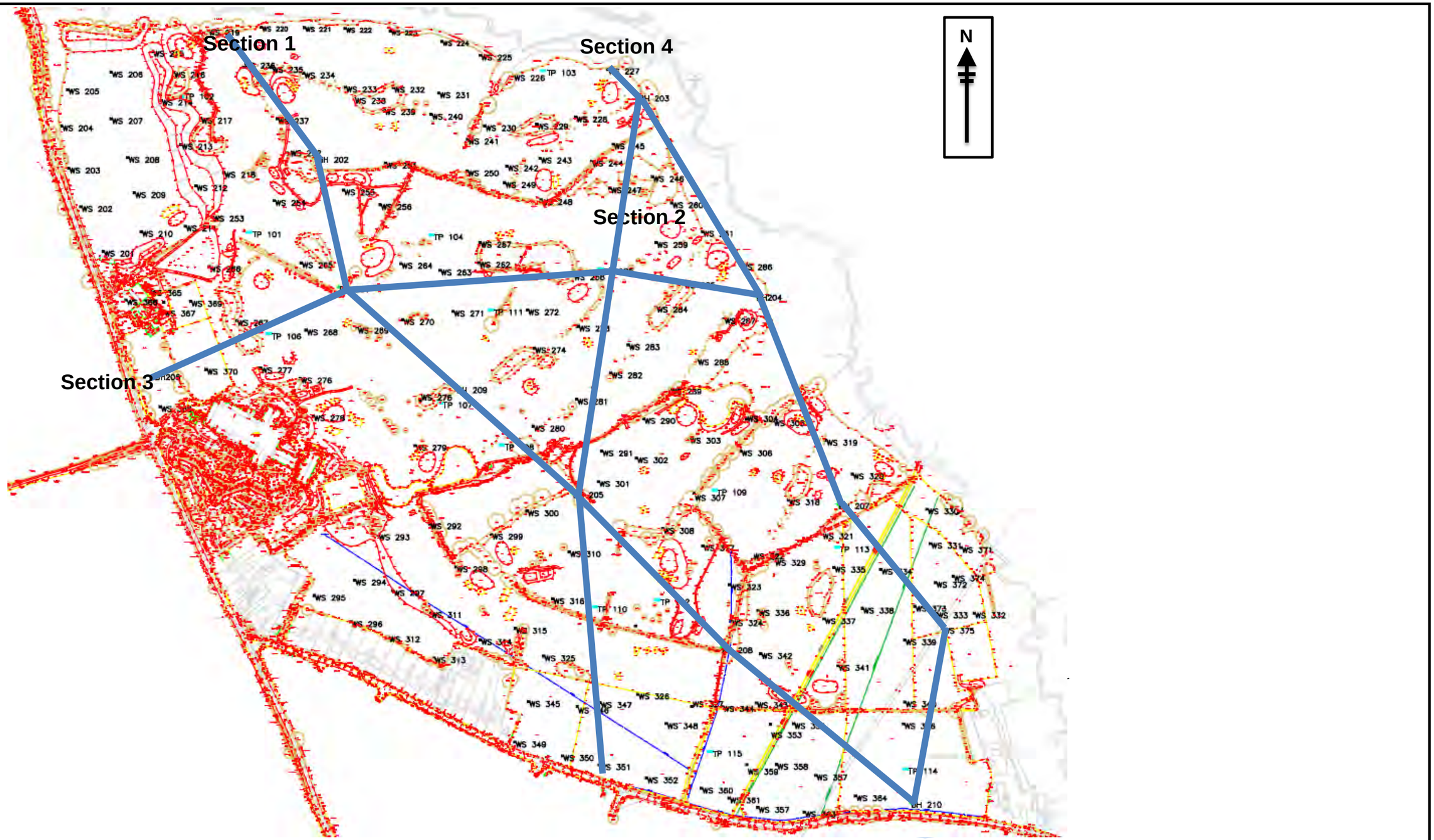


Project:	Boorley Green, Winchester Road, Hampshire			**Title**	**Masterplan**
Client:	MA Botley Ltd			Geo-Environmental Services Limited	
Ref No:	GE9523	**Revision:**	v1	28 Crescent Road, Brighton, BN2 3RP	
Drawn:	-	**Date:**		T: 01273 699 399 F: 01273 699 388	
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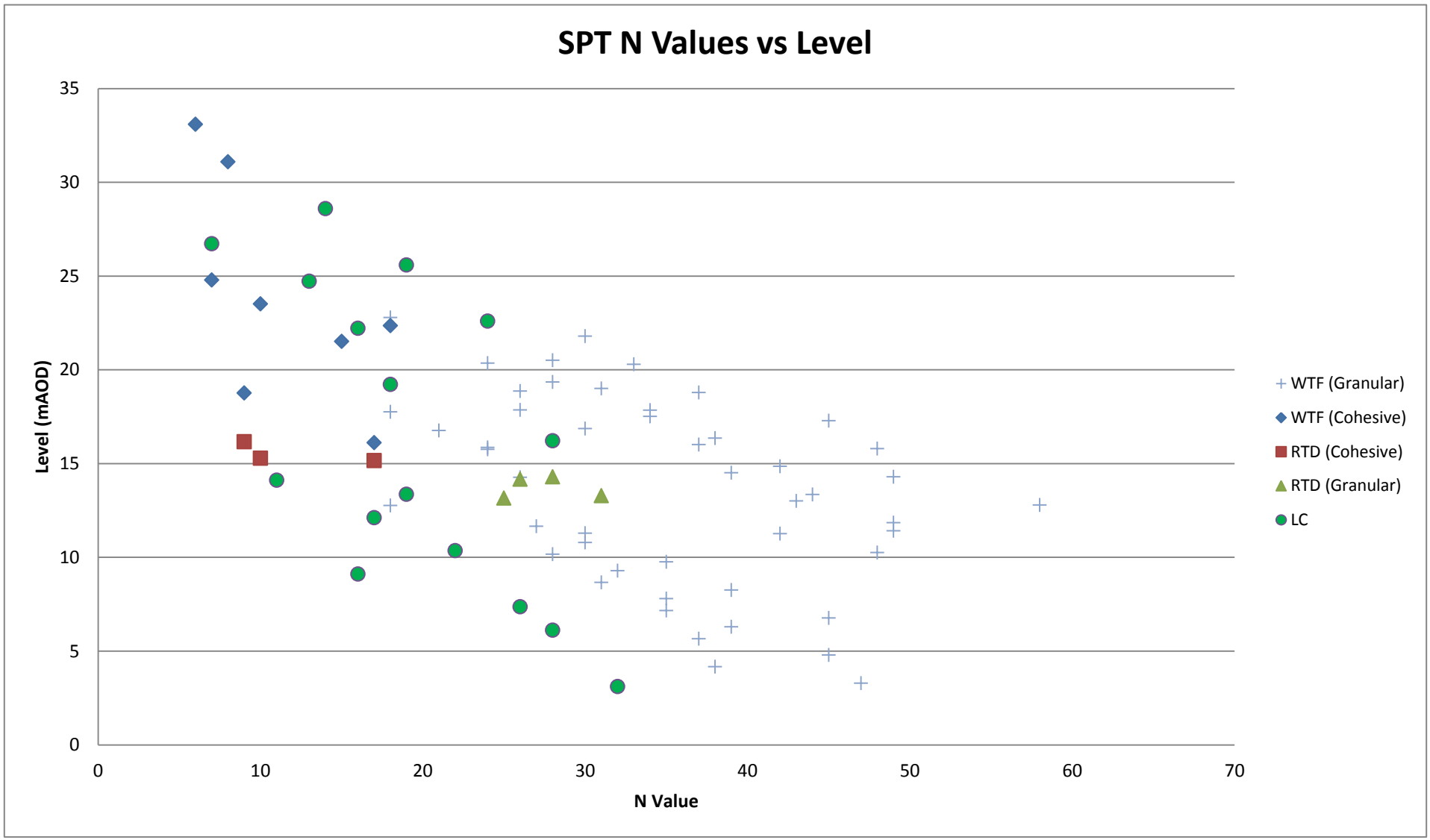
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Grid Ref:	SU 50978 15011	**Scale:**	Not to scale	**Drawn:**	JK	**Figure:** 3		
Client:	MA Botley Limited			**Ref:**	GE9523			

Geo-Environmental



Project:	Boorley Green			**Title:**	Lines of Sections		**Revision:**	v2
Address:	Boorley Green, Winchester Road, Hampshire			**Date:**	Sept-2013			
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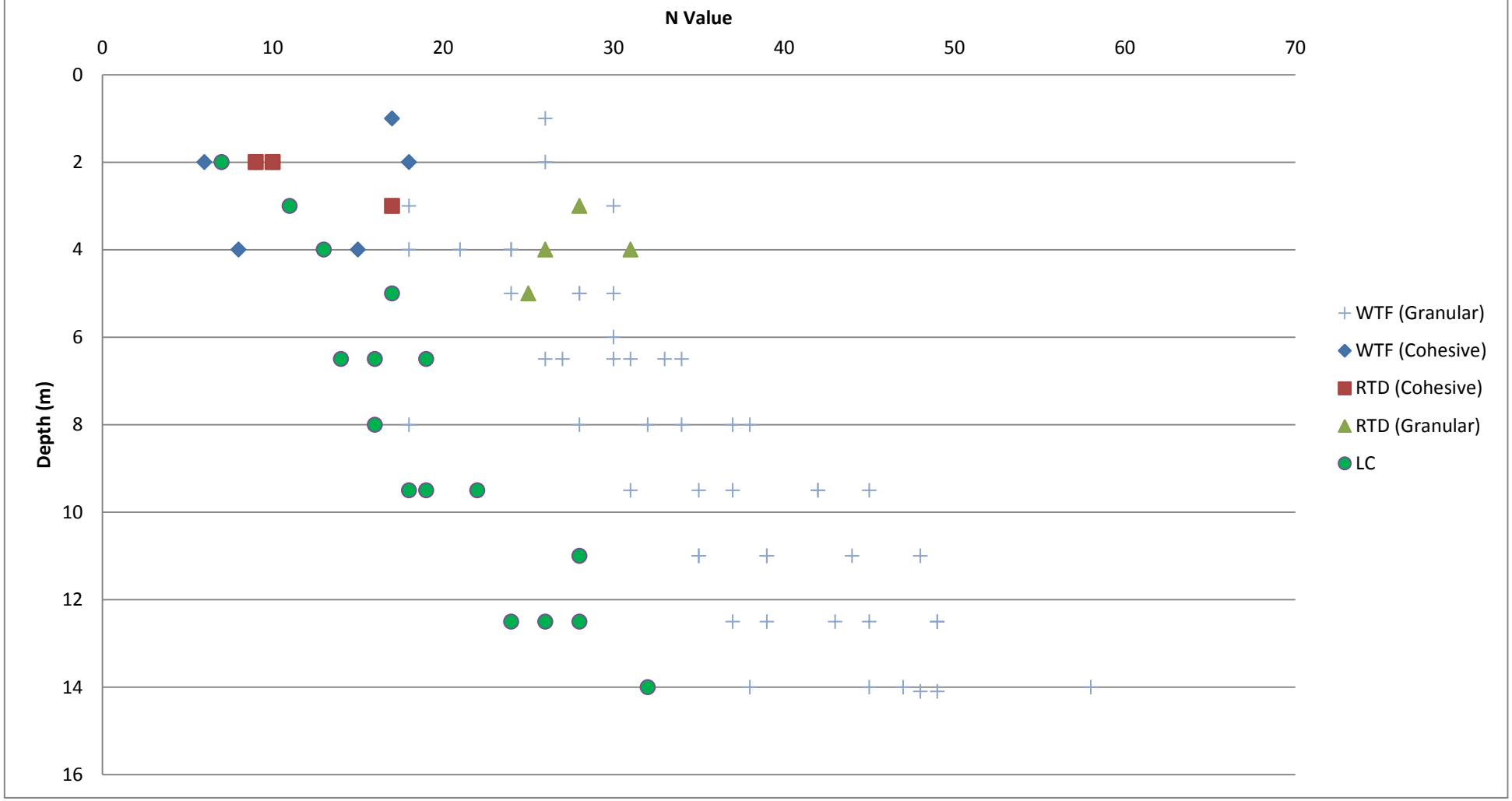
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Project:	Boorley Green, Winchester Road, Hampshire			**Title**	**SPT N Values vs Level (mAOD)**
Client:	MA Botley Ltd			**Geo-Environmental Services Limited**	
Ref No:	GE9253	**Revision:**	v1	**28 Crescent Road, Brighton, BN2 3RP**	
Drawn:	-	**Date:**	October 13	**T: 01273 699 399 F: 01273 699 388**	
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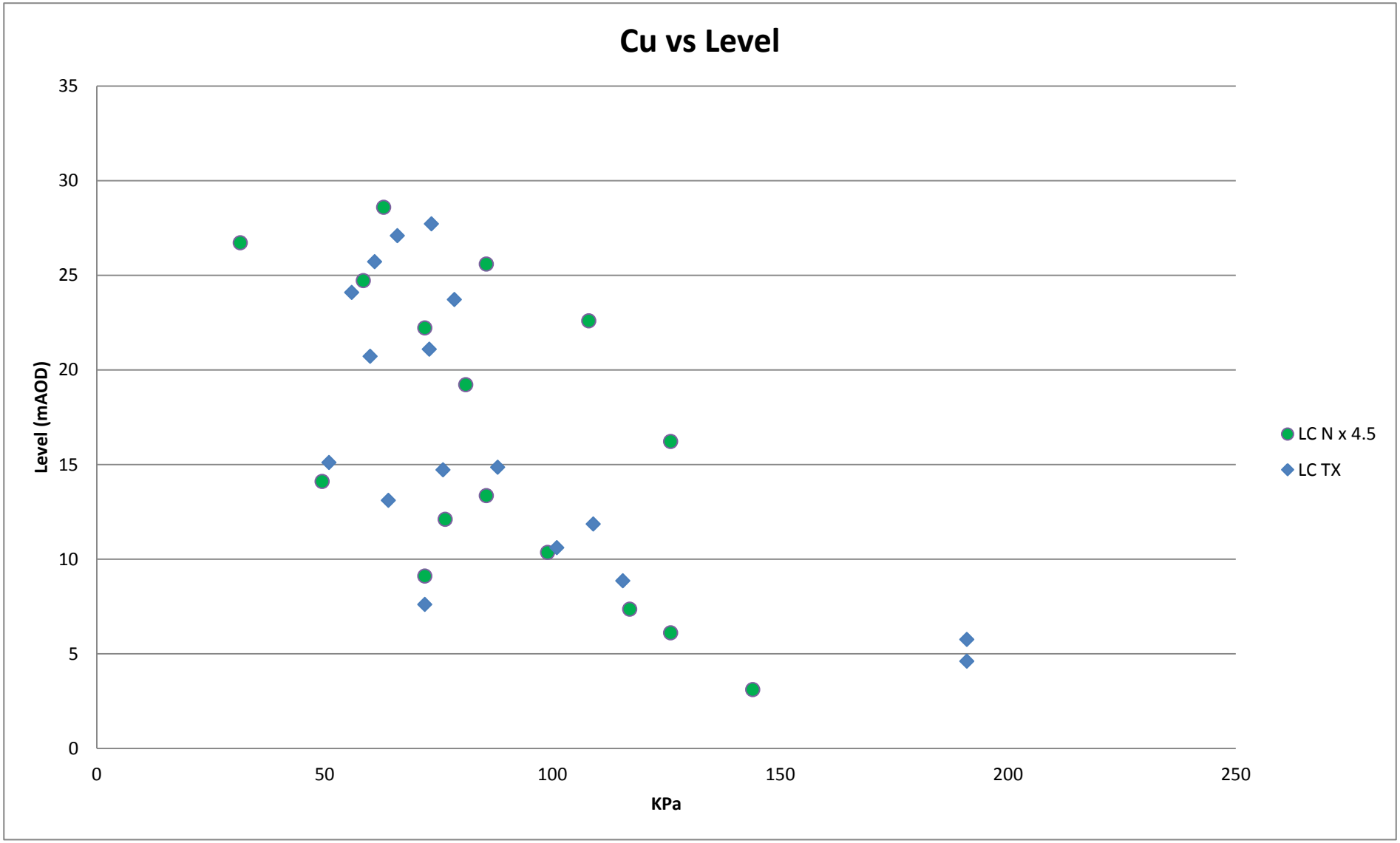
Geo-Environmental

SPT N Values vs Depth



Project:	Boorley Green, Winchester Road, Hampshire			**Title**	**SPT N Values vs Depth (mBGL)**
Client:	MA Botley Ltd			**Geo-Environmental Services Limited**	
Ref No:	GE9253	**Revision:**	v1	**28 Crescent Road, Brighton, BN2 3RP**	
Drawn:	-	**Date:**	October 13	**T: 01273 699 399 F: 01273 699 388**	
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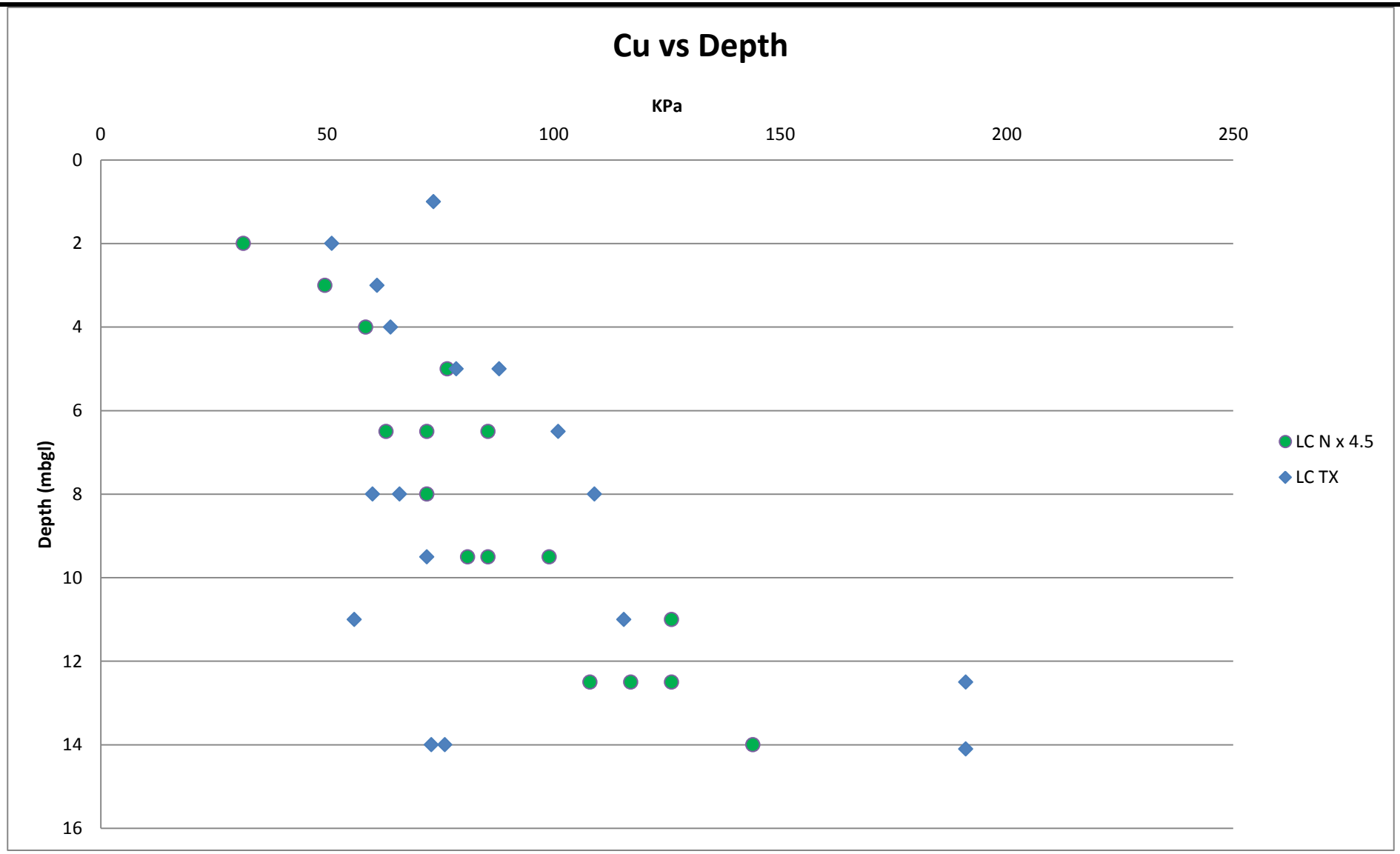
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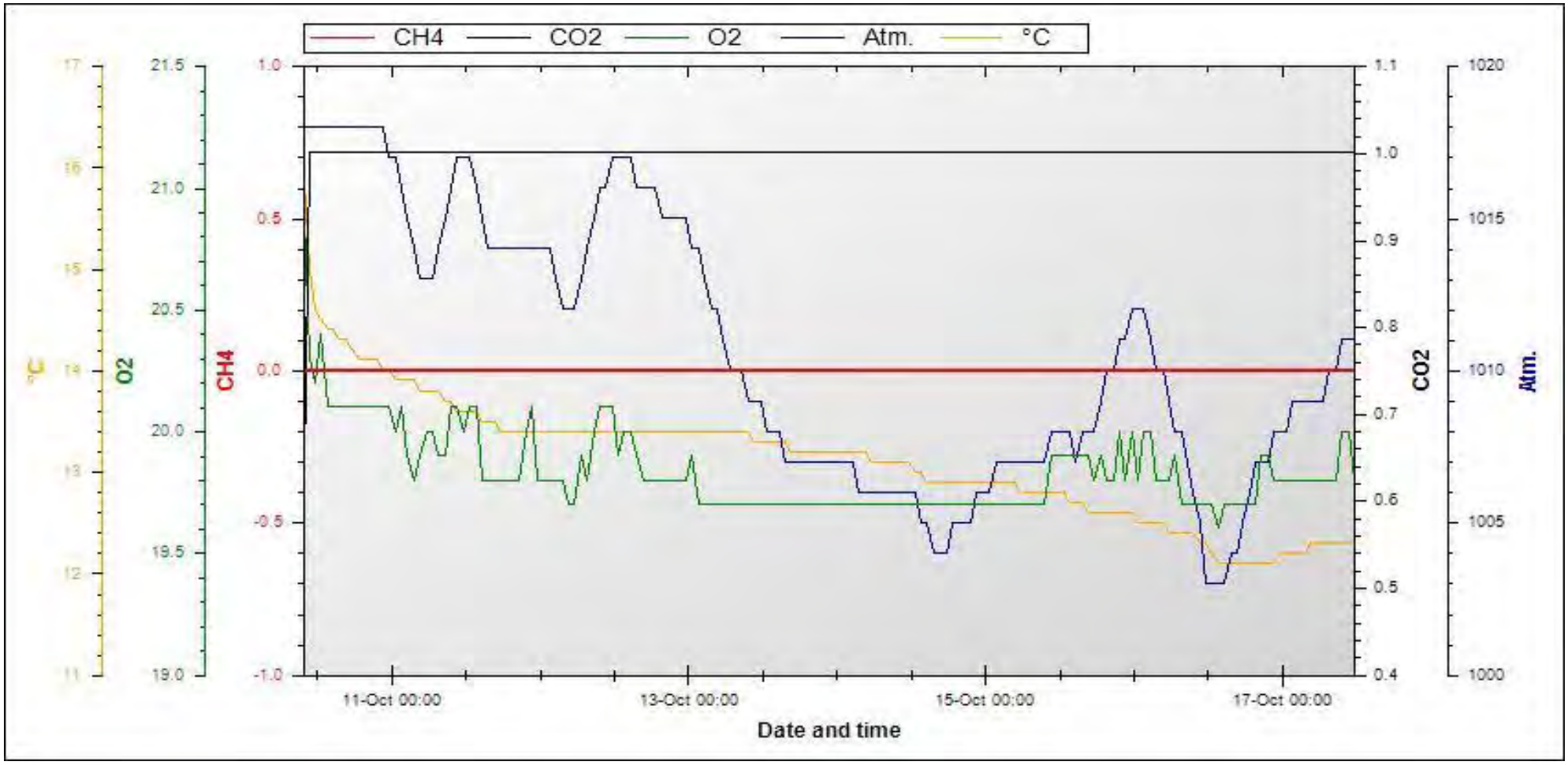
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Client:	MA Botley Ltd			**Geo-Environmental Services Limited**	
Ref No:	GE9253	**Revision:**	v1	**28 Crescent Road, Brighton, BN2 3RP**	
Drawn:	-	**Date:**	October 13	**T: 01273 699 399 F: 01273 699 388**	
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Geo-Environmental

Cu vs Depth

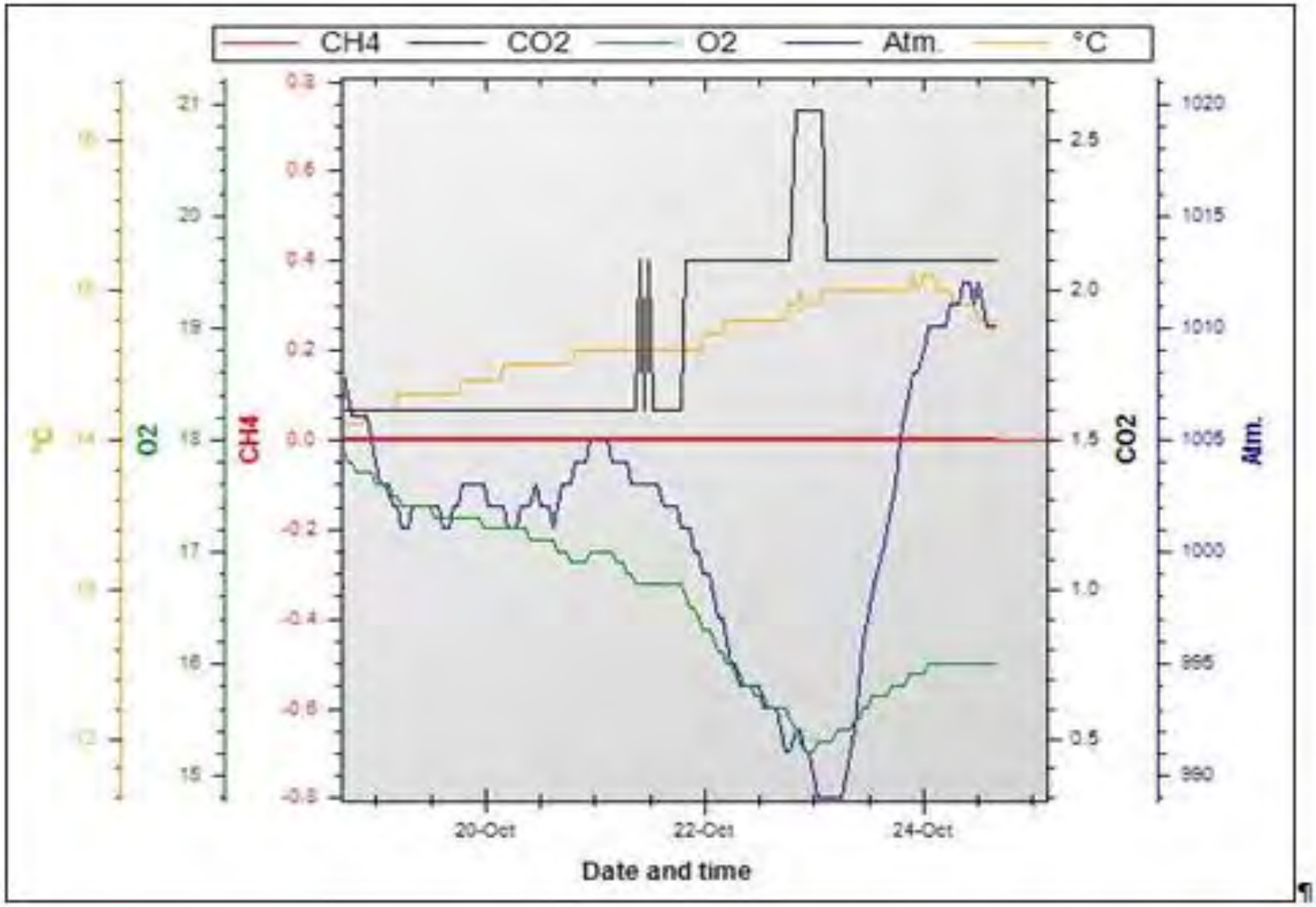


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Ref No:	GE9253	**Revision:**	v1	**28 Crescent Road, Brighton, BN2 3RP**	
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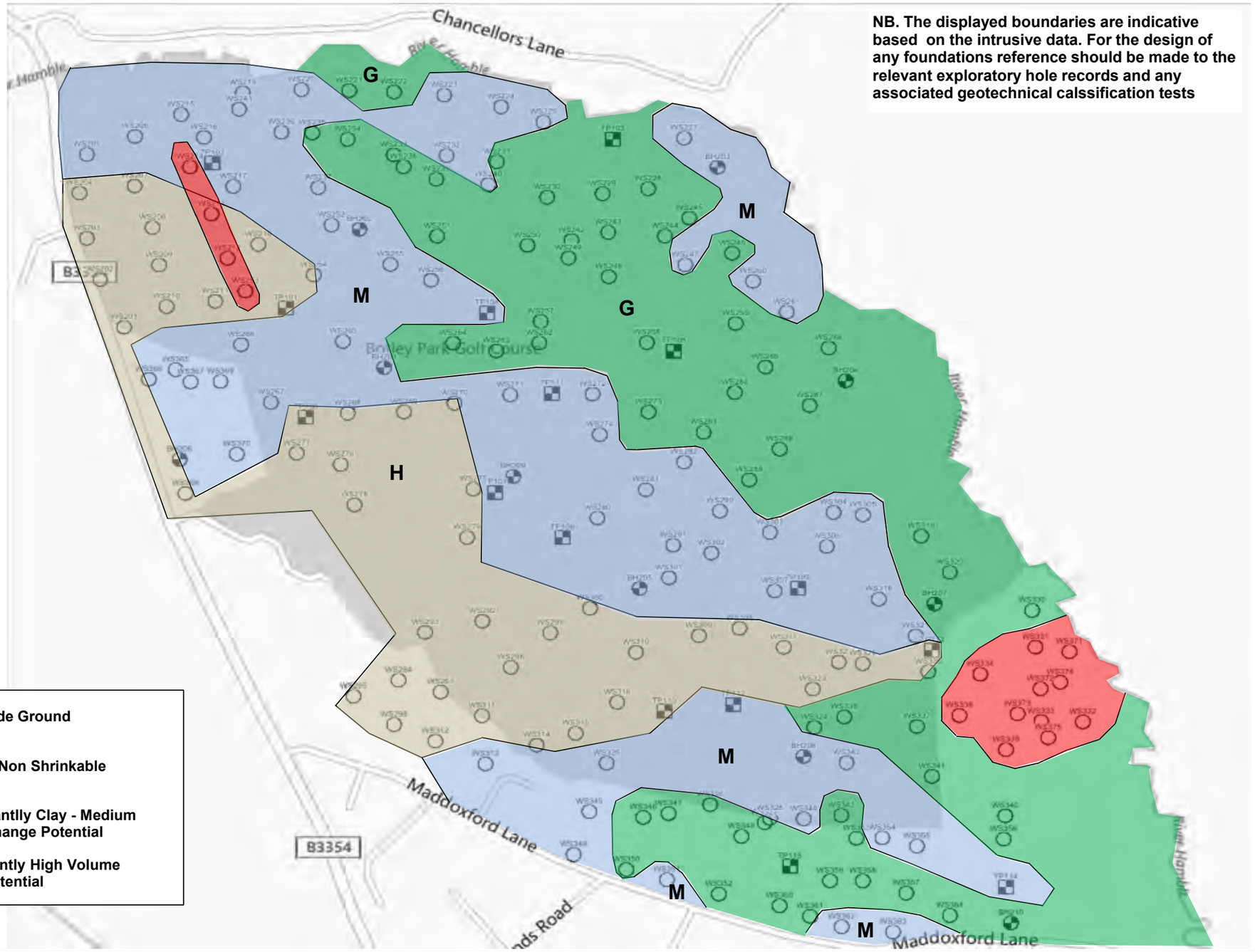
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Client:	MA Botley Ltd			**Geo-Environmental Services Limited**	
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Geo-Environmental



Project:	Boorley Green, Winchester Road, Hampshire			**Title**	**Gas Clam Data Plot for BH210**
Client:	MA Botley Ltd			**Geo-Environmental Services Limited**	
Ref No:	GE9253	**Revision:**	v1	**28 Crescent Road, Brighton, BN2 3RP**	
Drawn:	-	**Date:**	October 13	**T: 01273 699 399 F: 01273 699 388**	
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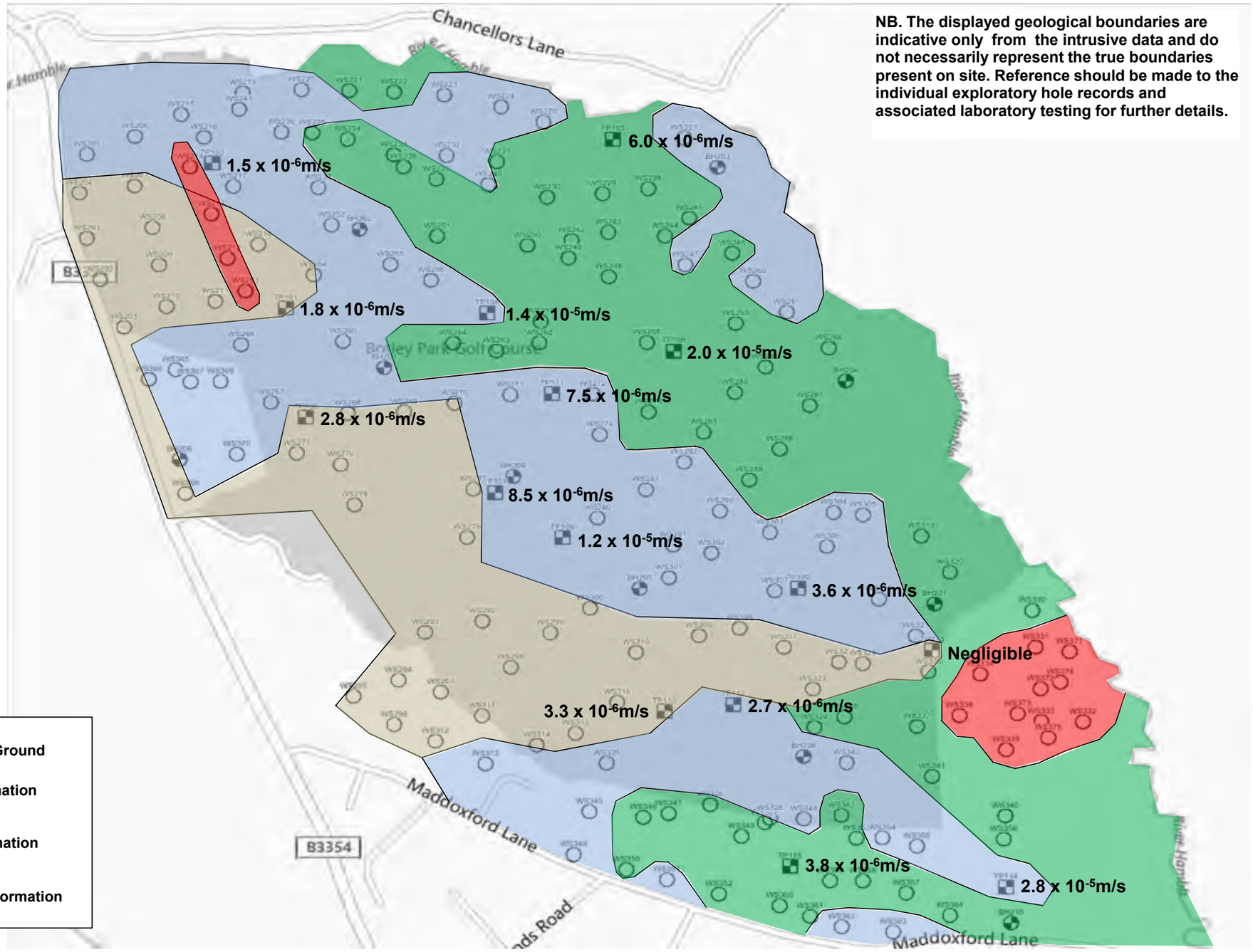
Geo-Environmental



NB. The displayed boundaries are indicative based on the intrusive data. For the design of any foundations reference should be made to the relevant exploratory hole records and any associated geotechnical calssification tests

N

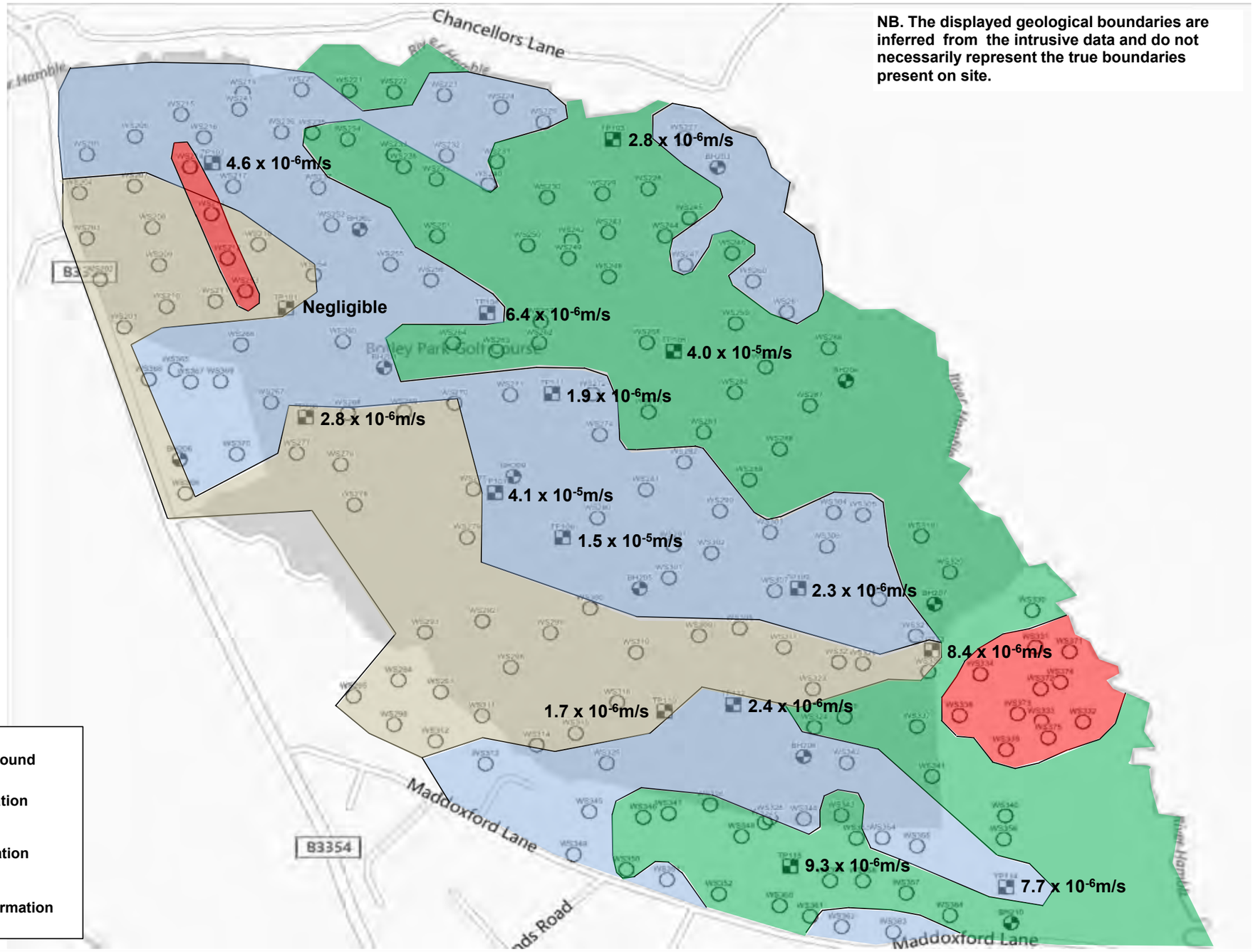
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Grid Ref:	SU 50978 15011	**Scale:**	Not to scale	**Drawn:**	JK	**Figure:**	11		
Client:	MA Botley Limited			**Ref:**	GE9523				



NB. The displayed geological boundaries are indicative only from the intrusive data and do not necessarily represent the true boundaries present on site. Reference should be made to the individual exploratory hole records and associated laboratory testing for further details.

N

Project:	Boorley Green			**Title:**	'Deep' Infiltration Rates			**Revision:**	v1
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Client:	MA Botley Limited			**Ref:**	GE9523				



Project:	Boorley Green			**Title:**	'Shallow' Infiltration Rates			**Revision:**	v1
Address:	Boorley Green, Winchester Road, Hampshire			**Date:**	Sept-2013			Geo-Environmental	
Grid Ref:	SU 50978 15011	**Scale:**	Not to scale	**Drawn:**	JK	**Figure:**	13		
Client:	MA Botley Limited			**Ref:**	GE9523				

APPENDICES

APPENDIX A

Desk Study Information

Southern Testing
Environmental & Geotechnical

Combined Phase 1 Desk Study and Preliminary Phase 2 Site Investigation Report



Desk Studies | Risk Assessments | Site Investigations | Geotechnical | Contamination Investigations | Remediation Design and Validation

Site: Botley Park, North Boorley Green, Hampshire

Client: Ashill Developments

Report Date: 24 February 2012

Project Reference: J10856

AGS ace CHAS BSI ISO 9001 ISO 14001 BS18001

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SUMMARY

The site, which extends to approximately 75 ha, comprises Botley Park Hotel and Country Club, including an 18 hole golf course, Braxells Farm to the northwest and field areas associated with Maddoxford Farm to the south east. It is proposed to redevelop the site with two areas of housing (28ha and 18.7ha), a Hotel, a School, Sports Pitches and areas of informal open public space.

Geological records indicate the site to be underlain by the Wittering Formation, with a limited area of the London Clay Formation and Whitecliff Member passing through the site in an east to west direction, roughly through the centre of the site.

A historical Ordnance Survey map search and desk study was carried out and indicates that the site has a history of agricultural use, prior to part of the site being developed into a large Hotel and Country Club with an eighteen hole golf course.

This report gives only a brief account of ground conditions, possible problems which may be encountered and likely foundation type based on a brief assessment of ground conditions. It is not a fully comprehensive site investigation report and it is anticipated that further work will be undertaken. The recommendations in this report are for guidance only.

A single phase of intrusive investigation has been carried out.

The soils across most of the site comprised sandy clay over sand, except in the centre and in the northwestern corner of the site, where clay soils were encountered.

Groundwater was struck in some of the trial holes at depths between 2.1m and 3.15m. Several low-lying areas were also waterlogged at the time of the fieldwork.

The sulphate content of the fill and natural soil was found to fall within Class DS 1. The ACEC classification for the site is AC-1s.

A preliminary allowable bearing capacity of 100kN/m^2 is suggested for the sandy clay, sand and clay soils alike.

Preliminary testing indicates that NHBC Medium Volume Change Potential (VCP) precautions are likely to apply where sandy clay soils are encountered. This classification should be increased to High VCP where clay soils are encountered. The sand soils will not be influenced by swelling or shrinkage.

Suspended or ground bearing floor slabs may be adopted, but where foundation 1.5m deep or greater are constructed because of the effect of tree roots, or made ground is encountered, suspended floor slabs are advised.

Soakage tests indicate poor rates of infiltration in the sand soils, and large deep soakaways are not considered to be a suitable method of surface water runoff. Small soakaways for individual properties or other sustainable drainage measures or attenuation may provide adequate soakage. Full-scale BRE 365 tests would be required for drainage design.

No significant contamination was encountered during this investigation. The only evidence of soil contamination is in the form of Benzo[a]pyrene in the soil mound adjacent to the driving range and beneath the parking area in the industrial area. Further work is required to define the extent of the contamination to enable design of any remediation that might be required.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Ashill Developments and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd believes are reliable. Nevertheless, Southern Testing Laboratories Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.





S Pratt MSc CGeol
(Countersigned)

A Holley MSc FGS
(Signed)

For and on behalf of Southern Testing Laboratories Limited

STL: J10856
24 February 2012

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A INTRODUCTION

1 Authority

Our authority for carrying out this work is contained in a letter of appointment, dated 21st November 2011, from Peter Hawkey of PJH Development Consultancy Services, on behalf of their client Ashill Developments Ltd.

2 Location

The site is located to the east of Winchester Road (B3354), Botley, Southampton, approximately 1km east of Hedge End Train Station, Hedge End, Hampshire. The approximate National Grid Reference of the site centre is SU 509 149.

3 Proposed Construction

It is proposed to develop a c.75 ha site with housing, a school, and areas of public open space. Ground loadings have not been given at this stage.

For the purposes of any future contamination risk assessment, the proposed development land use is classified as **Residential with plant uptake (CLEA model[1])** for the residential areas.

The gas sensitivity of the site is rated as **High** for the Residential areas (CIRIA C665[2]).

These classifications are the most stringent of all the proposed land uses and have been assumed to operate over the whole of the site for the purpose of this report.

4 Object

This is a preliminary Phase 1 desk study and Phase II geotechnical and contamination (risk estimation and evaluation) investigation (Tier 1).

The object of the investigation was to provide preliminary guidance on foundation bearing conditions and other soil parameters relevant to the proposed development, and to assess the likely nature and extent of soil, groundwater and soil gas contamination on the site.

5 Scope

This report presents our exploratory hole logs and test results and our interpretation of these data.

This report gives only a brief account of ground conditions, possible problems which may be encountered and likely foundation type based on a brief assessment of ground conditions. It is not a fully comprehensive site investigation report and it is anticipated that further work including geotechnical and chemical laboratory testing will be carried out. It is not an engineering design document and should any information be used it should be noted that variations will apply, according to variations in design loading, in techniques used, and in site

[1] Environment Agency Publication SC050021/SR3 'Updated technical background to the CLEA Model' (2009).
. [2] CIRIA C665 (2006) Assessing risks posed by hazardous ground gases to buildings.

conditions. Our figures therefore should not supersede the final design.

It is impossible to categorically define the extent of any contamination on site at this preliminary stage, due to the discrete number of sampling locations.

As with any site there may be differences in soil conditions between exploratory hole positions.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Ashill Developments Limited and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The recommendations contained in this report may not be appropriate to alternative development schemes.

B DESK STUDY & WALKOVER SURVEY

6 Desk Study

A desk study has been carried out. Reference has been made to the following information sources.

- Geological Maps
- Hydrogeological/Groundwater Vulnerability maps
- Aerial Photographs
- Historical Ordnance Survey Maps
- Environmental Databases
- EA website
- BRE Radon Atlas[3]
- Discussions with site employees

Note: Due to the extensive site area, the environmental report has been divided into six distinct areas. An Index Plan is presented within Appendix C. The historical maps have been sub divided into 6 areas as denoted on the Index Plan (A1, A2, B1, B2, C1 and C2).

The environmental databases search report compiled for this desk study contains site-specific environmental data drawn from data sets that comprise publicly available information together with data from third parties, some of which is under review. Accordingly, Southern Testing Laboratories Limited does not warrant its accuracy, reliability or completeness.

The full report is included in Appendix E, a summary of the salient features is included in the following sections of this report.

6.1 Geology

According to BGS maps, the Wittering Formation underlies the majority of the site. A limited area of London clay passes through the Wittering Formation in an east to west direction roughly through the centre of the site, which is surrounded by the Whitecliff Member. Terrace gravels are also present along the far eastern side of the site.

[3] BR 211 (2007) 'Radon: guidance on protective measures for new buildings'

Terrace Gravels

Terrace gravels are sheets of irregular and sub-rounded gravel and sand, laid down as terraces alongside rivers. There is usually a covering of sandy silty clay, termed brickearth, and old backfilled gravel workings are sometimes found.

The Wittering Formation

The Wittering Formation comprises Palaeogene marine deposits that occur as three main lithologies in the Southampton district. The three soil types are intricately interrelated and run together both laterally and vertically. The soil types are greenish and brownish grey clay with sand and silt lenses, interlaminated sands and clays, and fine medium sand with silty clay laminae or thin beds. Channel sands may be found that are restricted in lateral extent and may have a sharp interface with the adjacent sand laminated clay.

London Clay (Southampton)

In the Southampton area the London Clay ranges from 53 to 114m in thickness. Its base is marked by olive grey glauconitic sandy clayey silt, sandy silt or very silty fine-grained sand. It overlies red mottled clays and clean yellowish brown medium grained sands of the Reading Formation.

The London Clay in this area ranges from silty plastic clays and silty sands to widespread cross-bedded fine to medium grained sheet sands. Pebble beds of grey to black well rounded flints (up to 100mm) in a matrix of glauconitic fine to coarse grained quartz sand, silt and clay are found, but are generally less than a metre in thickness. Lenticular beds of fine to medium cross-bedded sands up to 10m thick are found at two horizons.

The five cycles identified in the London Basin have been correlated with five similar cycles in the Southampton area. The cycles are referred to as A to E, each cycle representing a coarsening upwards sequence and the transition from open marine shelf conditions through to a close off-shore environment and into a tidally dominated estuarine/deltaic environment in which channel sands were laid down within the distributary channel. The cross-bedded sheet sands were probably deposited in relatively shallow water above the wave base.

Division A is the lowermost and oldest of the London Clay cycles. It is further sub-divided into divisions A1 to A3. Division A1, the basement bed, is generally less than 1.5m thick and consists of shelly clay. Division A2 typically consists of clayey silt and silty clay with partings and laminae of very fine grained sand and silt, together with beds of bioturbated sandy silt. It is generally up to 30m in thickness.

The bulk of Division A is made up of sub-division A3 which itself shows a coarsening upwards sequence with silty clay passing locally upwards into fine to medium grained sands with calcareous concretions. These sands are known as the Bognor Sand Member. Fine to very fine sands with irregular clay flasers and partings have been found at the top of A3 around Shamblehurst which is about 5km north-west of the Whiteley site.

The Bognor Sand Member is perhaps the best known of the sandy beds in the London Clay but elsewhere and higher in the sequence are found the Nursling Sand, the Portsmouth, Whitecliff and Durley Members.

6.2 Hydrology and Hydrogeology

Data from the Environment Agency and other information relating to controlled waters is summarised below.

Data		Remarks	Possible Hazard to/from Site Y/N
Groundwater Vulnerability	Superficial Deposits	A Secondary A aquifer within superficial deposits is mapped along the northern, eastern and southern part of the site.	**Y**
	Bedrock	A Secondary A aquifer within bedrock deposits is mapped over most the site. A small area of unproductive bedrock strata is mapped in the centre of the site, extending to the east.	**Y**
Abstractions		There are two surface water abstraction licenses listed on site. Both are related to direct spray irrigation at the Botley Hotel and Country Club.	N
Source Protection Zones		The site is not situated within a groundwater source protection zone.	N
Surface Water Features		A primary river runs along the north and eastern site boundaries, with secondary and tertiary rivers running across areas of the site. A small length of canal is also mapped in the north western part of the site. There are also some ponds mapped on site, which appear to be part of the Golf Course.	**Y**
Flood Risk		Along the northern, and eastern site boundaries, where the primary river is mapped, an area of Zone III floodplain is mapped. This area is confined to a corridor along the existing river and does not pose a significant risk the majority of the site, especially where the proposed housing developments are located.	**Y**
Discharge Consents		There are five discharge consents listed within 50m of the site boundary. All five discharge consents are listed as discharge of sewage/treated effluent into freshwater rivers/streams.	N

6.3 Historical Map Search

Copy extracts of historical Ordnance Survey plans dating from 1868 to 2011 were obtained and are presented in Appendix C together with a detailed summary of the salient features from the 1:2500 historical maps for each of the six mapping areas (A1, A2, B1, B2, C1, C2).

In brief, from the 1:10,000 historical maps the site is first mapped on the 1868 map as primarily agricultural land, with an area of mixed woodland (Bushydeans Copse) situated in the centre-west of the site. Braxells Farm and Little Braxells Farm are located on the north-western and north-eastern boundaries respectively, with Maddoxford Farm buildings just off site to the south-east. The northern and eastern site boundaries are defined by a small river (Ford Lake) which runs to the south and joins into the River Hamble. Winchester Road bounds the site to the west and a track leading to Maddoxford Farm to the south.

The surrounding area is primarily rural/agricultural land, with Maddoxford Farm situated just off site to the south east. A railway line is situated approximately 400m south of the site and runs in a broadly northwest to southeast orientation.

1895 1:10000

Little has changed on the actual site, with the exception of the demolition of Little Braxells Farm. The surrounding area has also undergone little change in the terms of development. A few small gravel pits have been excavated approximately 500m southeast and east of the site.

1908-1910 1:10000

The majority of the land on site appears to remain as rural/agricultural land. In the south-eastern most part of the site, a gravel pit has been excavated on the eastern side of Ford Lake.

The surrounding area has undergone some minor expansion to the south of the site, with the construction of a public house, two nurseries and some additional residential properties.

The gravel pits, formerly located to the east and south east are now either no longer mapped or are mapped as Old Gravel Pits.

1957 1:10000

Braxells Farm on the western part of the site has undergone some minor alteration, with new outbuildings having been constructed. The rest of the site remains essentially unaltered, with the exception of the apparent removal of the area of mixed woodland known as Bushydeans Copse.

Boorley Green, to the immediate south of the site has also undergone minor development, with a few additional residential properties constructed along the roads that bound the site to the west and south.

1967-1968 1:10000

Braxells Farm has undergone significant expansion, with several new outbuildings having been constructed. The gravel pit situated in the south-eastern most part of the site is no longer mapped, and a property has been constructed directly south of the former quarry. The rest of the site remains essentially unaltered.

Boorley Green to the south of the site has expanded, with several new residential properties having been constructed and the former nurseries appear to have been demolished. A row of houses has been constructed on the northern side of the road (Maddoxford Lane) which bounds the site to the south.

1985-1989 1:10000

No real significant changes have taken place on site since the 1967-1968 maps.

Boorley Green to the south of the site has undergone further development, with the construction of new residential properties and minor expansion to surrounding farm buildings.

2002 1:10000

The site has been developed into Boorley Park Hotel and Country Club, and the surrounding fields have been developed into an eighteen hole golf course. As part of the construction of the golf course two lakes have been constructed. Braxells Farm is still situated on site, however appears to not hold as much land as it once used to. Part of the land to the north of Braxells Farm has been developed into a driving range.

2011 1:10000

No significant changes are noted on site or in the immediate surrounding area.

6.4 Environmental Databases

The following table gives the pertinent information obtained from the environmental database.

	Distance (m)	Direction	Details	Possible Hazard to site
Historical Industrial Land Uses	0	E	Quarrying of Sand and Gravel	Y
Current Industrial Land Uses	0	-	Giraffe Embroidery	N
	0	-	Electricity Substation	Y
	15	S	Gas Governor Station	N
	16	S	Gas Governor Station	N
	16	SW	Electricity Substation	Y
	43	E	Livestock Farming	N
	51	W	Longacre Saddlery	N
	51	W	Longacre Feeds	N
	64	SW	Electricity Substation	N
Current and Historical Landfills	-	-	There are no current or historical landfills mapped within 1km of the site.	N
Fuel Sites	-	-	None listed within 1km of the site	N
Fuel Pipelines	0	-	A high pressure Esso pipeline is mapped on site, along with a high-pressure gas main.	Y
Pollution Incidents	0	-	General biodegrable materials (food and drink) spilt into watercourse	N
	10	W	Oil and diesel spillage onto land.	N
IPC Part B Authorisations	-	-	None listed within 1km of the site	N
Hazardous Substances Consents	-	-	None listed within 1km of the site	N
Sensitive Land Use Designations	-	-	None listed within 1km of the site	N

6.5 Geological Hazards and Mining Activities

Data from various sources relating to potential geological hazards at the site are summarized below. The Hazard Potentials listed for the BGS data are as presented in the Groundsure report, derived from various generic BGS sources, which are not considered as site-specific. It is important that this information is considered in context of the actual site topography, ground conditions encountered during future investigation, and development proposals.

Data Source	Hazard	Hazard Potential to Site	Remarks
BGS	Potential for Collapsible Ground Stability Hazard	Very Low	-
	Potential for Compressible Ground Stability Hazard	Moderate	-
	Potential for Ground Dissolution Stability Hazard	Negligible	-
	Potential for Landslide Ground Stability Hazard	Very Low	-
	Potential for Running Sand Ground Stability Hazard	Low	Areas of Whitcliffe Sand are mapped on site. There is a risk of encountering running sands, if a high groundwater table is located on site.
	Potential for Swelling or Shrinking Clay Ground Stability Hazard	Moderate	Clay soils are susceptible to swelling and shrinkage in the presence of trees. Foundations depths will be affected where clay soils are in close proximity to trees in accordance with NHBC Chapter 4.2.
	Shallow Mining Hazard	Negligible	-
ARUP	Mining Instability	Negligible	-
CSS/KURG*	Underground openings	Negligible	-

**Chelsea Spelaeological Society/ Kent Underground Research Group*

6.6 Other Sources

The Groundsure report lists no sites determined as contaminated land under Part IIA within 500m of the proposed site.

A high-pressure gas main and two high pressure Esso Fuel pipelines run across the south eastern part of the existing golf course. No excavations should be undertaken in this area prior to consultation with the pipeline operators. Working restrictions are likely to apply within a set area around the pipeline.

6.7 Radon Risk

With reference to BRE guidance, no radon protection is required on this site.

7 Walkover Survey

A walkover survey was carried out on 7th December 2011.

The site comprises the Botley Country Club, an eighteen hole golf course, an outdoor driving range and two areas of farmland.

In general, the eighteen hole golf course slopes gently to the north and east towards the small wooded valley that bounds the site to the north and the east. Within the small wooded valley, Ford Lake, a small meandering stream, containing less than 1m of water at the time of our walkover survey, runs towards the south and joins onto a larger river network. The base of the stream bed ranges from approximately 2-6m lower than the ground level of the adjoining golf course.

The eighteen hole golf course undulates across the site, as expected from a professionally landscaped golf course. Mature and semi mature deciduous trees bound the site to the north and east and line most of the holes on the golf course. Several small copses of mixed deciduous trees are situated on site, which we understand are to remain as part of the proposed redevelopment. As part of the golf course two man made lakes are situated to the south east of the main clubhouse and several man made ditches run across the site acting as drainage for the golf course. Anecdotal evidence from staff on site suggests that the golf course was constructed into the existing landscape and the only material imported onto the site was sand and drainage materials in order to develop raised greens and maintain sufficient drainage.

To the north of the main Hotel complex Braxells Farm and associated fields are situated. Braxells Farm has been redeveloped into a small commercial/industrial estate. There is a two-storey farmhouse situated to the south of the commercial estate and a barn situated to the north. The barn appears to still be in use as storage for machinery, however access onto this plot of land was not permitted during our walkover survey. A visual inspection of the barn and its surroundings identified potential asbestos containing materials in the form of cementing sheeting on the roof of the barn. Furthermore, outside the barn, a modern plastic, internally bunded fuel/oil tank is situated adjacent to an external metal hazardous chemical storage unit.

Two small fields are situated to the east of the remaining Braxells Farm buildings, both were currently in use as pasture.

Directly north of the former Braxells Farm, in the north west corner of the site, an outdoor driving range is situated. The driving range comprises a wooden framed structure and an outdoor area. The driving range itself is very flat and runs from the north of Braxells Farm up to the northern site boundary. The eastern boundary of the driving range comprises earth banks approximately 2-3m in height, which separate the range from the adjacent hole three.

The fields to the south of the golf course and to the east of Maddoxford Farm are currently in use as pasture, with livestock grazing in the fields. The fields are generally flat and fall gently away to the east toward Maddoxford farm.

At the base of the green for hole 15 in the wooded valley are marker boards for the Esso pipelines and gas pipeline which run down towards Southampton, further marker boards were identified to the south of the fairway of hole 16 and hole 17. Along Maddoxford Road, which bounds the farm land to the south Esso and Scotia Gas infrastructure was identified.

The houses along the north side of Maddoxford Road that bound the site to the southwest are primarily detached bungalows.

7.1 Photographs

A series of photographs showing the site during our walkover survey is included in Appendix F.

C PRELIMINARY CONCEPTUAL MODEL

8 Introduction

In the context of this report, the conceptual model summarises the potential pollutant linkages identified for the site and forms the basis of the risk assessment for the site. The preliminary model comprises the potential sources of contamination, receptors that could be harmed and exposure pathways identified from the desk study and walkover survey. These potential linkages form the basis upon which the investigation is designed and reported.

9 Potential Sources of Contamination

The site has a history of rural and agricultural land use and is located within a rural/agricultural area, which has slowly redeveloped into residential land use to the south of the site.

A number of potentially contaminative uses have been identified, both on site and in the locality.

Potential contaminants associated with these uses have been compiled from DoE industry profiles/ CLR 8 and our experience of such sites

9.1 On Site Sources

Location/Land Use	Potential Contaminants	Risk
Former and current Land uses at Braxells Farm	Metals, Asbestos, PAH's, Hydrocarbons, Pesticides/Herbicides	Low to Moderate
Golf Course Maintenance Yard	Hydrocarbons, Made ground	Moderate
Driving Range	Potential made ground soils used during construction and landscaping.	Low to Moderate
Golf Course	Potential made ground soils used during construction and landscaping.	Low
Fields around Maddoxford Farm	Pesticides/Herbicides	Low
Former Gravel Pit	Land Gas	Low

Braxells Farm

Braxells Farm buildings have been situated on site since the first historical map, and have undergone redevelopment and expansion over the years. Braxells Farm has been converted into a small commercial/industrial estate, however the existing House and Barn remain in use and two small fields are kept as pasture.

There is a low to moderate risk of potential contamination in and around the area formerly occupied by Braxells Farm and associated outbuildings. Historical land uses, storage of potential chemicals, hydrocarbons and solvents all pose a potential risk of on site contamination in this area, as well as potentially backfilled slurry pits and the possible use of Pesticides/Herbicides on site

Golf Course Maintenance Yard

The golf course maintenance yard is located in an old barn, adjacent to Braxells farm. There is a potential risk of on site contamination associated with an above ground plastic fuel tank, a chemical storage area, and from leaks and spills from machinery. Additionally the barn appears to have been partially constructed with asbestos cement sheeting, which will need to be disposed of in a controlled manner if demolition is to take place.

Driving Range

The driving range was constructed when the Botley Hotel and Country Club was developed and is situated in an area formerly occupied by Braxells Farm and associated fields. There is a low to moderate risk of on site contamination associated with the areas use as part of Braxells Farm as described above. Pockets of potentially contaminated made ground could be encountered in this area associated with demolition of farm outbuildings.

The driving range itself comprises a flat grassed area with two to three metre high grass banks dividing the range from the adjacent golf course. There is a low risk of on site contamination associated with unknown composition of the materials used to construct the grass banks.

Golf Course

During our walkover survey of the golf course no significant potentially contaminative sources were identified. The area had historically been used as agricultural fields with no significant developments ever occurring on this area.

We understand that some inert material was imported during the construction of the course, comprising sand and drainage material used to create the raised greens across the golf course. At this stage, based on the historical map data and observations from our walkover survey, we do not consider there to be a significant risk of on site contamination in this area.

Fields to the South of the Golf Course, west of Maddoxford Farm

Access onto the fields was not possible during our walkover survey. However a clear visual assessment of the fields was possible from both the main road and the golf course land.

Based on our visual assessment and information from the historical maps we do not consider there to be a significant risk of on site contamination in this area.

Backfilled Gravel Pit

A gravel pit was situated in the far southeastern corner of the site, to the east of Maddoxford Farm, which extended to the north and south. The gravel pit was first mapped on the 1909 historical map, and by the 1964 it looks as though the pit had been backfilled, although this feature is not recorded as a historic landfill in the Groundsure report, or on the Environment Agency website.

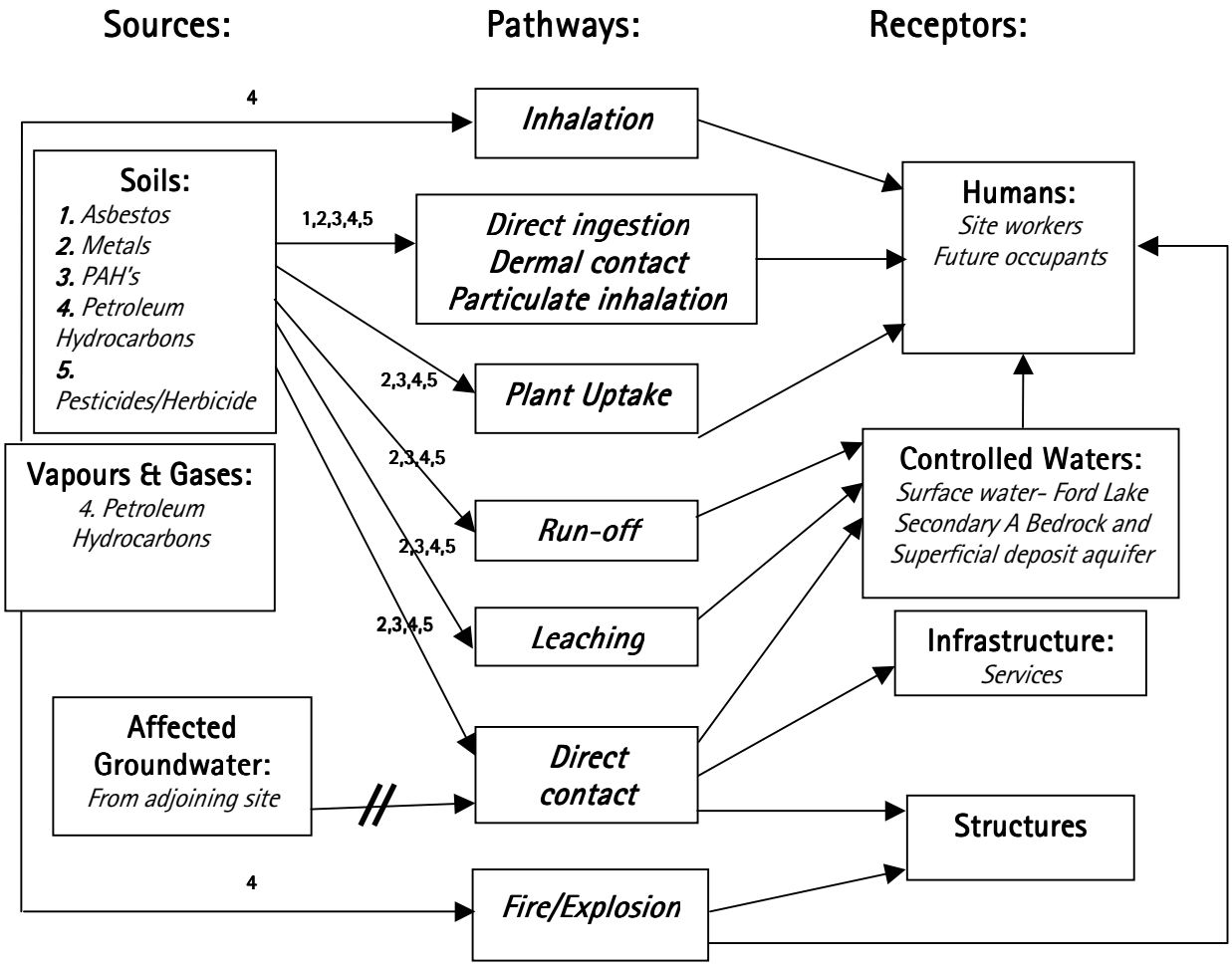
Given the age of the gravel pit, the presence of a stream that passes between the pit and the development, and the distance the pit is from the proposed development area (i.e. 400m), the risk from land gas generation and migration onto the subject development area is considered to be very low.

9.2 Off Site Sources

No significant sources of off site contamination were identified during either the desk study assessment or walkover survey.

10 Pollutant Linkages and Model Summary

The following diagram shows the potential pollutant linkages identified for the site and summarises the preliminary conceptual model:



// Denotes potential pollutant linkage not complete

D SITE INVESTIGATION

11 Method

The strategy adopted for the intrusive investigation comprised the following:

- 17 No. 3.0m-4.5m deep windowless trial holes, with in situ testing and sampling
- 3 No. borehole soakage tests (modified BRE 365 tests)
- A series of DCP CBR tests

Exploratory hole locations are shown in Plan 1 in Appendix A.

12 Weather Conditions

The fieldwork was carried out on 10th, 18th and 19th January 2012, at which time the weather was generally cold with period of light rain.

The month of December 2011 received roughly average rainfall concentrations in the southeast of England. The month of January 2012 was drier than average, with approximately 65% of the average rainfall.

13 Soils as Found

The soils encountered are described in detail in the attached exploratory hole logs (Appendix A). In general, we encountered sandy clay and sand soils in the boreholes drilled in the northern and southern parts of the site. Around the central parts of the site (DH 7, 8 and 11), and in the boreholes drilled in the northwestern side of the site (DH 1 and 2) we encountered clay soils. A summary is given below.

Sandy Clay and Sand soils (DH 103-106, 109-110, 114-117)

Soil Layer	Depth	Thickness	Soil Type	Description
-	GL-0.15m	0.15	TOPSOIL	Brown silty clay TOPSOIL.
1	0.1 to 0.6	0.1/0.45	MADE GROUND	Brown CLAY with brick fragments, clinker, chalk and flint gravel (MADE GROUND).
2	0.20/0.6m to 0.75m /3.0m+	0.55-2.4m+	Sandy CLAY	Medium strength grey and orange brown mottled very sandy CLAY.
3	0.75m/ 2.5 to 3.0m +	Absent or 0.8-2.3m +	SAND	Medium dense and dense orange and brown SAND.

Clay Soils (DH 101-102, 107-108, 111-13)

Soil Layer	Depth	Thickness	Soil Type	Description
-	GL-0.1/0.25	0.1/0.25	TOPSOIL	Brown silty clay TOPSOIL.
4	0.1/0.25 to 3.0m +	2.7m +	CLAY	Medium to high greyish brown extremely closely fissured CLAY.

Using our findings from this investigation, and the 1:10,560 geological map of the area, a very tentative plan has been enclosed showing the extrapolated underlying geology (see Appendix A). This is for guidance only and it is anticipated that this map will be refined and adjusted following further ground investigations.

13.1 Visual and Olfactory Evidence of Contamination

Evidence of possible contamination in the form of made ground was recorded at many of the trial hole locations. The made ground was generally between 0.1-0.45m thick, and comprised reworked soils, probably associated with the landscaping of the golf course.

Thick made ground was encountered in the banks surrounding the driving range. These soils were found to comprise, clay soils with many inclusions including brick, chalk, clinker, and organic patches. These occurrences are discussed in Section H.

14 Groundwater Strikes

Groundwater was struck at the time of drilling in some of the exploratory holes as follows:

Trial Hole	Measured Water level (bgl)
DH 102	3.15m
DH107	2.19m
DH 114	2.1m
DH 115	2.72m
DH 116	2.88m
DH 117	2.63m

The remaining boreholes were dry. Standpipe piezometers were installed in DH 105, 114, 107 and 117, but have not been measured as part of this investigation.

E FIELD TESTING AND SAMPLING

The following in-situ test and sampling methods were employed. Descriptions are given in Appendix B together with the test results.

- Standard Penetration Test (SPT)
- Hand Penetrometer
- DCP CBR test
- BRE 365 soakage tests (modified)

F GEOTECHNICAL LABORATORY TESTS

The following tests were carried out on selected samples. Test method references and results are given in Appendix C.

- Atterberg Limit tests
- Moisture Content
- Sulphate content and pH
- Particle Size Distribution (pipette)

G DISCUSSION OF GEOTECHNICAL TEST RESULTS AND RECOMMENDATIONS

15 Soil Classification and Properties

Soil Group	Soil Type	Depth	Compressibility	VCP	Permeability	Frost Susceptible	CBR	Remarks
1	Made Ground	0.1/0.45	High	Variable	Variable	Assume yes	Poor	Not suitable for foundations
2	Sandy CLAY	0.55-2.4m+	Low	Medium	Poor	No	Assume 3% at this stage	-
3	SAND	Absent or 0.8-2.3m +	Low	Negligi-ble	Poor or Moderate	Yes	Assume 7% at this stage	-
4	CLAY	0.1/0.25 to 3.0m +	Moderate	High	Poor	No	Assume 2% at this stage	-

16 Swelling and Shrinkage

The sand soils will not be influenced by swelling and shrinkage, and precautions for constructing foundations near trees should not be required where this stratum is encountered.

The sandy clay and clay soil layers (Soil Group 2 and 4) will be influenced by swelling and shrinkage, and precautions for building near trees may be required, where these soils are encountered. For guidance only, our extrapolated geological map shows the rough location of the different soil types is enclosed in Appendix A.

Four samples of sandy clay (Soil Group 2) were tested for plasticity. 3No out of the 4No. plasticity tests classified this soil group as NHBC MEDIUM Volume Change Potential (VCP), with one result in the NHBC HIGH class. On balance it is considered that the NHBC MEDIUM class would be appropriate for this soils group.

Four samples of clay (Soil Group 4) were also tested for plasticity. 3No. out of the 4No. plasticity tests classified this soil group as NHBC HIGH VCP, with one result in the NHBC MEDIUM class. On balance it is considered that the NHBC HIGH class would be appropriate for this soil group.

Based on the investigation carried our thus far, it is not expected that swelling and shrinkage precautions will be required in the sand soils (Soil Group 3) if encountered. However, it should be remembered that this is a provisional investigation only and that ground conditions in all parts of the site will vary between trial hole locations. The above guidance should therefore be treated as very provisional at this stage and further detailed area specific testing will be required.

Full details of protective measures are given in NHBC Chapter 4.2, but for convenience the depth requirements that may be required for the two soils layers is summarised below.

Soil Group 2- Sandy CLAY

Table of Foundation Depths. . . . Deciduous Trees. . . . Medium Volume Change Potential								
	Distance from the dwelling as a proportion of the tree height.							
(D/H Ratio)	**0.0**	**0.1**	**0.2**	**0.4**	**0.5**	**0.7**	**1.0**	**1.25**
Tree Species	**Depth of foundation in m/mm**							
Oak, Poplar, Willow, Hawthorn, Elm, Eucalyptus.(High demand)	*	*	*	2.3	2.2	1.8	1.3	0.9
Ash, Plane, Cherry, Fruit, Beech (Moderate demand)	2.0	1.85	1.7	1.4	1.25	1.0	0.9	0.9
Holly, Magnolia, Mulberry, Shrubs (Low demand)	1.5	1.4	1.25	1.0	0.9	0.9	0.9	0.9

Table of Foundation Depths. . . Conifers . . Medium Volume Change Potential.								
	Distance from dwelling as a proportion of the tree height							
(D/H Ratio)	0.0	0.1	0.2	0.3	0.35	0.4	0.5	0.6
Tree Species	Depth of foundation in metres/mm							
Lawsons, Leyland, Monterey Cypress (High Demand)	*	*	2.3	1.95	1.8	1.6	1.25	0.9
Cedar, Pine, Spruce, Douglas Fir, Wellingtonia & Yew (Moderate Demand)	2.0	1.7	1.35	1.05	0.9	0.9	0.9	0.9

Minimum depth = 900mm.

Soil Group 4- CLAY

Table of Foundation Depths. . . . Deciduous Trees. . High Volume Change Potential								
	Distance from the dwelling as a proportion of the tree height							
(D/H Ratio)	0.0	0.1	0.2	0.4	0.5	0.7	1.0	1.25
Tree Species	Depth of foundation in m/mm							
Oak, Poplar, Willow, Hawthorn Elm, Eucalyptus.(High demand)	*	*	*	*	2.5	2.1	1.5	1.0
Ash, Plane, Cherry, Fruit, Berry (Moderate demand)	2.4	2.2	2.0	1.65	1.45	1.1	1.0	1.0
Holly, Magnolia, Mulberry Shrubs (Low demand)	1.8	1.65	1.5	1.15	1.0	1.0	1.0	1.0

Table of Foundation Depths. . . . Conifers . . . High Volume Change Potential.								
	Distance from dwelling as a proportion of the tree height							
(D/H Ratio)	0.0	0.1	0.2	0.3	0.35	0.4	0.5	0.6
Tree Species	Depth of foundation in metres/mm							
Lawsons, Monterey Cypress (High Demand)	*	*	*	2.2	2.0	1.85	1.40	1.0
Cedar, Pine, Spruce, Douglas Fir, Wellingtonia, & Yew (Moderate Demand)	2.4	2.0	1.6	1.2	1.0	1.0	1.0	1.0

Minimum depth = 1000mm.

*Foundations below 2.5m must be designed individually by an engineer on an individual property basis taking into account soil desiccation, lateral pressure, trench stability and workmanship. At depths in excess of 2.5m a piled foundation is usually the most appropriate foundation.

Certain trees have a very high water demand (Oak, Poplar, Willow, Elm, Hawthorn, Eucalyptus) and if these are planted then a greater increase will be required.

Where trees have been or are to be removed from within 2m of the face of the excavation and where the height on removal is less than 50% of the maturity then distance (D) can be assumed to be 2m. This is to cater for the occurrence of 'saplings'.

17 Lateral Pressures & Heave

Where foundations are more than 1.5m deep, and are within the zone of influence of existing or removed trees, then precautions will also need to be taken against the effects of lateral swelling of soils beneath house units due to removal of trees, or cutting tree roots. The NHBC requirements for the relief of lateral pressure are set out in Chapter 4.2 of the NHBC Standards Manual, as revised in October 2003, and to which the reader is referred. The basic requirement is that compressible material or void former should be installed on the inner face of external foundation walls. With pier and beam foundations additional voids are required below ring beams.

In all cases where deep foundations are adopted, special precautions may be required to prevent damage to roots of retained trees.

18 Groundwater Levels

Groundwater was struck in some of the trial holes between depths of 2.1m to 3.15m.

The site is relatively low lying at around 18-40m AOD and is predominately underlain by relatively low permeability soils and there is a stream marking the eastern boundary. It is considered likely that groundwater levels may rise significantly in wet and winter months. Inflows into excavations made in the clay and sandy clay soils are likely to be restricted by low permeability, and we anticipate at this stage, should be controllable by periodic pumping from sumps within the main excavations. The sandy soils, particularly where they coincide with topographically lower parts of the site, may require dewatering, especially in wet and winter months where deep excavations are concerned.

Terrace Gravels deposits, associated with the stream, may underlie the eastern parts of the site. Strong groundwater inflows and running sands could be experienced in these areas.

More detailed investigations together with groundwater monitoring is recommended.

Several low-lying parts of the site were waterlogged at the time of the fieldwork. The location of these areas is shown on Plan 3 in Appendix A. These typically coincide with the sandy clay or clay type soil groups.

Soakaways are unlikely to be an effective means of surface water drainage in low-lying areas.

Groundwater levels vary considerably from season to season and year to year, often rising close to the ground surface in wet or winter weather, and falling in periods of drought. Long-term monitoring from boreholes or standpipes is required to assess the groundwater regime and this was not possible during the course of this site investigation.

19 Soakaways

We undertook several modified BRE 365 soakage tests (carried out in boreholes) during the course of the ground investigation. The purpose of these tests is to determine if soakaways are a feasible means of surface water runoff. The results are not intended for design.

The soakage tests were carried out in the fine sand soil group. We did not undertake any tests in the sandy clay or clay soil groups since these soils will have negligible or very low infiltration rates, and it is anticipated that soakaways will not be feasible in these areas.

The results of the tests are enclosed in full in Appendix B, and are summarised below.

Trial Hole	Test No.	Infiltration rate		Comments
		m/sec	Litre/m^2/min	
DH 103	1	$1.34x10^{-05}$	0.805	Carried out in fine sand soils.
DH 103	2	$5.19x10^{-6}$	0.311	Carried out in fine sand soils.
DH109	1	$4.38x10^{-6}$	0.263	Carried out in fine sand soils.
DH117	1	$1.01x10^{-6}$	0.061	Carried out in fine sand soils. Groundwater recorded at 2.63m bgl.

These results indicate poor rates of infiltration, and the use of large deep soakaways is not likely to be feasible. However, subject to full-scale BRE 365 soakage tests, it may be possible, to construct small soakaway for individual plots.

Soakaways are unlikely to be an effective means of surface water runoff in lower lying areas, which were found to be water logged at the time of the fieldwork, and where high groundwater levels are anticipated, which will restrict storage volumes.

Gravel soils are believed to be located on the far eastern and northern parts of the site, which lie outside of the proposed building plot area. Although not encountered during this preliminary investigation, it may be possible to exploit these soil horizons for soakage. We expect moderate to good rates of soakage in gravelly soils, however, groundwater levels may be high and storage volumes may be restricted.

It is clear that careful surface water drainage design will be required as most of the site is underlain by effectively impermeable or low permeable soils. It may be possible to discharge to the stream on the eastern boundary of the site, subject to regulatory approval, or provide a combination of direct discharge to soakaways. Sustainable methods will have to be given careful consideration, such as permeable paving, attenuation, including balancing swales and infiltration drainage. It is likely that a combination of these techniques will ultimately be required.

20 Sulphates and Acidity

The recorded pH values for the tested soils are in the range 3.9-6.6.

The Design Sulphate Class is likely to be DS 1. Groundwater should be assumed to be mobile. The ACEC site classification is therefore likely to be AC 1s.

21 Bearing Capacity/ Foundations

Traditional strip or trench fill foundations should mostly be suitable for this development.

Large parts of the site were covered with sand and very sandy clay (Soil Groups 2 and 3). In the sand soil group we recorded equivalent SPT 'N' values of between 11 and 19, with a single result of 37 (DH103). The sandy clay soil group was found to have UCS strengths (measured with a hand penetrometer) ranging between 120kN/m^2 and 250kN/m^2. On balance, having considered these results, we recommend a provisional allowable bearing pressure of around 100kN/m^2 for these soil groups.

The medium to high strength clay soils identified in the centre and northwestern parts of the site had similar UCS readings as the sandy clay soil group. Therefore we also recommend a provisional allowable bearing pressure of 100kN/m^2 for this soil group.

Groundwater levels on the lower parts of the site, and elsewhere, may be higher than recorded during this investigation and forming excavations for normal spread foundations may be difficult due to groundwater ingress and resulting trench instability. It would therefore be prudent at this stage to allow for special foundations such as piles/ vibro stone columns or vibro concrete columns in some areas of the site.

22 Floor Slabs

Ground bearing or suspended floor slabs could be utilised. However, where foundations have been deepened to 1.5m or more because of the effects of tree roots, or made ground greater than 0.6m thick is encountered, suspended floor slabs should be adopted, in accordance with NHBC recommendations.

23 Settlement

Under the loadings indicated above, settlements are expected to be within the normally accepted limits for housing of 25mm.

24 Excavations and Trenching

The sand soil group is likely to be particularly unstable in trial holes where groundwater is encountered. Therefore, An allowance for dewatering coupled with close support should be made where sandy clay and sandy soils are encountered.

Statutory support will be required in all excavations where men must work.

25 Road Construction

DCP CBR test were carried out at the location of each trial hole, except where deep made ground was encountered. The test results are attached in Appendix B, but in general CBR values carried out in sandy clay (Soil Group 2) ranged between 3.6% and 5.5%, CBR's carried out in sand (Soil Group 3) ranged between 7.0% and 7.9%, and CBR's carried out in clay (Soil Group 4) ranged between 1.6% and 2.2%.

Table C1 of the TRL Report 1132, 1984, provides average CBR values according to the plasticity index. According to his table, the CBR value of the sandy clay soil with plasticity index of around 25% is typically 3-4%, whereas the clay soils with plasticity index of around 40% is typically 2.5-3%.

On balance, considering the results of the in-situ tests and the estimated CBR value based on the plasticity of the soils, the following CBR values could be assumed for preliminary design: -

Soil Group	Description	CBR value	Frost susceptible
2	Sandy CLAY	3%	N
3	SAND	7%	**Y**
4	CLAY	2%	N

The clay and sandy clay soil groups are unlikely to be frost susceptible. However, the fine sand soil group is likely to be frost susceptible and a minimum 450mm thick construction thickness is required.

General

The most important element of any road construction is drainage and attention must be given not only to the drainage of the subsoil, but also to the various layers of construction. To this end the formation should be shaped to a camber or crossfall to allow water movement out of the sub-base. Silty soils soften extremely quickly if allowed to become wet or if they are excavated below the water table and this softening can give rise to a very substantial increase in costs.

Sub-base and coarse capping materials tend to segregate during placing operations, particularly when end tipped. On soft clay subgrades this can lead to punching and softening of the formation. The use of a layer of sand or geofabric will minimise the problem.

Because of the variability of shallow soils the formation should be proof rolled, and any soft spots found should be excavated and replaced with compacted granular material. The surface of the formation should then be compacted, prior to laying the road sub base. Details of surface tolerances and formation compaction are given in the DOT Specification for Highway Works (1991 amended Aug 1993), Clause 616.

Construction traffic should be kept off formations and it is often advisable to leave a protective layer of soil above formation level until the last moment before placing the sub-base.

H LAND QUALITY

26 Analytical Framework

There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

The CLEA model[4] provides a methodology for quantitative assessment of the long term risks posed to human health by exposure to contaminated soils. Toxicological data is used to calculate a Soil Guideline Value (SGV) for an individual contaminant, based on the proposed site use; these represent minimal risk concentrations and may be used as screening values.

The CLEA model and associated guidance was updated through 2009. A new model has been released and new TOX and SGV reports are to be published.

In the absence of any published SGVs for certain substances, Southern Testing have derived Tier 1 screening values for initial assessment of the soil, based on available current UK guidance including the LQM/CIEH[5] and CL: AIRE[6] generic assessment criteria. Site-specific assessments are undertaken wherever possible and/or applicable.

CLEA requires a statistical treatment of the test results to take into account the normal variations in concentration of potential contaminants in the soil and allow comparisons to be made with published guidance.

27 Site Investigation – Soil

27.1 Sampling Regime

The number of sample locations was limited and was based on a targeted investigation of potential sources of contamination and to provide general coverage. Further detailed investigations area required.

Areas noted as being at risk from contaminating in the preliminary conceptual model include the area around the golf course maintenance yard, where above ground fuel tanks were observed, the area of the industrial units, and general infilling associated with landscaping around the golf course.

27.2 Testing

The following tests were selected to provide general preliminary coverage of the site, and to target those potentially contaminated areas.

[4] Environment Agency Publication SC050021/SR3 'Updated technical background to the CLEA Model' (2009).
[5] The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment 2nd Edn. (2009).
[6] The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment (2009).

Test Suite	Number of Samples	Soil Tested
STL Key Contaminant Suite	9 7 2	Topsoil Made Ground Natural Soil
Asbestos Identification	2	Made ground
Hydrocarbons (TPH)	1 1	Made Ground Natural Soil

The test results are presented in full in Appendix D. A summary and discussion of the significance of the results and identified contamination sources is given below.

27.3 Test Results and Identified contamination sources

27.3.1 General Contaminants

The results of the key contaminant tests have been analysed in accordance with the CLEA methodology. The samples have been grouped into 3 populations comprising topsoil, made ground and natural soil. For each parameter in the topsoil and made ground population, the upper 95th percentile value (U_{95}) has been compared to a Tier 1 screening value. Where any parameter exceeds the screening value, the maximum value test is applied to determine whether or not this represents an outlier, i.e. a hotspot of contamination, or whether it is simply at the upper end of a normal population distribution. Any hotspots may be removed and the results re-analysed. For the natural soil group, the maximum values and mean average values for each contaminant have been compared to the screening value. The statistical analysis is presented in Appendix D. The source of the screening values is given in the footnotes. The test results are summarised as follows.

Soil Type: **Topsoil**

Samples Tested :	DH101 @ 0.10m, DH103 @ 0.10m, DH104 @ 0.10m, DH108 @ 0.10m, DH110 @ 0.10m, DH111 @ 0.10m, DH113 @ 0.10m, DH116 @ 0.10m, DH117 @ 0.10m

Contaminant	Unit	Measured Range	Arithmetic mean	Standard deviation	Upper 95th Percentile Bound Value	Screening Value
Arsenic (As) [4]	mg/kg	4 - 14	8.1	3.1	10	32
Cadmium (Cd) [4]	mg/kg	<0.1 - 0.2	0.13	0.05	0.16	10
Total Chromium (Cr) [5]	mg/kg	11 - 26	18	5.2	21	/
Lead (Pb) [5, 8]	mg/kg	21 - 69	36	16	43	450
Mercury (Hg) [4, 9]	mg/kg	<1	1.0	0.00	1.0	11
Selenium (Se) [4]	mg/kg	<3	3.0	0.00	3.0	350
Nickel (Ni) [4]	mg/kg	2.8 - 6.2	4.6	1.2	5.3	130
Copper (Cu) [6]	mg/kg	8 - 34	15	7.7	20	2300
Zinc (Zn) [6]	mg/kg	17 - 64	36	14	44	3700
Phenol [4]	mg/kg	<0.5 - 1.5	0.86	0.36	1.1	420
Benzo[a]pyrene [6]	mg/kg	<0.1	0.10	0.00	0.10	1
Naphthalene [6]	mg/kg	<0.1	0.10	0.00	0.10	9
Total Cyanide (CN) [7]	mg/kg	<1	1.0	0.00	1.0	/
Soil Organic Matter	%	2.9 - 7.9	5.2	1.9	/	/

We tested 9No. samples of topsoil. According to these results, the topsoil is free from any significant contamination with respect to the determinants tested.

Soil Type: Made Ground

Samples Tested :	DH101 @ 0.50m, DH102 @ 1.50m, DH105 @ 0.50m, DH106 @ 1.50m, DH110 @ 0.30m, DH113 @ 0.30m, DH115 @ 0.50m					
Contaminant	**Unit**	**Measured Range**	**Arithmetic mean**	**Standard deviation**	**Upper 95th Percentile Bound Value**	**Screening Value**
Arsenic (As) [4]	mg/kg	7 - 12	9.0	1.9	10	32
Cadmium (Cd) [4]	mg/kg	<0.1 - 0.2	0.13	0.05	0.16	10
Total Chromium (Cr) [5]	mg/kg	13 - 23	16	3.8	19	/
Lead (Pb) [5, 8]	mg/kg	12 - 95	46	35	64	450
Mercury (Hg) [4, 9]	mg/kg	<1	1.0	0.00	1.0	7
Selenium (Se) [4]	mg/kg	<3	3.0	0.00	3.0	350
Nickel (Ni) [4]	mg/kg	4.4 - 14	6.6	3.4	9.1	130
Copper (Cu) [6]	mg/kg	6 - 140	33	48	68	2300
Zinc (Zn) [6]	mg/kg	18 - 140	53	46	86	3700
Phenol [4]	mg/kg	<0.5	0.50	0.00	0.50	184
Benzo[a]pyrene [6]	**mg/kg**	**<0.1-7.7**	**1.5**	**2.8**	**3.5**	**0.8**
Naphthalene [6]	mg/kg	<0.1 - 0.5	0.16	0.15	0.27	1.5
Total Cyanide (CN) [7]	mg/kg	<1	1.0	0.00	1.0	/
Soil Organic Matter	%	0.5 - 4	2.3	1.3	/	/

7No. sample of made ground were also tested. The upper 95th percentile of Benzo[a]pyrene was the only contaminant found to have elevated concentrations.

Two samples were found to contain elevated concentrations of Benzo[a]pyrene. The sample taken from DH 106, at a depth of 1.5m, had a Benzo[a]pyrene concentration of 2.0mg/kg. This sample was taken from an area of deep made ground, which was recorded as containing clinker. A Benzo[a]pyrene concentration of 7.7mg/kg was recoded in the sample taken from DH 115 at a depth of 0.5m. This sample is also recorded as containing clinker, and was located in car parking area covered with blacktop plainings. Both blacktop and clinker are potential sources of Benzo[a]pyrene contamination. When these two samples are removed from the analysis, the made ground soil group is found to be free from significant contamination.

Soil Type: Natural Soil

Samples Tested :	DH107 @ 0.50m, DH109 @ 1.50m			
Contaminant	**Unit**	**Measured Range**	**Arithmetic mean**	**Screening Value**
Arsenic (As) [4]	mg/kg	12 - 25	19	32
Cadmium (Cd) [4]	mg/kg	0.1 - 0.1	0.10	10
Total Chromium (Cr) [5]	mg/kg	25 - 33	29	/
Lead (Pb) [5, 8]	mg/kg	18 - 37	28	450
Mercury (Hg) [4, 9]	mg/kg	<1	1.0	7
Selenium (Se) [4]	mg/kg	<3	3.0	350
Nickel (Ni) [4]	mg/kg	3.5 - 7.4	5.5	130
Copper (Cu) [6]	mg/kg	15 - 18	17	2300
Zinc (Zn) [6]	mg/kg	22 - 41	32	3700
Phenol [4]	mg/kg	<0.5	0.50	184
Benzo[a]pyrene [6]	mg/kg	<0.1	0.10	0.8
Naphthalene [6]	mg/kg	<0.1	0.10	1.5
Total Cyanide (CN) [7]	mg/kg	<1	1.0	/
Soil Organic Matter	%	0.7 - 4.3	2.5	/

Only two sample of natural soil were submitted for analysis. The maximum values and mean

average values for each contaminant have been compared to the screening value. The certificate indicates the tested soils are free from significant contamination with respect to the parameters tested.

Two samples were examined for asbestos. These samples were taken from the soil mounds at the locations of DH102 and DH106. Asbestos was not detected in these samples. However, whilst no asbestos containing materials were detected in the samples analysed and none were observed in the exploratory holes, it should be noted that the exploratory holes are of small diameter. Therefore, there is always the potential for pockets of asbestos or for asbestos containing materials to be present, which have not been detected in the sampling.

27.3.2 Organic Contaminants

Samples from DH 114 were tested for TPH. These samples were chosen for TPH analysis due to the close proximity of an above ground fuel tank. The soils did not show any visual or olfactory evidence of hydrocarbon contamination.

Two samples were submitted for analysis. The first sample was taken from shallow depth, and the second sample taken from a depth of 2.7m. TPH contamination is not present in either sample at detectable concentrations.

28 Summary of Identified Contamination

This preliminary investigation detected no significant contamination. The only contaminant detected of note is Benzo[a]pyrene found in the soil mound in DH 106, and beneath the parking area in DH 115.

28.1 Revised Conceptual Model

The preliminary site model has been refined in light of the findings of this investigation and is summarised below.

Metals	*Petroleum Hydrocarbons*	PAHs	Benzo[a]pyrene	*Asbestos*	PATHWAYS	RECEPTORS
N	N	N	Y	N	Ingestion and inhalation of contaminated soil and dust	Human Health
N	N	N	N	N/A	Inhalation of vapours or gases	
N	N	N	Y	N/A	Uptake into edible fruit and vegetables	
N	N	N	Y	N/A	Surface water run-off into surface water features	Water Environment
N	N	N	Y	N/A	Migration through ground into surface water or groundwater	
N	N	N	Y	N/A	Off-site migration of contaminated groundwater	
N	N	N	Y	N/A	Vegetation on site growing in contaminated soil	Flora and Fauna
N	N	N	Y	N/A	Aquatic life in affected waters	
N	N	N	Y	N/A	Contact with contaminated soil	Building materials/ buried services
N/A	N	N/A	N/A	N/A	Fire or explosion	

Key:

Y	Pollutant linkage likely
N	Pollutant linkage not likely
P	Pollutant linkage possible
n/a	Pathway not applicable to contaminant

The preliminary conceptual model highlighted a number of potential pollutant linkages based on information obtained in the desk study report. However, our intrusive site investigation did not find significant contamination and this is reflected in the revised conceptual model.

Only mildly elevated concentrations of Benzo[a]pyrene were detected at two locations. Depending on the land use in these areas, this contaminant may or may not be detrimental to the development of the site.

29 Recommendations

At this stage, according to our findings thus far, the site is not considered significantly contaminated, and remediation to deal with contamination is not likely to be required over the vast majority of the site.

The only contamination identified is in the form of Benzo[a]pyrene in the made ground soil at two trial holes locations. Additonal intrusive ground investigations are recommended to determine the extent of contamination in these areas. Once the results from this additonal testing has been analysed, a remediation strategy can be produced.

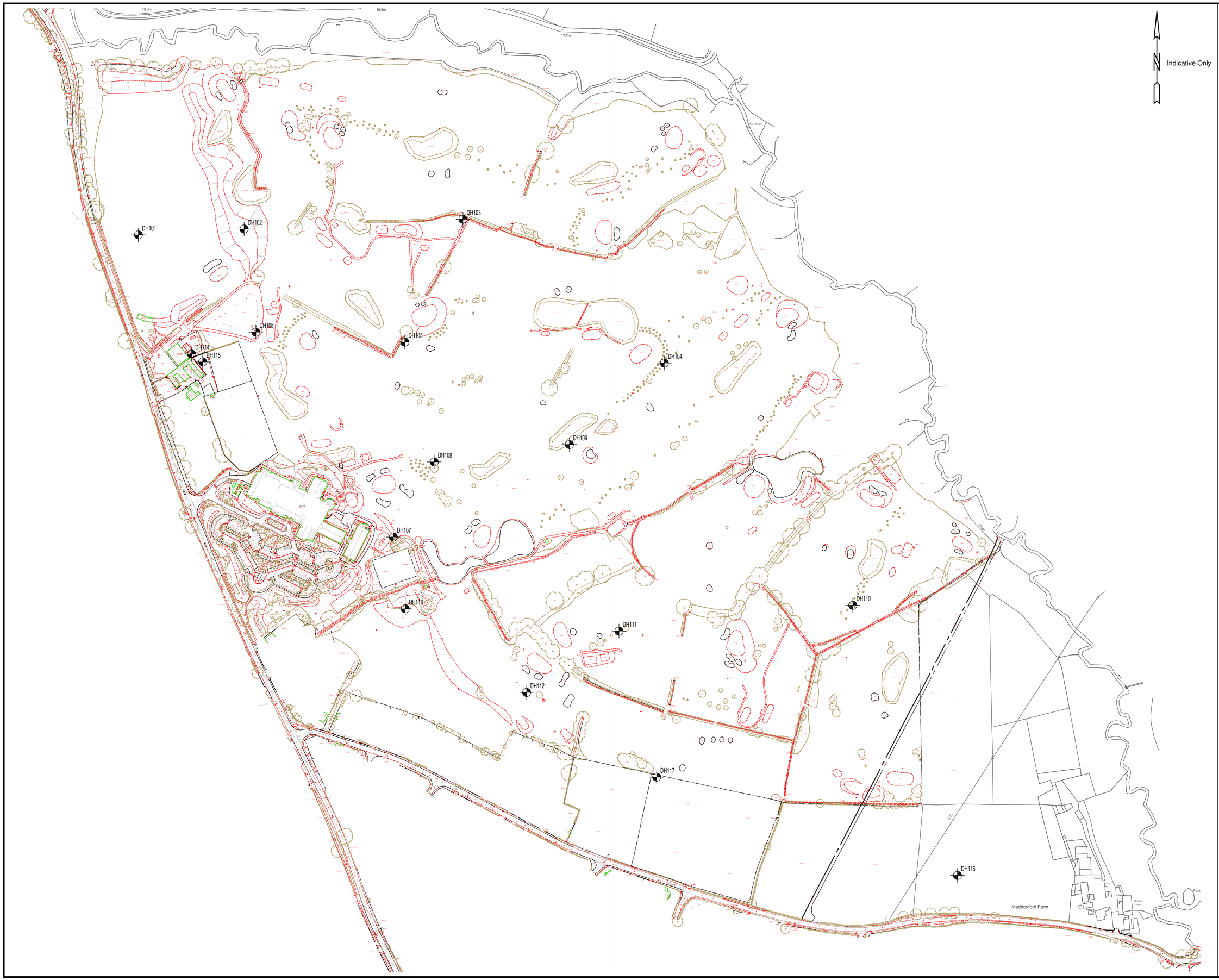
The proposed land use at the locations were elevated concentrations of Benzo[a]pyrene has been identified, will also influence the remediation strategy. If it is proposed to cover these areas with roads or buildings for example, and thus remove the pathway linkage in the source-pathway-receptor scenario, the made ground should be suitable to remain in-situ. However, if the areas are proposed to be residential garden areas, then remediation may be required and could involve either replacing all made ground soils with a certified clean soil or covering the contaminated ground with a suitably thick certified clean capping layer.

This area of the golf course mechanical store was highlighted as a potential source of contamination in the desk study, and although no contamination was identified during the course of this investigation, there remains a risk that hot spots of contamination are present, and further specific intrusive ground investigations are recommended in this area.

It is assumed that the site as a whole will be divided into land parcels and that individual site investigations will be carried out in each parcel. In this instance more parcel specific and targeted sampling and testing may be carried out (where required) to allow parcel specific risk assessments to be made. Where this is not the case, further detailed intrusive ground investigations will be required with a higher concentration of sampling locations in those areas identified as being of potential concern.

APPENDIX A

Site Plans and Exploratory Hole Logs



NOTES

1. Base drawing supplied by others. Trial Pit, Borehole and Window Sample locations added by Southern Testing.

2. Positions of Trial Holes are only indicative unless dimensioned.

Revisions:		
REV	DATE	DETAILS

SOUTHERN TESTING
Environmental & Geotechnical

Keeble House, Stuart Way, East Grinstead, West Sussex, RH19 4QA.
Tel: 01342 333100 Fax: 01342 410321
www.southerntesting.co.uk

Client:
PJH Developments Consultancy

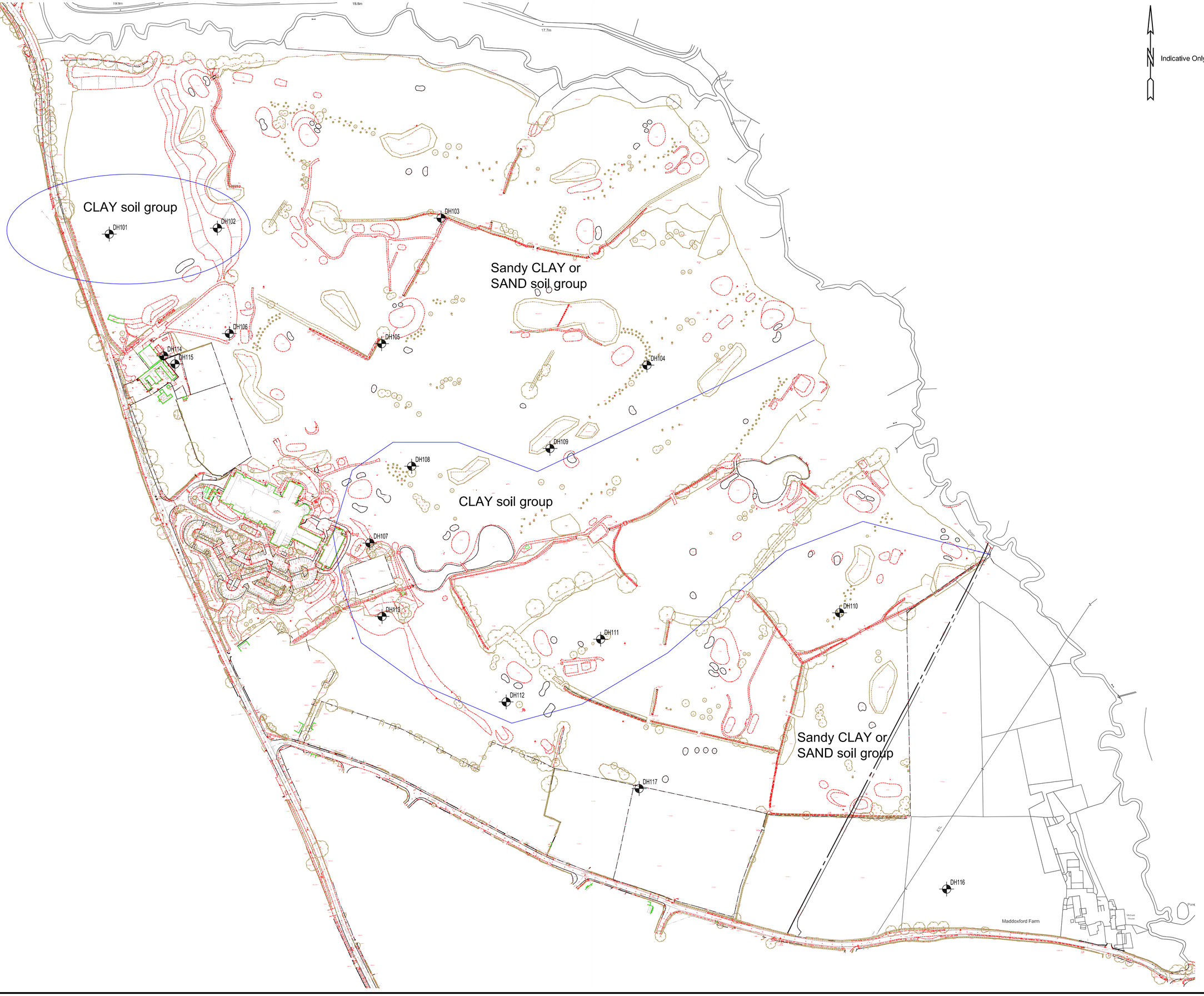
Job Title:
North Boorley Green

Description:
Borehole Location Plan
at time of investigation.

Drawing No:
STL_J10856 (Plan 1)

Drawing Status:

Scale: 1:2000	**Paper Size:** A1
Drawn by: CL (see notes)	**Checked by:** AH
Date: 20/01/2012	



NOTES

1. Base drawing supplied by others. Trial Pit, Borehole and Window Sample locations added by Southern Testing.

2. Positions of Trial Holes are only indicative unless dimensioned.

Revisions:		
REV	DATE	DETAILS

SOUTHERN TESTING
Environmental & Geotechnical
Keeble House, Stuart Way, East Grinstead, West Sussex, RH19 4QA.
Tel: 01342 333100 Fax: 01342 410321
www.southerntesting.co.uk

Client:
PJH Developments Consultancy

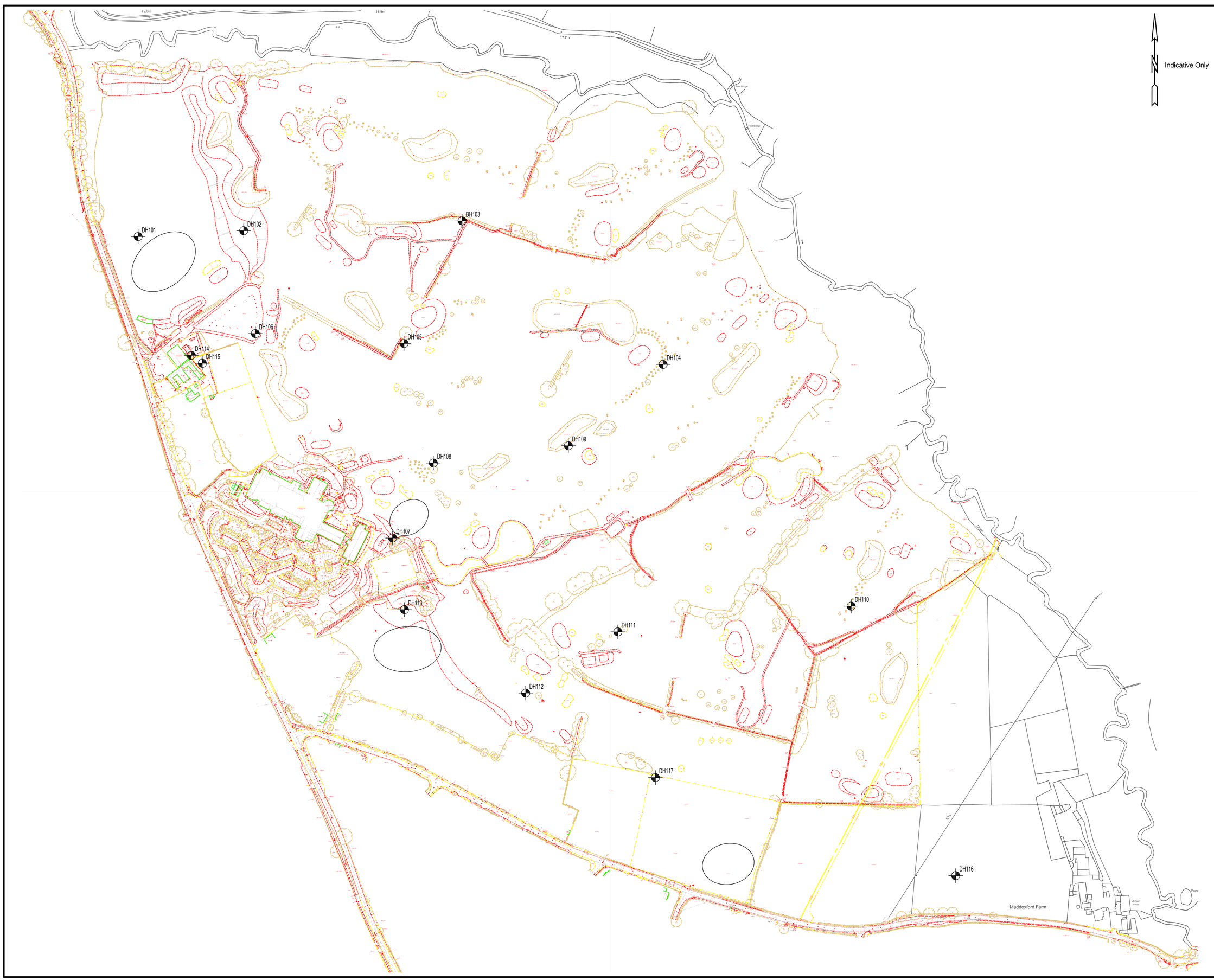
Job Title:
North Boorley Green

Description:
Extrapolated Geological Plan.

Drawing No:
STL_J10856 (Plan 2)

Drawing Status:

Scale: 1:2000	**Paper Size:** A1
Drawn by: CL (see notes)	**Checked by:** AH
Date: 20/01/2012	



NOTES

1. Base drawing supplied by others. Trial Pit, Borehole and Window Sample locations added by Southern Testing.

2. Positions of Trial Holes are only indicative unless dimensioned.

Revisions:		
REV	DATE	DETAILS

SOUTHERN TESTING
Environmental & Geotechnical
Keeble House, Stuart Way, East Grinstead, West Sussex. RH19 4QA.
Tel: 01342 333100 Fax: 01342 410321
www.southerntesting.co.uk

Client:
PJH Developments Consultancy

Job Title:
North Boorley Green

Description:
Areas noted as being particularly wet at time of investigation.

Drawing No:
STL_J10856 (Plan 3)

Drawing Status:

Scale: 1:2000	**Paper Size:** A1
Drawn by: CL (see notes)	**Checked by:** AH
Date: 20/01/2012	



NORTH BOORLEY GREEN

MASTERPLAN CONCEPT

Scenario 1

DATE: 05/09/11 **DWG NO:** 4

SCALE: nts

NORTH

KEY

- Existing development
- Proposed housing (30 dph)
- Existing hotel retained
- Proposed public open space
- Primary School
- Existing planting retained
- Proposed strategic landscape planting
- Proposed Local park / LEAP
- Community hub
- Principal access
- Secondary access
- Residential access road
- Existing / proposed pedestrian / cycle links

NOTE: Drawing for planning purposes only. Do not scale from this drawing

Southern Testing
Environmental & Geotechnical

TEST HOLE LOG

National Grid Reference		SU 509 149	
Job No	J10856	Date	13/01/2012
Logged by	AH	Engineer	AH

Site : **Site II Winchester Road, Botley**

Client : **PJH Development Consultancy Services**

Excavation Method : Windowless drilling rig

Hole No DH 101

Water strikes: **None**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	150		**TOPSOIL** Brown silty clay TOPSOIL with flint gravel.
		(450)		**MADE GROUND** Brown CLAY with brick fragments clinker, chalk and flint gravel (MADE GROUND).
500	D	600		**CLAY** Medium strength becoming high strength orange and pale grey mottled weathered CLAY.
750	D			Closely fissured by 1.5m. With thin siltstone laminations below 1.5m. Brown and orange mottled below 1.8m. Dark grey with brown staining on fissure surfaces below 2.6m.
900	⊥ 120			
1.2	⊥ 100			
1.5	D			
1.7	⊥ 160	*(2.2)*		
2.0	⊥ 200 ▽ 7			
2.5	D ⊥ 250			
		2.8		**CLAY** Higth strength grey extremely closely fissured CLAY with silt laminations.
3.0	D	3.0		

Hole No DH 102

Water strikes:
Water level: **3.15m**
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	200		**MADE GROUND** Dark brown organic CLAY with flint gravel, chalk and glass fragments (MADE GROUND).
500	D			**MADE GROUND** Brown CLAY with chalk lumps, flint gravel, clinker, soft organic patches, sandstone gravel etc. (MADE GROUND)
1.5	D	*(4.0)*		Crushed chalk between 2.8m and 3.0m.
2.5	D			
		4.2		**CLAY** Medium strength grey brown mottled weathered CLAY.
4.5	D ⊥ 100	*(400)*		
		4.6		

Hole No DH 103

Water strikes: **Dry**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	150		**MADE GROUND** Dark brown organic CLAY with flint gravel (MADE GROUND).
500	D ⊥ 90	*(750)*		**CLAY** Medium strength orange and brown mottled CLAY with sandy partings.
1.0	▽ 37	900		**SAND** Dense brown fine SAND.
1.5	D	*(1.1)*		Becoming pale yellow by 1.0m with orange iron stained patches.
		2.0		

Soakage test between 1 and 2m.

Hole No DH 104

Water strikes:
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	200		**MADE GROUND** Dark brown organic clayey SAND with flint gravel (MADE GROUND).
500	D ⊥ 220	*(550)*		**CLAY** High strength orangish brown and brown mottled weathered very sandy CLAY.
1.0	▽ 16	750		**SAND** Becoming increasingly sandy with depth.
1.2	D			Medium dense becoming dense yellow brown and orange mottled very clayey fine SAND.
2.0	D ▽ 35	*(2.3)*		Clay absent below 1.8m. Becoming a pale grey fine sand by 2.5m.
3.0	D ▽ 62	3.0		

*▽: Perth Penetration Test, 'N' value; ▼: Penetration Test, 'N' values; ⊥ : Unconfined Compression Strength by hand penetrometer, kN/m2;
V: Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

Southern Testing
Environmental & Geotechnical

TEST HOLE LOG

National Grid Reference		SU 509 149	
Job No	J10856	Date	13/01/2012
Logged by	AH	Engineer	AH

Site : **Site II Winchester Road, Botley**

Client : **PJH Development Consultancy Services**

Excavation Method : Windowless drilling rig

Hole No DH 105

Water strikes: **Dry**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
500	D	150 (450)	TOPSOIL	Dark brown organic fine sand TOPSOIL.
		600	MADE GROUND	Brown fine sandy CLAY with numerous rootlets and occasional flint gravel (MADE GROUND).
1.0	D ⊥ 200 ▽ 14		CLAY	High Strength pale grey and orange mottled fine sandy CLAY with occasional fine sandy partings.
1.5	D			
1.7	⊥ 250	(2.4)		
2.0	⊥ 230 ▽ 7			
2.5	D			
3.0	⊥ 280	3.0		

Piezometer installed to 3.0m

Hole No DH 106

Water strikes: **Dry**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
500	D	(2.5)	MADE GROUND	Dark brown clay MADE GROUND with much chalk, flint gravel, clinker. Crushed brick at 1.0m.
1.5	D	2.5 (1.2)	MADE GROUND	Grey very clayey fine SAND with occasional flint gravel, organic pockets and glauconitic patches (possibly MADE GROUND).
2.4	D	3.7 (800)	SAND	Medium dense orange fine SAND with green glauconitic patches.
3.0	D	4.5		
4.0	D ▽ 12			

Hole No DH 107

Water strikes:
Water level: **2.19m bgl**
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	150 (350)	TOPSOIL	Brown organic clay TOPOIL with thick roots.
300	D	500	MADE GROUND	Dark brown CLAY with black organic patches, flint gravel, occasional fine brick fragments and carbon patches (MADE GROUND).
750	D		CLAY	Medium to high strength dark grey and orange mottled weathered CLAY. Roots to 1.5m. Becoming pale grey and orange mottled by 0.9m. Extremely closely fissured by 1.2m. Mostly grey with some orange mottling below 2.0m. With extremely closely fissured siltstone laminations between 2-2.5m.
1.0	⊥ 110			
1.3	⊥ 170			
1.5	D	(2.4)		
1.7	⊥ 150			
2.0	⊥ 200			
2.2	⊥ 300			
2.5	D			
3.0	D ▽ 11	2.9	SAND	Medium dense greenish grey fine SAND.
		3.2	CLAY	High strength bluish grey CLAY with sand partings.
		3.5		

Hole No DH 108

Water strikes: **None**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	100	TOPSOIL	Brown organic clay TOPOIL.
200	D	300	MADE GROUND	Desiccated brown CLAY with numerous roots and occasional fine brick fragments (MADE GROUND).
500	⊥ 300		CLAY	High strength greyish brown and brown mottled extremely closely fissured CLAY. Some iron staining between fissures below 1.0m. Occasional orange silt patches.
700	D	(2.7)		
1.0	⊥ 250			
1.5	D ⊥ 250			
2.0	⊥ 250			
2.5	D			
3.0	⊥ 300	3.0		

*▽: Perth Penetration Test, 'N' value; ▼: Penetration Test, 'N' values; ⊥ : Unconfined Compression Strength by hand penetrometer, kN/m2;
V: Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

Southern Testing
Environmental & Geotechnical

TEST HOLE LOG

National Grid Reference		SU 509 149	
Job No	J10856	Date	13/01/2012
Logged by	AH	Engineer	AH

Site : **Site II Winchester Road, Botley**

Client : **PJH Development Consultancy Services**

Excavation Method : Windowless drilling rig

Hole No DH 109

Water strikes: **None**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
150	D	150 (750)	TOPSOIL	Brown organic clay TOPOIL.
			CLAY	Desiccated brown and orange mottled CLAY with rootlets.
900	D	900 (2.1)	SAND	Medium dense grey and orange mottled slightly clayey SAND.
2.0	▽ 19			
3.0	D	3.0		

Hole No DH 110

Water strikes: **None**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	150 (350)	TOPSOIL	Brown organic fine sandy clay TOPOIL.
300	D	500 (500)	MADE GROUND	Brown fine sandy CLAY with numerous rootlets (MADE GROUND).
500	D ⊥ 120		MADE GROUND	High strength orange and grey mottled CLAY with sandy partings and occasional flint gravel (MADE GROUND). Possible land drain at 1.0m.
1.0	⊥ 120	1.0 (2.0)	CLAY	Medium becoming high strength grey brown and yellow mottled fine sandy CLAY with sandy partings . Sand absent below 2.0m.
1.5	D ⊥ 150			
2.0	⊥ 230			
2.5	D			
3.0	⊥ 250	3.0		

Hole No DH 111

Water strikes: **None**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	250 (2.8)	TOPSOIL	Brown organic fine sandy clay TOPOIL.
500	D ⊥ 110		CLAY	Medium becoming high strength pale grey and orange mottled weathered CLAY with extremely closely spaced fissured orange silt patches. Extremely closely fissured by 1.5m.
1.0	D ⊥ 110			
1.5	D ⊥ 180			
2.0	D ⊥ 250			
2.5	⊥ 200			
3.0	D ⊥ 250	3.0		

Hole No DH 112

Water strikes: **None**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	200 (800)	TOPSOIL	Brown organic fine sandy clay TOPOIL with flint gravel.
500	D ⊥ 150		CLAY	Medium strength pale grey and orange mottled weathered CLAY with fine rootlets.
		1.0		

*▽: Perth Penetration Test, 'N' value; ▼: Penetration Test, 'N' values; ⊥ : Unconfined Compression Strength by hand penetrometer, kN/m2;
V: Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

Southern Testing
Environmental & Geotechnical

TEST HOLE LOG

National Grid Reference		SU 509 149	
Job No	J10856	Date	13/01/2012
Logged by	AH	Engineer	AH

Site : **Site II Winchester Road, Botley**

Client : **PJH Development Consultancy Services**

Excavation Method : Windowless drilling rig

Hole No DH 113

Water strikes: **Water entering hole from surface.**
Water level:
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	150	TOPSOIL	Brown organic fine sandy clay TOPOIL.
300	D	(350)	MADE GROUND	Saturated brown organic CLAY with numerous roots and occasional fine brick fragments (MADE GROUND)
500	D	500	CLAY	
800	⊥ 90	(500)		
		1.0		Medium strength orange and grey mottled weathered CLAY.

Hole No DH 114

Water strikes:
Water level: **2.1m**
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
300	D	150	MADE GROUND	Black GRAVEL- (blacktop planings).
700	⊥ 150	200	MADE GROUND	White crushed CHALK backfill (MADE GROUND).
1.0	D ⊥ 120	500	MADE GROUND	Brown sandy CLAY with brick fragments and flint gravel (MADE GROUND).
1.6	⊥ 120		CLAY	
2.0	D	(2.0)		Medium strength grey and orange mottled weathered CLAY.
2.8	▽ 11			Less orange with depth.
3.0	D	2.5	SAND	Medium dense blue grey and orange mottled fine SAND.
		(800)		
		3.3		

Hole No DH 115

Water strikes:
Water level: **2.72m**
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
500	D	200	MADE GROUND	Black GRAVEL- (blacktop planings).
800	D	400	MADE GROUND	sandy gravelly SUBBASE.
1.3	⊥ 150	600	MADE GROUND	Clayey RUBBLE comprising brick, flint gravel, concrete and clinker (MADE GROUND).
1.5	D ⊥ 130	(500)		
		1.1	SAND	Greenish brown becoming greenish grey clayey fine SAND with rare medium flint gravel.
			CLAY	
		(1.9)		Becoming increasingly clayey with depth.
2.5	D ⊥ 160			High strength greenish grey and orange mottled very fine sandy CLAY.
		3.0		Grey and orange mottled by 2.5m.

Hole No DH 116

Water strikes:
Water level: **2.88m**
Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D	150	TOPSOIL	Brown organic fine sandy clay TOPSOIL.
200	D	300	CLAY	
750	⊥ 180		CLAY	Brown fine sandy slightly organic CLAY.
1.0	D ▽ 11	(1.2)		High strength grey and orange mottled very sandy CLAY with sand patches.
2.0	D ▽ 13	1.5	SAND	Medium dense orange and grey mottled clayey fine SAND with clayey patches.
3.0	D ▽ 16	(1.5)		
		3.0		

*▽: Perth Penetration Test, 'N' value; ▼: Penetration Test, 'N' values; ⊥ : Unconfined Compression Strength by hand penetrometer, kN/m2;
V : Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

Southern Testing
Environmental & Geotechnical

TEST HOLE LOG

National Grid Reference		SU 509 149	
Job No	J10856	Date	13/01/2012
Logged by	AH	Engineer	AH

Site : **Site II Winchester Road, Botley**

Client : **PJH Development Consultancy Services**

Excavation Method : Windowless drilling rig

Hole No **DH 117**

Water strikes:

Water level: **2.63m**

Pit sides:

Depth m/mm	Sample Type or	Test Type & Value	Depth (Thickness)	Key	Soil Description
100	D		150	TOPSOIL	Brown organic fine sandy clay TOPSOIL.
200	D		250	SAND	
500	D			CLAY	Brown slightly sandy organic fine SAND.
750	⊥ 160		(750)		High strength brown and orange mottled slighlty sandy CLAY.
1.0		16	1.0	SAND	
1.2	D				Occasional flint gravels between 0.5-0.9m. Very flint gravelly below 0.9m.
2.0	D	14	(2.0)		Medium dense pale grey and orange mottled fine SAND with patches of very sandy clay.
3.0	D	17	3.0		Clay absent below 1.5m. Greenish grey fine SAND by 2.0m. Extremely closely spaced laminations of red clay below 2.9m.

Hole No

Water strikes:

Water level:

Pit sides:

Depth m/mm	Sample Type or	Test Type & Value	Depth (Thickness)	Key	Soil Description

Hole No

Water strikes:

Water level:

Pit sides:

Depth m/mm	Sample Type or	Test Type & Value	Depth (Thickness)	Key	Soil Description

Hole No

Water strikes:

Water level:

Pit sides:

Depth m/mm	Sample Type or	Test Type & Value	Depth (Thickness)	Key	Soil Description

*▽: Perth Penetration Test, 'N' value; ▼: Penetration Test, 'N' values; ⊥ : Unconfined Compression Strength by hand penetrometer, kN/m2;
V: Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

APPENDIX B

Field Sampling and in-situ Test Methods & Results

Field Sampling and in-situ Test Methods

Disturbed Samples

Disturbed samples were taken from the trial holes intervals and stored in sealed glass jars and polythene bags, as appropriate.

Standard Penetration Test

The Standard Penetration (SPT) Test is specified in BS EN ISO 22476-3 : 2005. In this test, a 51mm diameter open-ended tube is driven into the ground by a 63.5 kg hammer falling freely through 760 mm. The tube is seated by driving to a penetration of 150mm, or by 25 standard blows, whichever occurs first. It is then driven for a maximum of a further 300mm and the number of blows is termed the penetration resistance (N). If 300mm penetration cannot be achieved in 50 blows (100 blows in soft rock), the test drive is terminated.

When testing in gravels, a conical end piece is attached to the tube. The test is then called an SPT(C).

This test provides an indirect method of assessing the properties of cohesionless soils, and the following table (after Terzaghi and Peck) gives the approximate condition:-

Number Blows (N)	Density
0 - 4	Very Loose
4 – 10	Loose
10 – 30	Medium Dense
30 – 50	Dense
Over 50	Very Dense

Hand Penetrometer Test

The hand penetrometer consists of a spring loaded and calibrated plunger which is forced into the soil. A reading of unconfined compression strength (equal to twice cohesion) is given on a calibrated scale. In common with other hand methods of strength assessment (eg. the shear vane) it does not give an accurate indication of bearing capacity in stiff or fissured soils, because of the small test area. The figures are used for strength classification according to the table below.

Hand Penetrometer Value (kPa)	Undrained Shear Strength cu (kPa)	Undrained Shear Strength of Clays
Less than 20	Less than 10	Extremely Low
20 to 40	10 to 20	Very Low
40 to 80	20 to 40	Low
80 to 150	40 to 75	Medium
150 to 300	75 to 150	High
300 to 600	150 to 300	Very High
More than 600	More than 300	Extremely High

Dynamic Cone Penetrometer (DCP) CBR Test (Modified)

The CBR value is the result of an empirical test on soil that can be used for road design purposes. In the field the definitive test requires the use of a reaction load, usually a four-wheel drive vehicle, excavating plant, a CBR jack, and load measuring equipment. The dynamic cone CBR test uses light portable equipment and is used to provide a continuous record of the penetration resistance of each layer in the ground for a depth of a metre from the surface. The penetration resistance provides a measure from which CBR values may be calculated using formulae published by the Transport Research Laboratory.

In the test a 22 mm diameter 60° cone is driven into the ground to a depth of up to one metre by a 9 kg weight, freely falling over 600 mm. The number of blows is recorded for each successive 50mm penetration increment.

A plot of the cumulative number of blows versus depth penetrated is drawn. This plot usually takes the form of a series of straight lines, the slopes of which are measured and expressed as penetration in mm per blow. Several authors have prepared relationships between the DCP readings and the CBR and it is the practice of this laboratory to adopt the lower of two values derived from formulae established by Kleyn & Van Heerden, and by the TRL.

$$CBR = 10^{(2.632 - 1.28 \mathrm{Log}_{10}(mm/blow))} \quad \text{(K\&tVH)}^1$$

$$CBR = 10^{(2.48 - 1.057 \mathrm{Log}_{10}(mm/blow))} \quad \text{(TRL)}^2$$

The test is an adaptation of the Perth Penetrometer Test developed for the granular soils in Perth West Australia in the 1960s, and in the UK by this laboratory since 1973. It is similar to the Victoria Country Roads Board Penetrometer, the Transvaal Road Department Penetrometer, and the TRL dynamic cone penetrometer. It has been used for the determination of CBR values, after calibration for the local soil, and for compaction comparisons. In UK conditions it has been found to give consistent results for granular soils. It has the advantage that, as it can be driven through bituminous surfacings, granular road base, sub base and hardcore, the strength and thickness of each layer can be estimated.

Soakage Tests after BRE 365 (1991)

The BRE 365 paper on soakaway design allows for the design of trench soakaways as well as traditional square and circular soakaways.

The test to measure the soil infiltration rate is carried out in pits, which are excavated to the full depth of the proposed soakaway. In this instance, the tests were undertaken in narrow diameter boreholes. The trial pits are filled and allowed to drain to empty or near empty, three times, on the same day or on consecutive days.

The pit is considered full when the water level is the same as the proposed inlet invert. The time for the water level to fall from ¾ full to ¼ full is obtained and the soil infiltration rate is obtained from the following formula:

$$f = \frac{V_{p75-25}}{a_{p50} \, x \, t_{p75-25}}$$

---

[1] Kleyn & Van Heerden
[2] TRL

Where: f = soil infiltration rate (in this case expressed in l/m²/minute)

V_{p75-25} = the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} = the internal surface area of the trial pit up to 50% effective depth and including the base area;

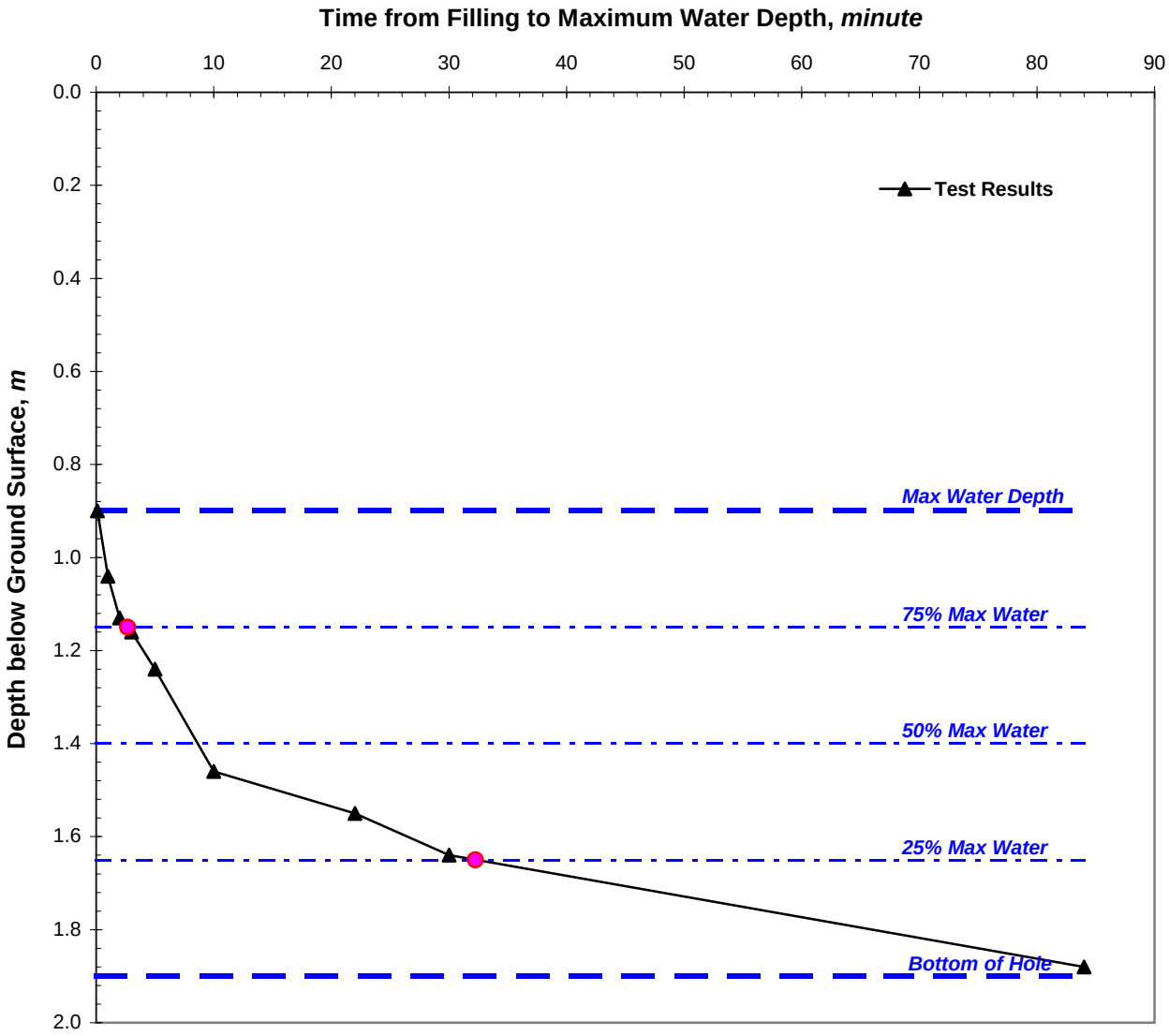
t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

The soakage rate in this report in expressed as l/m²/minute, which is a convenient rate to use. The BRE use a unit of m/sec, which is the value in l/m²/minute divided by 60,000.

BRE 365 stipulates that the pit should be refilled three times in all, on the same day, or on successive days. Because of time and cost constraints testing was restricted to 1 day.

BRE Digest 365 Soakage Test

Test Hole No: DH 103
Test No: Test No 1 (Initial)



Diameter of Borehole, m	0.100	Depth of Water at Start of Test, ***m***	0.900
Depth to End of Borehole Casing, m	0.500	Max Water Dropdown during Test, ***m***	0.980
Depth to Borehole Base, m	1.900	Total Soakage Test Time, ***min***	84.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.165
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.133
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m^2 /min***	**0.805**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**1.34E-05**

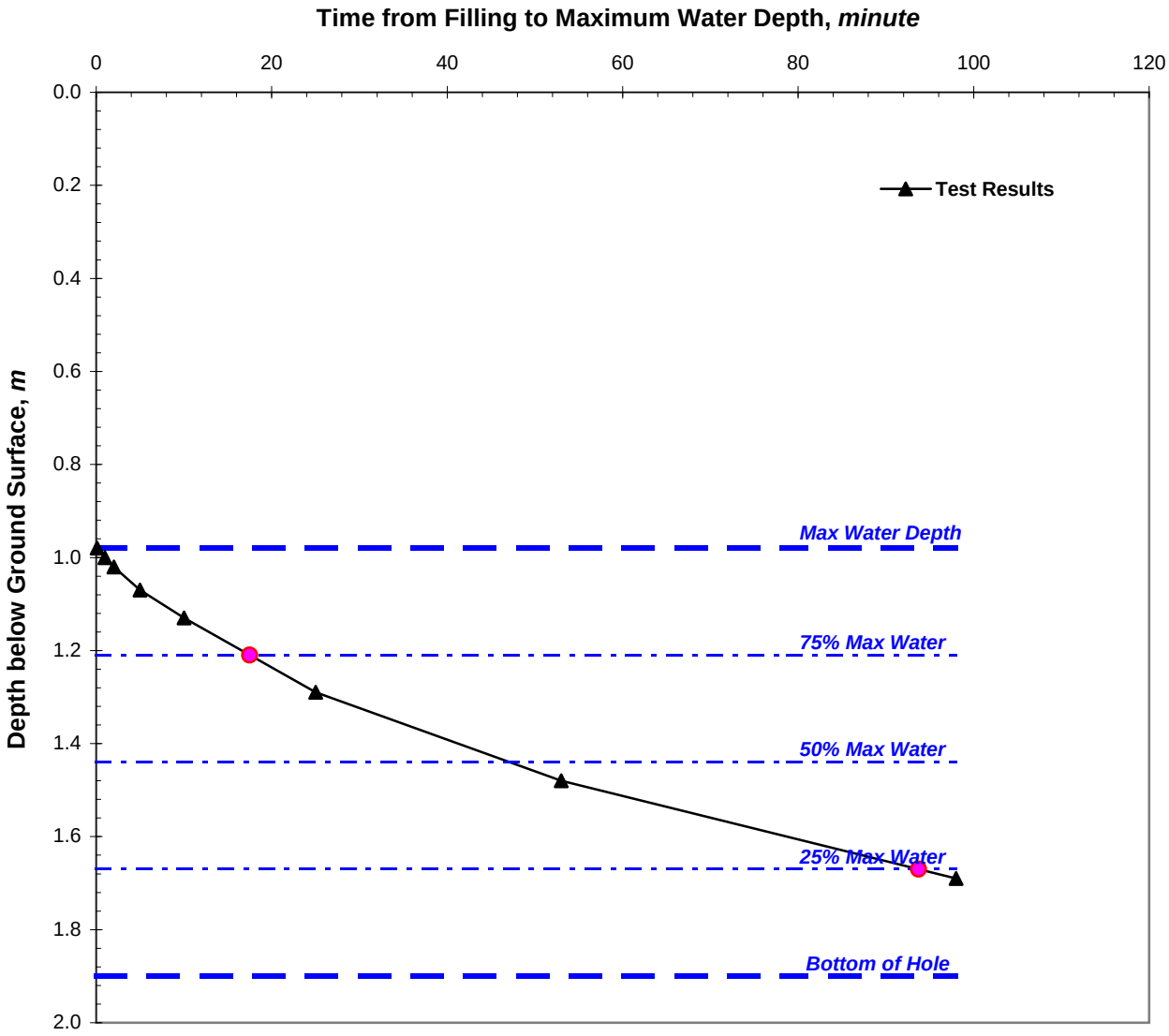
Comments:

Pit was nearly emptied at finish of test.

Client:	PJH Development Consultancy Services	**Job No:**	J10856	**Test Date:**	10/Jan/2012		
Site:	Site II Winchester Road, Botley	**Tested By:**	ST	**Engineer:**	AH	**Fig. S1**	

BRE Digest 365 Soakage Test

Test Hole No: DH 103
Test No: Test No 2 (Repeated)



Diameter of Borehole, m	0.100	Depth of Water at Start of Test, ***m***	0.980
Depth to End of Borehole Casing, m	0.500	Max Water Dropdown during Test, ***m***	0.710
Depth to Borehole Base, m	1.900	Total Soakage Test Time, ***min***	98.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.152
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.047
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m^2 /min***	**0.311**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**5.19E-06**

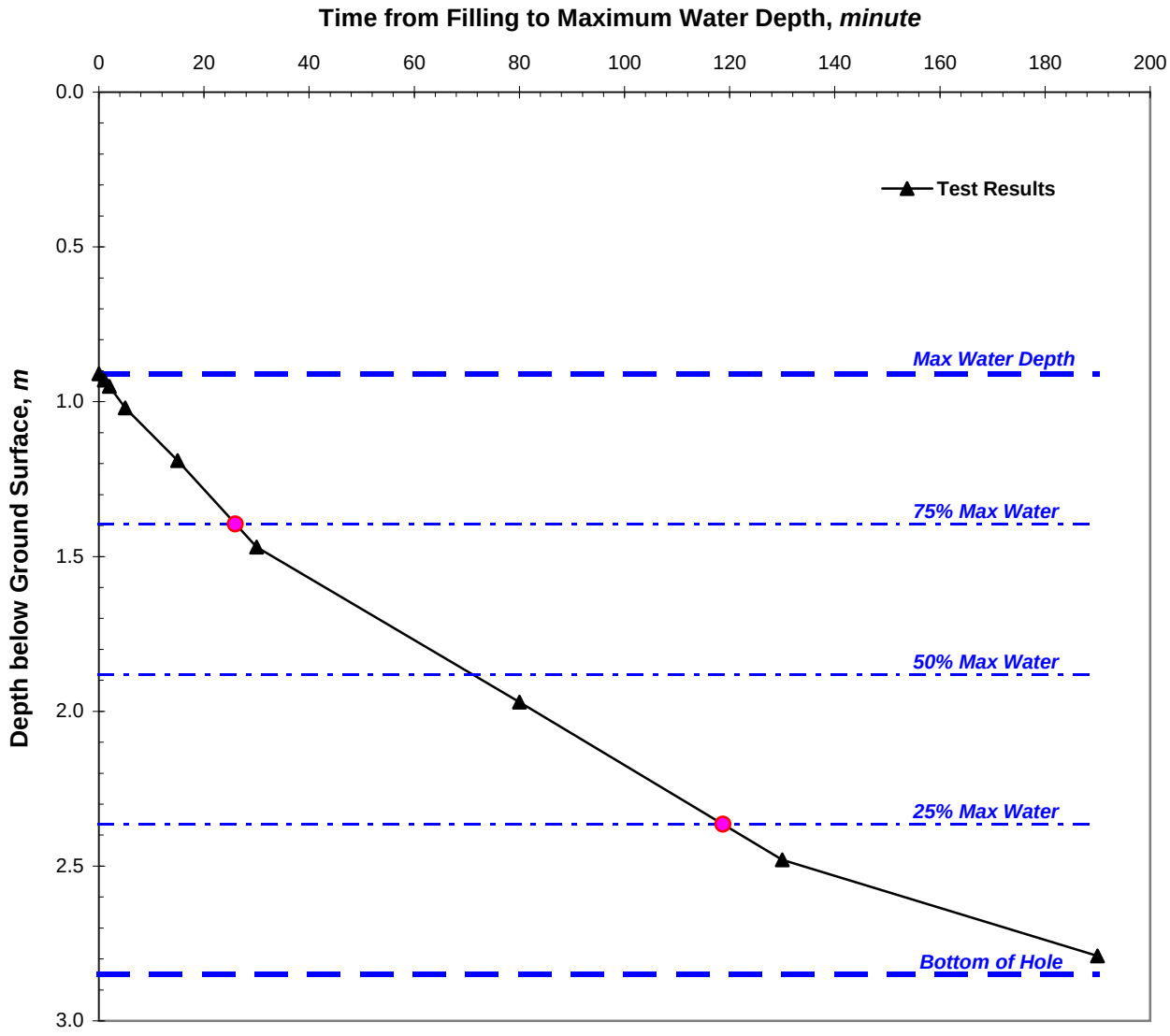
Comments:

Pit was nearly emptied at finish of test.

Client:	PJH Development Consultancy Services	**Job No:**	J10856	**Test Date:**	10/Jan/2012		
Site:	Site II Winchester Road, Botley	**Tested By:**	ST	**Engineer:**	AH	**Fig. S2**	

BRE Digest 365 Soakage Test

Test Hole No: DH 109
Test No: Test No 1 (Initial)



Diameter of Borehole, m	0.100	Depth of Water at Start of Test, ***m***	0.910
Depth to End of Borehole Casing, m	0.500	Max Water Dropdown during Test, ***m***	1.880
Depth to Borehole Base, m	2.850	Total Soakage Test Time, ***min***	190.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.313
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.082
Depth to Top of Granular Fill, ***m***		Soakage Rate, ***litre/m²/min***	**0.263**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**4.38E-06**

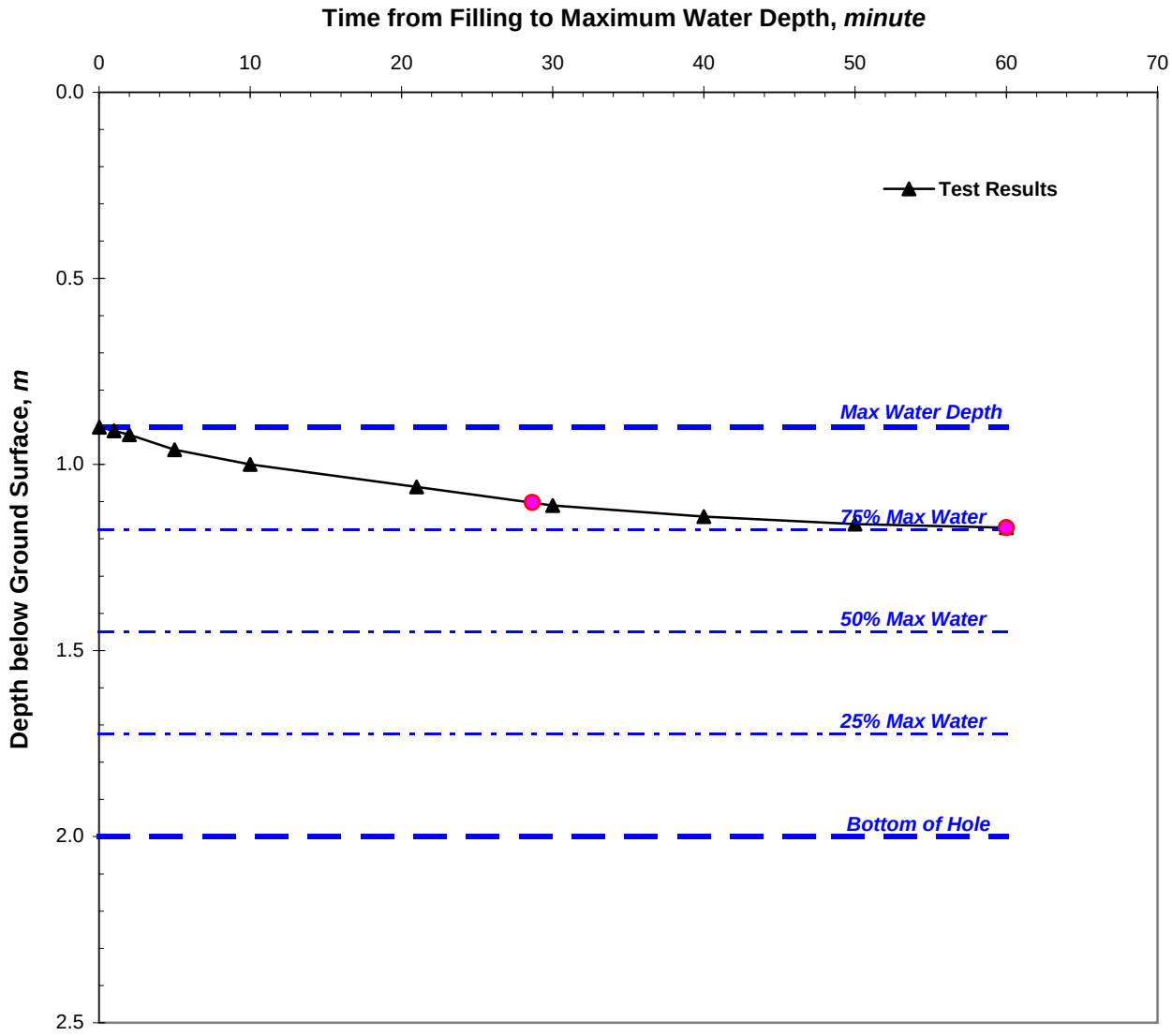
Comments:

Pit was nearly emptied at finish of test.

Client:	PJH Development Consultancy Services	**Job No:**	J10856	**Test Date:**	10/Jan/2012		
Site:	Site II Winchester Road, Botley	**Tested By:**	ST	**Engineer:**	AH	**Fig. S3**	

BRE Digest 365 Soakage Test

Test Hole No: DH 117
Test No: Test No 1 (Initial)



Diameter of Borehole, m	0.100	Depth of Water at Start of Test, ***m***	0.900
Depth to End of Borehole Casing, m	0.500	Max Water Dropdown during Test, ***m***	0.270
Depth to Borehole Base, m	2.000	Total Soakage Test Time, ***min***	60.0
Depth to Top of Permeable Soils, ***m***		Mean Internal Discharge Area, m^2	0.279
Depth to Groundwater Surface, ***m***		Discharge Rate, ***litre/min***	0.017
Depth to Top of Granular Fill, ***m***		Soakage Rate, $litre/m^2/min$	**0.061**
Voids Assumed within Borehole, %	100%	BRE Soil Infiltration Rate, ***m/sec***	**1.01E-06**

Comments: ***Standing water at start of test at 1.58m bgl.***
Water level did not fall to 75% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	PJH Development Consultancy Services	**Job No:**	J10856	**Test Date:**	10/Jan/2012		
Site:	Site II Winchester Road, Botley	**Tested By:**	ST	**Engineer:**	AH	**Fig. S4**	

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

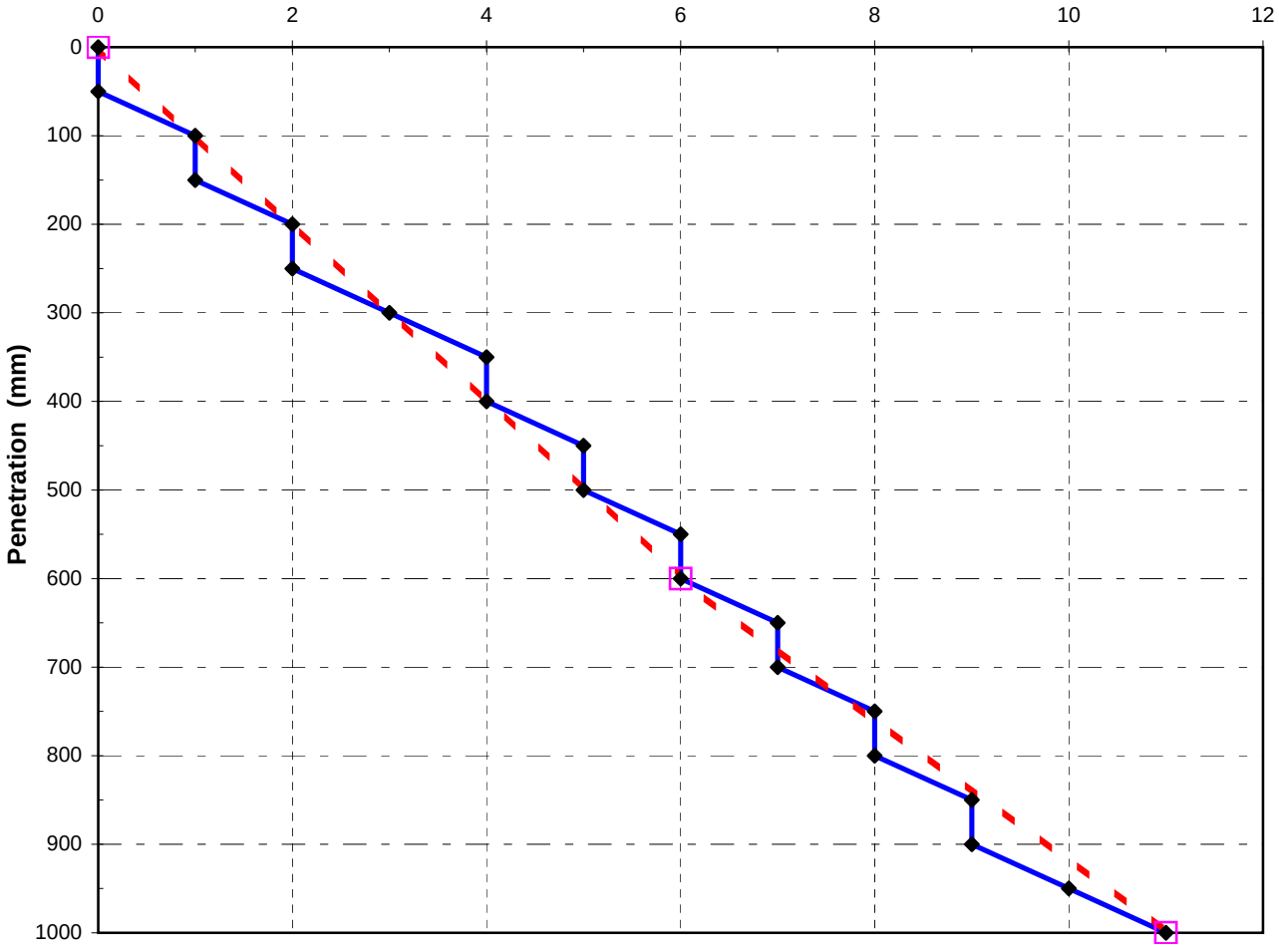
Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 101

Chainage:
Start Layer: GL
Soil Condition: CLAY
Notes:

Tested By: AH
Checked By: AH
Test Date: 10-Jan-12

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	600	600	6	6	100.0	1.2	FILL	
2	600	1000	400	11	5	80.0	1.6	CLAY	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

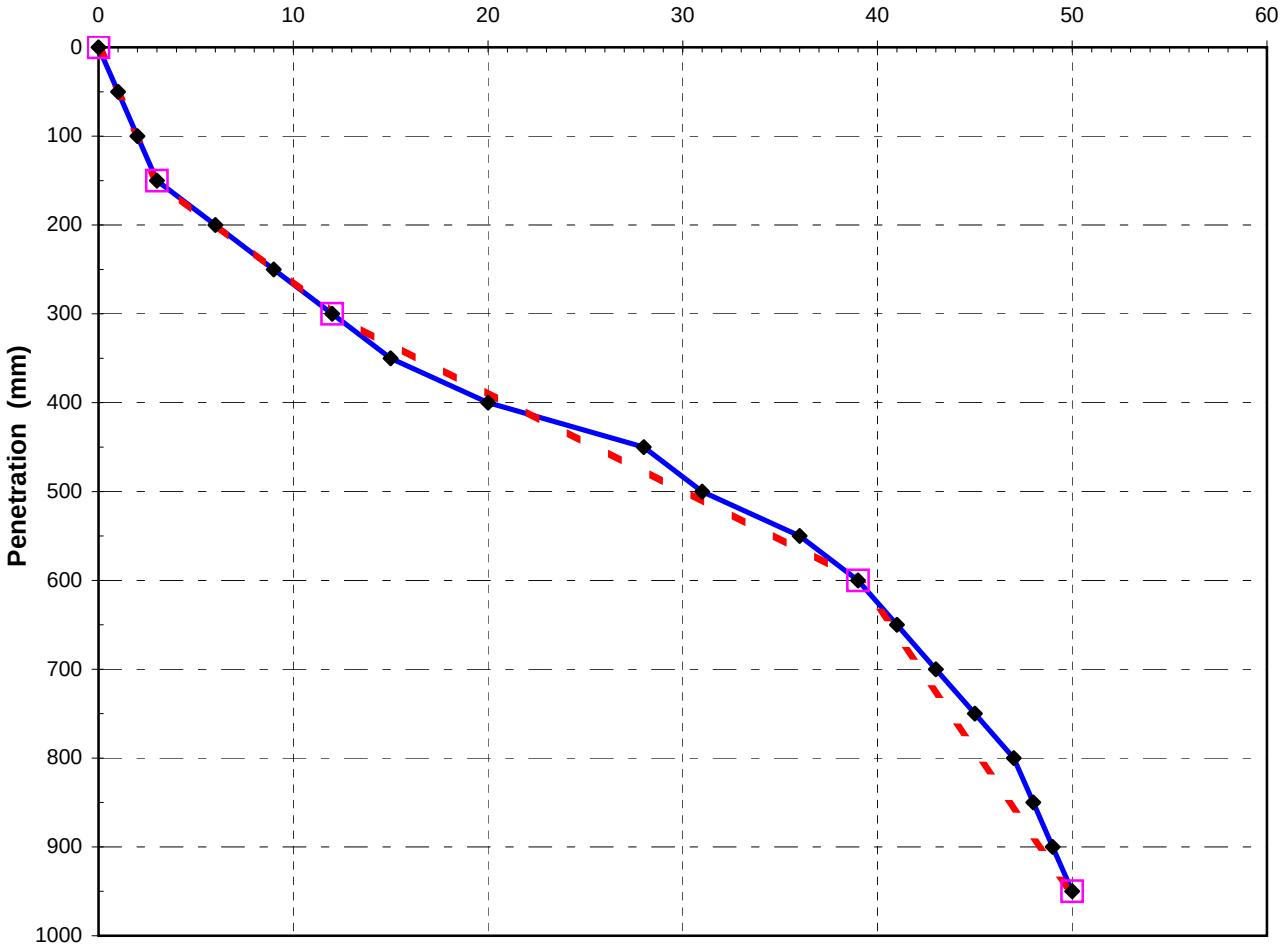
Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 102

Chainage:
Start Layer: GL
Soil Condition: FILL
Notes:

Tested By: AH
Checked By: AH
Test Date: 10-Jan-12

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	3	3	50.0	2.9	FILL	
2	150	300	150	12	9	16.7	12	FILL	
3	300	600	300	39	27	11.1	20	FILL	
4	600	950	350	50	11	31.8	5.1	FILL	

Client:	**PJH Development Consultancy Services**	**Job No:** J10856	
Site:	**Site II Winchester Road, Botley**	**Date:** 1.2.12	**Fig.**

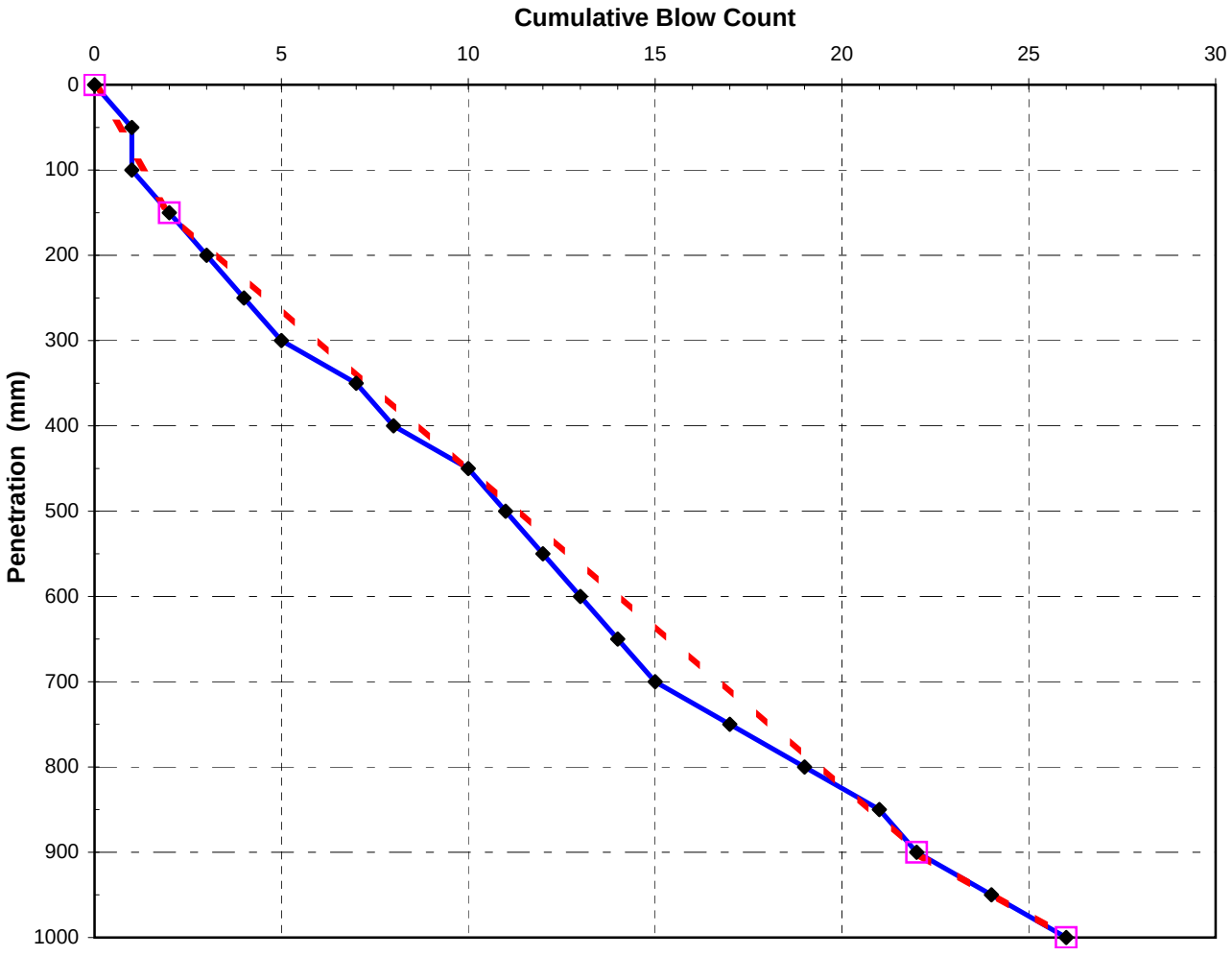
Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 103

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	10-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	2	2	75.0	1.7	FILL	
2	150	900	750	22	20	37.5	4.1	CLAY	
3	900	1000	100	26	4	25.0	7.0	SAND	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

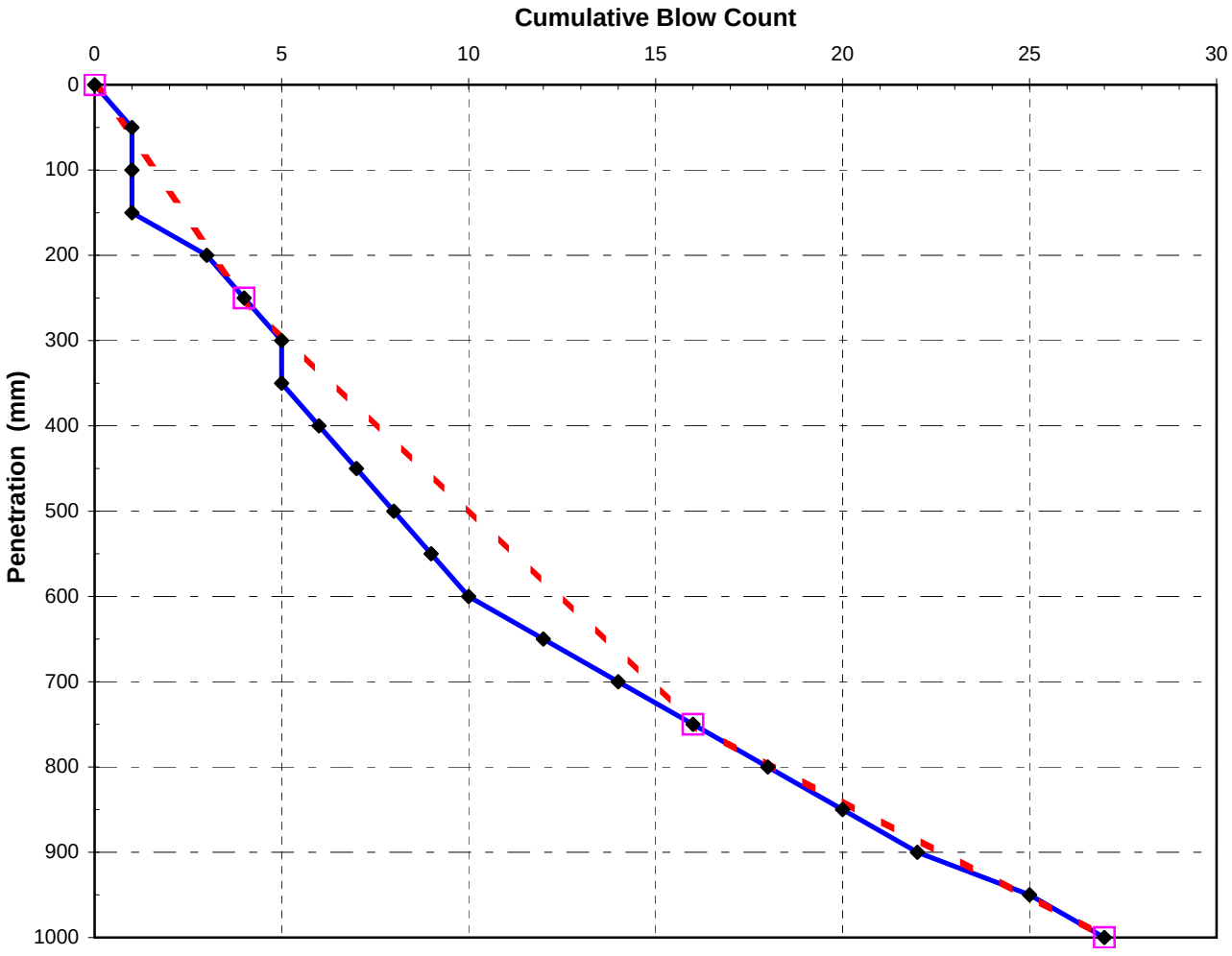
Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 104

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY/ SAND	Test Date:	10-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	250	250	4	4	62.5	2.2	FILL	
2	250	750	500	16	12	41.7	3.6	CLAY	
3	750	1000	250	27	11	22.7	7.9	SAND	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

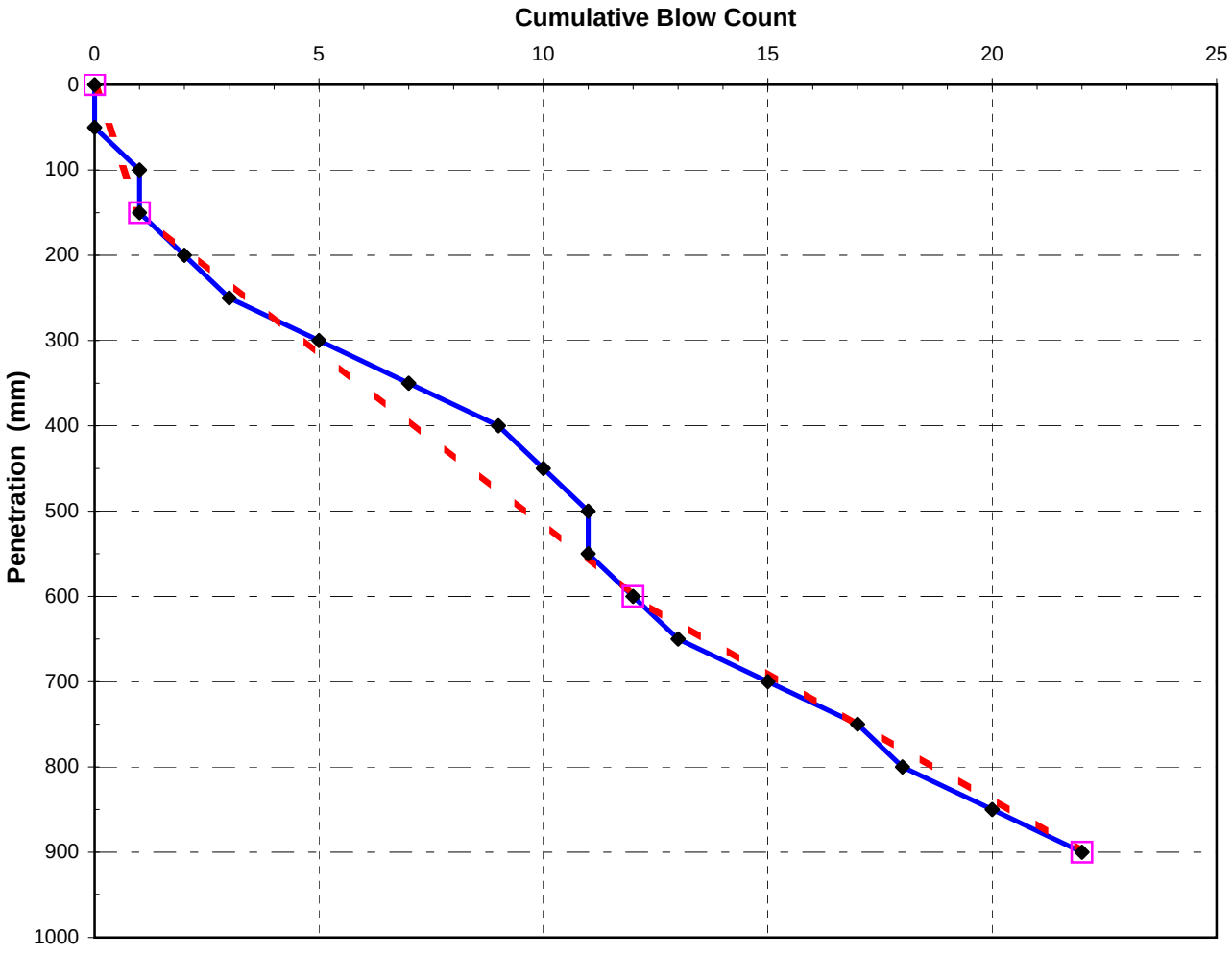
Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 105

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	10-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	1	1	150.0	0.7	TOPSOIL	
2	150	600	450	12	11	40.9	3.7	FILL	
3	600	900	300	22	10	30.0	5.5	CLAY	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

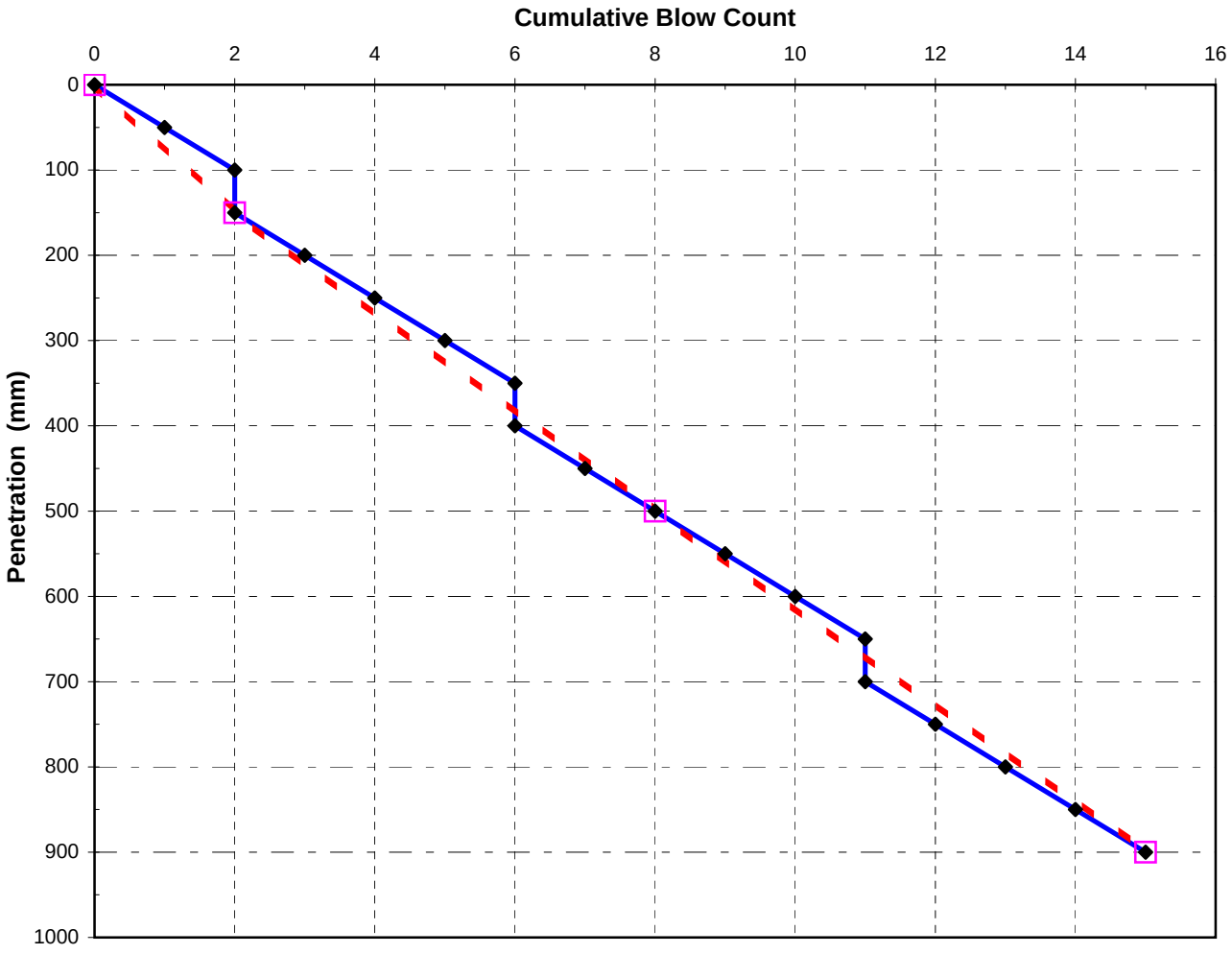
ST Consult

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 107

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	18-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	2	2	75.0	1.7	TOPSOIL	
2	150	500	350	8	6	58.3	2.4	FILL	
3	500	900	400	15	7	57.1	2.4	CLAY	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

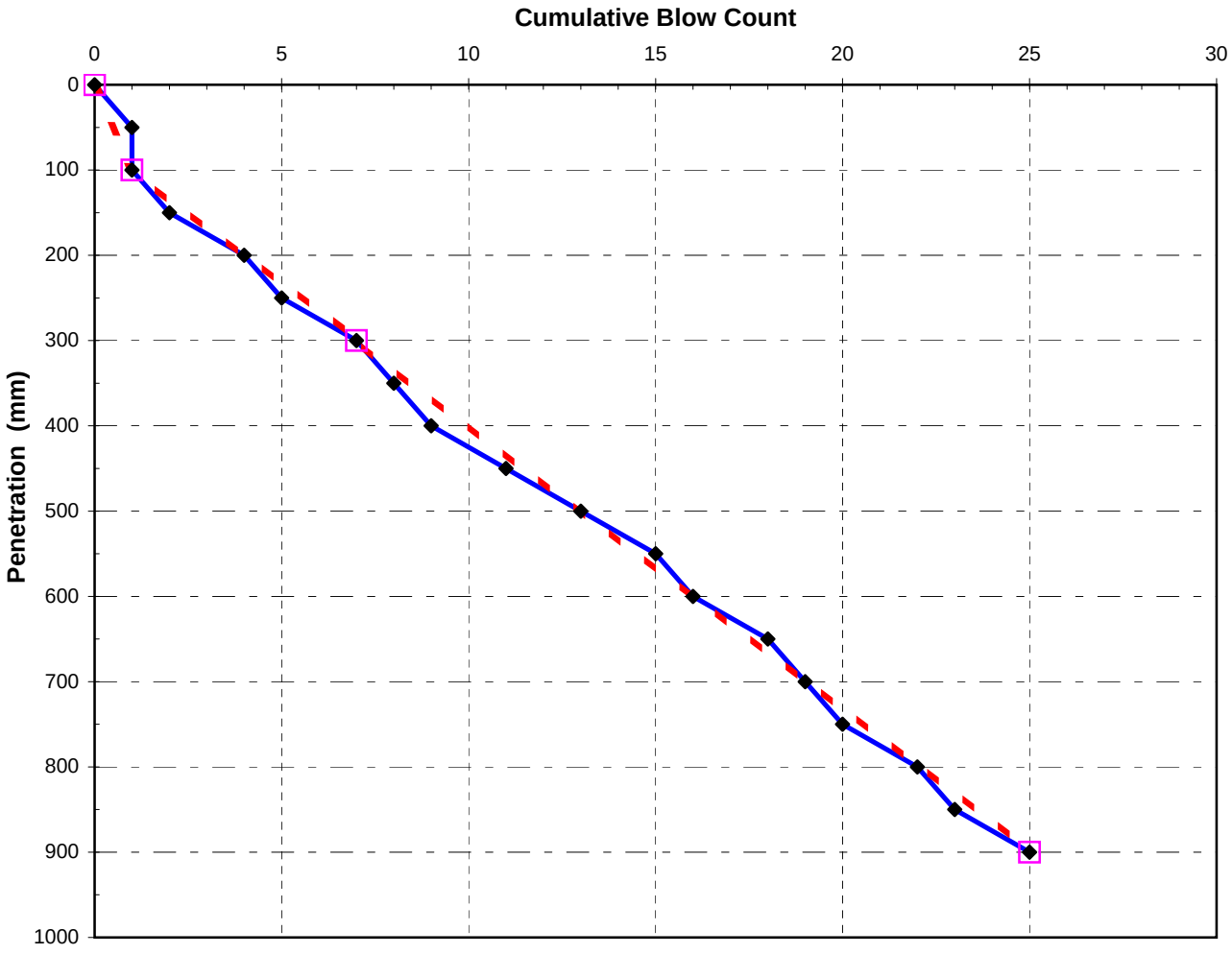
Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 108

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	18-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	100	100	1	1	100.0	1.2	TOPSOIL	
2	100	300	200	7	6	33.3	4.8	FILL	
3	500	900	400	25	18	22.2	8.1	CLAY	

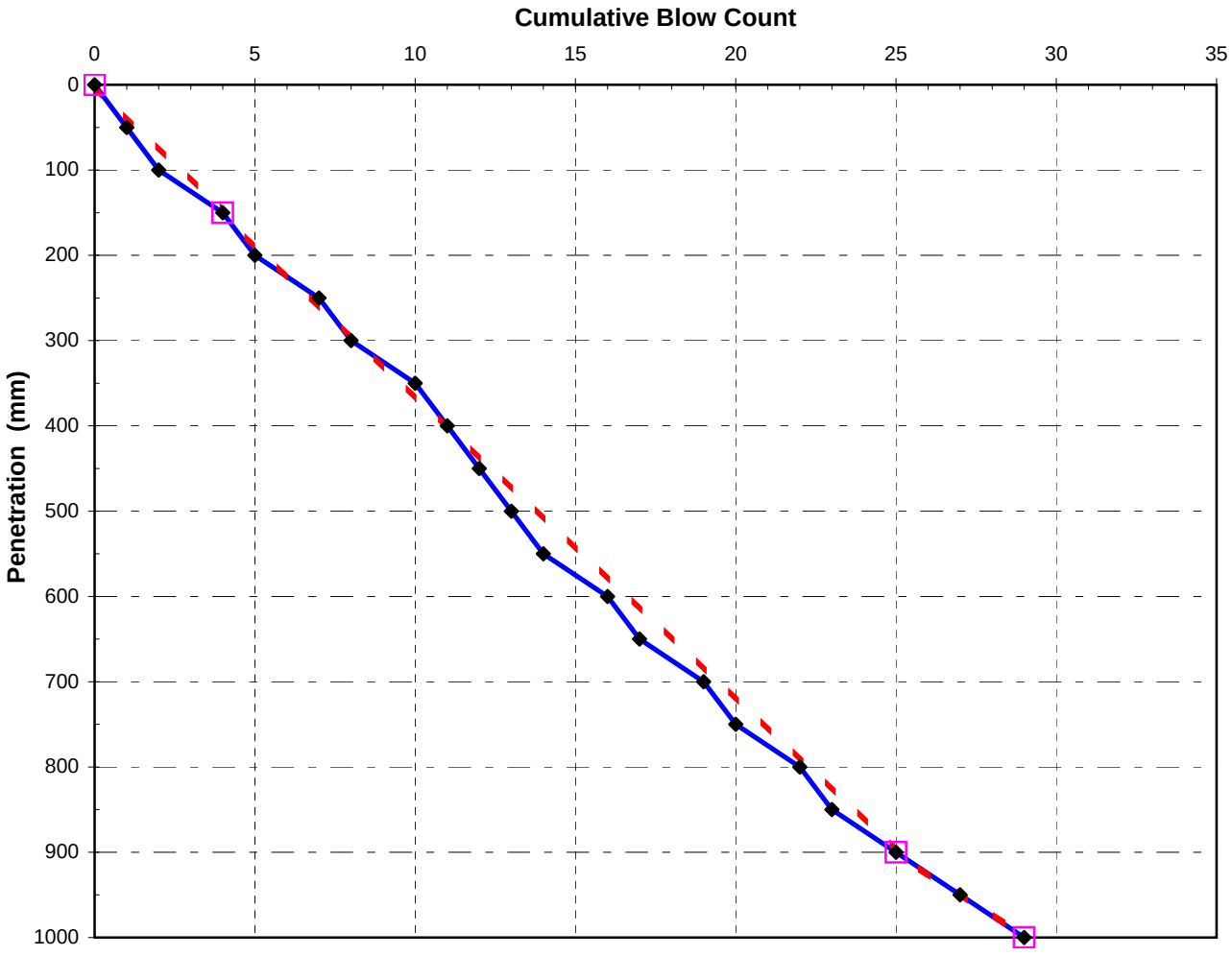
Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 109

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	18-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	4	4	37.5	4.1	TOPSOIL	
2	150	900	750	25	21	35.7	4.4	CLAY	
3	900	1000	100	29	4	25.0	7.0	SAND	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

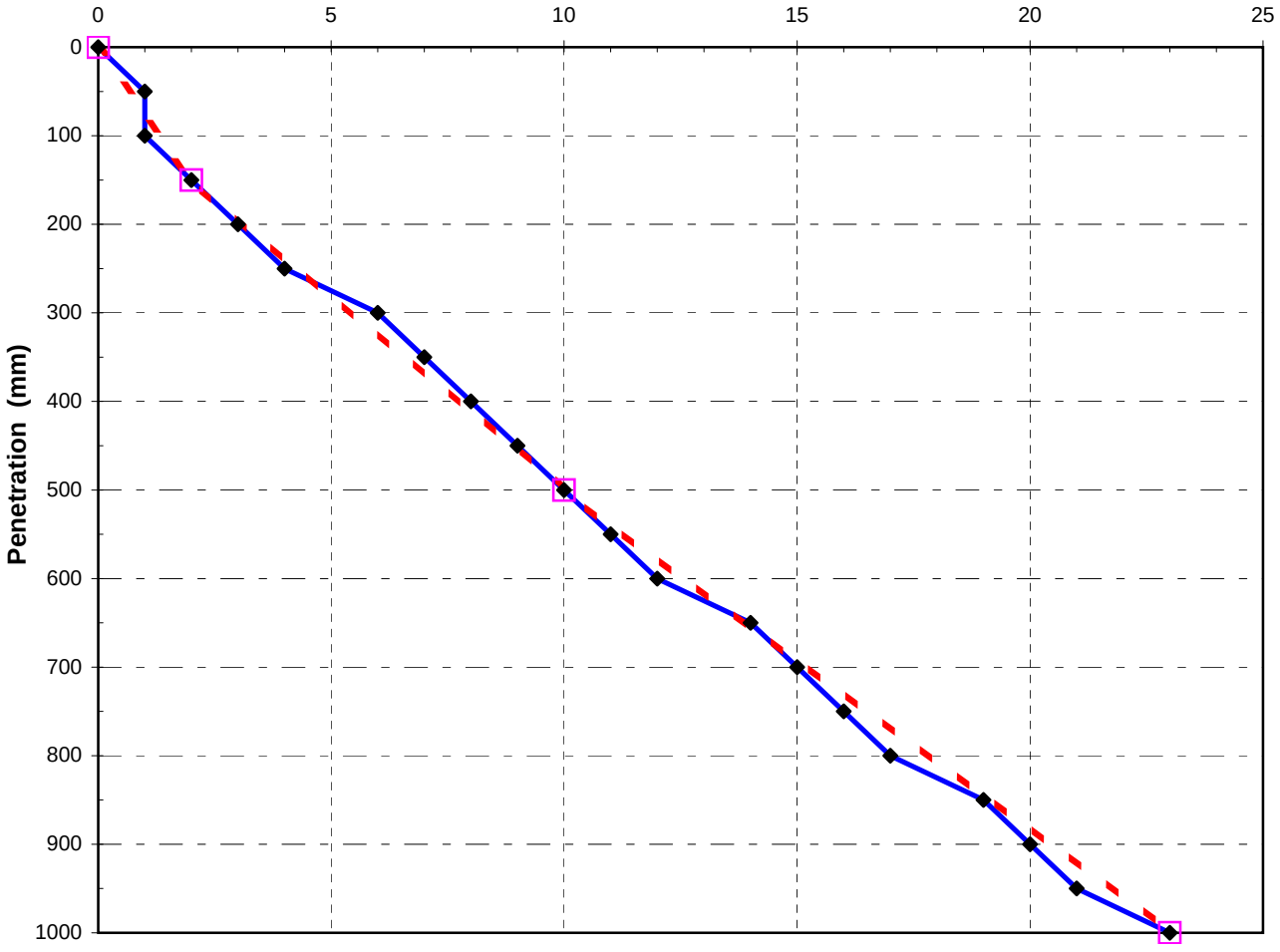
Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 110

Chainage:
Start Layer: GL
Soil Condition: CLAY
Notes:

Tested By: AH
Checked By: AH
Test Date: 18-Jan-12

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	2	2	75.0	1.7	TOPSOIL	
2	150	500	350	10	8	43.8	3.4	CLAY	
3	500	1000	500	23	13	38.5	4.0	CLAY	

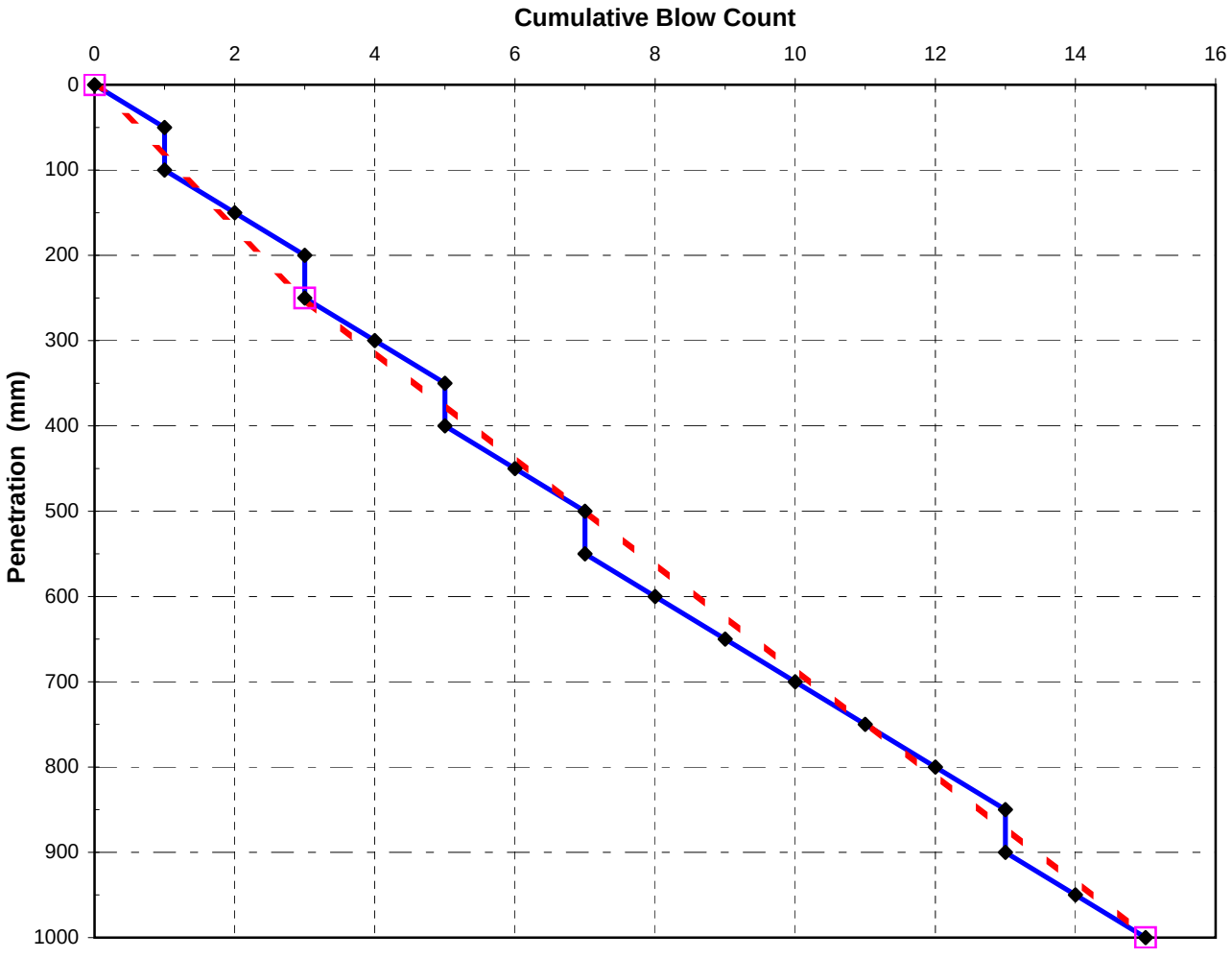
Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 111

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	18-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	250	250	3	3	83.3	1.5	TOPSOIL	
2	250	1000	750	15	12	62.5	2.2	CLAY	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

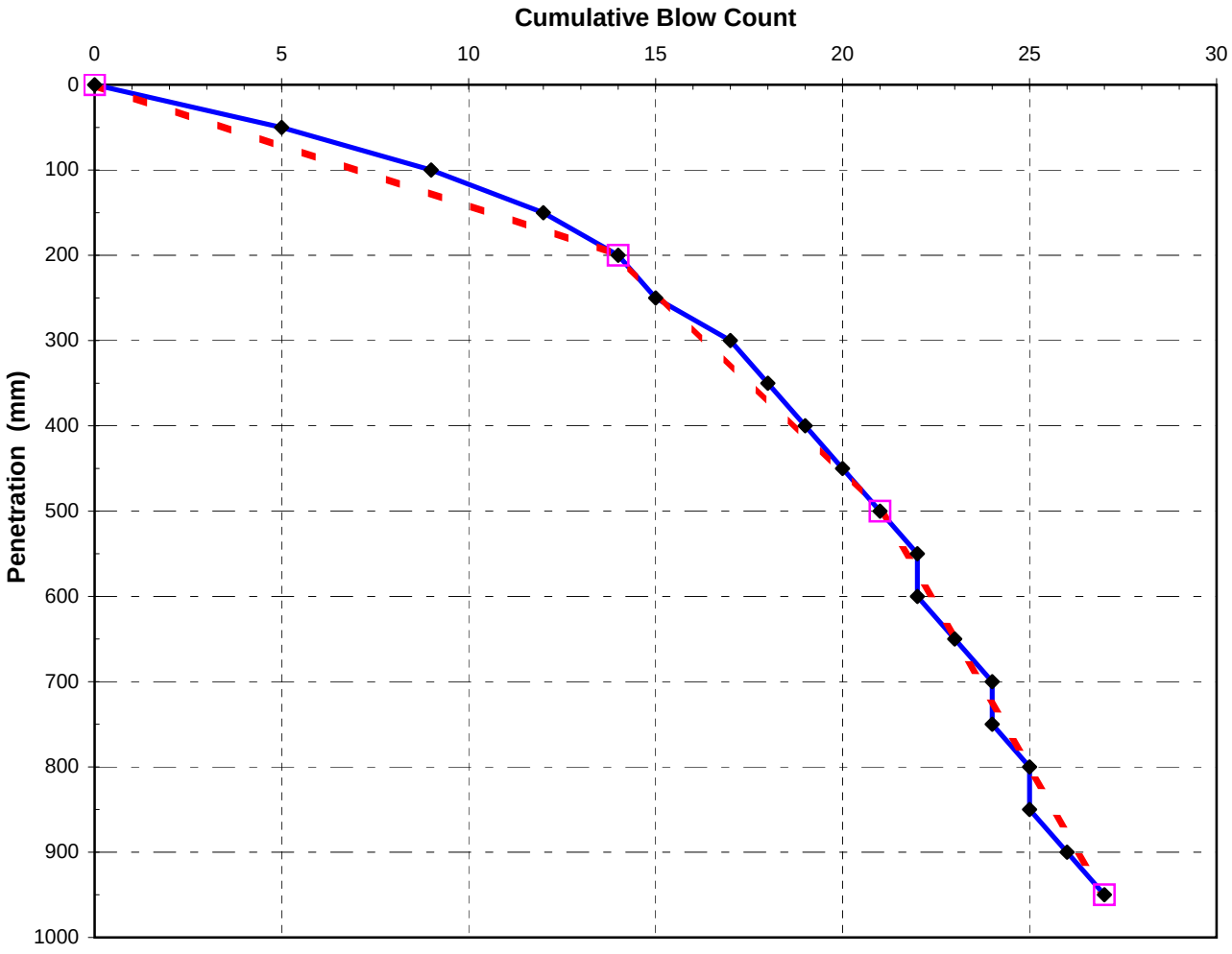
ST Consult

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 114

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	19-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	200	200	14	14	14.3	14	TOPSOIL	
2	200	500	300	21	7	42.9	3.5	FILL	
3	500	950	450	27	6	75.0	1.7	CLAY	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

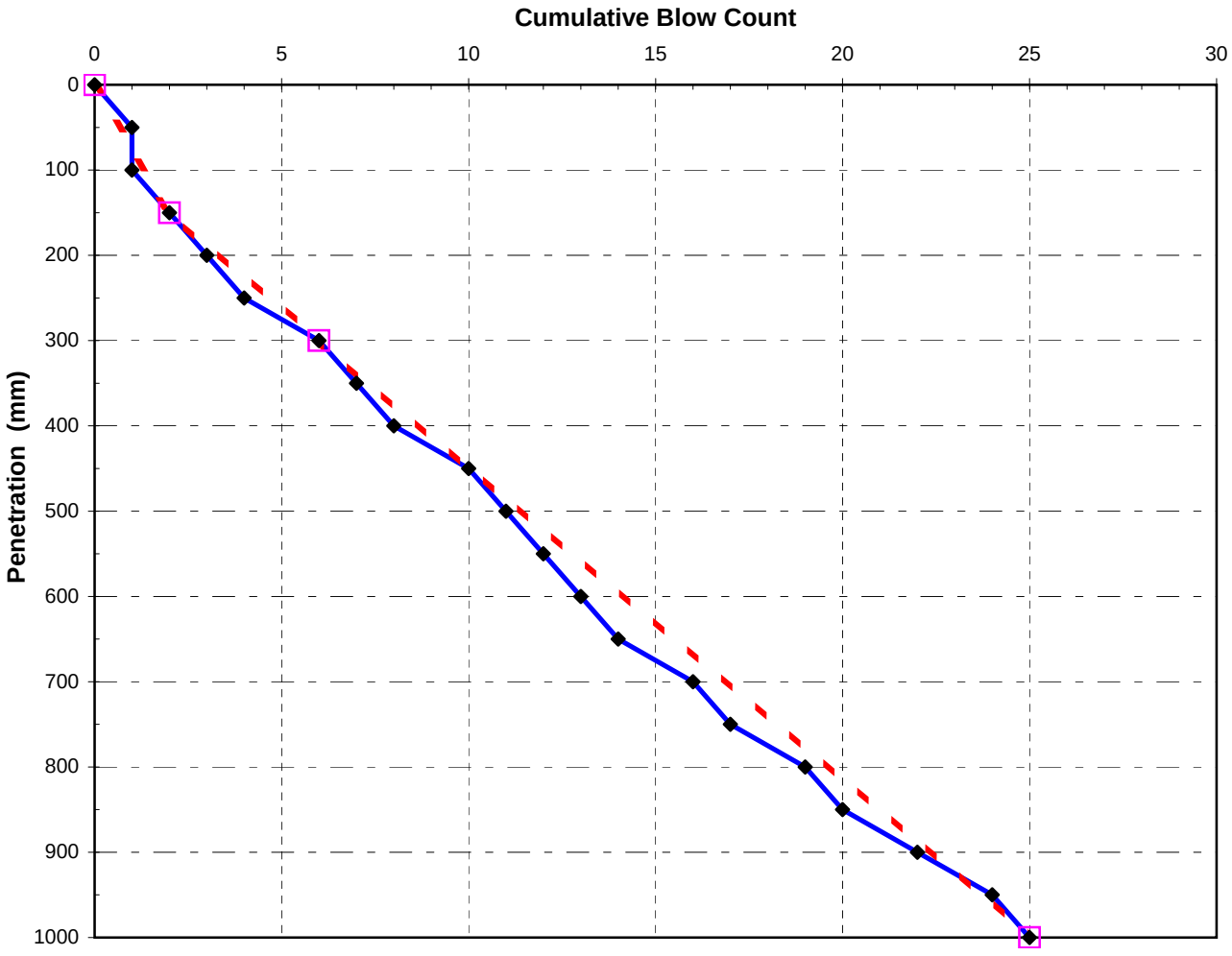
Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 116

Chainage:		Tested By:	AH
Start Layer:	GL	Checked By:	AH
Soil Condition:	CLAY	Test Date:	19-Jan-12
Notes:			

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	2	2	75.0	1.7	TOPSOIL	
2	150	300	150	6	4	37.5	4.1	CLAY	
3	300	1000	700	25	19	36.8	4.2	CLAY	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

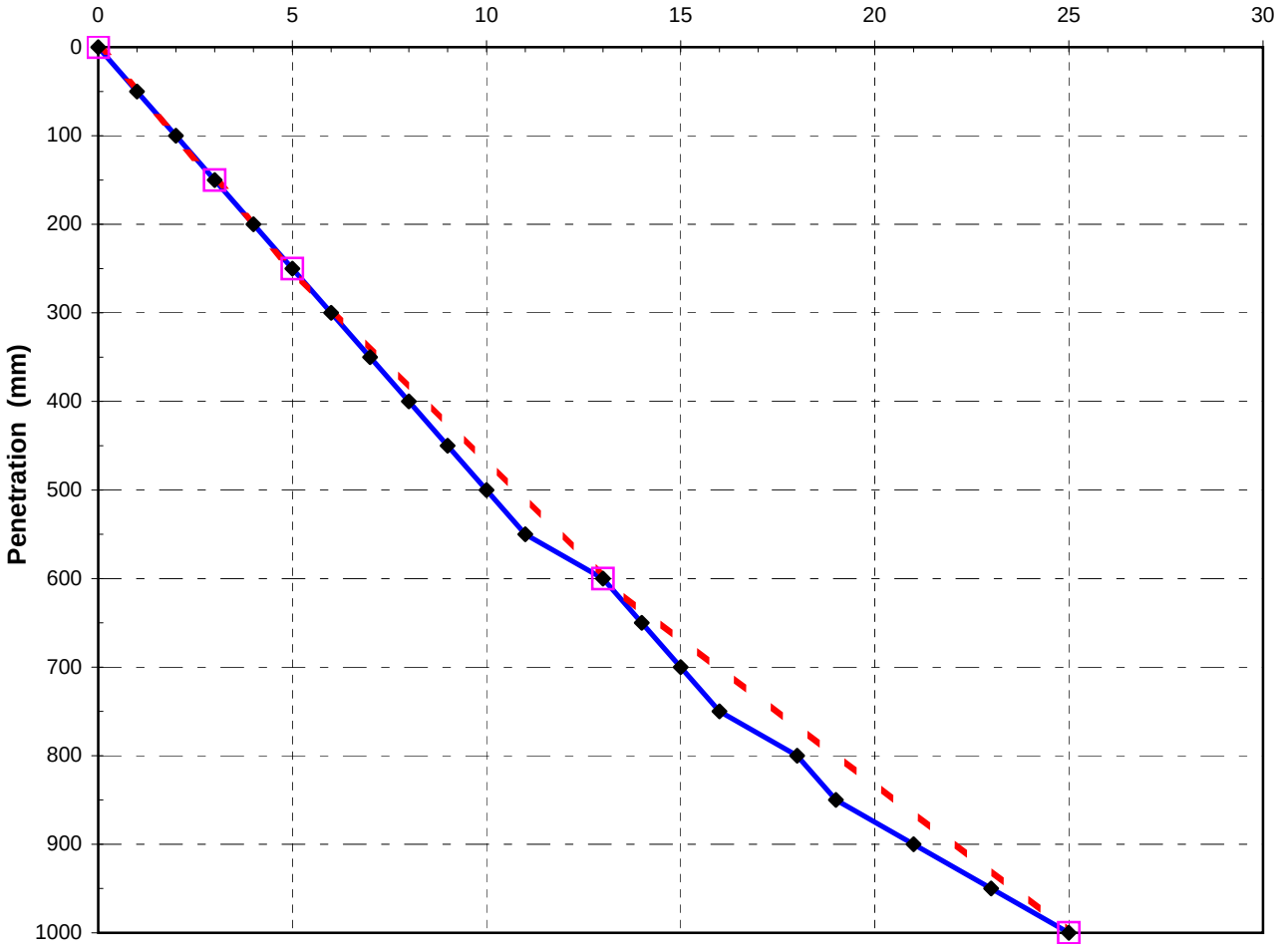
Dynamic Cone Penetrometer (DCP) Test Results

Test No: DH 117

Chainage:
Start Layer: GL
Soil Condition: CLAY
Notes:

Tested By: AH
Checked By: AH
Test Date: 19-Jan-12

Perth Cone CBR Penetration *vs* Cumulative Blow Count



Evaluated CBR Values from DCP Test Results

Layer No	From *(mm)*	To *(mm)*	Depth *(mm)*	Blow Count	No. of Blows	DCP *mm/blow*	CBR *%*	Soil Type	Remarks
1	0	150	150	3	3	50.0	2.9	TOPSOIL	
2	150	250	100	5	2	50.0	2.9	SAND	
3	250	600	350	13	8	43.8	3.4	CLAY	
4	600	1000	400	25	12	33.3	4.8	CLAY	

Client:	**PJH Development Consultancy Services**	**Job No:**	J10856	
Site:	**Site II Winchester Road, Botley**	**Date:**	1.2.12	**Fig.**

APPENDIX C

Geotechnical Laboratory Test Methods & Results

Geotechnical Laboratory Test Methods & Results

Atterberg Limit Tests

This is a valuable classification test, which is used to determine the moisture contents at which a soil changes from a liquid through a plastic to a solid state and gives an indication of the clay quantities present in the soil.

Moisture Content

A sample of soil is dried to constant dry weight at a temperature of 105 degrees centigrade and the moisture content determined.

Determination of pH value

The pH value is a measure of acidity or alkalinity. It is measured using an electrometric meter, directly in the case of water, or in a soil suspension in distilled water.

Sulphate Test

The sulphate content of groundwater or of a 2:1 water to soil extract is determined by passing the solution through an ion exchange column and titrating the effluent with NaOH solution.

The method cannot be used if the soil or ground water contains anions of other strong acids, such as chloride, nitrates and phosphates. If the site is near an estuary or close to the sea, it may lead to erroneous results because of the high concentration of chloride in sea water.

Sedimentation Test

This provides a method of determining the proportions of coarse, medium and fine silt and clay in a soil sample. The soil specimen is dispersed in water with added anti-flocculant, and samples of water and suspended matter are taken at specified intervals of time, at a depth of 100 mm. The rates of fall of particles in water are proportional to their diameters, and their specific gravity. The time intervals are selected such that all particles of a specified size (eg silt size) have fallen past the sampling depth. The mass of suspended matter in the samples is determined by weighing and is used to determine the percentage of soil in the specimen, which is finer than the specified size.

In this way, the percentage of silt and clay fractions is calculated.

Atterberg Limits Test Result Summary Sheet

Test carried out in accordance with BS 1377-2:1990(2003) cl. 3.2, 4.2, 4.3, 5.3 & 5.4

Project No : ***J10856*** **Checked By :** ***TG*** **Date:** ***30-Jan-2012***

Project Name : ***Site II Winchester Road, Botley***

Client : ***PJH Development Consultancy Services***

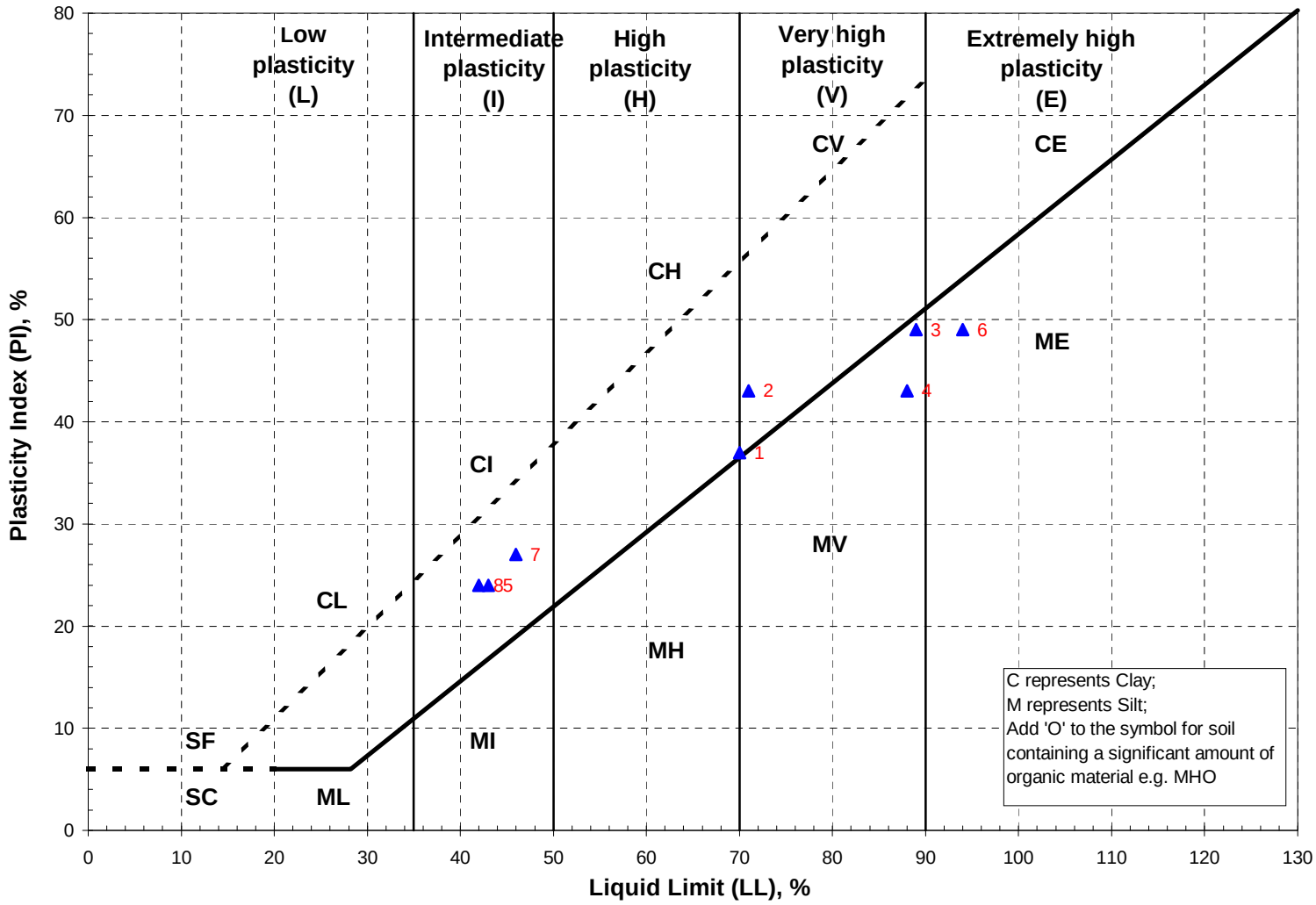
Plot No	TH No.	Depth (m)	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class-ification	% Passing 425µm (%)	Visual Description
1	***DH101***	***1.50***	***33.9***	***70***	***33***	***37***	***CH/CV***	***100***	***Stiff high strength pale grey brown mottled yellow brown CLAY.***
2	***DH105***	***1.50***	***26.1***	***71***	***28***	***43***	***CV***	***100***	***Very stiff very high strength light grey brown patched orange brown and yellow brown sandy CLAY.***
3	***DH107***	***1.50***	***44.4***	***89***	***40***	***49***	***MV***	***100***	***Firm high strength pale grey patched light brown CLAY.***
4	***DH108***	***1.50***	***50.0***	***88***	***45***	***43***	***MV***	***100***	***Firm high strength pale grey patched yellow brown CLAY.***
5	***DH110***	***1.50***	***19.7***	***43***	***19***	***24***	***CI***	***100***	***Firm medium to high strength grey speckled yellow brown and grey very sandy CLAY.***
6	***DH111***	***1.50***	***47.6***	***94***	***45***	***49***	***ME***	***100***	***Firm medium strength yellow brown patched light grey CLAY.***
7	***DH115***	***1.50***	***28.1***	***46***	***19***	***27***	***CI***	***100***	***Firm medium strength yellow grey patched grey and yellow brown sandy CLAY.***
8	***DH116***	***1.00***	***22.1***	***42***	***18***	***24***	***CI***	***98***	***Stiff high strength yellow brown mottled grey very sandy CLAY with occasional gravel.***

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Plasticity Chart for Atterberg Limit Test Results



Sample List	
1	DH101@1.5m
2	DH105@1.5m
3	DH107@1.5m
4	DH108@1.5m
5	DH110@1.5m
6	DH111@1.5m
7	DH115@1.5m
8	DH116@1m

Statistics	
Liquid Limit	
Max	94
Min	42
Average	68
Plastic Limit	
Max	45
Min	18
Average	31
Plasticity Index	
Max	49
Min	24
Average	37

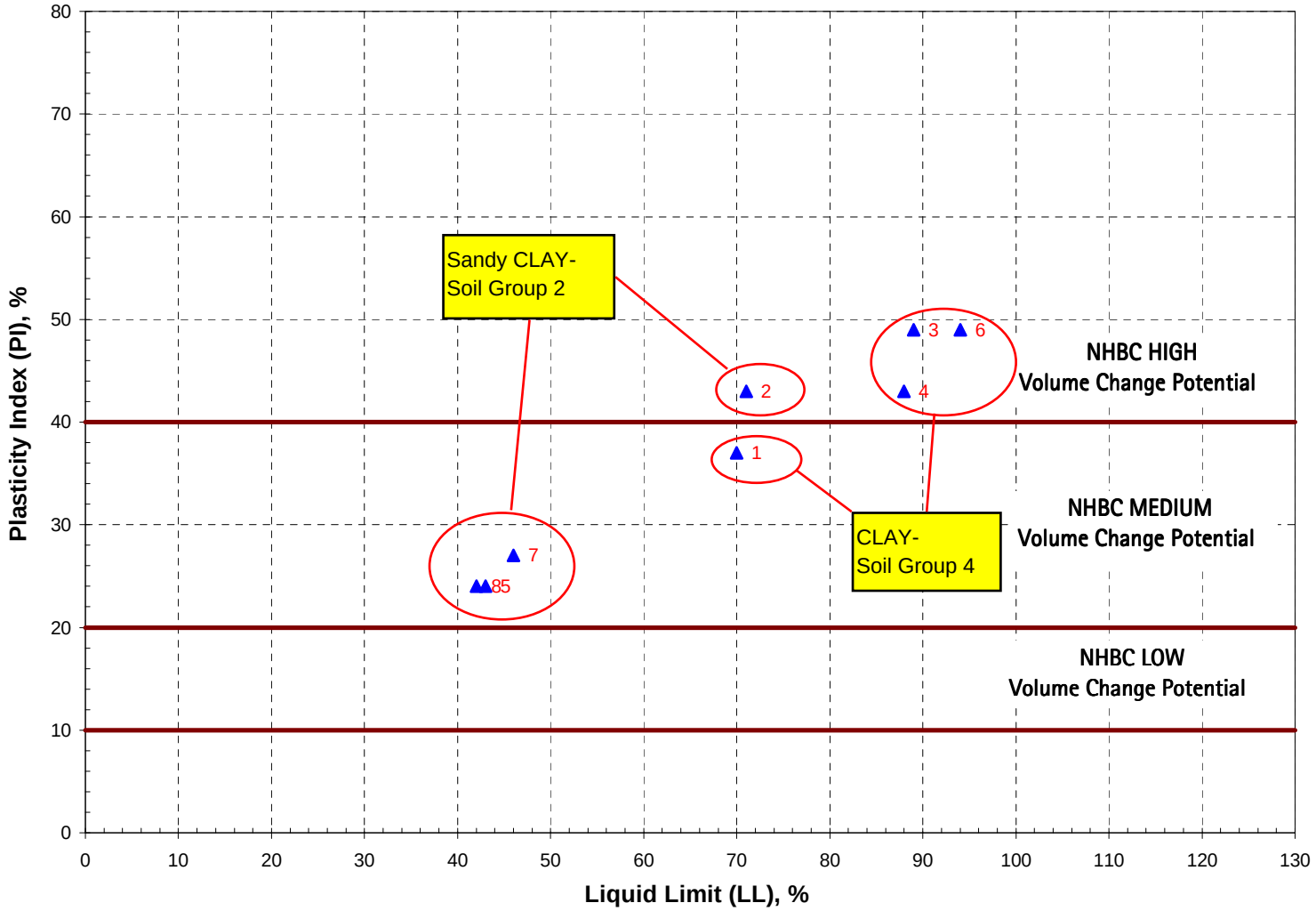
Project Name:	*Site II Winchester Road, Botley*	**Project No:**	*J10856*	**Project Engineer:**	*AH*
Client:	*PJH Development Consultancy Services*	**Date:**	*30/01/2012*	*Figure No. 2*	

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Plot Relating Soil Plasticity to NHBC Classification for Volume Change Potential



Sample List

1	DH101@1.5m
2	DH105@1.5m
3	DH107@1.5m
4	DH108@1.5m
5	DH110@1.5m
6	DH111@1.5m
7	DH115@1.5m
8	DH116@1m

Statistics

Liquid Limit	
Max	94
Min	42
Average	68
Plastic Limit	
Max	45
Min	18
Average	31
Plasticity Index	
Max	49
Min	24
Average	37

Project Name:	*Site II Winchester Road, Botley*	**Project No:**	*J10856*	**Project Engineer:**	*AH*
Client:	*PJH Development Consultancy Services*	**Date:**	*30/01/2012*	*Figure No. 3*	

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Soil / Groundwater Sulphate Content Test Results

Test carried out in accordance with BS 1377-3:1990 (2003) cl. 5.3, 5.4, 5.6 & 9.5

Project No : ***J10856*** **Client :** ***PJH Development Consultancy Services***

Project Name : ***Site II Winchester Road, Botley***

Tested By : ***STL Lab.*** **Checked :** ***CAT*** **Date :** ***30-Jan-12***

TH No.	Depth	Sample Type	Soil Sulphate in 2:1 Water Extract		Groundwater Sulphate		Total Potential Sulphate		pH Value	Percentage Passing 2mm Sieve	Visual Description
	(m)		g /l SO_3	BRE mg /l SO_4	g /l SO_3	BRE mg /l SO_4	% SO_3	BRE % SO_4			
DH101	**2.50**	SB	***0.07***	***84***					***3.9***	***100.0***	Stiff high strength light grey brown patched yellow brown and brown sandy CLAY
DH104	**2.00**	SB	***0.00***	***0***					***4.6***	***100.0***	Orange yellow very sandy CLAY
DH107	**3.00**	SB	***0.02***	***24***					***4.3***	***100.0***	Very soft very low strength buff patched yellow brown very sandy CLAY
DH110	**2.50**	SB	***0.02***	***24***					***6.6***	***100.0***	Stiff high strength buff brown slightly sandy CLAY
DH117	**1.20**	SB	***0.03***	***36***					***6.4***	***100.0***	Very soft very low strength buff patched yellow brown very sandy CLAY

Particle Size Distribution - Sedimentation By Pipette Method

BS1377-2:1990(2003) cl. 9.2, 9.3 & 9.4

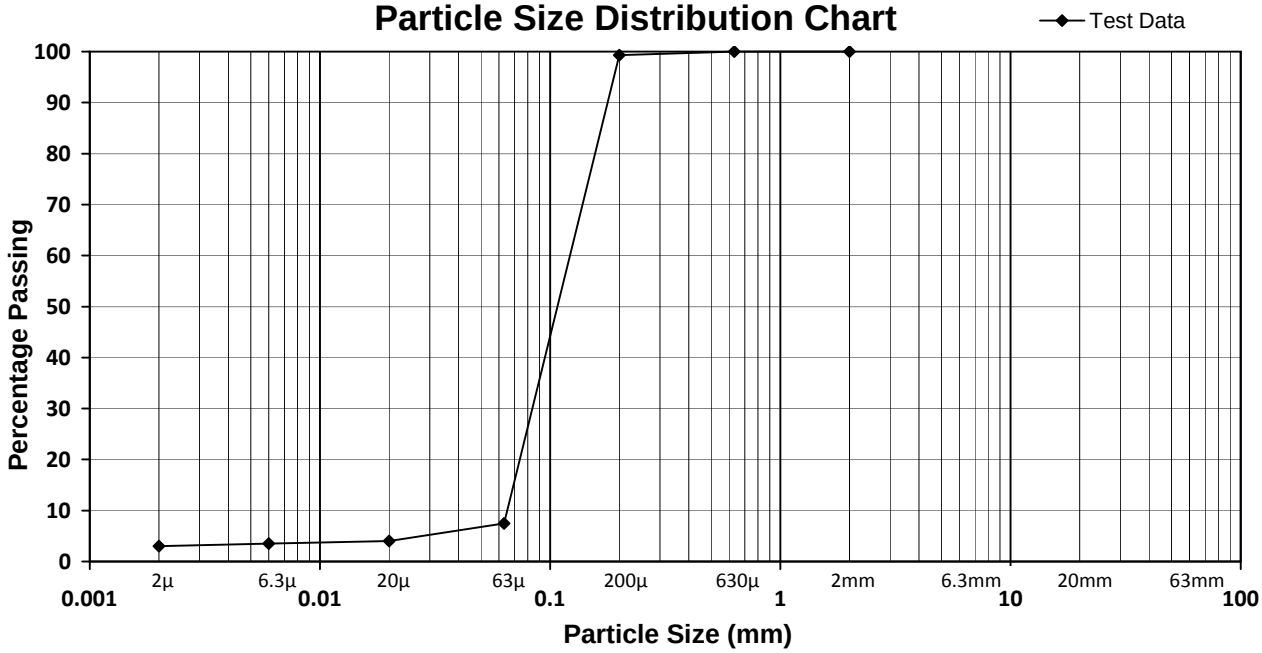
Project Name	**Site II Winchester Road, Botley**		
Client	**PJH Development Consultancy Services**	**Project Engineer**	**AH**

Project No.	**J10856**
Hole ID	**DH103**
Depth (m)	**1.50**
Sample Type	**Small**
Date Issued	**2 Feb 12**
Tested By	**AS**
Checked By	**TG**

Visual Description of Sample:

Buff brown silty SAND.

Particle Size Distribution Chart



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			
3%	4%			92%			0%			

Particle Size	% Passing
2mm	100%
630µ	100%
200µ	99%
63µ	8%
20µ	4%
6µ	4%
2µ	3%

Particle Density (Measured)	**2.63** Mg/m³

Comment:

Method of Pre-Treatment	None

Test Methods:

Wet & Dry Grading BS1377-2: 1990 (2003) cl. 9.2 & 9.3

Sedimentation by Pipette BS1377-2:1990(2003) cl 9.4

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8LU

Particle Size Distribution - Sedimentation By Pipette Method

BS1377-2:1990(2003) cl. 9.2, 9.3 & 9.4

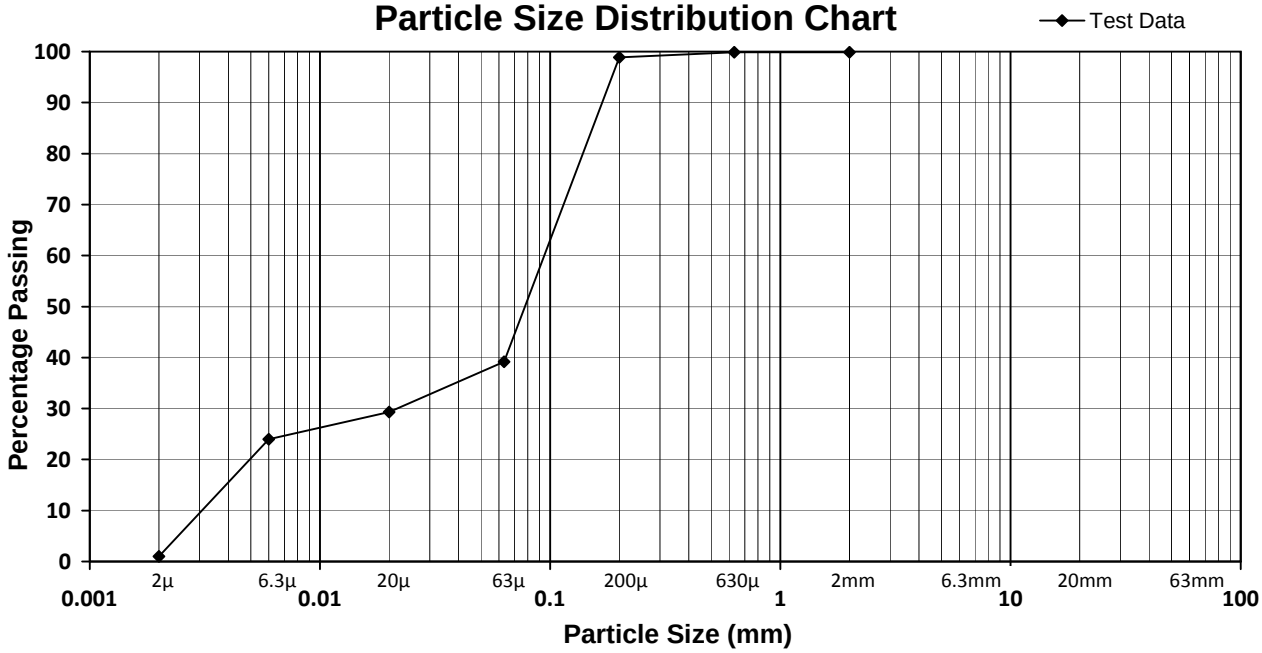
Project Name	**Site II Winchester Road, Botley**		
Client	**PJH Development Consultancy Services**	**Project Engineer**	**AH**

Project No.	**J10856**
Hole ID	**DH104**
Depth (m)	**1.20**
Sample Type	**Small**
Date Issued	**2 Feb 12**
Tested By	**AS**
Checked By	**TG**

Visual Description of Sample:

Firm medium to high strength yellow grey mottled yellow brown very sandy SILT.

Particle Size Distribution Chart



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			
1%	38%			61%			0%			

Particle Size	% Passing
2mm	100%
630µ	100%
200µ	99%
63µ	39%
20µ	29%
6µ	24%
2µ	1%

Particle Density (Measured)	**2.56** Mg/m³

Comment:

Method of Pre-Treatment	None

Test Methods:

Wet & Dry Grading BS1377-2: 1990 (2003) cl. 9.2 & 9.3

Sedimentation by Pipette BS1377-2:1990(2003) cl 9.4

Particle Size Distribution - Sedimentation By Pipette Method

BS1377-2:1990(2003) cl. 9.2, 9.3 & 9.4

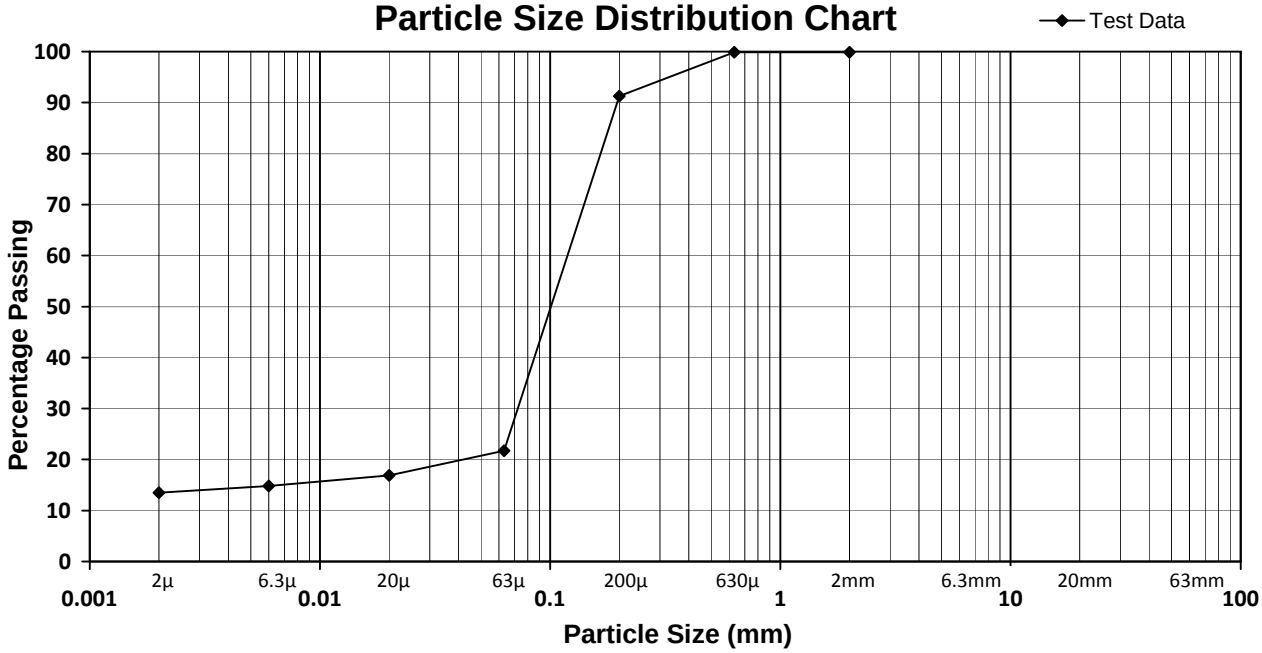
Project Name	**Site II Winchester Road, Botley**		
Client	**PJH Development Consultancy Services**	**Project Engineer**	**AH**

Project No.	**J10856**
Hole ID	**DH106**
Depth (m)	**4.00**
Sample Type	**Small**
Date Issued	**2 Feb 12**
Tested By	**AS**
Checked By	**TG**

Visual Description of Sample:

Olive grey speckled yellow brown very sandy CLAY.

Particle Size Distribution Chart



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			
14%	8%			78%			0%			

Particle Size	% Passing
2mm	100%
630µ	100%
200µ	91%
63µ	22%
20µ	17%
6µ	15%
2µ	14%

Particle Density (Measured)	**2.66** Mg/m³

Comment:

Method of Pre-Treatment	None

Test Methods:

Wet & Dry Grading BS1377-2: 1990 (2003) cl. 9.2 & 9.3

Sedimentation by Pipette BS1377-2:1990(2003) cl 9.4

Particle Size Distribution - Sedimentation By Pipette Method

BS1377-2:1990(2003) cl. 9.2, 9.3 & 9.4

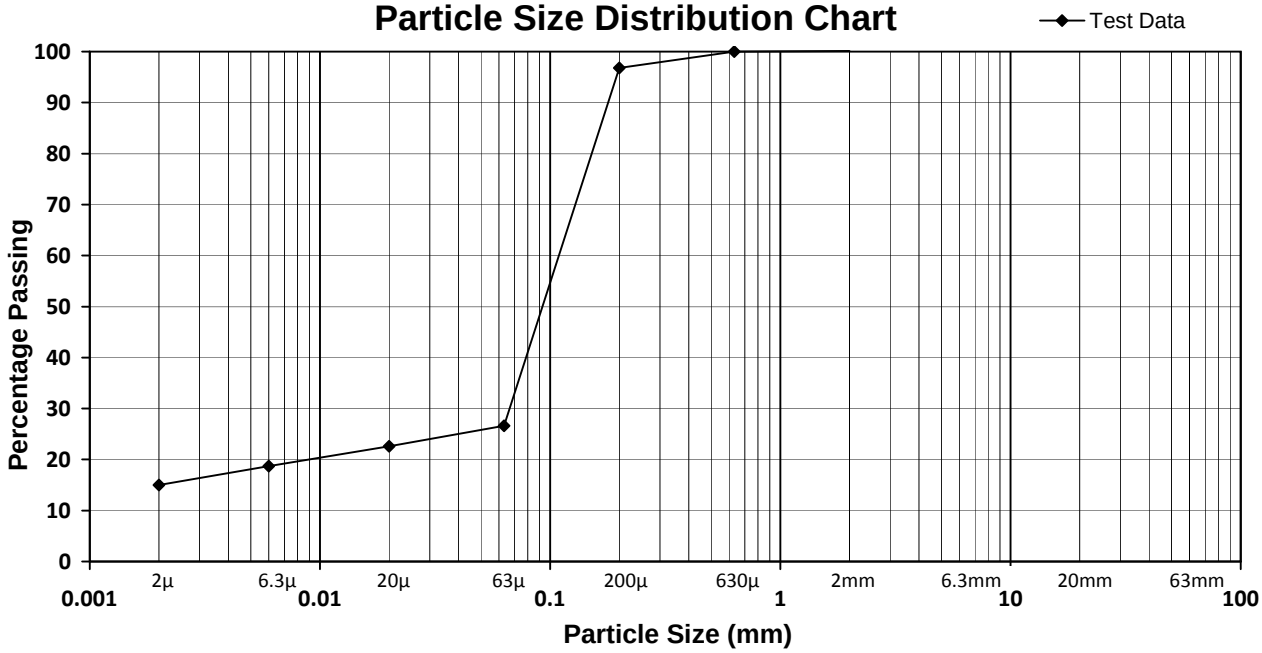
Project Name	**Site II Winchester Road, Botley**		
Client	**PJH Development Consultancy Services**	**Project Engineer**	**AH**

Project No.	**J10856**
Hole ID	**DH117**
Depth (m)	**2.00**
Sample Type	**Small**
Date Issued	**2 Feb 12**
Tested By	**AS**
Checked By	**TG**

Visual Description of Sample:

Yellow grey mottled buff brown clayey SAND.

Particle Size Distribution Chart



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			
15%	12%			74%			0%			

Particle Size	% Passing
2mm	100%
630µ	100%
200µ	97%
63µ	27%
20µ	23%
6µ	19%
2µ	15%

Particle Density (Measured)	**2.59** Mg/m³

Comment:

Method of Pre-Treatment	None

Test Methods:

Wet & Dry Grading BS1377-2: 1990 (2003) cl. 9.2 & 9.3

Sedimentation by Pipette BS1377-2:1990(2003) cl 9.4

APPENDIX D

Contamination Laboratory Test Results

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

CERTIFICATE OF ANALYSIS

Site :	Site II Winchester Road, Botley	**Job No :**	J10856
Sample Group :	Topsoil	**Client :**	PJH Development Consultancy Services
Test Suite :	STL Key Contaminants Suite	**Date Issued :**	16/Feb/2012

Customer Sample Reference		DH101	DH103	DH104	DH108	DH110
		0.1	0.1	0.1	0.1	0.1
Determinand	Units					
pH		6.5	6.3	5.6	5.8	5.6
Arsenic	mg/kg	12	7	4	14	6
Cadmium	mg/kg	0.2	<0.1	<0.1	0.1	0.1
Chromium	mg/kg	24	15	11	26	14
Copper	mg/kg	34	10	8	17	11
Lead	mg/kg	69	23	24	31	21
Mercury	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	mg/kg	6.2	5.8	2.8	3.3	3.7
Selenium	mg/kg	<3	<3	<3	<3	<3
Zinc	mg/kg	64	40	17	29	25
Phenols(Mono)	mg/kg	1.2	1	0.7	1.5	0.7
Cyanide(Total)	mg/kg	<1	<1	<1	<1	<1
(Water Soluble) SO4-- expressed a	g/l	0.02	0.01	0.01	0.01	0.01
Sulphide	mg/kg	<10	<10	<10	<10	<10
Benzo(a)Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Retained on 2mm	%	<0.1	<0.1	1.9	<0.1	<0.1
Soil Organic Matter	%	7.4	4.8	3.1	7.9	4.3
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b/k)Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Moisture	%	27	24	17	26	24
Fraction Organic Carbon - F(oc)	%	<1	<1	<1	<1	<1
Moisture @ 105 C	%	31	24	17	32	27

- : not determined -- : dependent option I/S : insufficient sample nt : not tested

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

CERTIFICATE OF ANALYSIS

Site :	Site II Winchester Road, Botley	**Job No :**	J10856
Sample Group :	Topsoil	**Client :**	PJH Development Consultancy Services
Test Suite :	STL Key Contaminants Suite	**Date Issued :**	16/Feb/2012

Customer Sample Reference		DH111	DH113	DH116	DH117
Depth (m)		0.1	0.1	0.1	0.1
Determinand	Units				
pH		6.8	5.5	6	5.5
Arsenic	mg/kg	7	9	6	8
Cadmium	mg/kg	0.1	0.2	0.2	0.1
Chromium	mg/kg	16	24	18	16
Copper	mg/kg	13	16	13	12
Lead	mg/kg	37	53	41	29
Mercury	mg/kg	<1.0	<1.0	<1.0	<1.0
Nickel	mg/kg	4.5	5.4	5.1	4.4
Selenium	mg/kg	<3	<3	<3	<3
Zinc	mg/kg	26	41	39	42
Phenols(Mono)	mg/kg	<0.5	1.1	<0.5	<0.5
Cyanide(Total)	mg/kg	<1	<1	<1	<1
(Water Soluble) SO4-- expressed a	g/l	0.01	0.03	0.01	0.01
Sulphide	mg/kg	<10	<10	<10	<10
Benzo(a)Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Retained on 2mm	%	<0.1	<0.1	18.4	<0.1
Soil Organic Matter	%	4.3	7.4	2.9	4.5
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b/k)Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Moisture	%	20	31	16	21
Fraction Organic Carbon - F(oc)	%	<1	<1	<1	<1
Moisture @ 105 C	%	20	39	20	22

- : not determined -- : dependent option I/S : insufficient sample nt : not tested

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

Statistical Tests for Contaminated Soils

Table

Site : Site II Winchester Road, Botley **Client :** PJH Development Consultancy Ser **Job No :** J10856

Sample Group [3] : Topsoil **Test Suite :** STL Key Contaminants Suite **Date :** 16/Feb/2012

Contaminant		Test Results and Statistics				Mean Value Test [1]			Max Value Test [2]		
		No. of sample tested	Range	Arithmetic mean	Standard deviation	Upper bound (US_{95})	Residential with plant uptake		Max value	Sample Ref. of max value	Outlier check [2]
							Screening value	Check			
Arsenic (As) [4]	mg/kg	9	4 - 14	8.1	3.1	10	32		14	DH108 @ 0.10m@40926	N/A
Cadmium (Cd) [4]	mg/kg	9	<0.1 - 0.2	0.13	0.05	0.16	10		0.2	DH101 @ 0.10m@40918	N/A
Total Chromium (Cr) [5]	mg/kg	9	11 - 26	18	5.2	21	/		26	DH108 @ 0.10m@40926	N/A
Hexavalent Chromium (CrVI)* [5]	mg/kg	0					/				
Lead (Pb) [5, 8]	mg/kg	9	21 - 69	36	16	43	450		69	DH101 @ 0.10m@40918	N/A
Mercury (Hg) [4, 9]	mg/kg	9	<1	1.0	0.00	1.0	11		1	DH101 @ 0.10m@40918	N/A
Selenium (Se) [4]	mg/kg	9	<3	3.0	0.00	3.0	350		3	DH101 @ 0.10m@40918	N/A
Nickel (Ni) [4]	mg/kg	9	2.8 - 6.2	4.6	1.2	5.3	130		6.2	DH101 @ 0.10m@40918	N/A
Copper (Cu) [6]	mg/kg	9	8 - 34	15	7.7	20	2300		34	DH101 @ 0.10m@40918	N/A
Zinc (Zn) [6]	mg/kg	9	17 - 64	36	14	44	3700		64	DH101 @ 0.10m@40918	N/A
Phenol [4]	mg/kg	9	<0.5 - 1.5	0.86	0.36	1.1	420		1.5	DH108 @ 0.10m@40926	N/A
Benzo[a]pyrene [6]	mg/kg	9	<0.1	0.10	0.00	0.10	1.0		0.1	DH101 @ 0.10m@40918	N/A
Naphthalene [6]	mg/kg	9	<0.1	0.10	0.00	0.10	9.0		0.1	DH101 @ 0.10m@40918	N/A
Total of 16 PAHs (USEPA)	mg/kg	0					/				
Total Cyanide (CN) [7]	mg/kg	9	<1	1.0	0.00	1.0	/		1	DH101 @ 0.10m@40918	N/A
Free Cyanide * [7]	mg/kg	0					/				
Complex Cyanides * [7]	mg/kg	0					/				
Thiocyanate * [7]	mg/kg	0					/				
Acidity (pH Value)	units	0					/				
Soil Organic Matter	%	9	2.9 - 7.9	5.2	1.9		/		7.9	DH108 @ 0.10m@40926	N/A

Pass the Mean Value Test;
Fail the Mean Value Test.

Notes: [1] : Interpretation of test results is based on CLEA publication CLR 7; Colour coding is only valid if read with the key and the related comments.
[2] : Pass: pass the outlier test, I.e. the maximum value does NOT classify as an outlier; Failed: fail the outlier test, I.e. the maximum value classifies as an outlier.
[3] : Assume SOM of 6% for Topsoil and minimum organic content of 1% for Subsoil.
[4] : Soil Guideline Value (SGV) 2009
[5] : Soil Guideline Value (SGV) 2002.
[6] : GAC based on LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment 2nd Edn 2009. Copper and Zinc may have phytotoxic effects at the given concentrations. Alternative criteria shouls be adopted for importation of Topsoil or other soils for cultivation.
[7] : Screening criteria derived on a site specific basis if test results above detection limit occur
[8] : In the case of Lead (Pb), the geometric mean rather than the arithmetic mean, is used as the basis for the comparison of soil concentration data with the SGV, in accordance with the CLEA recommendations.
[9] : SGV/GAC for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present.
* : Dependent options, see Section Soil Contamination Analysis; ^ : 1:2 extract; - : Not determined; -- : Dependent option; / : No values defined or given; NL : No limit set; N/A : Not applicable.

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

CERTIFICATE OF ANALYSIS

Site :	Site II Winchester Road, Botley	**Job No :**	J10856
Sample Group :	MADE GROUND	**Client :**	PJH Development Consultancy Services
Test Suite :	STL Key Contaminants Suite	**Date Issued :**	16/Feb/2012

Customer Sample Reference		DH101	DH102	DH105	DH106	DH110
	Depth (m	0.5	1.5	0.5	1.5	0.3
Determinand	Units					
pH		8.3	7.9	5.9	8.2	6.2
Arsenic	mg/kg	11	12	9	8	7
Cadmium	mg/kg	<0.1	0.1	<0.1	0.2	<0.1
Chromium	mg/kg	17	19	13	13	16
Copper	mg/kg	140	14	6	23	8
Lead	mg/kg	95	22	12	86	16
Mercury	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	mg/kg	6.4	4.7	5.1	14	4.4
Selenium	mg/kg	<3	<3	<3	<3	<3
Zinc	mg/kg	50	21	26	89	18
Phenols(Mono)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Cyanide(Total)	mg/kg	<1	<1	<1	<1	<1
(Water Soluble) SO4-- expressed a	g/l	0.01	0.15	0.01	0.33	<0.01
Sulphide	mg/kg	<10	<10	<10	<10	<10
Benzo(a)Pyrene	mg/kg	<0.1	<0.1	<0.1	2	<0.1
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Retained on 2mm	%	12.4	<0.1	2.8	4.5	<0.1
Soil Organic Matter	%	3.8	0.5	1.2	2.8	1.4
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.6	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	3.4	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	3.3	<0.1
Benzo(a)Anthracene	mg/kg	<0.1	<0.1	<0.1	2.4	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	2.2	<0.1
Benzo(b/k)Fluoranthene	mg/kg	<0.1	<0.1	<0.1	3.4	<0.1
Indeno(123-cd)Pyrene	mg/kg	<0.1	<0.1	<0.1	1.2	<0.1
Dibenzo(ah)Anthracene	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1
Benzo(ghi)Perylene	mg/kg	<0.1	<0.1	<0.1	1.2	<0.1
Moisture	%	17	19	13	19	17
Fraction Organic Carbon - F(oc)	%	<1	<1	<1	<1	<1
Moisture @ 105 C	%	23	23	15	23	23

- : not determined -- : dependent option I/S : insufficient sample nt : not tested

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

CERTIFICATE OF ANALYSIS

Site :	Site II Winchester Road, Botley	**Job No :**	J10856
Sample Group :	MADE GROUND	**Client :**	PJH Development Consultancy Services
Test Suite :	STL Key Contaminants Suite	**Date Issued :**	16/Feb/2012

Customer Sample Reference		DH113	DH115
	Depth (m	0.3	0.5
Determinand	Units		
pH		7.5	8.9
Arsenic	mg/kg	9	7
Cadmium	mg/kg	<0.1	0.2
Chromium	mg/kg	23	13
Copper	mg/kg	19	24
Lead	mg/kg	24	66
Mercury	mg/kg	<1.0	<1.0
Nickel	mg/kg	4.7	6.8
Selenium	mg/kg	<3	<3
Zinc	mg/kg	24	140
Phenols(Mono)	mg/kg	<0.5	<0.5
Cyanide(Total)	mg/kg	<1	<1
(Water Soluble) SO4-- expressed a	g/l	0.05	0.09
Sulphide	mg/kg	<10	<10
Benzo(a)Pyrene	mg/kg	<0.1	7.7
Naphthalene	mg/kg	<0.1	0.5
Retained on 2mm	%	<0.1	<0.1
Soil Organic Matter	%	2.4	4
Acenaphthylene	mg/kg	<0.1	0.3
Acenaphthene	mg/kg	<0.1	2.9
Fluorene	mg/kg	<0.1	2
Phenanthrene	mg/kg	<0.1	11
Anthracene	mg/kg	<0.1	3.5
Fluoranthene	mg/kg	<0.1	17
Pyrene	mg/kg	<0.1	15
Benzo(a)Anthracene	mg/kg	<0.1	7.6
Chrysene	mg/kg	<0.1	7.4
Benzo(b/k)Fluoranthene	mg/kg	<0.1	12
Indeno(123-cd)Pyrene	mg/kg	<0.1	3.9
Dibenzo(ah)Anthracene	mg/kg	<0.1	1.6
Benzo(ghi)Perylene	mg/kg	<0.1	4.5
Moisture	%	25	18
Fraction Organic Carbon - F(oc)	%	<1	<1
Moisture @ 105 C	%	27	19

- : not determined -- : dependent option I/S : insufficient sample nt : not tested

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

Statistical Tests for Contaminated Soils

Table

Site : Site II Winchester Road, Botley **Client :** PJH Development Consultancy Ser **Job No :** J10856

Sample Group [3] : MADE GROUND **Test Suite :** STL Key Contaminants Suite **Date :** 16/Feb/2012

Contaminant		Test Results and Statistics				Mean Value Test [1]			Max Value Test [2]		
		No. of sample tested	Range	Arithmetic mean	Standard deviation	Upper bound (US_{95})	Residential with plant uptake		Max value	Sample Ref. of max value	Outlier check [2]
							Screening value	Check			
Arsenic (As) [4]	mg/kg	7	7 - 12	9.0	1.9	10	32		12	DH102 @ 1.50m@40918	N/A
Cadmium (Cd) [4]	mg/kg	7	<0.1 - 0.2	0.13	0.05	0.16	10		0.2	DH106 @ 1.50m@40918	N/A
Total Chromium (Cr) [5]	mg/kg	7	13 - 23	16	3.8	19	/		23	DH113 @ 0.30m@40926	N/A
Hexavalent Chromium (CrVI)* [5]	mg/kg	0					/				
Lead (Pb) [5, 8]	mg/kg	7	12 - 95	46	35	64	450		95	DH101 @ 0.50m@40918	N/A
Mercury (Hg) [4, 9]	mg/kg	7	<1	1.0	0.00	1.0	7.0		1	DH101 @ 0.50m@40918	N/A
Selenium (Se) [4]	mg/kg	7	<3	3.0	0.00	3.0	350		3	DH101 @ 0.50m@40918	N/A
Nickel (Ni) [4]	mg/kg	7	4.4 - 14	6.6	3.4	9.1	130		14	DH106 @ 1.50m@40918	N/A
Copper (Cu) [6]	mg/kg	7	6 - 140	33	48	68	2300		140	DH101 @ 0.50m@40918	N/A
Zinc (Zn) [6]	mg/kg	7	18 - 140	53	46	86	3700		140	DH115 @ 0.50m@40926	N/A
Phenol [4]	mg/kg	7	<0.5	0.50	0.00	0.50	184		0.5	DH101 @ 0.50m@40918	N/A
Benzo[a]pyrene [6]	mg/kg	5	<0.1	0.10	0.00	0.10	0.80		0.1	DH101 @ 0.50m@40918	N/A
Naphthalene [6]	mg/kg	7	<0.1 - 0.5	0.16	0.15	0.27	1.5		0.5	DH115 @ 0.50m@40926	N/A
Total of 16 PAHs (USEPA)	mg/kg	0					/				
Total Cyanide (CN) [7]	mg/kg	7	<1	1.0	0.00	1.0	/		1	DH101 @ 0.50m@40918	N/A
Free Cyanide * [7]	mg/kg	0					/				
Complex Cyanides * [7]	mg/kg	0					/				
Thiocyanate * [7]	mg/kg	0					/				
Acidity (pH Value)	units	0					/				
Soil Organic Matter	%	7	0.5 - 4	2.3	1.3		/		4	DH115 @ 0.50m@40926	N/A

Notes: [1] : Interpretation of test results is based on CLEA publication CLR 7; Colour coding is only valid if read with the key and the related comments.

[2] : Pass: pass the outlier test, I.e. the maximum value does NOT classify as an outlier; Failed: fail the outlier test, I.e. the maximum value classifies as an outlier.

[3] : Assume SOM of 6% for Topsoil and minimum organic content of 1% for Subsoil.

[4] : Soil Guideline Value (SGV) 2009

[5] : Soil Guideline Value (SGV) 2002.

[6] : GAC based on LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment 2nd Edn 2009. Copper and Zinc may have phytotoxic effects at the given concentrations. Alternative criteria shouls be adopted for importation of Topsoil or other soils for cultivation.

[7] : Screening criteria derived on a site specific basis if test results above detection limit occur

[8] : In the case of Lead (Pb), the geometric mean rather than the arithmetic mean, is used as the basis for the comparison of soil concentration data with the SGV, in accordance with the CLEA recommendations.

[9] : SGV/GAC for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present.

Pass the Mean Value Test;
Fail the Mean Value Test.

* : Dependent options, see Section Soil Contamination Analysis; ^ : 1:2 extract; - : Not determined; -- : Dependent option; / : No values defined or given; NL : No limit set; N/A : Not applicable.

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Statistical Tests for Contaminated Soils

Table

Site : Site II Winchester Road, Botley **Client :** PJH Development Consultancy Ser\ **Job No :** J10856

Sample Group [3] : MADE GROUND **Test Suite :** STL Key Contaminants Suite **Date :** 16/Feb/2012

Contaminant		Test Results and Statistics				Mean Value Test [1]			Max Value Test [2]		
		No. of sample tested	Range	Arithmetic mean	Standard deviation	Upper bound (US_{95})	Residential with plant uptake Screening value	Check	Max value	Sample Ref. of max value	Outlier check [2]
Arsenic (As) [4]	mg/kg	7	7 - 12	9.0	1.9	10	32		12	DH102 @ 1.50m@40918	N/A
Cadmium (Cd) [4]	mg/kg	7	<0.1 - 0.2	0.13	0.05	0.16	10		0.2	DH106 @ 1.50m@40918	N/A
Total Chromium (Cr) [5]	mg/kg	7	13 - 23	16	3.8	19	/		23	DH113 @ 0.30m@40926	N/A
Hexavalent Chromium (CrVI)* [5]	mg/kg	0					/				
Lead (Pb) [5, 8]	mg/kg	7	12 - 95	46	35	64	450		95	DH101 @ 0.50m@40918	N/A
Mercury (Hg) [4, 9]	mg/kg	7	<1	1.0	0.00	1.0	7.0		1	DH101 @ 0.50m@40918	N/A
Selenium (Se) [4]	mg/kg	7	<3	3.0	0.00	3.0	350		3	DH101 @ 0.50m@40918	N/A
Nickel (Ni) [4]	mg/kg	7	4.4 - 14	6.6	3.4	9.1	130		14	DH106 @ 1.50m@40918	N/A
Copper (Cu) [6]	mg/kg	7	6 - 140	33	48	68	2300		140	DH101 @ 0.50m@40918	N/A
Zinc (Zn) [6]	mg/kg	7	18 - 140	53	46	86	3700		140	DH115 @ 0.50m@40926	N/A
Phenol [4]	mg/kg	7	<0.5	0.50	0.00	0.50	184		0.5	DH101 @ 0.50m@40918	N/A
Benzo[a]pyrene [6]	mg/kg	7	<0.1 - 7.7	1.5	2.8	3.5	0.80		7.7	DH115 @ 0.50m@40926	Pass
Naphthalene [6]	mg/kg	7	<0.1 - 0.5	0.16	0.15	0.27	1.5		0.5	DH115 @ 0.50m@40926	N/A
Total of 16 PAHs (USEPA)	mg/kg	0					/				
Total Cyanide (CN) [7]	mg/kg	7	<1	1.0	0.00	1.0	/		1	DH101 @ 0.50m@40918	N/A
Free Cyanide * [7]	mg/kg	0					/				
Complex Cyanides * [7]	mg/kg	0					/				
Thiocyanate * [7]	mg/kg	0					/				
Acidity (pH Value)	units	0					/				
Soil Organic Matter	%	7	0.5 - 4	2.3	1.3		/		4	DH115 @ 0.50m@40926	N/A

Pass the Mean Value Test.
Fail the Mean Value Test.

Notes: [1] : Interpretation of test results is based on CLEA publication CLR 7; Colour coding is only valid if read with the key and the related comments.
[2] : Pass: pass the outlier test, i.e. the maximum value does NOT classify as an outlier; Failed: fail the outlier test, i.e. the maximum value classifies as an outlier
[3] : Assume SOM of 6% for Topsoil and minimum organic content of 1% for Subsoil.
[4] : Soil Guideline Value (SGV) 2009
[5] : Soil Guideline Value (SGV) 2002
[6] : GAC based on LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment 2nd Edn 2009. Copper and Zinc may have phytotoxic effects at the given concentrations. Alternative criteria shouls be adopted for importation of Topsoil or other soils for cultivation.
[7] : Screening criteria derived on a site specific basis if test results above detection limit occur
[8] : In the case of Lead (Pb), the geometric mean rather than the arithmetic mean, is used as the basis for the comparison of soil concentration data with the SGV, in accordance with the CLEA recommendations.
[9] : SGV/GAC for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present.

* : Dependent options, see Section Soil Contamination Analysis, ^ : 1:2 extract; - : Not determined; – : Dependent option; / : No values defined or given; NL : No limit set; N/A : Not applicable.

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

CERTIFICATE OF ANALYSIS

Site :	Site II Winchester Road, Botley	**Job No :**	J10856
Sample Group :	Natural Soil	**Client :**	PJH Development Consultancy Services
Test Suite :	STL Key Contaminants Suite	**Date Issued :**	16/Feb/2012

Customer Sample Reference		DH107	DH109
	Depth (m	0.5	1.5
Determinand	Units		
pH		7.3	4.7
Arsenic	mg/kg	12	25
Cadmium	mg/kg	0.1	0.1
Chromium	mg/kg	25	33
Copper	mg/kg	18	15
Lead	mg/kg	37	18
Mercury	mg/kg	<1.0	<1.0
Nickel	mg/kg	7.4	3.5
Selenium	mg/kg	<3	<3
Zinc	mg/kg	41	22
Phenols(Mono)	mg/kg	<0.5	<0.5
Cyanide(Total)	mg/kg	<1	<1
(Water Soluble) SO4-- expressed a	g/l	0.02	0.02
Sulphide	mg/kg	<10	<10
Benzo(a)Pyrene	mg/kg	<0.1	<0.1
Naphthalene	mg/kg	<0.1	<0.1
Retained on 2mm	%	<0.1	<0.1
Soil Organic Matter	%	4.3	0.7
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)Anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b/k)Fluoranthene	mg/kg	<0.1	<0.1
Indeno(123-cd)Pyrene	mg/kg	<0.1	<0.1
Dibenzo(ah)Anthracene	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	mg/kg	<0.1	<0.1
Moisture	%	24	18
Fraction Organic Carbon - F(oc)	%	<1	<1
Moisture @ 105 C	%	30	19

- : not determined -- : dependent option I/S : insufficient sample nt : not tested

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Scientific Analysis Laboratories Ltd

Certificate of Analysis

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Report Number: 264980-1

Date of Report: 06-Feb-2012

Customer: Southern Testing Laboratories
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

Customer Contact: Mr Andrew Holley

Customer Job Reference: J10856
Customer Purchase Order: STL7829C
Customer Site Reference: Site II Winchester Road, Botley
Date Job Received at SAL: 24-Jan-2012
Date Analysis Started: 25-Jan-2012
Date Analysis Completed: 06-Feb-2012

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
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Tests covered by this certificate were conducted in accordance with SAL SOPs

1650

Report checked
and authorised by :
Miss Claire Brown
Project Manager

Issued by :
Miss Claire Brown
Project Manager

[redacted]

SAL Reference: 264980
Project Site: Site II Winchester Road, Botley
Customer Reference: J10856

Soil Analysed as Soil
STL Key Contamintion Suite

				SAL Reference	**264980 001**	**264980 002**	**264980 003**	**264980 004**	**264980 005**	**264980 006**
				Customer Sample Reference	**DH101 @ 0.10m**	**DH101 @ 0.50m**	**DH102 @ 1.50m**	**DH103 @ 0.10m**	**DH104 @ 0.10m**	**DH105 @ 0.50m**
				Date Sampled	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**
				Type	**Topsoil**	**Clay**	**Clay**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Arsenic	T257	A40	2	mg/kg	**12**	**11**	**12**	**7**	**4**	**9**
Cadmium	T257	A40	0.1	mg/kg	**0.2**	<0.1	**0.1**	<0.1	<0.1	<0.1
Chromium	T257	A40	0.5	mg/kg	**24**	**17**	**19**	**15**	**11**	**13**
Copper	T257	A40	2	mg/kg	**34**	**140**	**14**	**10**	**8**	**6**
Lead	T257	A40	2	mg/kg	**69**	**95**	**22**	**23**	**24**	**12**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**6.2**	**6.4**	**4.7**	**5.8**	**2.8**	**5.1**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3	<3
Zinc	T257	A40	2	mg/kg	**64**	**50**	**21**	**40**	**17**	**26**
Fraction Organic Carbon - F(oc)	T21	A40	1	%	<1	<1	<1	<1	<1	<1
pH	T7	A40			**6.5**	**8.3**	**7.9**	**6.3**	**5.6**	**5.9**
Soil Organic Matter	T287	A40	0.1	%	**7.4**	**3.8**	**0.5**	**4.8**	**3.1**	**1.2**
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	**0.02**	**0.01**	**0.15**	**0.01**	**0.01**	**0.01**
Sulphide	T4	A40	10	mg/kg	<10	<10	<10	<10	<10	<10
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
Phenols(Mono)	T221	AR	0.5	mg/kg	**1.2**	<0.5	<0.5	**1.0**	**0.7**	<0.5
Moisture	T277	AR	0.1	%	**27**	**17**	**19**	**24**	**17**	**13**
Moisture @ 105 C	T162	AR	0.1	%	**31**	**23**	**23**	**24**	**17**	**15**
Retained on 2mm	T2	A40	0.1	%	<0.1	**12.4**	<0.1	<0.1	**1.9**	**2.8**

SAL Reference: 264980
Project Site: Site II Winchester Road, Botley
Customer Reference: J10856

Soil Analysed as Soil
STL Key Contamintion Suite

				SAL Reference	**264980 007**	**264980 008**	**264980 009**	**264980 010**	**264980 011**	**264980 012**
				Customer Sample Reference	**DH106 @ 1.50m**	**DH107 @ 0.50m**	**DH108 @ 0.10m**	**DH109 @ 1.50m**	**DH110 @ 0.10m**	**DH110 @ 0.30m**
				Date Sampled	**10-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Arsenic	T257	A40	2	mg/kg	**8**	**12**	**14**	**25**	**6**	**7**
Cadmium	T257	A40	0.1	mg/kg	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	<0.1
Chromium	T257	A40	0.5	mg/kg	**13**	**25**	**26**	**33**	**14**	**16**
Copper	T257	A40	2	mg/kg	**23**	**18**	**17**	**15**	**11**	**8**
Lead	T257	A40	2	mg/kg	**86**	**37**	**31**	**18**	**21**	**16**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**14**	**7.4**	**3.3**	**3.5**	**3.7**	**4.4**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3	<3
Zinc	T257	A40	2	mg/kg	**89**	**41**	**29**	**22**	**25**	**18**
Fraction Organic Carbon - F(oc)	T21	A40	1	%	<1	<1	<1	<1	<1	<1
pH	T7	A40			**8.2**	**7.3**	**5.8**	**4.7**	**5.6**	**6.2**
Soil Organic Matter	T287	A40	0.1	%	**2.8**	**4.3**	**7.9**	**0.7**	**4.3**	**1.4**
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	**0.33**	**0.02**	**0.01**	**0.02**	**0.01**	<0.01
Sulphide	T4	A40	10	mg/kg	<10	<10	<10	<10	<10	<10
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
Phenols(Mono)	T221	AR	0.5	mg/kg	<0.5	<0.5	**1.5**	<0.5	**0.7**	<0.5
Moisture	T277	AR	0.1	%	**19**	**24**	**26**	**18**	**24**	**17**
Moisture @ 105 C	T162	AR	0.1	%	**23**	**30**	**32**	**19**	**27**	**23**
Retained on 2mm	T2	A40	0.1	%	**4.5**	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 264980
Project Site: Site II Winchester Road, Botley
Customer Reference: J10856

Soil Analysed as Soil
STL Key Contamintion Suite

				SAL Reference	**264980 013**	**264980 014**	**264980 015**	**264980 018**	**264980 019**	**264980 020**
				Customer Sample Reference	**DH111 @ 0.10m**	**DH113 @ 0.10m**	**DH113 @ 0.30m**	**DH115 @ 0.50m**	**DH116 @ 0.10m**	**DH117 @ 0.10m**
				Date Sampled	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**
				Type	**Clay**	**Topsoil**	**Clay**	**Clay**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Arsenic	T257	A40	2	mg/kg	**7**	**9**	**9**	**7**	**6**	**8**
Cadmium	T257	A40	0.1	mg/kg	**0.1**	**0.2**	<0.1	**0.2**	**0.2**	**0.1**
Chromium	T257	A40	0.5	mg/kg	**16**	**24**	**23**	**13**	**18**	**16**
Copper	T257	A40	2	mg/kg	**13**	**16**	**19**	**24**	**13**	**12**
Lead	T257	A40	2	mg/kg	**37**	**53**	**24**	**66**	**41**	**29**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**4.5**	**5.4**	**4.7**	**6.8**	**5.1**	**4.4**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3	<3
Zinc	T257	A40	2	mg/kg	**26**	**41**	**24**	**140**	**39**	**42**
Fraction Organic Carbon - F(oc)	T21	A40	1	%	<1	<1	<1	<1	<1	<1
pH	T7	A40			**6.8**	**5.5**	**7.5**	**8.9**	**6.0**	**5.5**
Soil Organic Matter	T287	A40	0.1	%	**4.3**	**7.4**	**2.4**	**4.0**	**2.9**	**4.5**
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	**0.01**	**0.03**	**0.05**	**0.09**	**0.01**	**0.01**
Sulphide	T4	A40	10	mg/kg	<10	<10	<10	<10	<10	<10
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
Phenols(Mono)	T221	AR	0.5	mg/kg	<0.5	**1.1**	<0.5	<0.5	<0.5	<0.5
Moisture	T277	AR	0.1	%	**20**	**31**	**25**	**18**	**16**	**21**
Moisture @ 105 C	T162	AR	0.1	%	**20**	**39**	**27**	**19**	**20**	**22**
Retained on 2mm	T2	A40	0.1	%	<0.1	<0.1	<0.1	<0.1	**18.4**	<0.1

SAL Reference: 264980
Project Site: Site II Winchester Road, Botley
Customer Reference: J10856

Soil Analysed as Soil
Miscellaneous

				SAL Reference	**264980 016**	**264980 017**	**264980 021**	**264980 022**
				Customer Sample Reference	**DH114 @ 0.30m**	**DH114 @ 2.70m**	**DH102 @ 2.50m**	**DH106 @ 2.40m**
				Date Sampled	**18-JAN-2012**	**18-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**
				Type	**Topsoil**	**Sand**		
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Asbestos ID	T27	A40			-	-	Asbestos not detected **-**	Asbestos not detected **-**
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	-	-

SAL Reference: 264980
Project Site: Site II Winchester Road, Botley
Customer Reference: J10856

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**264980 001**	**264980 002**	**264980 003**	**264980 004**	**264980 005**	**264980 006**
				Customer Sample Reference	**DH101 @ 0.10m**	**DH101 @ 0.50m**	**DH102 @ 1.50m**	**DH103 @ 0.10m**	**DH104 @ 0.10m**	**DH105 @ 0.50m**
				Date Sampled	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**	**10-JAN-2012**
				Type	**Topsoil**	**Clay**	**Clay**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	T16	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T16	AR	0.1	mg/kg	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 264980
Project Site: Site II Winchester Road, Botley
Customer Reference: J10856

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**264980 007**	**264980 008**	**264980 009**	**264980 010**	**264980 011**	**264980 012**
				Customer Sample Reference	**DH106 @ 1.50m**	**DH107 @ 0.50m**	**DH108 @ 0.10m**	**DH109 @ 1.50m**	**DH110 @ 0.10m**	**DH110 @ 0.30m**
				Date Sampled	**10-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	T16	AR	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	**3.4**	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	T16	AR	0.1	mg/kg	**3.3**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	**2.4**	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	T16	AR	0.1	mg/kg	**2.2**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	**3.4**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	**2.0**	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	**1.2**	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	**0.5**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	**1.2**	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T16	AR	0.1	mg/kg	**21**	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 264980
Project Site: Site II Winchester Road, Botley
Customer Reference: J10856

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**264980 013**	**264980 014**	**264980 015**	**264980 018**	**264980 019**	**264980 020**
				Customer Sample Reference	**DH111 @ 0.10m**	**DH113 @ 0.10m**	**DH113 @ 0.30m**	**DH115 @ 0.50m**	**DH116 @ 0.10m**	**DH117 @ 0.10m**
				Date Sampled	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**	**18-JAN-2012**
				Type	**Clay**	**Topsoil**	**Clay**	**Clay**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.5**	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**2.9**	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**2.0**	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**11**	<0.1	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**3.5**	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**17**	<0.1	<0.1
Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**15**	<0.1	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**7.6**	<0.1	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**7.4**	<0.1	<0.1
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**12**	<0.1	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**7.7**	<0.1	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**3.9**	<0.1	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**1.6**	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**4.5**	<0.1	<0.1
PAH(total)	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**97**	<0.1	<0.1

Index to symbols used in 264980-1

Value	Description
AR	As Received
A40	Assisted dried < 40C
W	Analysis was performed at another SAL laboratory
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Reported results on as received samples are corrected to a 105 degree centigrade dry weight basis except TPH c10-c40
Sub contracted analysis performed by SAL Manchester & REC Asbestos South East Limited
Retained on 2mm is removed before analysis
Where an asbestos result of none detected is reported, this is obtained from analysis of a representative sub sample.

Method Index

Value	Description
T2	Grav
T162	Grav (1 Dec) (105 C)
T221	Colorimetry (CE)
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T4	Colorimetry
T277	Grav (1 Dec) (40 C)
T27	PLM
T16	GC/MS
T7	Probe
T257	ICP/OES (SIM) (Aqua Regia Extraction)
T219	GC/FID (SE)
T21	OX/IR
T287	Calc TOC/0.58
T245	ICP/OES(Aqua Regia Extraction)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Asbestos ID	T27	A40			SU	021-022
TPH (C10-C40)	T219	AR	10	mg/kg	N	016-017
Arsenic	T257	A40	2	mg/kg	M	001-015,018-020
Cadmium	T257	A40	0.1	mg/kg	M	001-015,018-020
Chromium	T257	A40	0.5	mg/kg	M	001-015,018-020
Copper	T257	A40	2	mg/kg	M	001-015,018-020
Lead	T257	A40	2	mg/kg	M	001-015,018-020
Mercury	T245	A40	1.0	mg/kg	U	001-015,018-020
Nickel	T257	A40	0.5	mg/kg	M	001-015,018-020
Selenium	T257	A40	3	mg/kg	U	001-015,018-020
Zinc	T257	A40	2	mg/kg	M	001-015,018-020
Fraction Organic Carbon - F(oc)	T21	A40	1	%	WN	001-015,018-020
pH	T7	A40			M	001-015,018-020
Soil Organic Matter	T287	A40	0.1	%	WN	001-015,018-020
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	M	001-015,018-020
Sulphide	T4	A40	10	mg/kg	N	001-015,018-020
Cyanide(Total)	T4	AR	1	mg/kg	M	001-015,018-020
Phenols(Mono)	T221	AR	0.5	mg/kg	M	001-015,018-020
Moisture	T277	AR	0.1	%	N	001-015,018-020
Moisture @ 105 C	T162	AR	0.1	%	N	001-015,018-020
Retained on 2mm	T2	A40	0.1	%	N	001-015,018-020
Naphthalene	T16	AR	0.1	mg/kg	U	001-015,018-020
Acenaphthylene	T16	AR	0.1	mg/kg	U	001-015,018-020
Acenaphthene	T16	AR	0.1	mg/kg	M	001-015,018-020
Fluorene	T16	AR	0.1	mg/kg	M	001-015,018-020
Phenanthrene	T16	AR	0.1	mg/kg	U	001-015,018-020
Anthracene	T16	AR	0.1	mg/kg	M	001-015,018-020
Fluoranthene	T16	AR	0.1	mg/kg	N	001-015,018-020
Pyrene	T16	AR	0.1	mg/kg	N	001-015,018-020
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	M	001-015,018-020
Chrysene	T16	AR	0.1	mg/kg	M	001-015,018-020
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	M	001-015,018-020
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	M	001-015,018-020
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	M	001-015,018-020
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	M	001-015,018-020
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	M	001-015,018-020
PAH(total)	T16	AR	0.1	mg/kg	U	001-015,018-020

APPENDIX E

Desk Study

GroundSure EnviroInsight

Address: NORTH BOORLEY GREEN, CROWS NEST LANE, BOTLEY, SOUTHAMPTON, SO32 2DD

Date: Nov 22, 2011

GroundSure Reference: HMD-137-204554

Your Reference: J10856

Client: Southern Testing



Brought to you by GroundSure

Aerial Photograph of Study Site

NW ▲ N NE

◄W E►

SW ▼ S SE



Aerial photography supplied by Getmapping PLC.
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Site Name: NORTH BOORLEY GREEN, CROWS NEST LANE, BOTLEY, SOUTHAMPTON, SO32 2DD
Grid Reference: 450961,114145
Size of Site: 90.54 ha

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.

Report Section	Number of records found within (X) m of the study site boundary					
1. Environmental Permits, Incidents and Registers	on-site	0-50	51-250	251-500	501-1000	1000-1500
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
Records of historic IPC Authorisations	0	0	0	0	-	-
Records of Part A(1) and IPPC Authorised Activities	0	0	0	0	-	-
Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0	-	-
Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0	-	-
Records of List 1 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0	-	-
Records of Licensed Discharge Consents	1	4	1	2	-	-
Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0		
1.2 Records of COMAH and NIHHS sites	0	0	0	0	-	-
1.3 Environment Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	1	1	0	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-
2. Landfill and Other Waste Sites	on-site	0-50	51-250	251-500	501-1000	1000-1500
2.1 Landfill Sites						
Environment Agency Registered Landfill Sites	0	0	0	0	0	-
Landfill Data – Operational Landfill Sites	0	0	0	0	0	-
Environment Agency Historic Landfill Sites	0	0	0	0	0	2
Landfill Data – Non-Operational Landfill Sites	0	0	0	0	0	-
BGS/DoE Landfill Site Survey	0	0	0	0	0	0
GroundSure Local Authority Landfill Sites Data	0	0	0	0	0	0
2.2 Landfill and Other Waste Sites Findings						
Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Environment Agency Licensed Waste Sites	0	0	0	0	0	2

3. Current Land Uses	on-site	0-50	51-250	251-500	501-1000	1000-1500
3.1 Current Industrial Sites Data	2	4	5	-	-	-
3.2 Records of Petrol and Fuel Sites	0	0	0	0	-	-
3.3 Underground High Pressure Oil and Gas Pipelines	2	0	0	0	-	-

4. Geology	Description
4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? *	No
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site? *	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
Source: Scale: 1:50,000 BGS Sheet 315	

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

5. Hydrogeology and Hydrology	on-site	0-50	51-250	251-500	501-1000	1001-2000
5.1 Are there any records of Productive Strata in the Superficial Geology within 500m of the study site?				Yes		
5.2 Are there any records of Productive Strata in the Bedrock Geology within 500m of the study site?				Yes		
5.3 Groundwater Abstraction Licences (within 1000m of the study site).	0	0	0	0	0	-
5.4 Surface Water Abstraction Licences (within 1000m of the study site).	2	0	1	0	2	-
5.5 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	0
5.6 Are there any Source Protection Zones within 500m of the study site?					No	

5.7 River Quality	on-site	0-50	51-250	251-500	501-1000	1001-1500
Is there any Environment Agency information on river quality within 1500m of the study site?	No	Yes	Yes	No	Yes	Yes
5.8 Detailed River Network entries within 500m of the site	28	4	2	26	-	-
5.9 Surface water features within 250m of the study site	Yes	Yes	Yes	-	-	-

6. Flooding	
6.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site?	Yes
6.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site?	Yes
6.3 Are there any Flood Defences within 250m of the study site?	No
6.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
6.5 Are there any areas used for Flood Storage within 250m of the study site?	No
6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Very High
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

7. Designated Environmentally Sensitive Sites	on-site	0-50	51-250	251-500	501-1000	1001-1500
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	-	-
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	-	-

7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	-	-
7.3 Records of Local Nature Reserves (LNR)	0	0	0	0	-	-
7.4 Records of Special Areas of Conservation (SAC)	0	0	0	0	-	-
7.5 Records of Special Protection Areas (SPA)	0	0	0	0	-	-
7.6 Records of Ramsar sites	0	0	0	0	-	-
7.7 Records of World Heritage Sites	0	0	0	0	-	-
7.8 Records of Environmentally Sensitive Areas	0	0	0	0	-	-
7.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	-	-
7.10 Records of National Parks	0	0	0	0	-	-
7.11 Records of Nitrate Sensitive Areas	0	0	0	0	-	-
7.12 Records of Nitrate Vulnerable Zones	0	0	0	0	-	-

8. Natural Hazards

8.1 What is the maximum risk of natural ground subsidence?	Moderate

9. Mining

9.1 Are there any coal mining areas within 75m of the study site?	No
9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site?	Negligible
9.3 Are there any brine affected areas within 75m of the study site?	No

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. 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.

2. 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.

3. 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 underground oil and gas pipelines.

4. Geology

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

5. 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.

6. Flooding

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

7. 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. These searches are conducted using radii of up to 500m.

8. 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.

9. Mining

Provides information on areas of coal and shallow mining.

10. 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

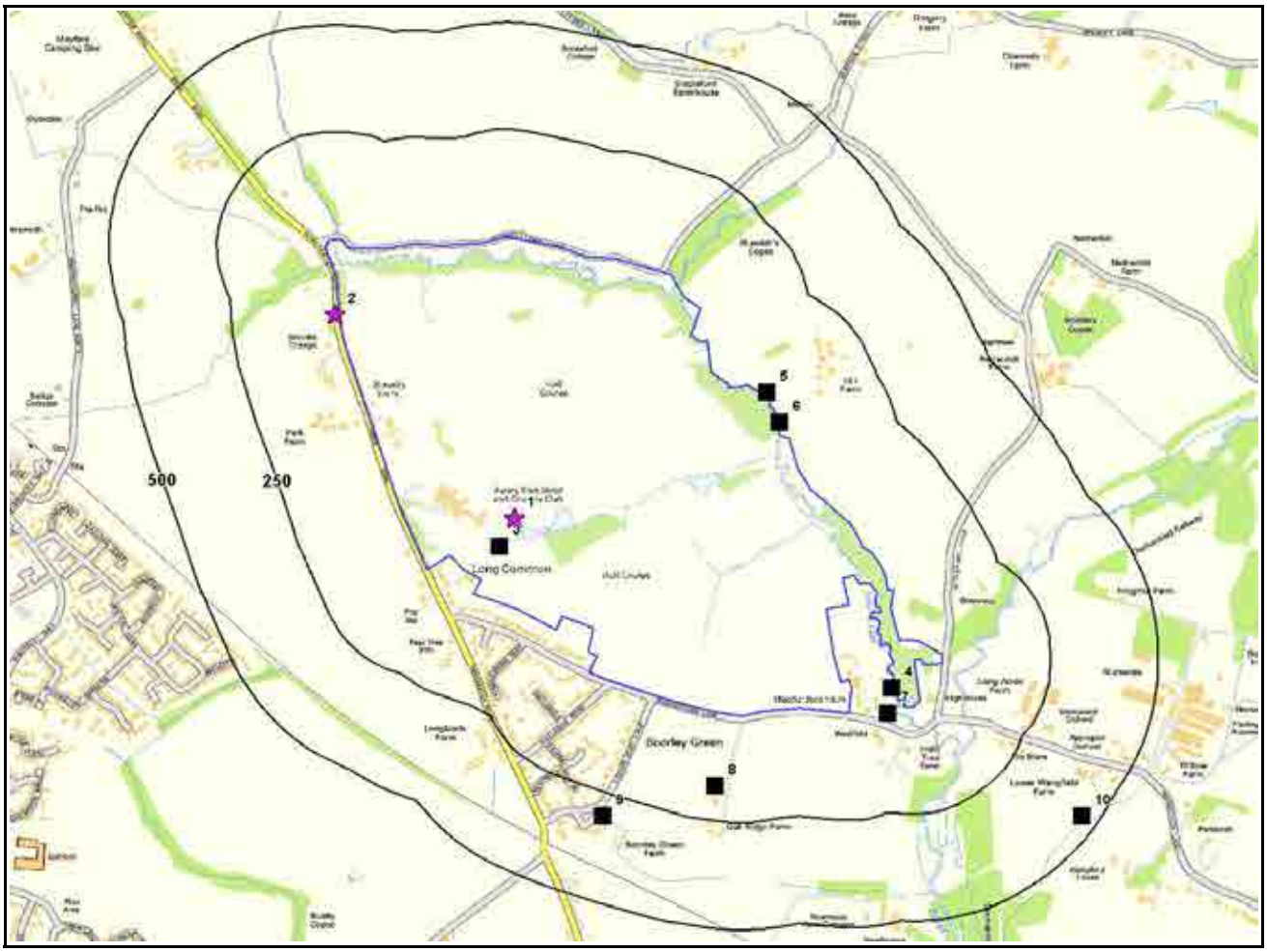
Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes 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.

1. Environmental Permits, Incidents and Registers Map

NW ▲ N NE



◄W E►

SW ▼ S SE

Authorisations,Incidents and Registers Legend

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- Site Outline
- 250 / 500 Search Buffers (m)
- 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

1.Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

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

Records of historic IPC Authorisations within 500m of the study site: **0**

Database searched and no data found.

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: **0**

Database searched and no data found.

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.

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.

Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: **0**

Database searched and no data found.

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: **0**

Database searched and no data found.

Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: **0**

Database searched and no data found.

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: **0**

Database searched and no data found.

Records of Licensed Discharge Consents within 500m of the study site: **8**

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
3	0.0	On Site	450720, 114800	Address: Botley Park Hotel & Country Club, Botley Park Hotel & Country Club, Botley, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P11555 Permit Version: 1	Receiving Water: Saline Estuary Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 21/6/1991 Effective Date: 21/6/1991 Revocation Date: -
4	3.0	W	451630, 114470	Address: Maddoxford Farm, Maddoxford Farm, Botley, Hampshire Effluent Type: Unspecified Permit Number: H01199 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 15/4/1965 Effective Date: 15/4/1965 Revocation Date: -
5	5.0	NE	451340, 115160	Address: Hill Farm, Hill Farm, Botley Hampshire Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: H01825 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 17/1/1964 Effective Date: 17/1/1964 Revocation Date: 4/11/1992
6	8.0	E	451370, 115090	Address: Hill Farm House, Hill Farm House, Botley Hampshire Effluent Type: Sewage Discharges - Unspecified - Not Water Company Permit Number: H01824 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 17/1/1964 Effective Date: 17/1/1964 Revocation Date: -
7	40.0	SW	451620, 114410	Address: Maddoxford Farm House, Maddoxford Farm House, Botley Hampshire Effluent Type: Sewage Discharges - Unspecified - Not Water Company Permit Number: H01343 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 15/4/1965 Effective Date: 15/4/1965 Revocation Date: 31/3/1997
8	170.0	S	451220, 114240	Address: Oakridge Farm, Botley, Oakridge Farm, Maddoxford Lane, Botley, Southampton, Hampshire, SO32 2DB Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: P02535 Permit Version: 1	Receiving Water: Into Land Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 19/1/1990 Effective Date: 19/1/1990 Revocation Date: 31/3/1997
9	304.0	S	450960, 114170	Address: Oatlands Lane/crowsnest Lane, Oatlands Lane/crowsnest Lane, Boorley Green, Botley, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01129 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 25/4/1980 Effective Date: 25/4/1980 Revocation Date: 31/3/1997
10	459.0	SE	452070, 114170	Address: Wangfield Farm, Wangfield Farm, Botley, Hampshire Effluent Type: Unspecified Permit Number: H01759 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: - Effective Date: - Revocation Date: 1/10/1991

Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: 0

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

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

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: 2

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
1	0.0	On Site	450754, 114866	Incident Date: 21/2/2003 Incident Identification: 138534 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Food and Drink	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	10.0	W	450338, 115341	Incident Date: 14/1/2002 Incident Identification: 52195 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

Records of National Incidents Recording System, List 1 within 250m of the study site: 0

Database searched and no data found.

1.4 Sites Determined as Contaminated Land under Part IIA 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.

2. Landfill and Other Waste Sites Map

NW N NE



◄W E►

SW S SE

Landfill & Other Waste Sites Legend

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- Site Outline
- Search Buffers (m): 250, 500
- E.A. Active Landfill
- E.A. Historic Landfill (Area Data)
- E.A. Historic Landfill (Point Data)
- BGS / DoE Survey Landfill
- Local Authority Landfill (Area Data)
- Local Authority Landfill (Point Data)
- Operational Waste Treatment Licence
- Closed Waste Treatment Licence
- REGIS Waste Licence
- Operational Landfill
- Closed Landfill

2. Landfill and Other Waste Sites

2.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site: 0

Database searched and no data found.

Records of operational landfill sites sourced from Landmark within 1000m of the study site: 0

Database searched and no data found.

Records of Environment Agency historic landfill sites within 1500m of the study site: 2

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details	
Not shown	1419.0	S	450600, 113000	Site Address: Botley House Country Club, Brook Lane Waste Licence: - Site Reference: FEA30, EAST 8 Waste Type: Inert Regis Reference: -	Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -
Not shown	1494.0	S	451800, 112800	Site Address: Pinkmead Farm, Botley, Hamsphire Waste Licence: - Site Reference: FW28, WR1-245 Waste Type: Inert Regis Reference: -	Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

Records of non-operational landfill sites sourced from Landmark within 1000m of the study site: 0

Database searched and no data found.

Records of BGS/DoE non-operational landfill sites within 1500m of the study site: 0

Database searched and no data found.

Records of Local Authority landfill sites within 1500m of the study site: 0

Database searched and no data found.

2.2 Other Waste Sites

Records of operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Database searched and no data found.

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Database searched and no data found.

Records of Environment Agency licensed waste sites within 1500m of the study site: 2

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

ID	Distance	Direction	NGR	Details	
Not shown	1364.0	W	449220, 114390	Site Address: Shamblehurst Lane, Hedge End, Hampshire, SO30 2FN Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Regis Licence Number: HOP003 EPR reference: - Operator: Hopkins Recycling Ltd Waste Management licence No: 19919 Annual Tonnage: 0.0	Issue Date: 01/07/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: H W R C Shamblehurst Lane Correspondence Address: Unit 10, Bridge Farm, Curbridge, Botley, Hampshire, SO30 2HB
Not shown	1364.0	W	449220, 114390	Site Address: 9a, Shamblehurst Lane South, Hedge End, Southampton, Hampshire, SO30 2FN Type: Household Waste Amenity Site Size: < 25000 tonnes Regis Licence Number: HOP003 EPR reference: EA/EPR/FP3992HP/A001 Operator: Hopkins Recycling Ltd Waste Management licence No: 19919 Annual Tonnage: 9000.0	Issue Date: 01/07/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: H W R C Correspondence Address: -

3. Current Land Use Map

NW N NE

◄W E►

SW S SE



Current Land Use Legend

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Site Outline

250
500
Search Buffers (m)

Current Industrial Sites

Petrol & Fuel Sites

Underground High Pressure Oil & Fuel Pipelines

3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: **11**

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

ID	Distance	Direction	Company	Address	Activity	Category
1	0.0	On Site	Giraffe Embroidery Ltd	Braxells Farm, Winchester Road, Botley, Southampton, SO32 2BX	Textiles, Fabrics, Silk and Machinery	Industrial Products
2	0.0	On Site	Electricity Sub Station	SO32	Electrical Features	Infrastructure and Facilities
3A	15.0	S	Gas Governor	SO32	Gas Features	Infrastructure and Facilities
4A	16.0	S	Gas Governor Station	SO32	Gas Features	Infrastructure and Facilities
5	16.0	SW	Electricity Sub Station	SO32	Electrical Features	Infrastructure and Facilities
6	43.0	E	M D J Newell	Maddoxford Farm, Maddoxford Lane, Botley, Southampton, SO32 2DB	Livestock Farming	Farming
7B	51.0	W	Longacre Saddlery	Long Acre House, Winchester Road, Botley, Southampton, SO32 2DH	Hobby, Sports and Pastime Products	Consumer Products
8B	51.0	W	Longacre Feeds	Long Acre House, Winchester Road, Botley, Southampton, SO32 2DH	Animal Feeds, Pet Foods, Hay and Straw	Foodstuffs
9	64.0	SW	Electricity Sub Station	SO32	Electrical Features	Infrastructure and Facilities
10	154.0	S	Gas Valve Company	SO32	Gas Features	Infrastructure and Facilities
11	171.0	NE	Aero Antiques	Durley Airstrip, Netherhill, Botley, Southampton, SO32 2BP	Aviation Engineers	Engineering Services

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: **0**

Database searched and no data found.

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site: **2**

The following Underground High Pressure Oil and Gas pipeline records provided by Linewatch are represented as linear features on the Current Land Use map:

ID	Distance	Direction	Address	Operator	Telephone
12	0.0	On Site	Fishergerman Chartered Surveyors, Pipelines Office, New Road, Hardley, Hythe, Southampton, Hampshire, SO45 3NW	Esso pipelines	023 8088 3150

13	0.0	On Site	Fishergerman Chartered Surveyors, Pipelines Office, New Road, Hardley, Hythe, Southampton, Hampshire, SO45 3NW	Esso pipelines	023 8088 3150

4. Geology

4.1 Artificial Ground and Made Ground

Database searched and no data found.

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

4.2 Superficial Ground and Drift Geology

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

Lex Code	Description	Rock Type
RTDU-SAGR	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND AND GRAVEL
RTD3-SAGR	RIVER TERRACE DEPOSITS, 3	SAND AND GRAVEL
ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

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

4.3 Bedrock and Solid Geology

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

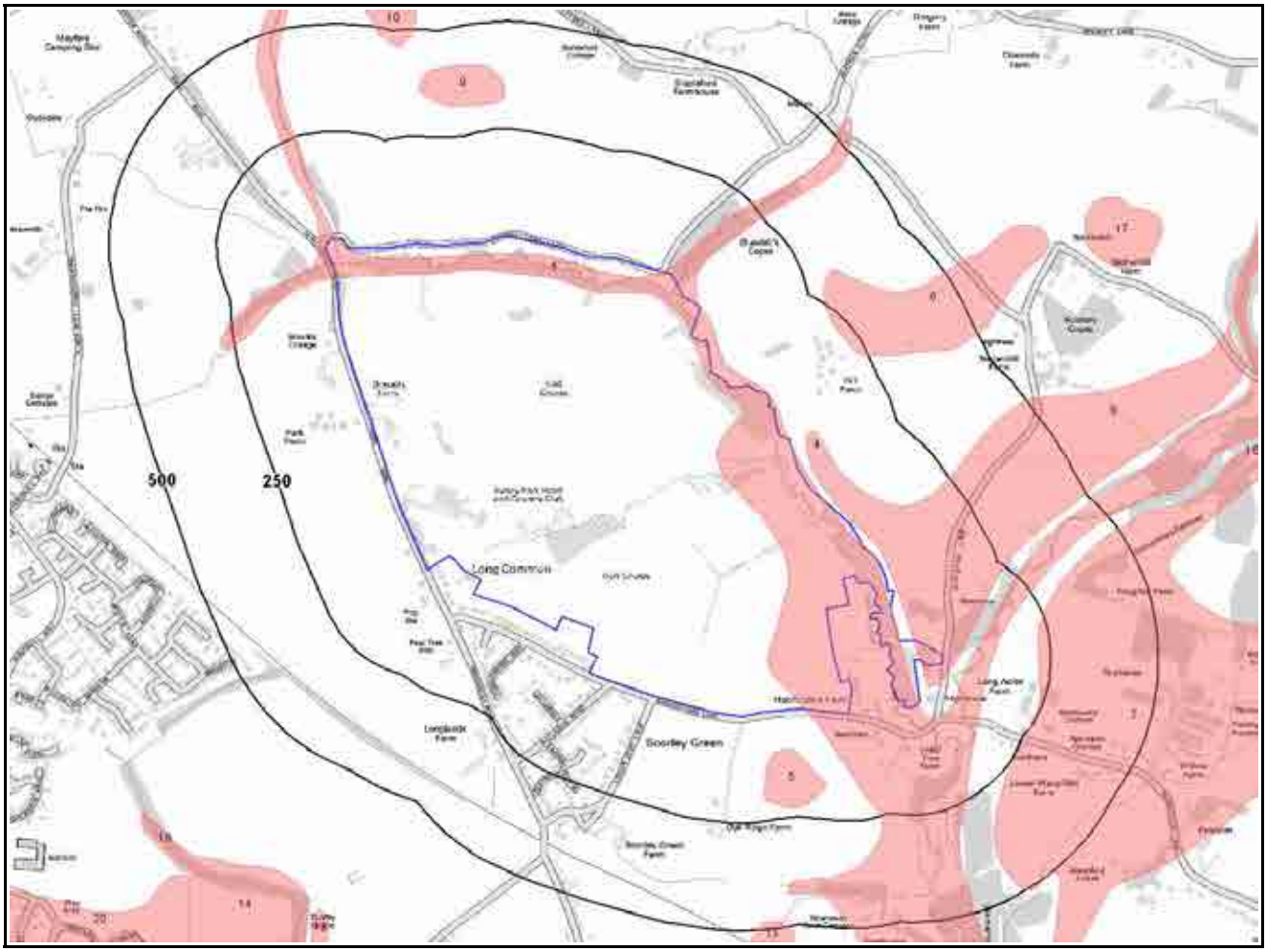
LEX Code	Description	Rock Type
WHI-SAND	WHITECLIFF SAND MEMBER	SAND
LC-CLSS	LONDON CLAY FORMATION	CLAY, SILT AND SAND
WTT-SSCL	WITTERING FORMATION	SAND, SILT AND CLAY

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

For more detailed geological and ground stability data please refer to the "GroundSure GeoInsight". Available from our website.

5a. Hydrogeology - Aquifer Within Superficial Geology

NW N NE

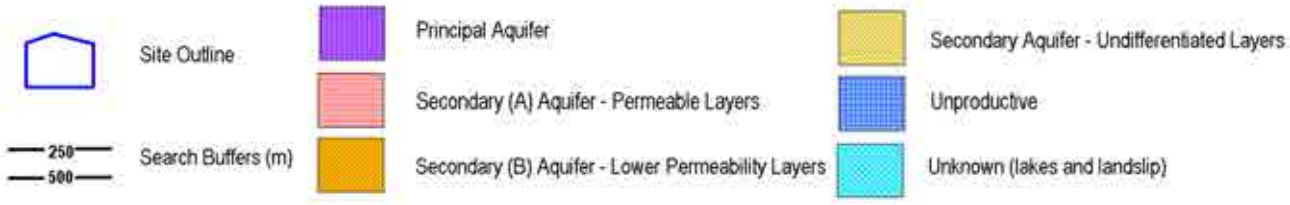


W E

SW S SE

Aquifer Within Superficial Geology Legend

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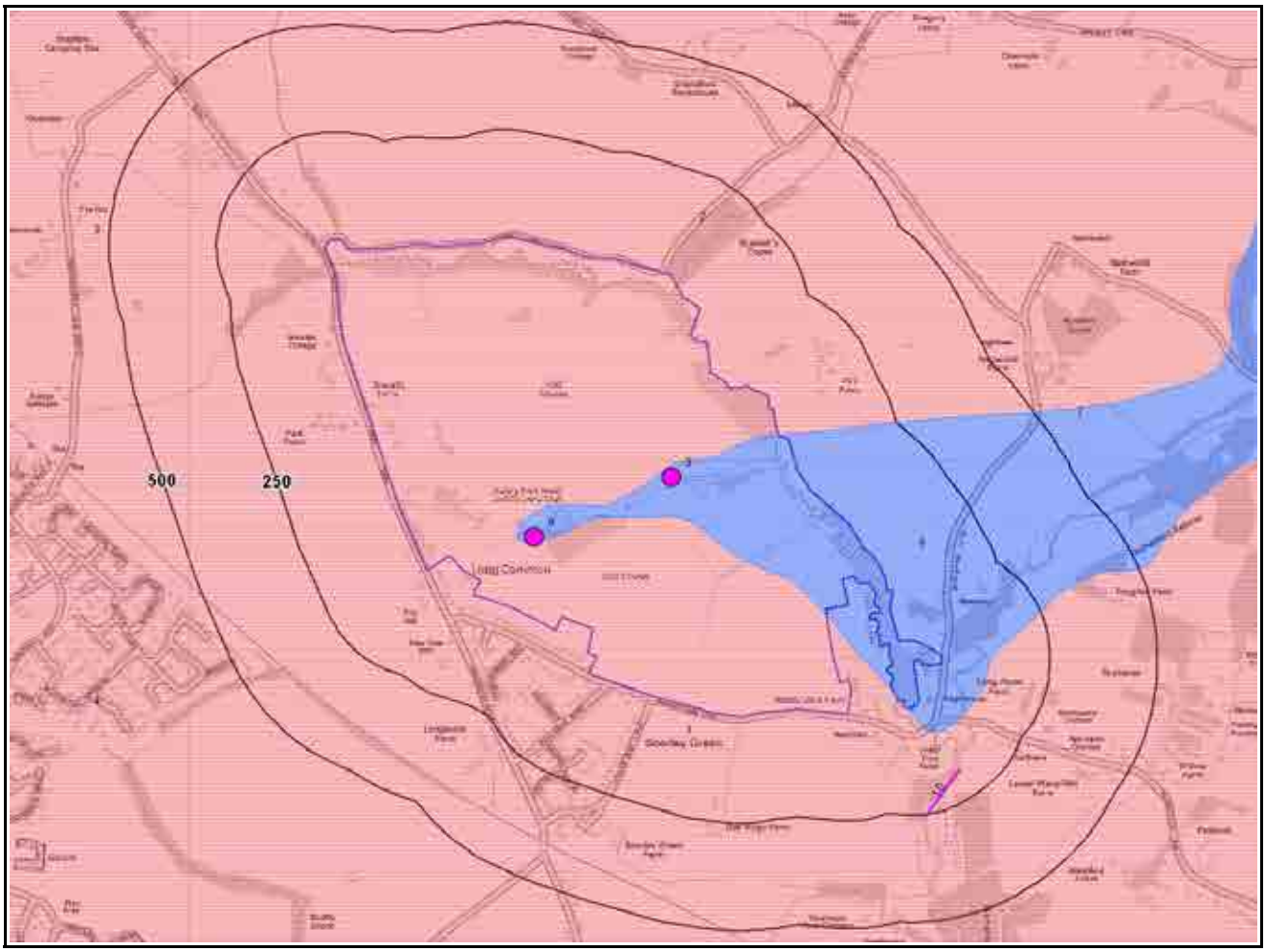


5b. Hydrogeology - Aquifer Within Bedrock Geology and Abstraction Licenses

NW N NE

W E

SW S SE



Aquifer Within Bedrock Geology Legend

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Site Outline

Search Buffers (m)
250
500

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)

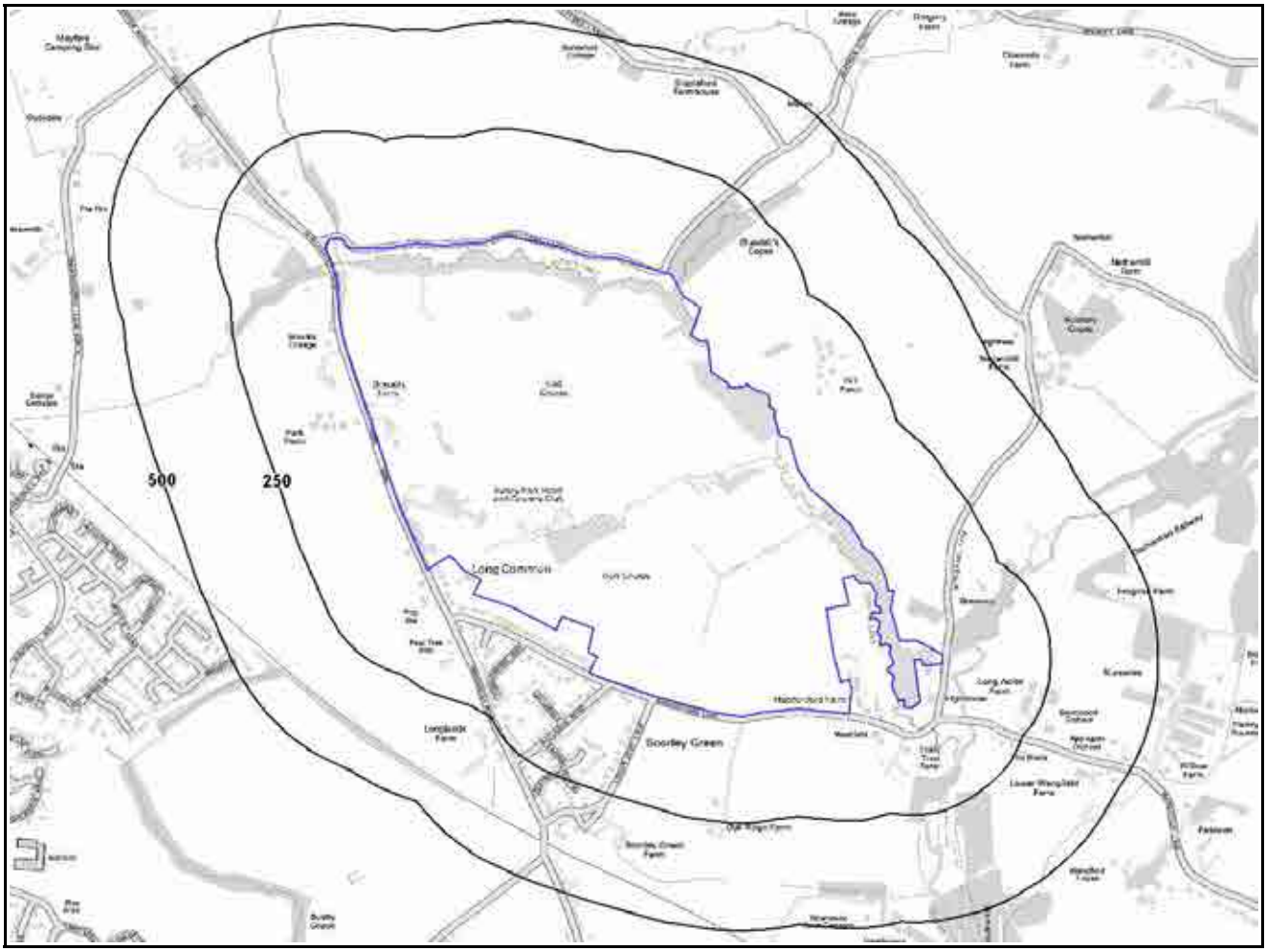
Surface Water Abstraction Licence

5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses

NW N NE

W E

SW S SE



SPZ and Potable Water Abstraction Licenses
Legend

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Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2 - Outer Catchment

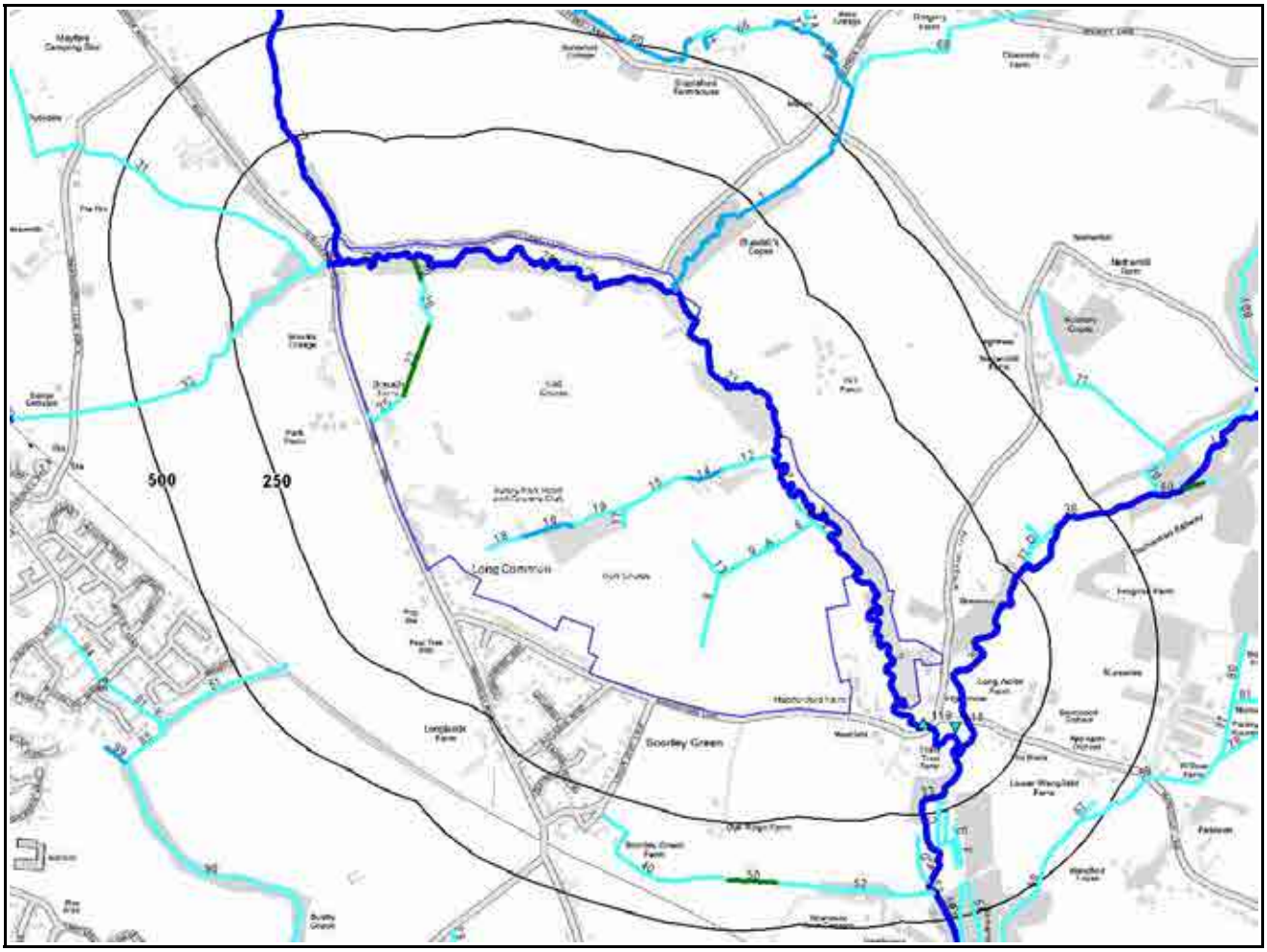
Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

5d. Hydrology – Detailed River Network and River Quality

NW N NE

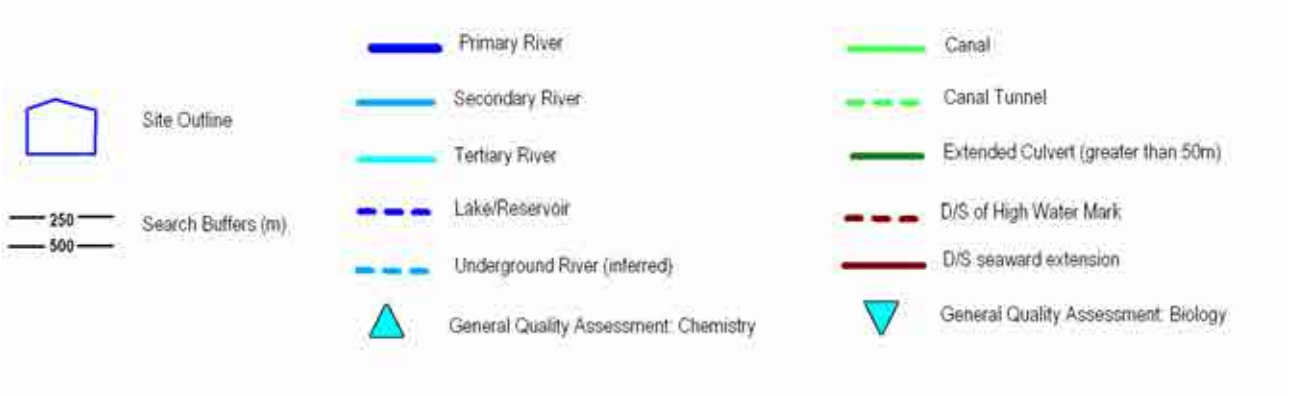


W E

SW S SE

Hydrology Legend

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5.Hydrogeology and Hydrology

5.1 Aquifer within Superficial Deposits

Are there records of productive strata 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 (5a):

ID	Distance [m]	Direction	Designation	Description
1	0.0	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
2	0.0	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
3	0.0	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
4	30.0	E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	92.0	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	220.0	NE	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
7	221.0	E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
8	300.0	NE	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
9	312.0	N	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
10	462.0	N	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
11	482.0	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

5.2 Aquifer within Bedrock Deposits

Are there records of productive strata 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 (5b):

ID	Distance [m]	Direction	Designation	Description
1	0.0	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
2	0.0	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	0.0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
7	0.0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
3	315.0	W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	427.0	W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 1000m of the study site? No

Database searched and no data found.

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 1000m 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 (5b):

ID	Distance	Direction	NGR	Details	
8	0.0	On Site	450800, 114820	Licence No: 11/42/25.1/65CA Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Botley Hotel & Country Club At Maddoxford (point A) Data Type: Point	Annual Volume (m³): 8500 Max Daily Volume (m³): 85 Application No: - Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 11/6/2009 Version End Date:

9	0.0	On Site	451120, 114960	Licence No: 11/42/25.1/65CA Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Botley Hotel & Country Club At Maddoxford (point B) Data Type: Point	Annual Volume (m³): 8500 Max Daily Volume (m³): 85 Application No: - Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 11/6/2009 Version End Date:
10	182.0	SE	451790, 114280	Licence No: 11/42/25.3/51 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Holly Tree Farm Data Type: Line	Annual Volume (m³): - Max Daily Volume (m³): - Application No: WR.4129 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 15/1/1971 Version End Date:
Not shown	672.0	S	451780, 113760	Licence No: 11/42/25.3/27A Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Newhouse Farm, Botley Data Type: Point	Annual Volume (m³): 7910 Max Daily Volume (m³): 159.11 Application No: WR.4127 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 11/6/2009 Version End Date:
Not shown	887.0	S	451750, 113540	Licence No: 30/052 Details: Fish Pass/Canoe Pass Direct Source: Southern Region Surface Waters Point: Point A On Mill Stream, Botley Mill Data Type: Point	Annual Volume (m³): 0 Max Daily Volume (m³): 0 Application No: 169/018H Original Start Date: 4/7/2007 Expiry Date: 31/3/2016 Issue No: 1 Version Start Date: 12/6/2009 Version End Date:

5.5 Potable Water Abstraction Licences

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

Database searched and no data found.

5.6 Source Protection Zones

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

Database searched and no data found.

5.7 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? **Yes**

Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (5d):

ID	Distance [m]	Direction	NGR	River Details	Biological Quality Grade				
					2005	2006	2007	2008	2009

115	101.0	SE	451780, 114380	River Name: Horton Heath Str. (ford Lake) Reach: R. Hamble Conf - Lower Upham End/Start of Stretch: End of Stretch NGR	A	A	A	A	A
Not shown	995.0	NE	452500, 115200	River Name: Hamble Reach: Tidal Limit At Botley - Durley Mill End/Start of Stretch: Start of Stretch NGR	A	B	B	B	B
Not shown	995.0	NE	452500, 115200	River Name: Hamble Reach: Durley Mill - Moors Stream Conf End/Start of Stretch: End of Stretch NGR	A	A	B	B	B
Not shown	1440.0	S	451520, 112970	River Name: Hamble Reach: Tidal Limit At Botley - Durley Mill End/Start of Stretch: End of Stretch NGR	A	B	B	B	B

Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (5d):

ID	Distance [m]	Direction	NGR	River Details	Chemical Quality Grade (Headline Indicator)				
					2005	2006	2007	2008	2009
119	48.0	SE	451704, 114383	River Name: R. Hamble Reach: Tidal Limit At Botley - Durley Mill End/Start of Stretch: Sample Point NGR	B	B	B	B	A
Not shown	995.0	NE	452500, 115200	River Name: R. Hamble Reach: Tidal Limit At Botley - Durley Mill End/Start of Stretch: Start of Stretch NGR	B	B	B	B	A
Not shown	995.0	NE	452500, 115200	River Name: R. Hamble Reach: Durley Mill - Moors Stream Conf End/Start of Stretch: End of Stretch NGR	B	B	B	B	A
Not shown	1383.0	NE	452858, 115375	River Name: R. Hamble Reach: Durley Mill - Moors Stream Conf End/Start of Stretch: Sample Point NGR	B	B	B	B	A
Not shown	1440.0	S	451520, 112970	River Name: R. Hamble Reach: Tidal Limit At Botley - Durley Mill End/Start of Stretch: End of Stretch NGR	B	B	B	B	A

5.8 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 (5d):

ID	Distance	Direction		Details
1	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined

2	0.0	On Site	River Name: Ford Lake Water Course Name: Ford Lake Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
3	0.0	On Site	River Name: Drain Water Course Name: Ford Lake Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NA Main River Status: Currently Undefined
4	0.0	On Site	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
5	0.0	On Site	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
6	0.0	On Site	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
7	0.0	On Site	River Name: - Water Course Name: Ford Lake Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
8	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
9	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
10A	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
11A	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
12	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
13	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
14	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
15	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
16	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
17	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
18	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
19	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
20	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
21	0.0	On Site	River Name: Ford Lake Water Course Name: Ford Lake Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined

22	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
23	0.0	On Site	River Name: - Water Course Name: Ford Lake Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
24	0.0	On Site	River Name: Ford Lake Water Course Name: Ford Lake Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
25	0.0	On Site	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
26	0.0	On Site	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
27	0.0	On Site	River Name: - Water Course Name: Ford Lake Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
28B	0.0	On Site	River Name: - Water Course Name: Moorgreen Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
29B	11.0	W	River Name: - Water Course Name: Moorgreen Stream Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
30	35.0	SE	River Name: River Hamble Water Course Name: River Hamble Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
31	50.0	W	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
32	50.0	W	River Name: - Water Course Name: Moorgreen Stream Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
33	150.0	SE	River Name: - Water Course Name: River Hamble Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
34C	229.0	S	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
35C	254.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
36	279.0	NE	River Name: Hamble Water Course Name: River Hamble Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
37	279.0	NE	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
38E	290.0	S	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
39G	292.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
40	301.0	S	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
41D	315.0	NE	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined

42D	315.0	NE	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
43E	324.0	S	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
44F	324.0	S	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
45E	325.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
46F	325.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
47E	325.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
48G	329.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
49	339.0	S	River Name: - Water Course Name: River Hamble Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
50	382.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
51	389.0	SW	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
52	397.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
53	408.0	S	River Name: - Water Course Name: River Hamble Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
54	421.0	S	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
55	425.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
56	433.0	S	River Name: Hamble Water Course Name: River Hamble Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
57	461.0	SE	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
58	461.0	SE	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
59	462.0	SE	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
60	477.0	N	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined

5.9 Surface Water Features

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

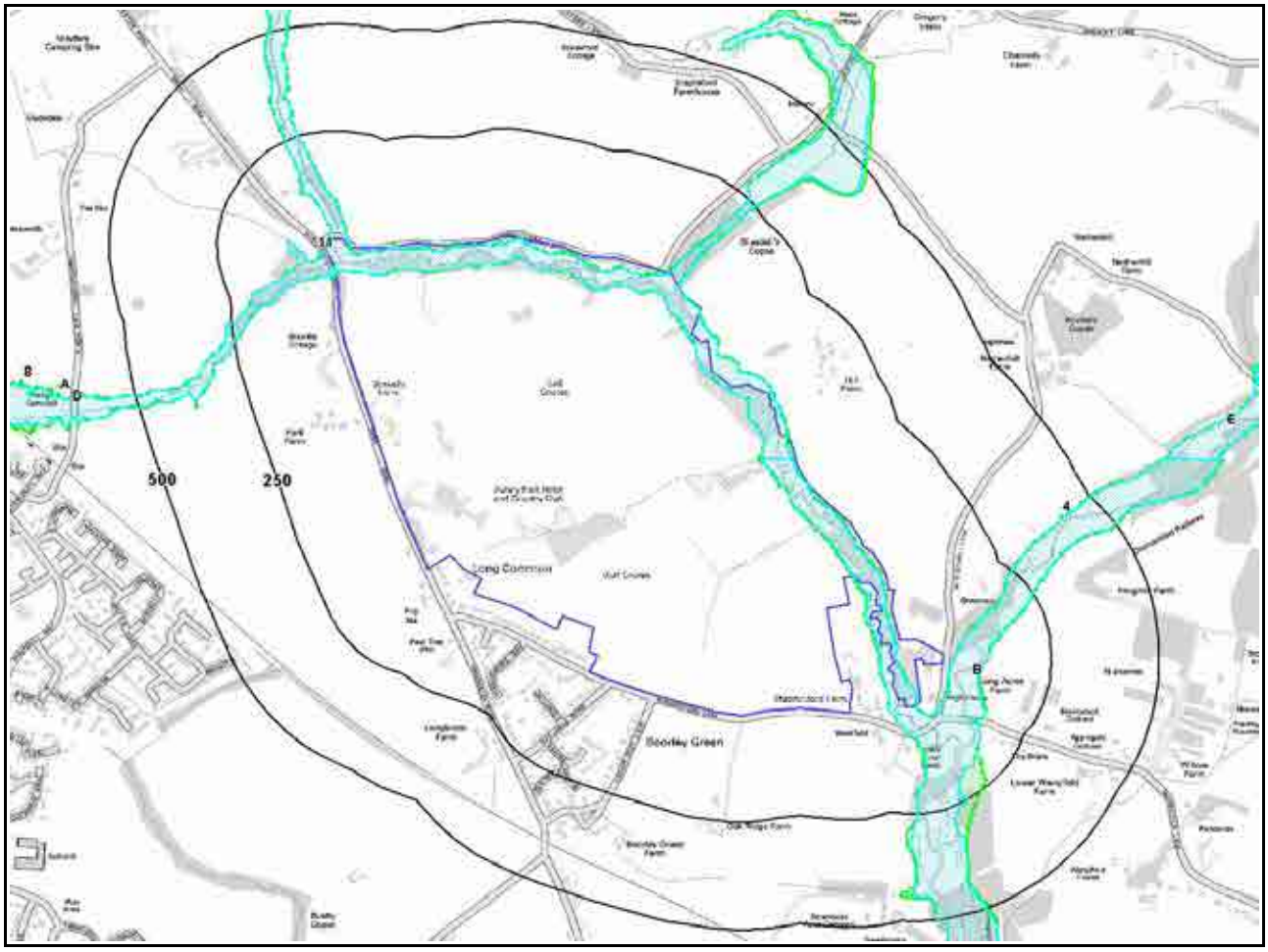
The following surface water records are not represented on mapping:

Distance to Surface Water (m)	on-site	0-50	51-250
Surface water features within 250m of the study site	Yes	Yes	Yes

6. Environment Agency Flood Map

NW ▲ N NE

◄W



E►

SW ▼ S SE

Environment Agency Flood Legend

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Site Outline

250
500
Search Buffers (m)

Zone 2 Floodplain

Zone 3 Floodplain

Flood Storage Area

Area Benefiting from Flood Defences

Flood Defences

6. Flooding

6.1 Zone 2 Flooding

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain? **Yes**

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance	Direction	Update	Type
1C	0.0	On Site	01-Nov-2011	Zone 2 - (Fluvial Models)
2B	0.0	On Site	01-Nov-2011	Zone 2 - (Fluvial Models)

6.2 Zone 3 Flooding

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 3 floodplain? **Yes**

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance	Direction	Update	Type
9B	0.0	On Site	01-Nov-2011	Zone 3 - (Fluvial Models)
10C	0.0	On Site	01-Nov-2011	Zone 3 - (Fluvial Models)
11	14.0	W	01-Nov-2011	Zone 3 - (Fluvial Models)

6.3 Flood Defences

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

6.4 Areas benefiting from Flood Defences

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

6.5 Areas used for Flood Storage

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

6.6 Groundwater Flooding Susceptibility Areas

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

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

6.7 Groundwater Flooding Confidence Areas

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

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.

7.Designated Environmentally Sensitive Sites Map

NW ▲ N NE

◄W E►

SW S ▼ SE



Designated Environmentally Sensitive Sites Legend

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Site Outline

250
500
Search Buffers (m)

SAC

SSSI

NNR

World Heritage Sites

SPA

Ramsar

LNR

Environmentally Sensitive Areas

Areas of Outstanding Natural Beauty

Nitrate Sensitive Areas

National Parks

7.Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 500m of the study site? **No**

Records of Sites of Special Scientific Interest (SSSI) within 500m of the study site: **0**

Database searched and no data found.

Records of National Nature Reserves (NNR) within 500m of the study site: **0**

Database searched and no data found.

Records of Special Areas of Conservation (SAC) within 500m of the study site: **0**

Database searched and no data found.

Records of Special Protection Areas (SPA) within 500m of the study site: **0**

Database searched and no data found.

Records of Ramsar sites within 500m of the study site: **0**

Database searched and no data found.

Records of Local Nature Reserves (LNR) within 500m of the study site: **0**

Database searched and no data found.

Records of World Heritage Sites within 500m of the study site: **0**

Database searched and no data found.

Records of Environmentally Sensitive Areas within 500m of the study site: **0**

Database searched and no data found.

Records of Areas of Outstanding Natural Beauty (AONB) within 500m of the study site: **0**

Database searched and no data found.

Records of National Parks (NP) within 500m of the study site: **0**

Database searched and no data found.

Records of Nitrate Sensitive Areas within 500m of the study site: **0**

Database searched and no data found.

Records of Nitrate Vulnerable Zones within 500m of the study site: **0**

Database searched and no data found.

8. Natural Hazards Findings

8.1 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:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site? **Moderate**

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

Hazard
Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. 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 probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

8.1.2 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.

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? **Null - Negligible**

Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

8.1.4 Compressible Ground

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

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

Hazard
Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property poss ible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

8.1.5 Collapsible Rocks

What is the maximum Collapsible 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
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

8.1.6Running 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 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.

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

9.Mining

9.1 Coal Mining

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

Database searched and no data found.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*? **Negligible**

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? **No**

Database searched and no data found.

10.Contacts

GroundSure Helpline
Telephone: 08444 159 000
info @ groundsure.com

British Geological Survey (England & Wales)
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

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

Health Protection Agency
Chilton, Didcot, Oxon, OX11 0RQ
Tel: 01235 822622 www.hpa.org.uk/radiation
Radon measures and general radon information and guidance

The Coal Authority
200 Lichfield Lane, Mansfield, Notts NG18 4RG
Tel: 0845 762 6848. DX 716176 Mansfield 5
www.coal-authority.co.uk
Coal mining reports and related enquiries

Ordnance Survey
Romsey Road
Southampton SO16 4GU
Tel: 08456 050505

Local Authority
Authority: Winchester City Council
Phone: 01962 840 222
Web: www.winchester.gov.uk
Address: City Offices, Colebrook Street, Winchester, Hampshire, SO23 9LJ

Get Mapping PLC
Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW
Tel: 01252 845444

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Standard Terms and Conditions

1 Definitions

In these conditions unless the context otherwise requires:

"Beneficiary"means the Client or the customer of the Client for whom the Client has procured the Services.

"Commercial"means any building which is not Residential.

"Commission"means an order for Consultancy Services submitted by a Client.

"Consultancy Services" mean consultancy services provided by GroundSure including, without limitation, carrying out interpretation of third party and in-house environmental data, provision of environmental consultancy advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Content" means any data, database or other information contained in a Report or Mapping which is provided to GroundSure by a Data Provider.

"Contract" means the contract between GroundSure and the Client for the performance of the Services which arises upon GroundSure's acceptance of an Order or Commission and which shall incorporate these conditions, the relevant GroundSure User Guide, proposal by GroundSure and the content of any subsequent report, and any agreed amendments in accordance with clause 11.

"Client" means the party that submits an Orderor Commission.

"Data Provider" means any third party providing Content to GroundSure.

"Data Report" means reports comprising factual data with no professional interpretation in respect ofthe level of likely risk and/or liability available from GroundSure.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028 and whose registered office is at Greater London House, Hampstead Road, London NW1 7EJ.

"Intellectual Property" means any patent, copyright, design rights, service marks, moral rights, data protection rights, know-how, trademark or any other intellectual property rights.

"Mapping" an historical map or a combination of historical maps of various ages, time periods and scales available from GroundSure.

"Order" means an order form submitted by the Client requiring Services from GroundSure in respect of a specified Site.

"Order Website" means online platform via which Orders may be placed.

"Report" means a Risk Screening Report or Data Report for commercial or residential property available from GroundSure relating to the Site prepared in accordance with the specifications set out in the relevant User Guide.

"Residential" means any building used as or suitable for use as an individual dwelling.

"Risk Screening Report" means one of GroundSure's risk screening reports, comprising factual data with interpretation in respect ofthe level of likely risk and/or liability, excluding **"Consultancy Services"**.

"Services" means the provision of any Report, Mapping or Consultancy Services which GroundSure has agreed to carry out for the Client/Beneficiary on these terms and conditions in respect of the Site.

"Site"means the landsite in respect of which GroundSure provides the Services.

"User Guide" means the relevant current version of the user guide, available upon request from GroundSure.

2 Scope of Services

2.1 GroundSure agrees to carry out the Services in accordance with the Contract and to the extent set out therein.

2.2 GroundSure shall exercise all the reasonable skill, care and diligence to be expected of experienced environmental consultants in the performance of the Services.

2.3 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 the Contract.

2.4 Terms and conditions appearing on a Client's order form, printed stationery or other communication, including invoices, to GroundSure, its employees, servants, agents or other representatives or any terms implied by custom, practice or course of dealing shall be of no effect and these terms and conditions shall prevail over all others.

2.5 In the event that a Client/Beneficiary opts to take out insurance in conjunction with or as a result of the Services, such insurance shall be subject solely to the terms of any policy issued to it in that respect and GroundSure will have no liability therefore.

2.6 GroundSure's quotations/proposals are valid for a period of 30 days only. GroundSure reserves the right to withdraw any quotation at any time before GroundSure accepts an Order or Commission. GroundSure's acceptance of an Order or Commission shall be effective only where such acceptance is in writing and signed by GroundSure's authorised representative or where accepted via GroundSure's Order Website.

3 The Client's obligations

3.1 The Client shall ensure the Beneficiary complies with and is bound by the terms and conditions set out in the Contract and shall provide that Groundsure may in its own right enforce such terms and conditions against the Beneficiary pursuant to the Contracts (Rights of Third parties) Act 1999. The Client shall be liable for all breaches of the Contract by the Beneficiary as if they were breaches by the Client. The Client shall be solely responsible for ensuring that the Report/Mapping ordered is appropriate and suitable for the Beneficiary's needs.

3.2 The Client shall (or shall procure that the Beneficiary shall) supply to GroundSure as soon as practicable and without charge all information necessary and accurate relevant data including any specific and/or unusual environmental information relating to the Site known to the Client/Beneficiary which may pertain to the Services and shall give such assistance as GroundSure shall reasonably require in the performance of the Services (including, without limitation, access to a Site, facilities and equipment as agreed in the Contract).

3.3 Where Client/Beneficiary approval or decision is required, such approval or decision shall be given or procured in reasonable time as not to delay or disrupt the performance of any other part of the Services.

3.4 The Client shall not and shall not knowingly permit the Beneficiary to, save as expressly permitted by these terms and conditions, re-sell, alter, add to, amend or use out of context the content of any Report, Mapping or, in respect of any Services, information given by GroundSure. For the avoidance of doubt, the Client and Beneficiary may make the Report, Mapping or GroundSure's findings available to a third party who is considering acquiring the whole or part of the Site, or providing funding in relation to the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.5 The Client is responsible for maintaining the confidentiality of its user name and password if using GroundSure's internet ordering service and accepts responsibility for all activity that occurs under such account and password.

4 Reliance

4.1 Upon full payment of all relevant fees and subject to the provisions of these terms and conditions, the Client and Beneficiary are granted an irrevocable royalty-free licence to access the information contained in a Report, Mapping or in a report prepared by GroundSure in respect of or arising out of Consultancy Services. The Services may only be used for the benefit of the Client and those persons listed in clauses 4.2 and 4.3.

4.2 In relation to Data Reports, Mapping and Risk Screening Reports, the Client shall be entitled to make Reports available to (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 (v) the professional advisers and lenders of the first purchaser or tenant of the Site. Accordingly GroundSure shall have the same duties and obligations to those persons in respect of the Services as it has to the Client and those persons shall have the benefit of any of the Client's rights under the Contract as if those persons were parties to the Contract. For the avoidance of doubt, the limitations of GroundSure's liability as set out in clauses 7 and 11.6 shall apply.

4.3 In relation to Consultancy Services, reliance shall be limited to the Client, Beneficiary and named parties on the Report.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise agreed in writing with GroundSure, any other party considering the information supplied by GroundSure as part of the Services, including (but not limited to) insurance underwriters, does so at their own risk and GroundSure has no legal obligations to such party unless otherwise agreed in writing.

4.5 The Client shall not and shall not knowingly permit any person (including the Beneficiary) who is provided with a copy of any Report, (except as permitted herein or by separate agreement with GroundSure) to,: (a) remove, suppress or modify any trade mark, copyright or other proprietary marking from the Report or Mapping; (b) create any product which is derived directly or indirectly from the data contained in the Report or Mapping; (c) combine the Report or Mapping with, or incorporate the Report or Mapping into any other information data or service; or (d) re-format or otherwise change (whether by modification, addition or enhancement) data or images contained in the Report or Mapping.

4.6 Notwithstanding clause 4.5, if the Client acts in a professional capacity, it may make reasonable use of a Report and/or findings made as a result of Consultancy Services to advise Beneficiaries. However, GroundSure shall have no liability in respect of any opinion or report given to such Beneficiaries by the Client or a third party.

5 Fees and Disbursements

5.1 GroundSure shall charge the Client fees at the rate and frequency specified in the Contract together, in the case of Consultancy Services, with all proper disbursements incurred by GroundSure in performing the Services. For the avoidance of doubt, the fees payable for the Services are as set out in GroundSure's written proposal, Order Website or Order acknowledgement form. 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.

5.2 Unless GroundSure requires prepayment, the Client shall promptly pay all fees disbursements and other monies due to GroundSure in full without deduction, counterclaim or set off together with such value added tax or other tax as may be required within 30 days from the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client (**"Payment Date"**). GroundSure reserves the right to charge interest which shall accrue on a daily basis from 30 days after the date of Payment Date until the date of payment (whether before or after judgment) at the rate of five per cent per annum above the Bank of England base rate from time to time.

5.3 In the event that the Client disputes the amount payable in respect of GroundSure's invoice it shall notify GroundSure no later than 28 days after the date thereof that it is in dispute. In default of such notification the Client shall be deemed to have agreed the amount thereof. As soon as reasonably practicable following receipt of a notification in respect of any disputed invoice, a member of the management team at GroundSure shall contact the Client and the parties shall use all reasonable endeavours to resolve the dispute.

6 Intellectual Property

6.1 Subject to the provisions of clause 4.1, the Client and the Beneficiary hereby acknowledge that all Intellectual Property in the Services and Content are and shall remain owned by either GroundSure or the Data Providers and nothing in these terms purports to transfer or assign any rights to the Client or the Beneficiary in respect of the Intellectual Property.

6.2 The Client shall acknowledge the ownership of the Content where such Content is incorporated or used in the Client's own documents, reports, systems or services whether or not these are supplied to a third party.

6.3 Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client acknowledges that the proprietary rights subsisting in copyright, database rights and any other intellectual property rights in respect of any data and information contained in any Report are and shall remain (subject to clause 11.1) the property of GroundSure and/or any third party that has supplied data or information used to create a Report, and that these conditions do not purport to grant, assign or transfer any such rights in respect thereof to a Client and/or a Beneficiary.

6.5 The Client and each of the parties set out in clause 4.2 are permitted to make up to 8 (commercial) or 2 (residential) printed copies of the Report only. Further copies of the Report may not be made in whole or in part without the prior written permission of GroundSure who shall be entitled to make a charge for each additional copy.

6.6 The Client shall (and shall procure that any recipients of the Report as permitted under clause 4.2 shall):

(i) not remove, suppress or modify any trademark, 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 data contained in 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; and
(v) not reformat or otherwise change (whether by modification, addition or enhancement), data contained in the Services (save that those acting in a professional capacity to the Beneficiary shall not be in breach of this clause 6.6(v) where such reformatting is in the normal course of providing advice based upon the Services),
in each case of parts (iii) to (v) inclusive, whether or not such product or report is produced for commercial profit or not.
6.7 The Client and/or Beneficiary shall and shall procure that any party 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

7.1 Nothing in these terms and conditions shall limit GroundSure's liability for causing death or personal injury through negligence or willful default.
7.2 Save as otherwise set out in these conditions, any information provided by one party ("**Disclosing Party**") to the other party ("**Receiving Party**") shall be treated as confidential except so far as authorised by the Disclosing Party to provide such information in whole or in part to a third party.
7.3 Nothing in these conditions shall affect the statutory rights of a consumer under the applicable consumer protection legislation from time to time.
7.4 In relation to Data Reports, Mapping and Risk Screening Reports, GroundSure's liability under the Contract shall cease upon the expiry of six years from the date when the Beneficiary became aware that it may have a claim against GroundSure in respect of the Services provided always that there shall be no liability at the expiration of twelve years from the completion of the Contract. For the avoidance of doubt, any claims in respect of which proceedings are notified to GroundSure in writing prior to the expiry of the time periods referred to in this clause shall survive the expiry of those time periods provided any such claim is actually commenced within six months of notification.
7.5 In relation to Consultancy Services GroundSure's liability under the Contract shall cease upon the expiry of six years from the date the Services were completed.
7.6 GroundSure shall not be liable to the Client or any person to whom the Client provides a copy of a Data Report, Mapping or Risk Screening Report in any circumstances whatsoever unless arising out of a breach on its part of the obligations set out in the Contract.
7.7 GroundSure shall not be liable if the Data Reports, Mapping or Risk Screening Report are used otherwise than as provided or referred to in these conditions and the relevant User Guide.
7.8 Subject to the provisions of clause 7.3, GroundSure makes no representation, warranties, express or implied, as to the accuracy, reliability, completeness, validity or fitness for purpose of any Content and shall not be liable for any omission, error or inaccuracy in relation thereto unless GroundSure should reasonably have been alerted to any omission, error or inaccuracy in the Content.
7.9 Subject to the provisions of clause 7.1 and irrespective of whether multiple parties make use of the same Services the total liability of GroundSure under or in connection with the Contract, whether in contract in tort for breach of statutory duty or otherwise shall not exceed £10 million per claim or series of connected claims,
7.10 Whilst GroundSure will use all reasonable endeavours to maintain operability of its internet ordering service it will not be liable for any loss or damages caused by a delay or loss of use of such service. The Client shall use GroundSure's internet ordering service at its own risk. GroundSure shall not be responsible for any damage to a Client or permitted assignee's computer, software, modem, telephone or other property resulting from the use of GroundSure's internet ordering service.
7.11 The Client accepts, and shall use all reasonable endeavours to procure that anyone who is provided with a copy of the Report accepts, that it has no claim or recourse to any Data Provider or to GroundSure in respect of the acts or omissions of such Data Providers including Content supplied by them.
7.12 GroundSure shall provide the Services using reasonable skill and care, however, GroundSure shall not be liable for any inaccurate statement or risk rating in a Report which resulted from a reasonable interpretation of the Content.
7.13 Subject to clause 7.1, GroundSure shall not be liable to the Client, the Beneficiary or any third party in contract, tort (including, without limitation, negligence) or for misrepresentation or breach of statutory duty or otherwise in respect of any loss of profits, goodwill, revenue or opportunity, or any indirect or consequential loss (even if such loss was reasonably foreseeable).
7.14 GroundSure undertakes for the duration of the liability periods referred to in clauses 7.4 and 7.5 to maintain professional indemnity insurance in respect of its liabilities under this Contract. GroundSure shall produce evidence of such insurance if requested by the Client. A greater level of cover may be available upon request and agreement with the Client.

8 GroundSure right to suspend or terminate

8.1 In the event that GroundSure reasonably believes that the Client or Beneficiary as applicable has not provided the information or assistance required to enable the proper performance of the Services, GroundSure shall be entitled on fourteen days written notice to suspend all further performance of the Services until such time as any such deficiency has been made good.
8.2 GroundSure may additionally terminate the Contract immediately on written notice in the event that:
(i) the Client shall fail to pay any sum due to GroundSure within 28 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 material term of the Contract (including, but not limited to, the obligations in clause 4) incapable of remedy or if remediable, is not remedied within 14 days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.2, the Client may at any time after commencement of the Services by notice in writing to GroundSure require GroundSure to terminate or suspend immediately performance of all or any of the Services.
9.2 The Client waives all and any right of cancellation it may have under the Consumer Protection (Distance Selling) Regulations 2000 (as amended) in respect of the Order of a Report/Mapping. This does not affect the Beneficiary's statutory rights.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination or any suspension of the Services, 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/Beneficiary any property of the Client/ Beneficiary in GroundSure's possession or control.
10.2 In the event of termination/suspension of the Contract under clauses 8 or 9, 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/suspension. In respect of any Consultancy Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination/suspension of the Contract.

11 General

11.1 The mapping contained in the Services is protected by Crown copyright and must not be used for any purpose outside the context of the Services or as specifically provided in these terms.
11.2 GroundSure reserves the right to amend these terms and conditions. No variation to these terms shall be valid unless signed by an authorised representative of GroundSure.
11.3 No failure on the part of GroundSure to exercise and no delay in exercising, any right, power or provision under these terms and conditions shall operate as a waiver thereof.
11.4 Save as expressly provided in clauses 4.2, 4.3, 6.3 and 11.5, 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.
11.5 The Secretary of State for Communities and Local Government acting through Ordnance Survey may enforce breach of clause 6.1 of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.
11.6 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 Data Providers; or
(viii) changes in law.
11.7 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.
11.8 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email and on the second working day after the day of posting if sent by first class post.
11.9 The Contract constitutes the entire contract between the parties and shall supersede all previous arrangements between the parties.
11.10 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 provisionsshall not in any way be tainted or impaired.
11.11 These terms and conditions shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with these terms and conditions shall be subject to the exclusive jurisdiction of the English courts.
11.12 If the Client or Beneficiary has a complaint about the Services, notice can be given in any format eg writing, phone, email to the Compliance Officer at GroundSure who will respond in a timely manner.

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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

Map Name: MasterMap

Map date: **2011**

Scale: 1:2,500

Printed at: 1:2,500

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Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
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W: www.groundsure.com

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Production date: 22 November 2011

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

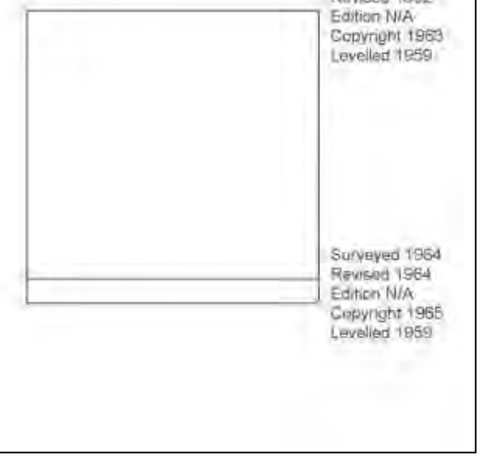
Map Name: National Grid

Map date: **1962-1964**

Scale: 1:2,500

Printed at: 1:2,500

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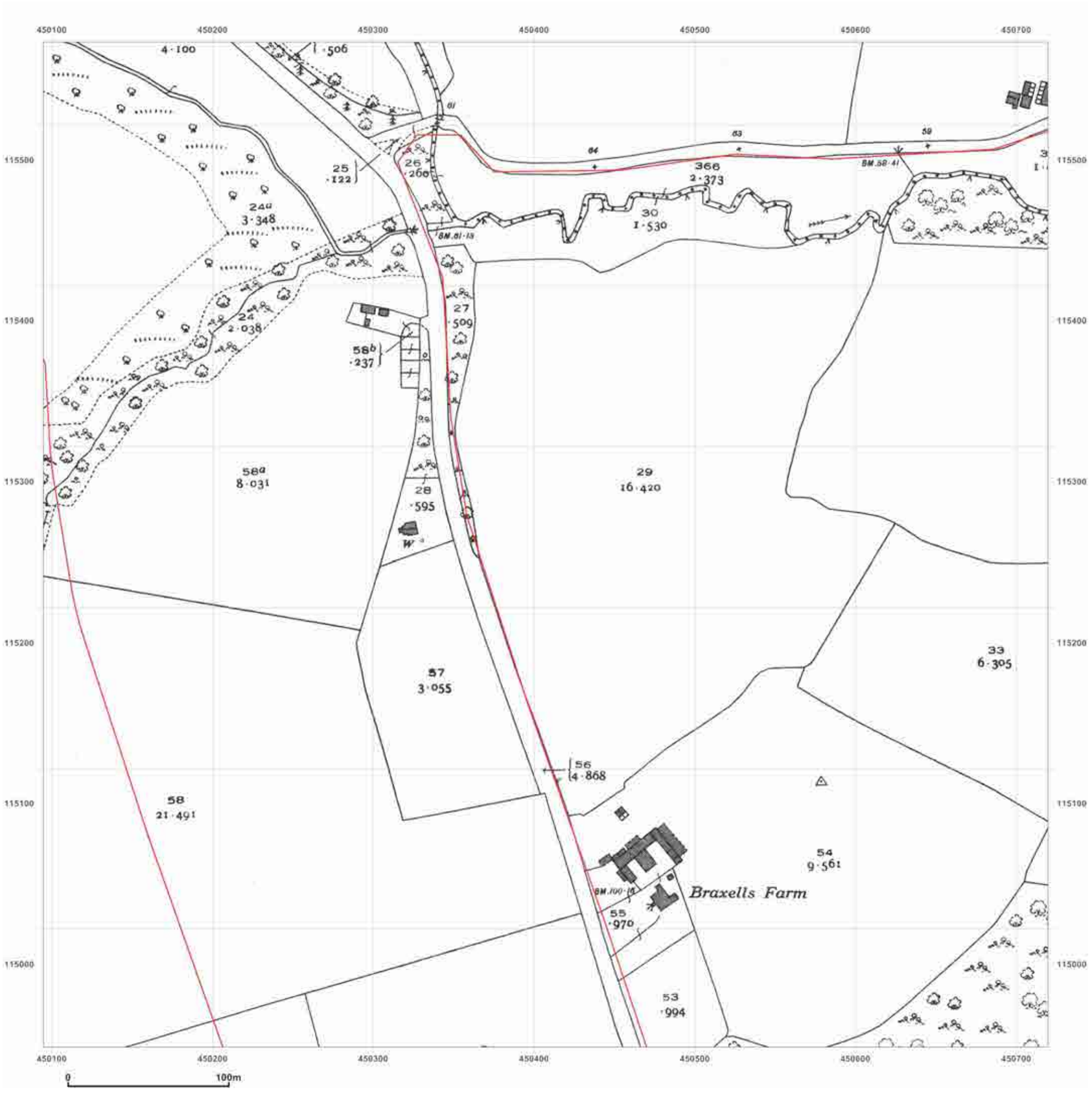
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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

Map Name: County Series

Map date: **1940**

Scale: 1:2,500

Printed at: 1:2,500

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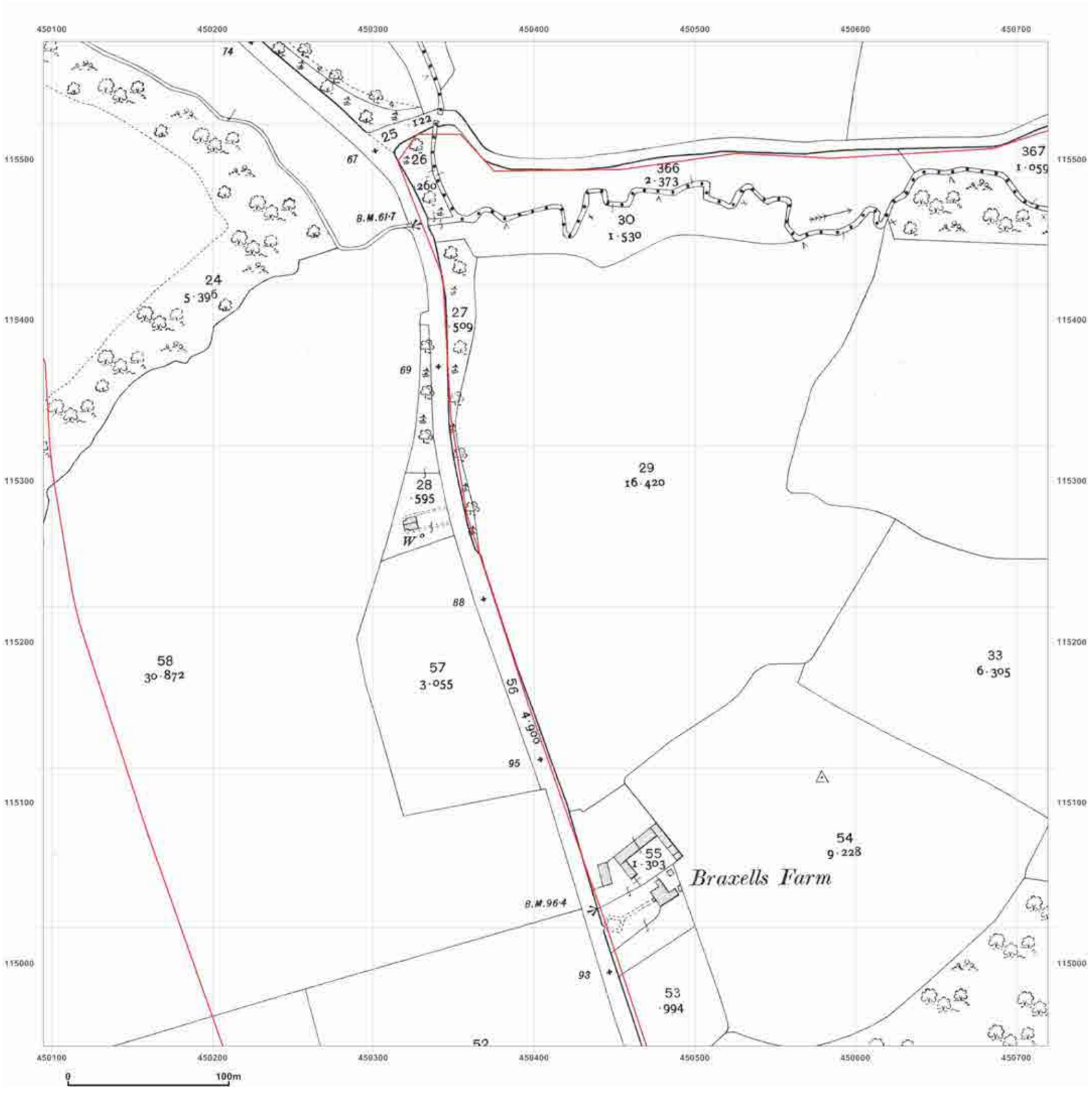
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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

Map Name: County Series

Map date: **1909**

Scale: 1:2,500

Printed at: 1:2,500

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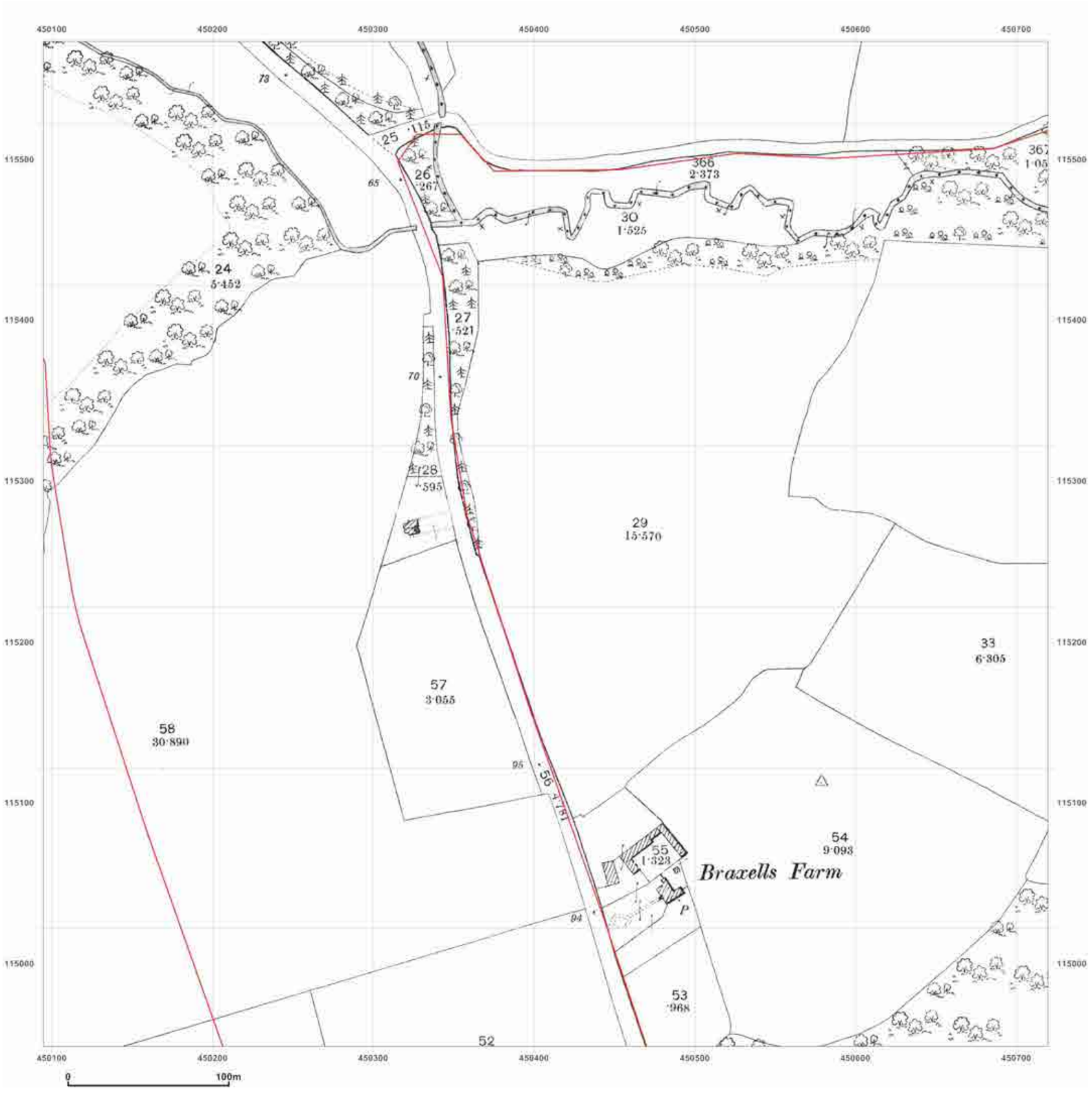
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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500

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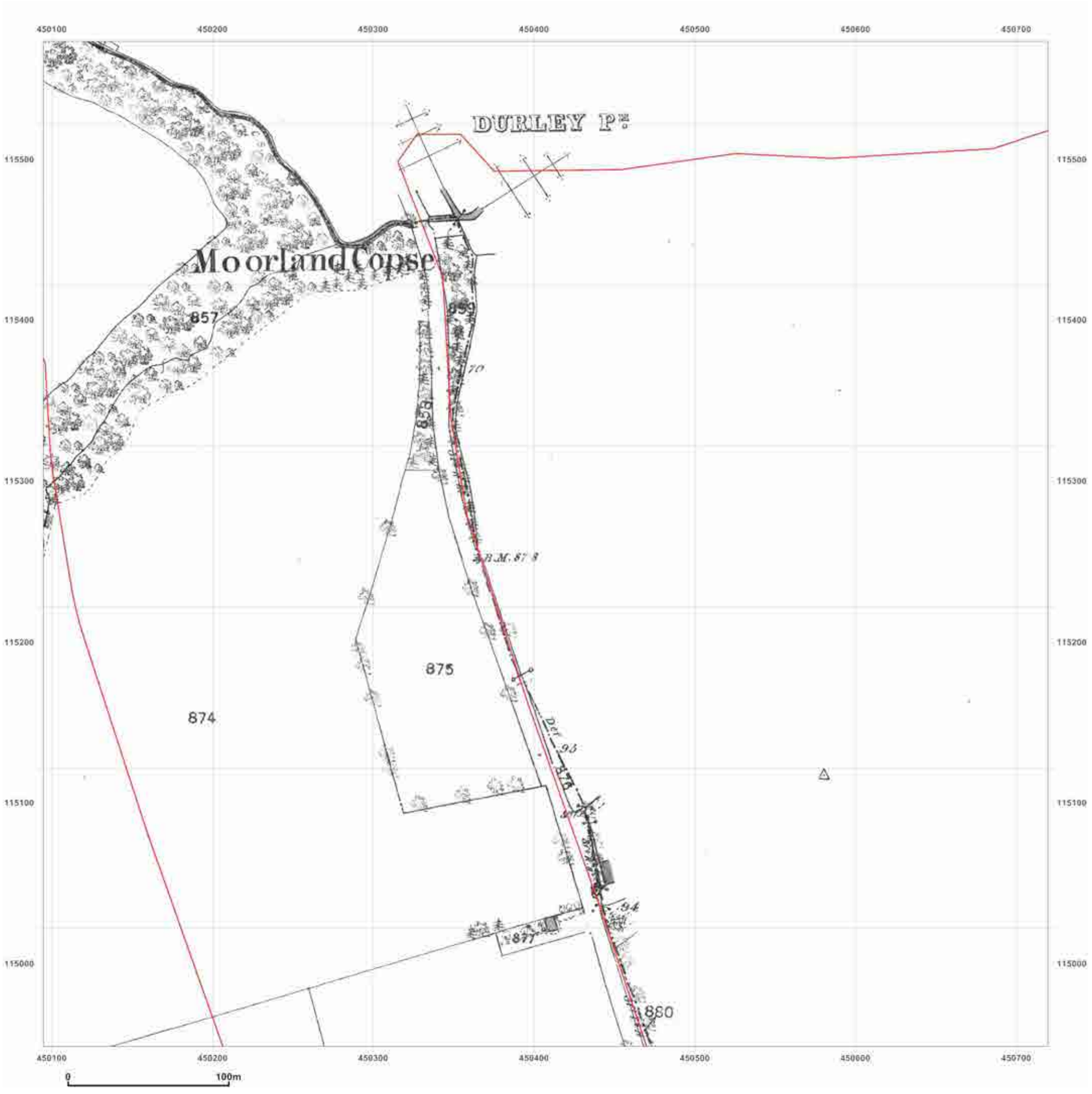
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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

Map Name: County Series

Map date: **1869**

Scale: 1:2,500

Printed at: 1:2,500

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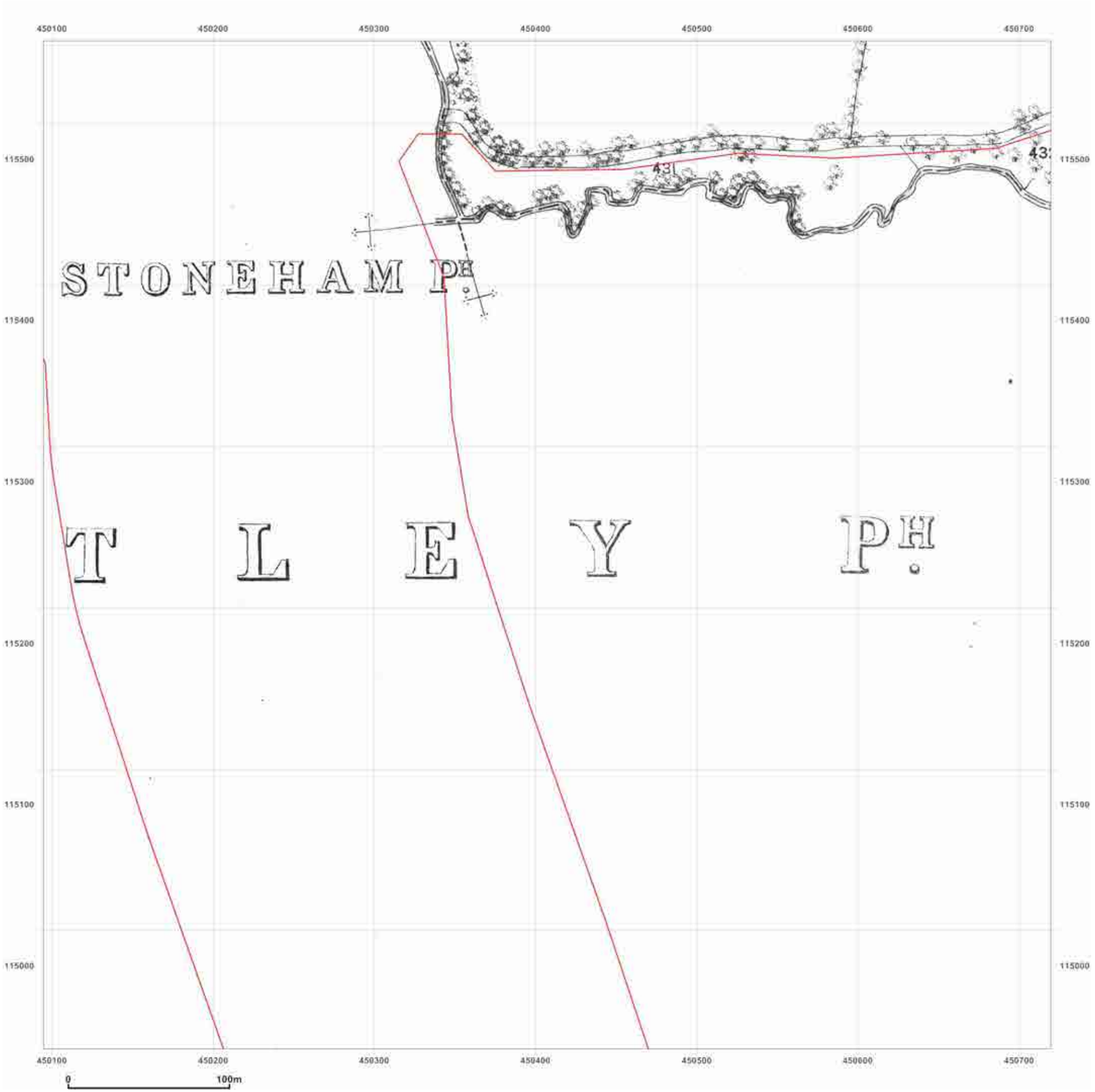
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Production date: 22 November 2011

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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1868
Revised 1868
Edition NA
Copyright NA
Levelled NA

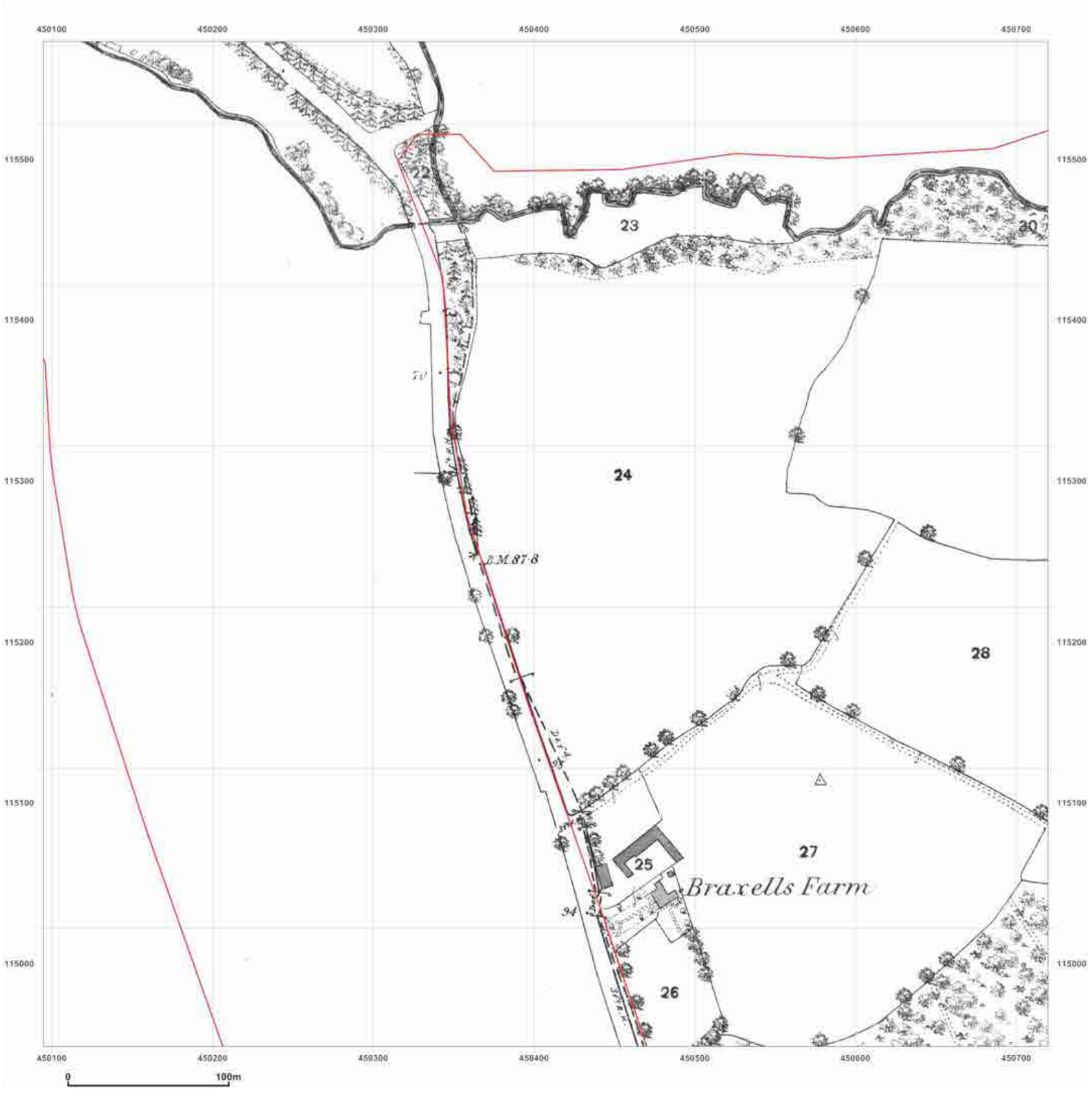
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Production date: 22 November 2011

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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A1
Grid Ref: 450407, 115261

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

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Production date: 22 November 2011

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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: MasterMap

Map date: **2011**

Scale: 1:2,500

Printed at: 1:2,500

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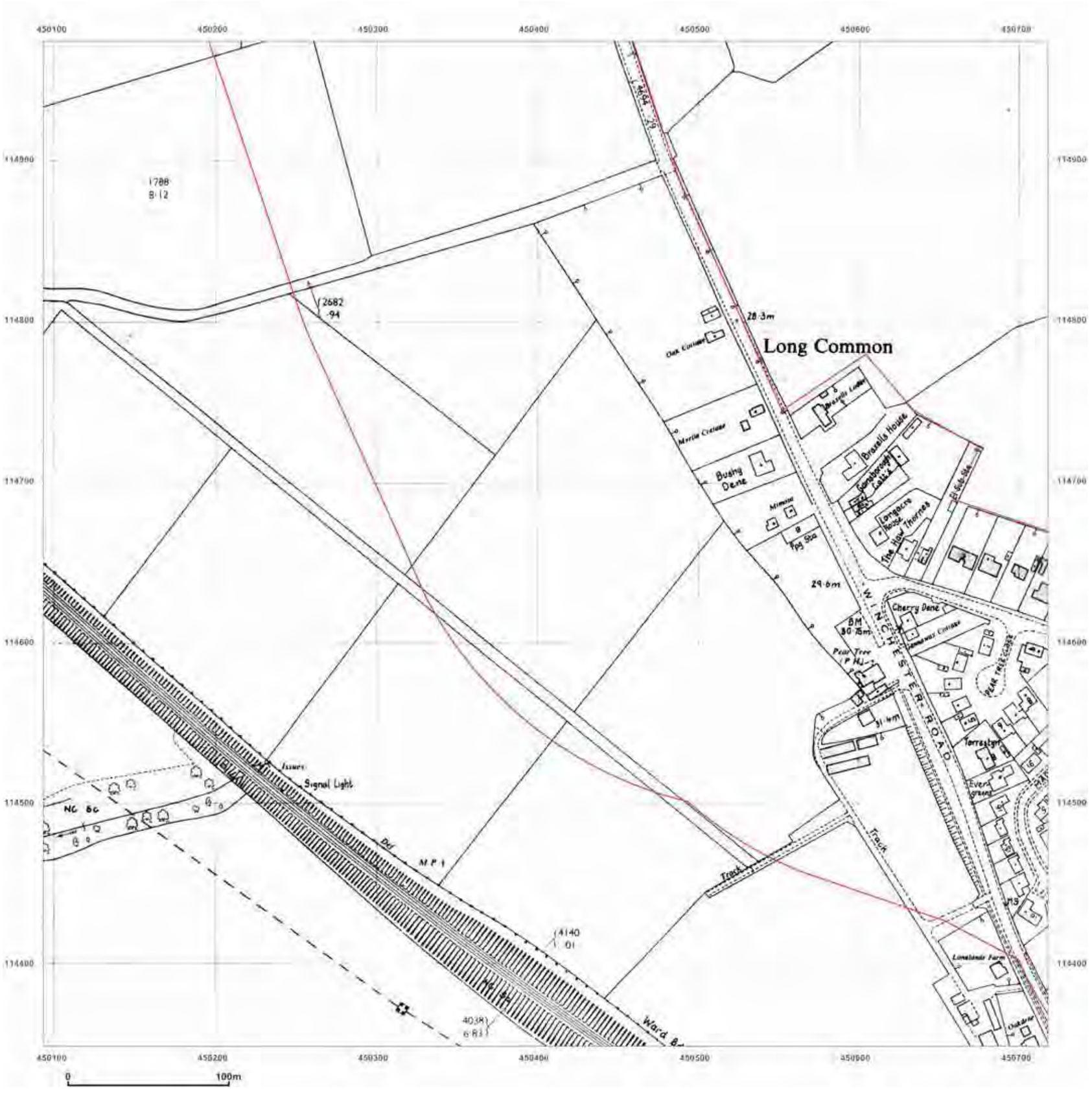
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Production date: 22 November 2011

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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: National Grid

Map date: **1989**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1959
Revised 1989
Edition N/A
Copyright 1989
Levelled 1959

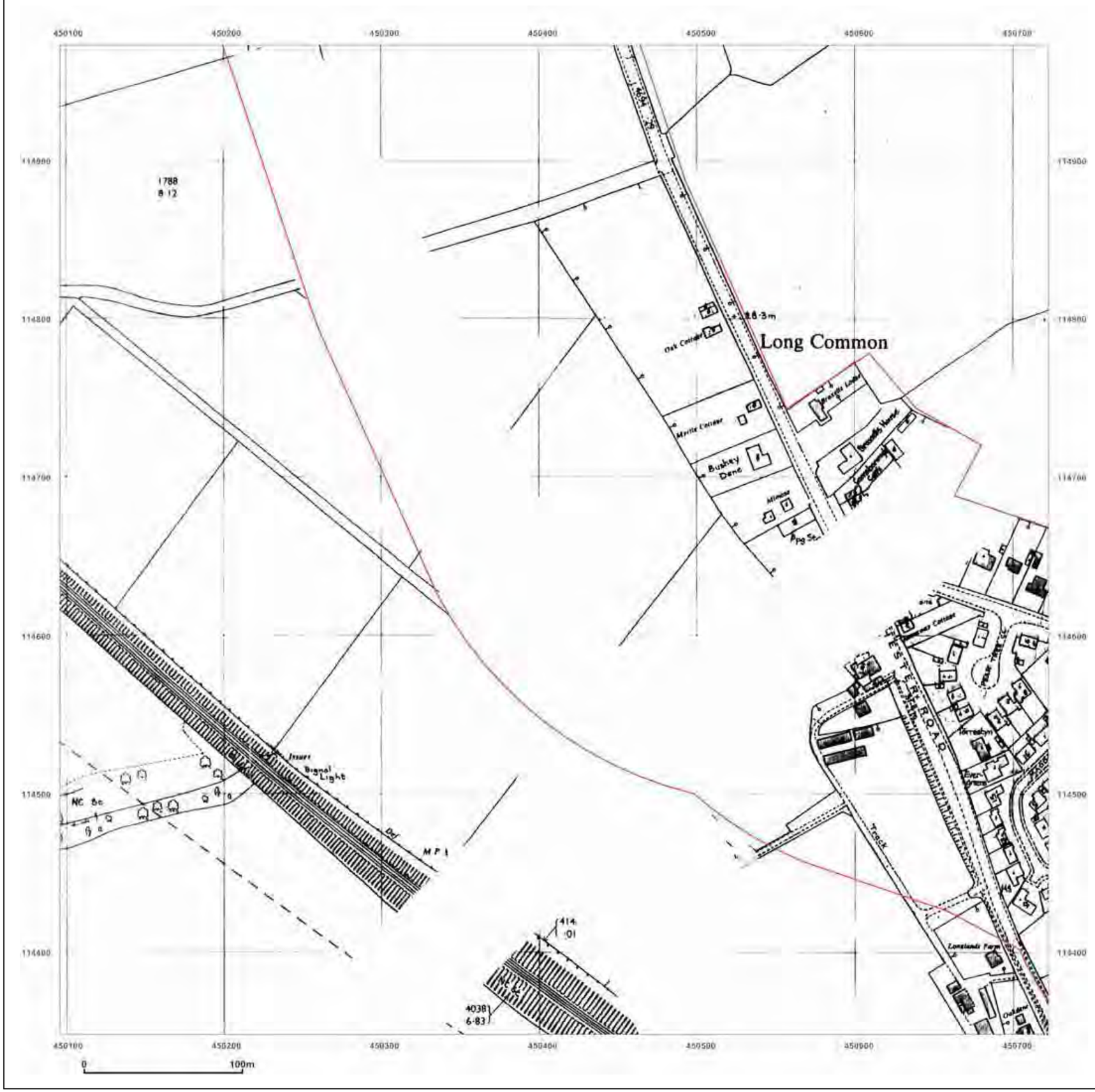
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: National Grid

Map date: **1988**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1959
Revised 1985
Edition N/A
Copyright 1988
Levelled 1959

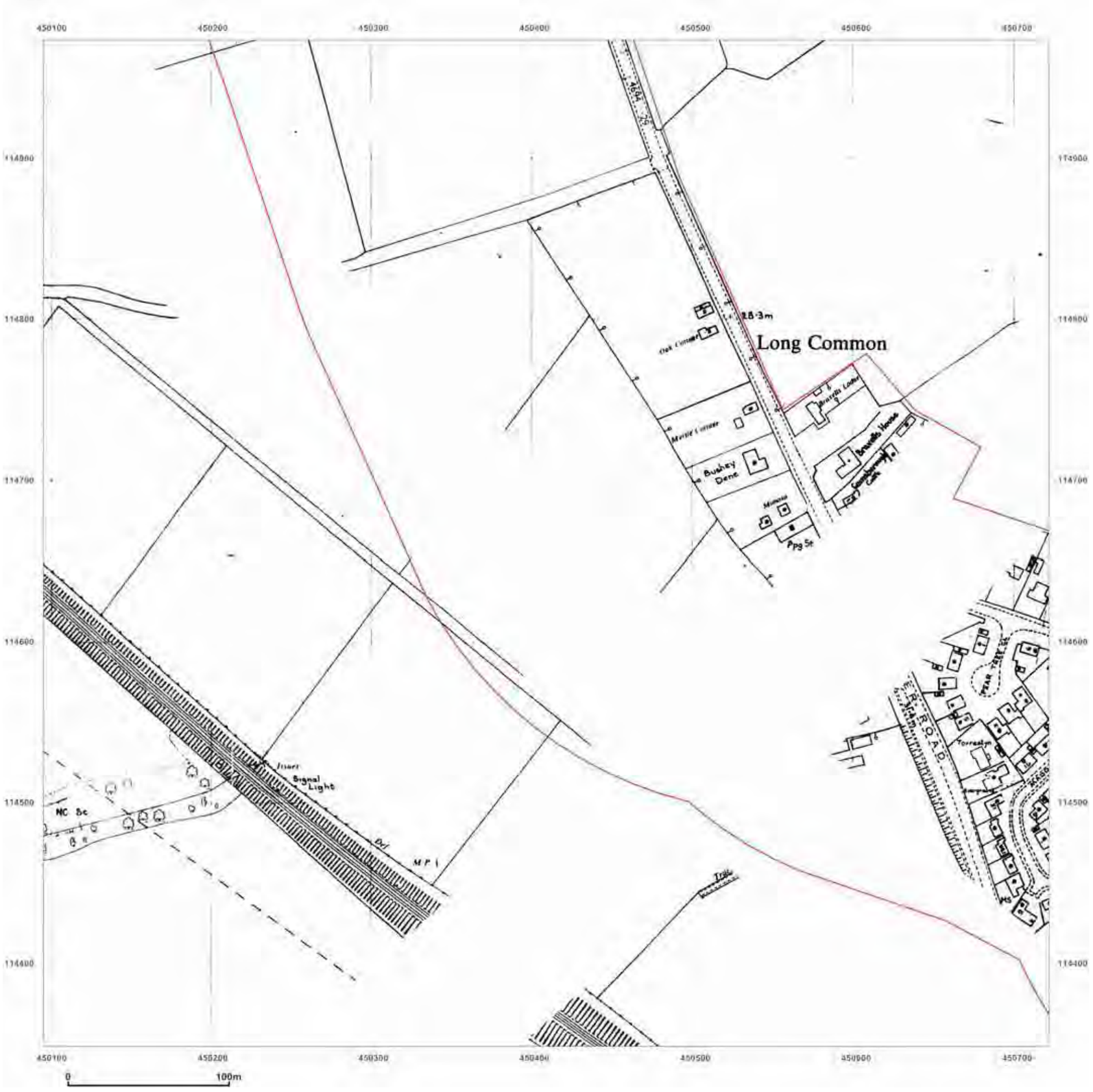
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: National Grid

Map date: **1987**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1959
Revised 1985
Edition N/A
Copyright 1987
Levelled 1959

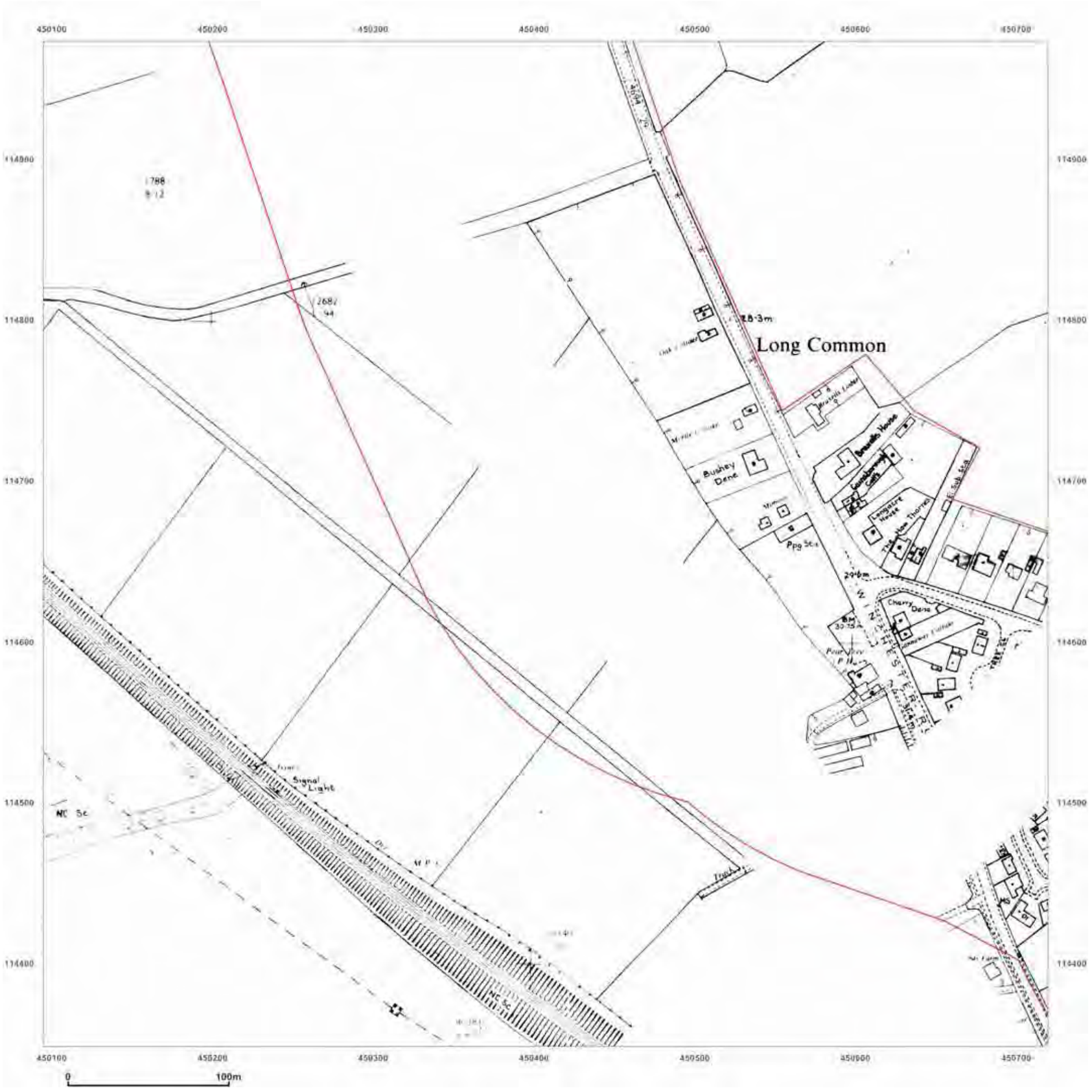
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Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: National Grid

Map date: **1985**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed N/A
Revised 1985
Edition N/A
Copyright 1988
Levelled 1954

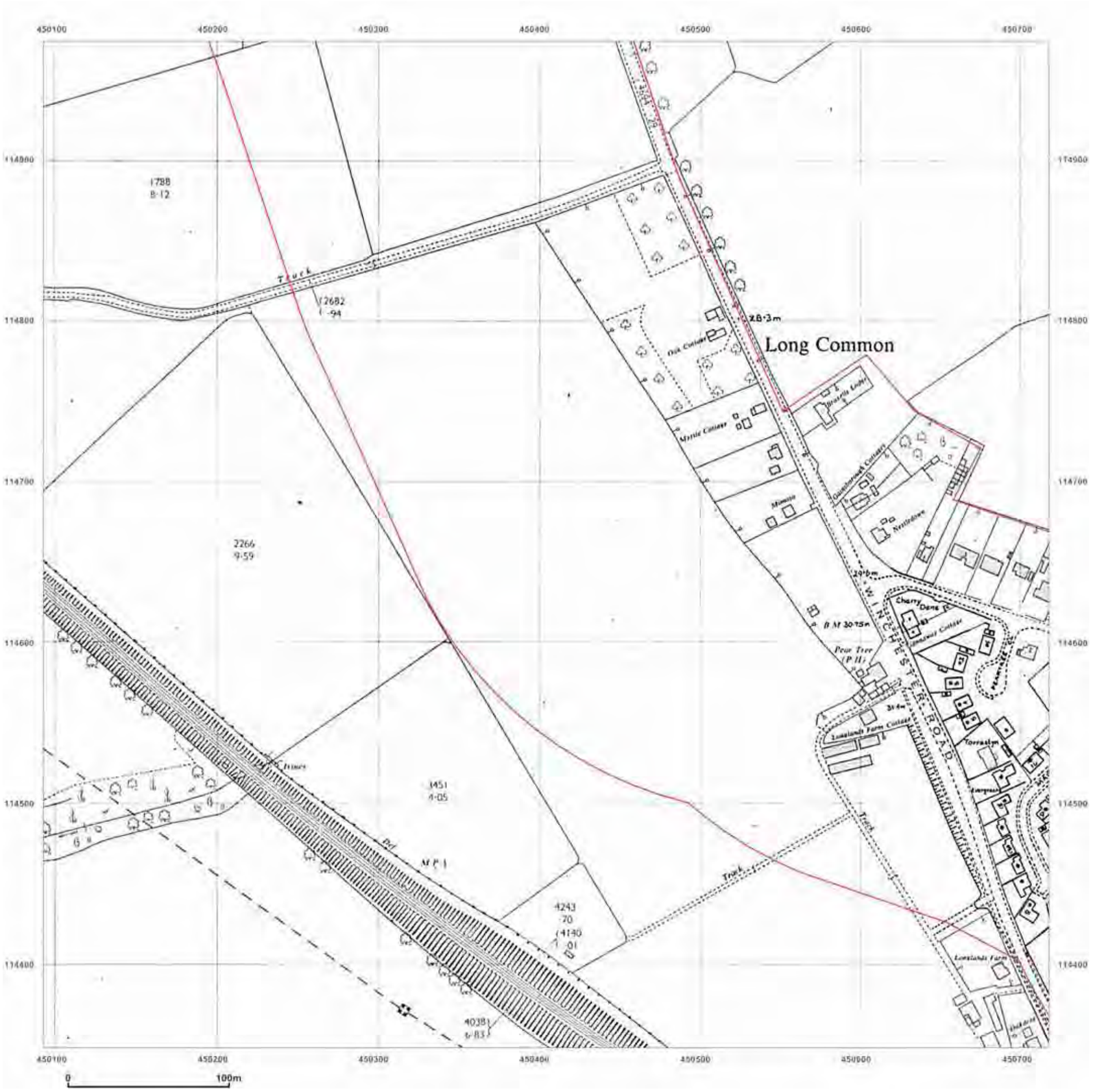
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Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: National Grid

Map date: **1980**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1959
Revised 1980
Edition N/A
Copyright 1980
Levelled 1959

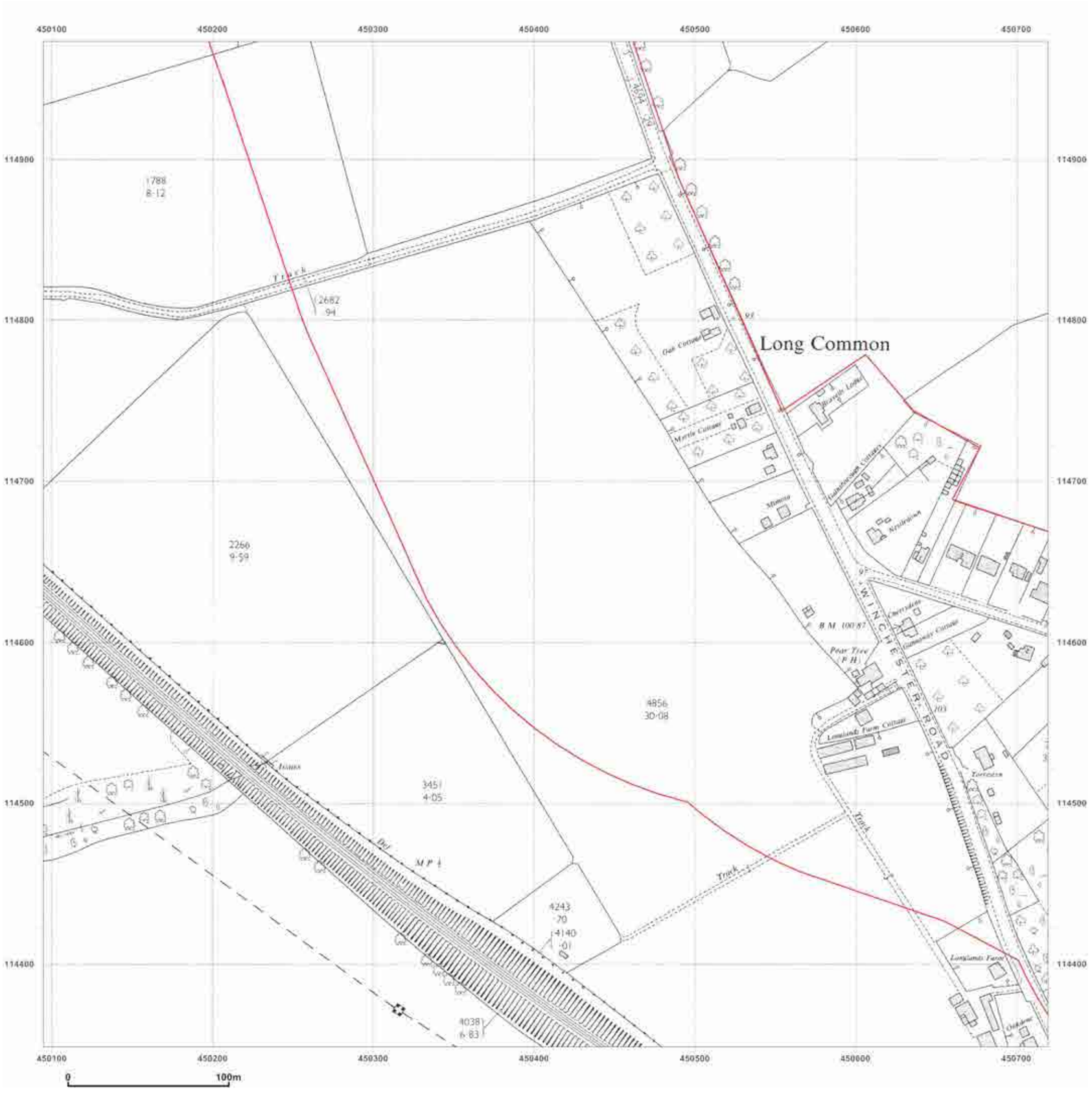
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

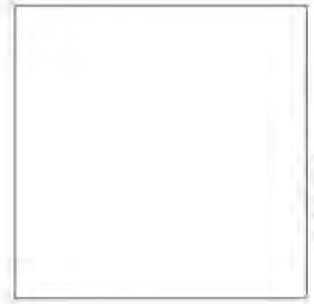
Map Name: National Grid

Map date: **1964**

Scale: 1:2,500

Printed at: 1:2,500





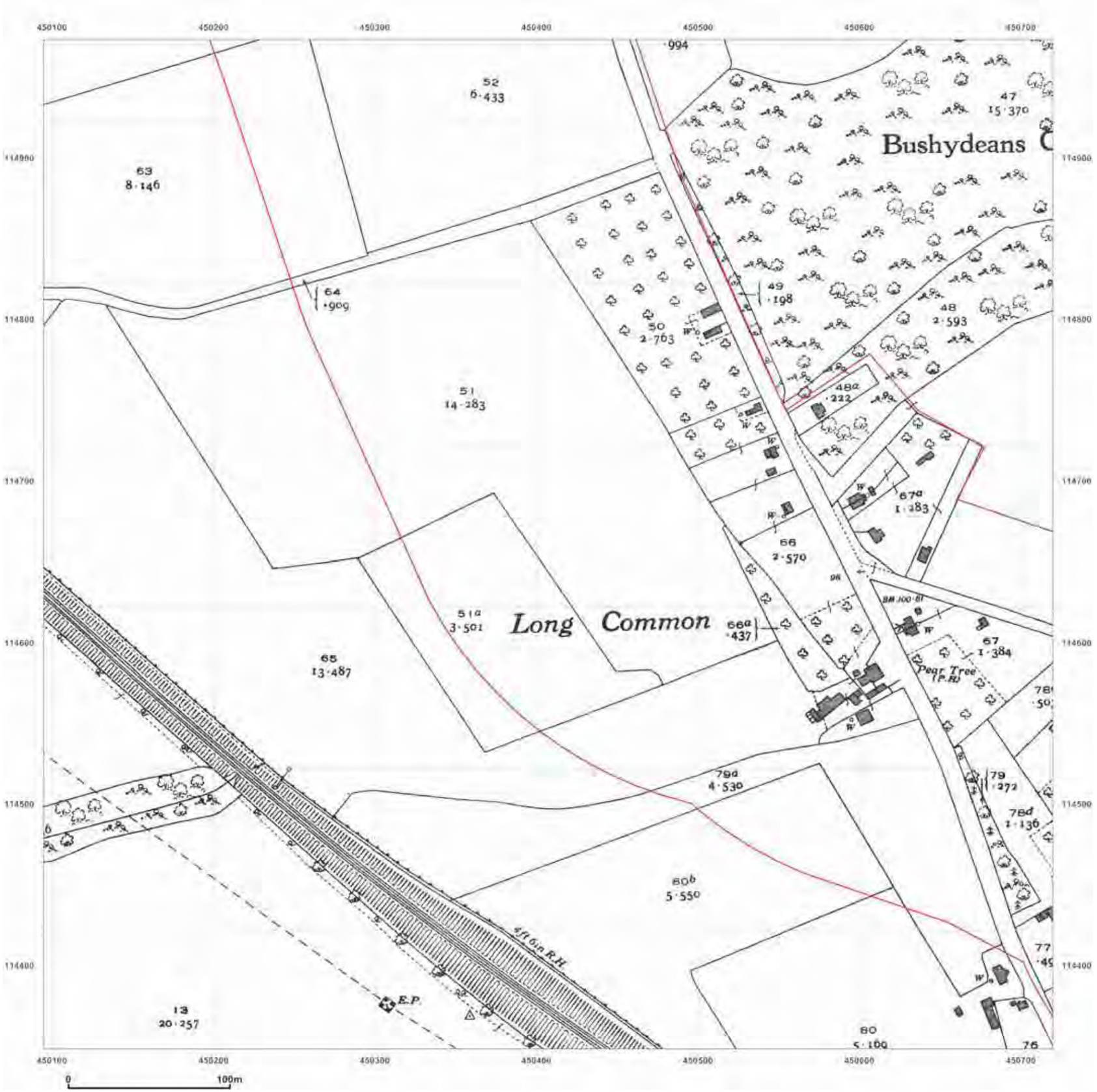
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Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: County Series

Map date: **1940**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1940
Revised 1940
Edition NA
Copyright NA
Levelled NA

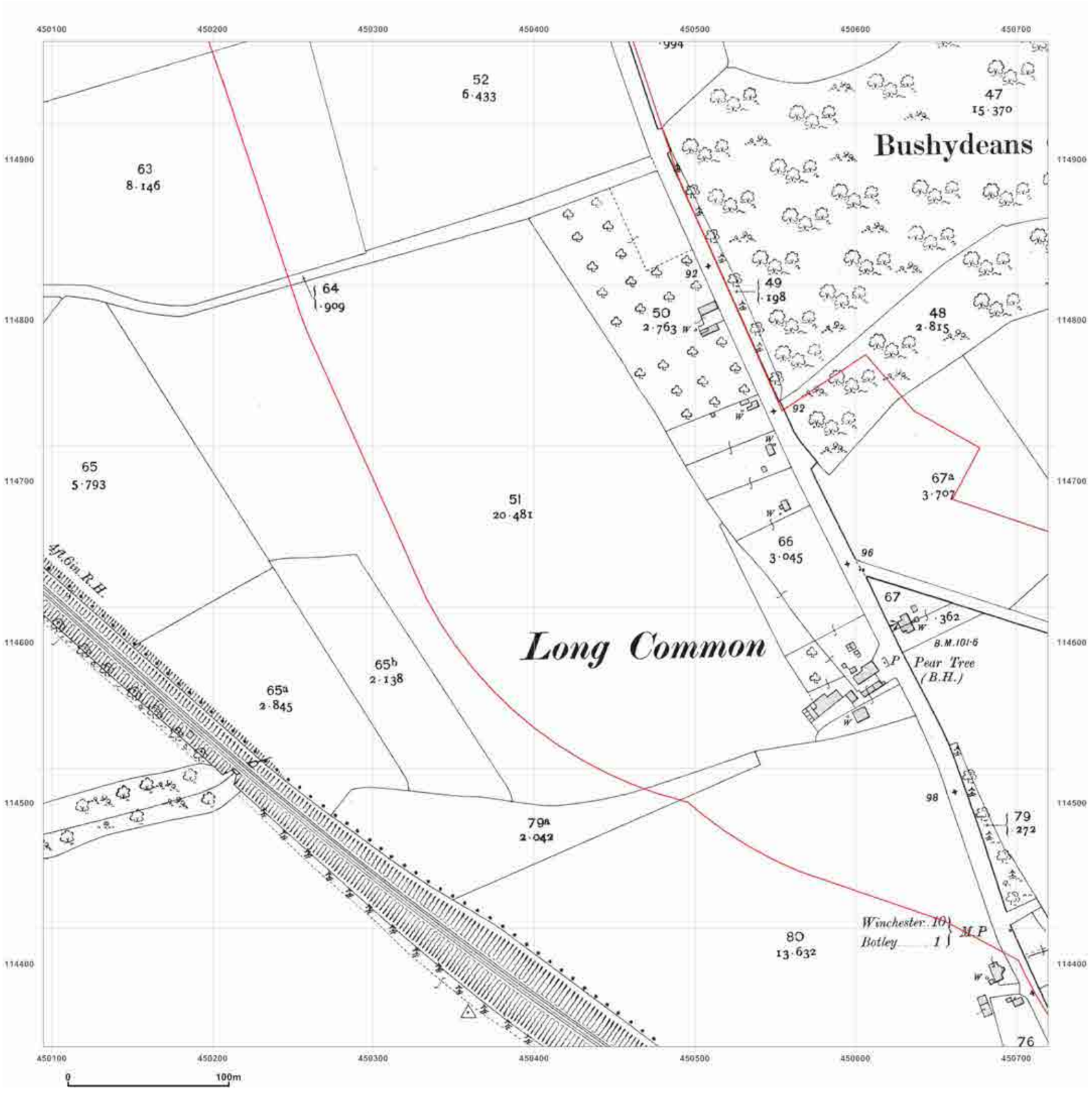
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Site Details:

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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: County Series

Map date: **1909**

Scale: 1:2,500

Printed at: 1:2,500

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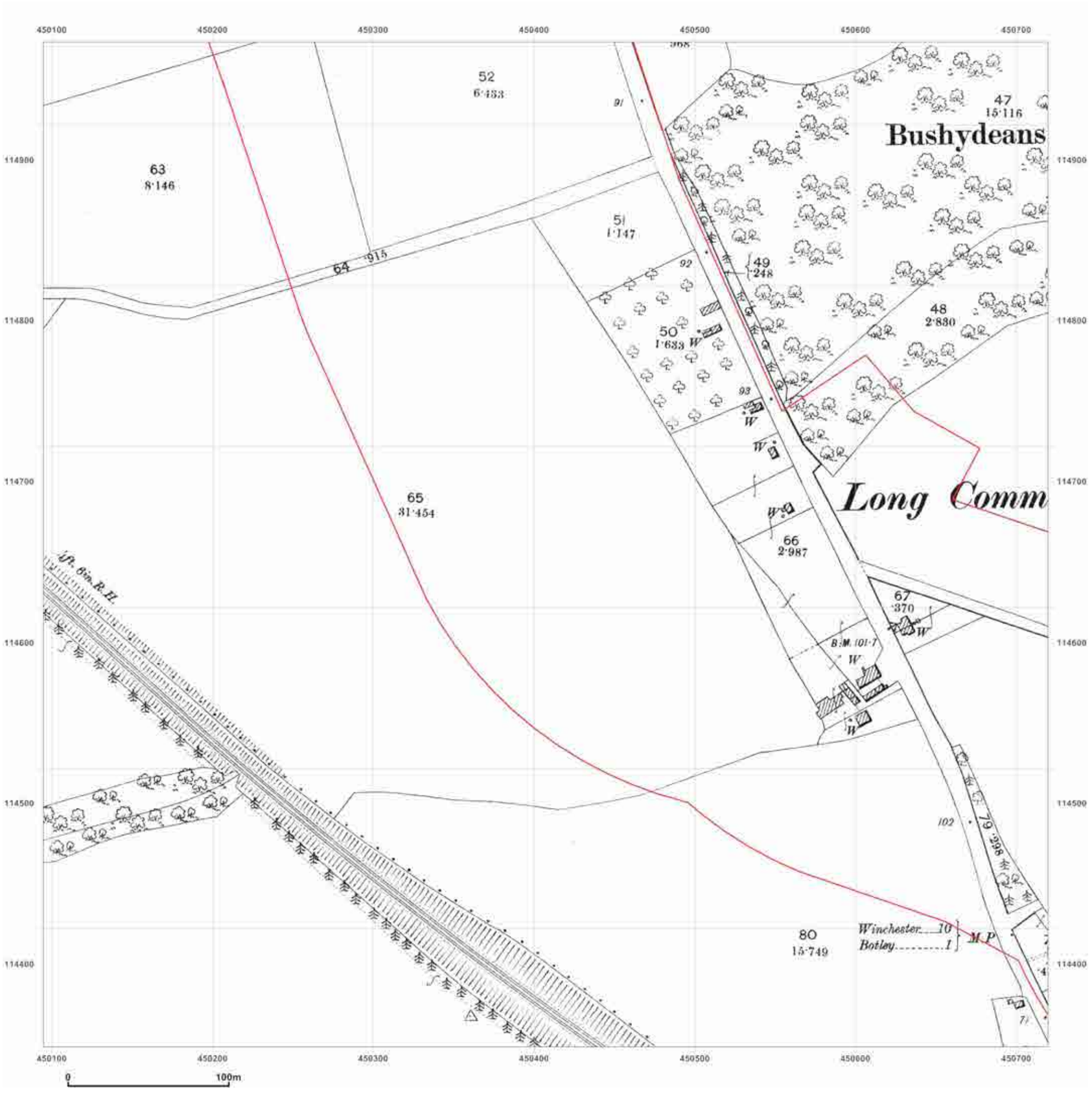
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Site Details:

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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500

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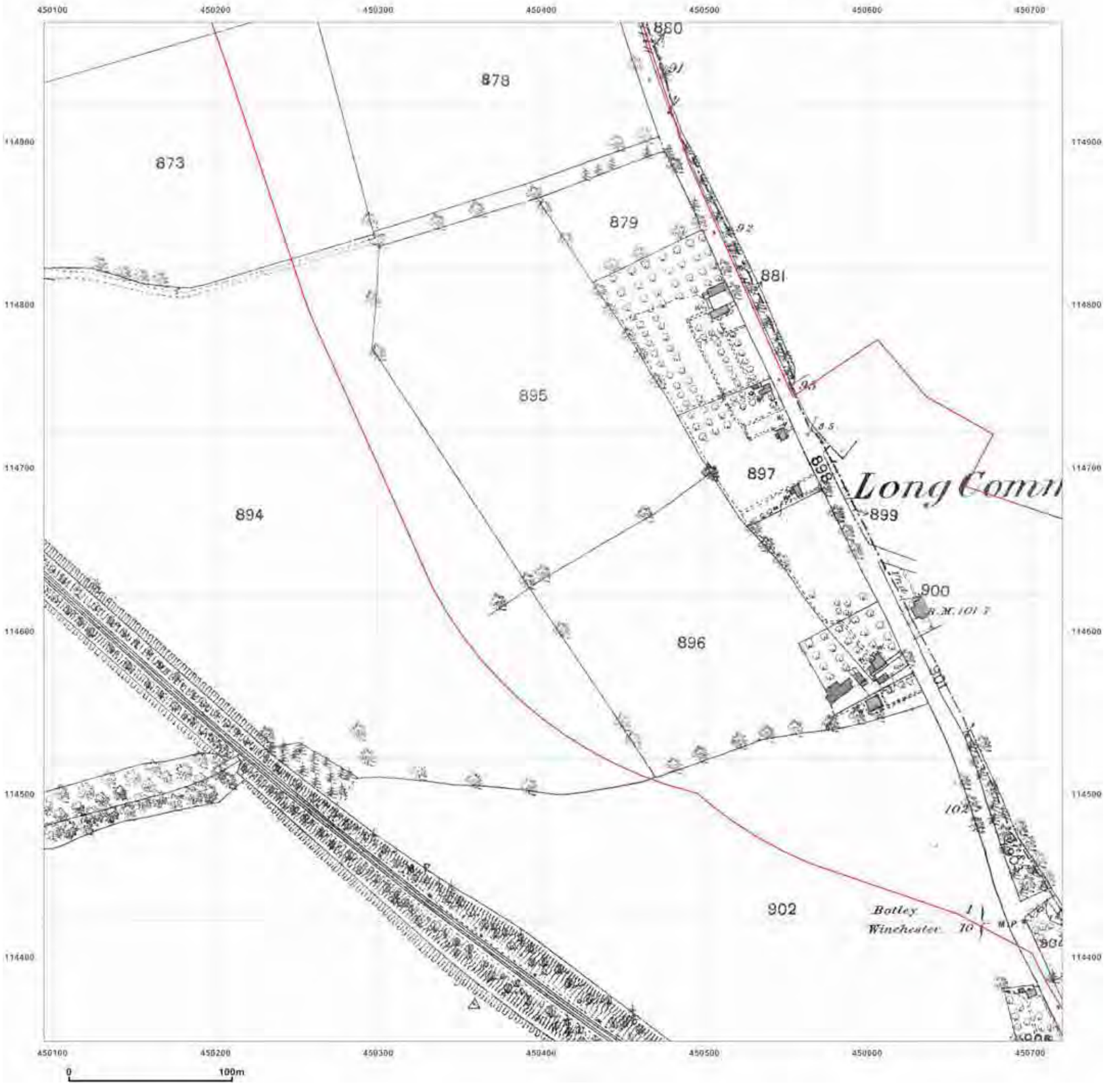
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: County Series

Map date: **1869**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1869
Revised 1869
Edition NA
Copyright NA
Levelled NA

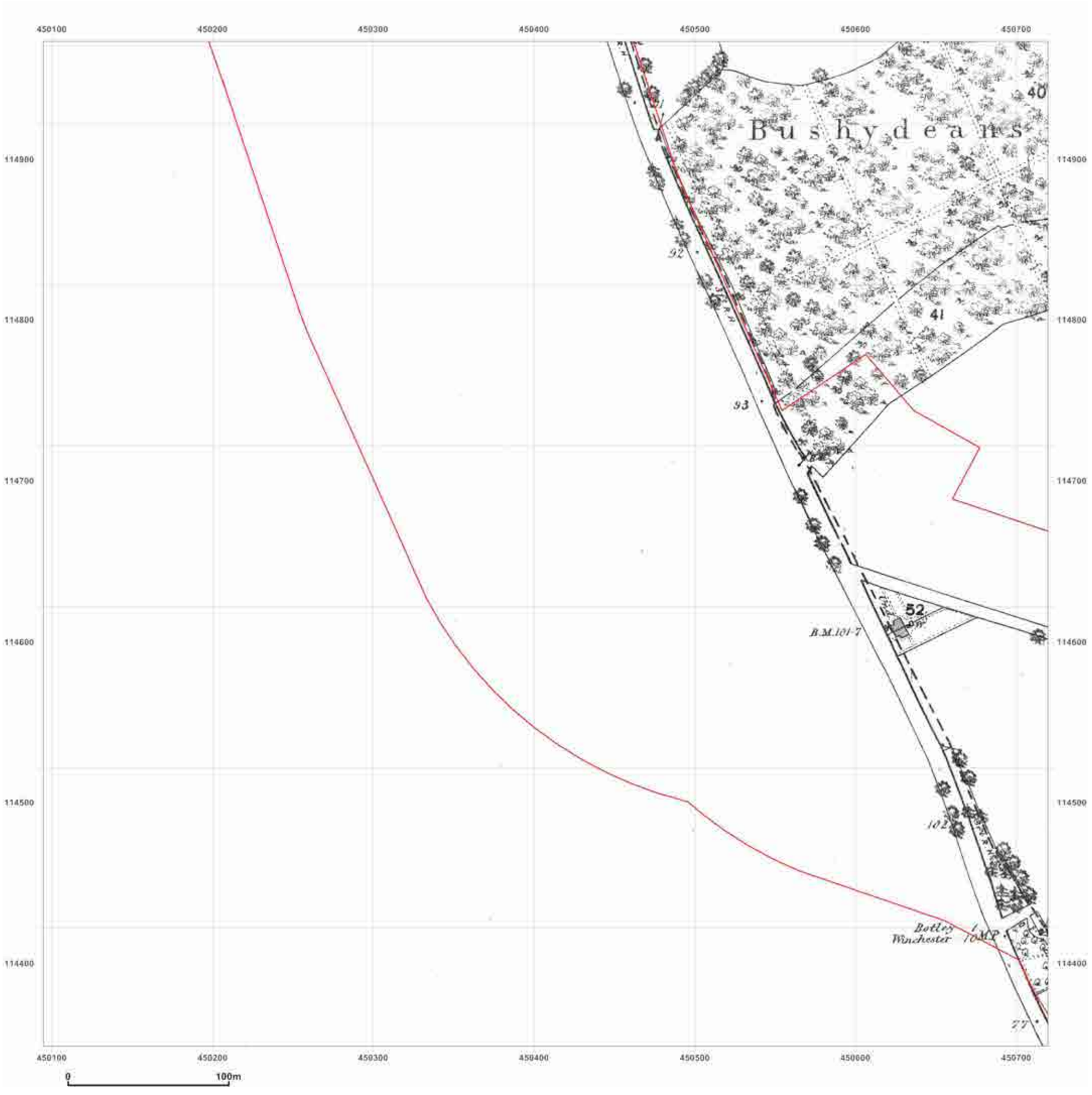
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Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_A2
Grid Ref: 450407, 114661

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

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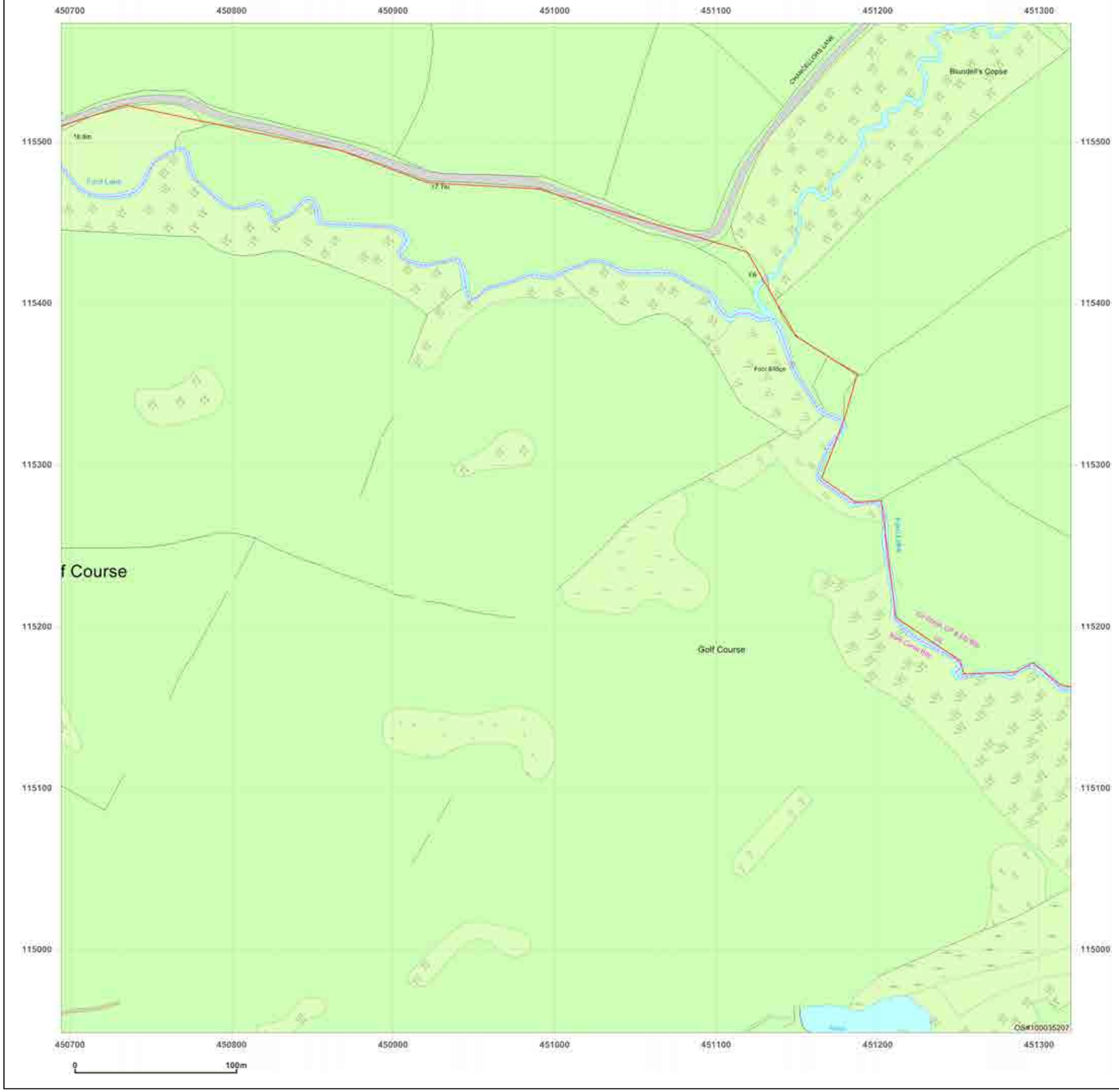
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

Map Name: MasterMap

Map date: **2011**

Scale: 1:2,500

Printed at: 1:2,500

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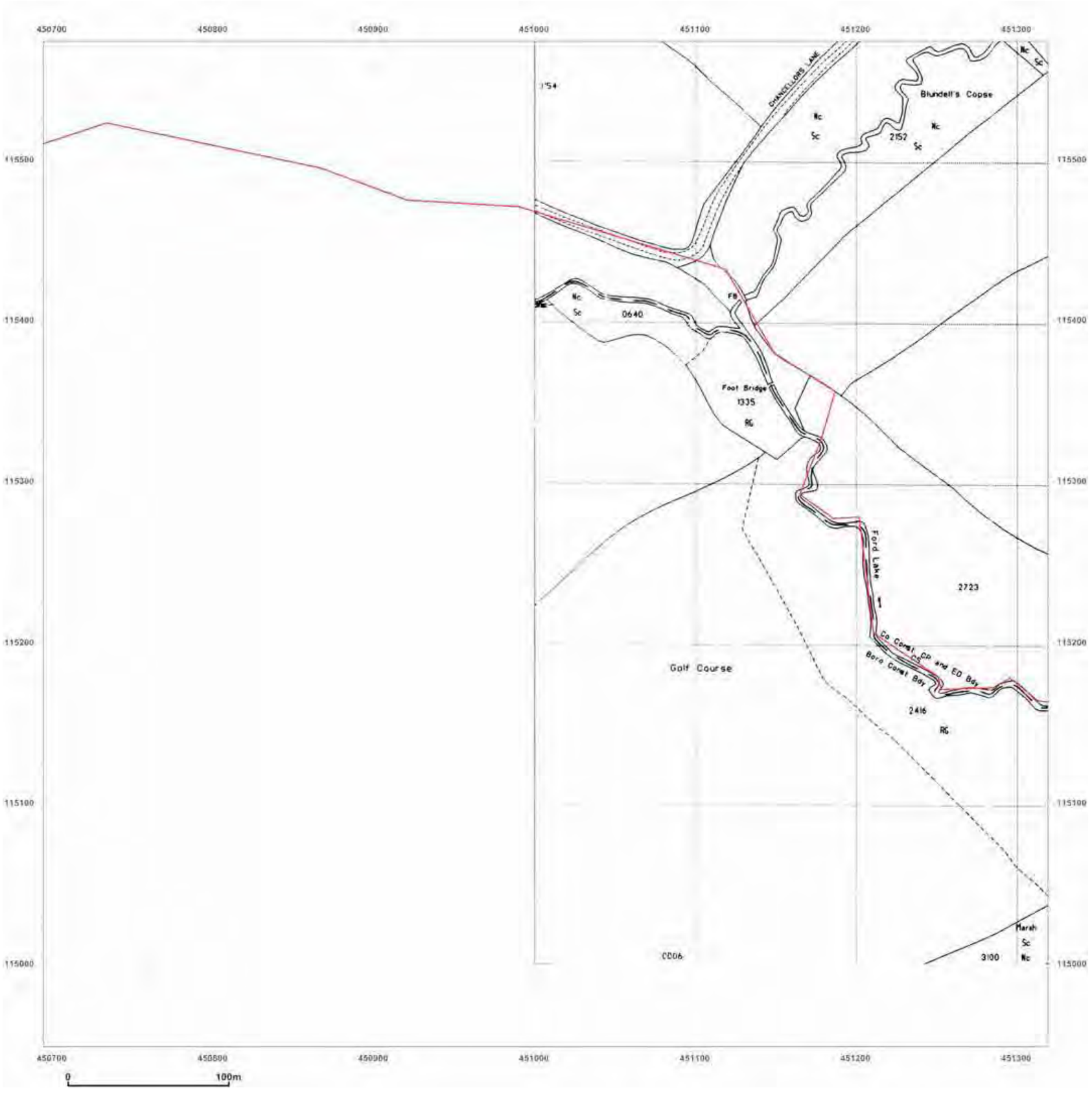
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

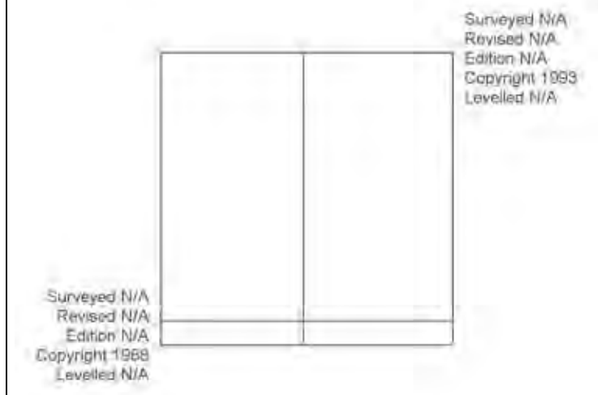
Map Name: National Grid

Map date: **1988-1993**

Scale: 1:2,500

Printed at: 1:2,500





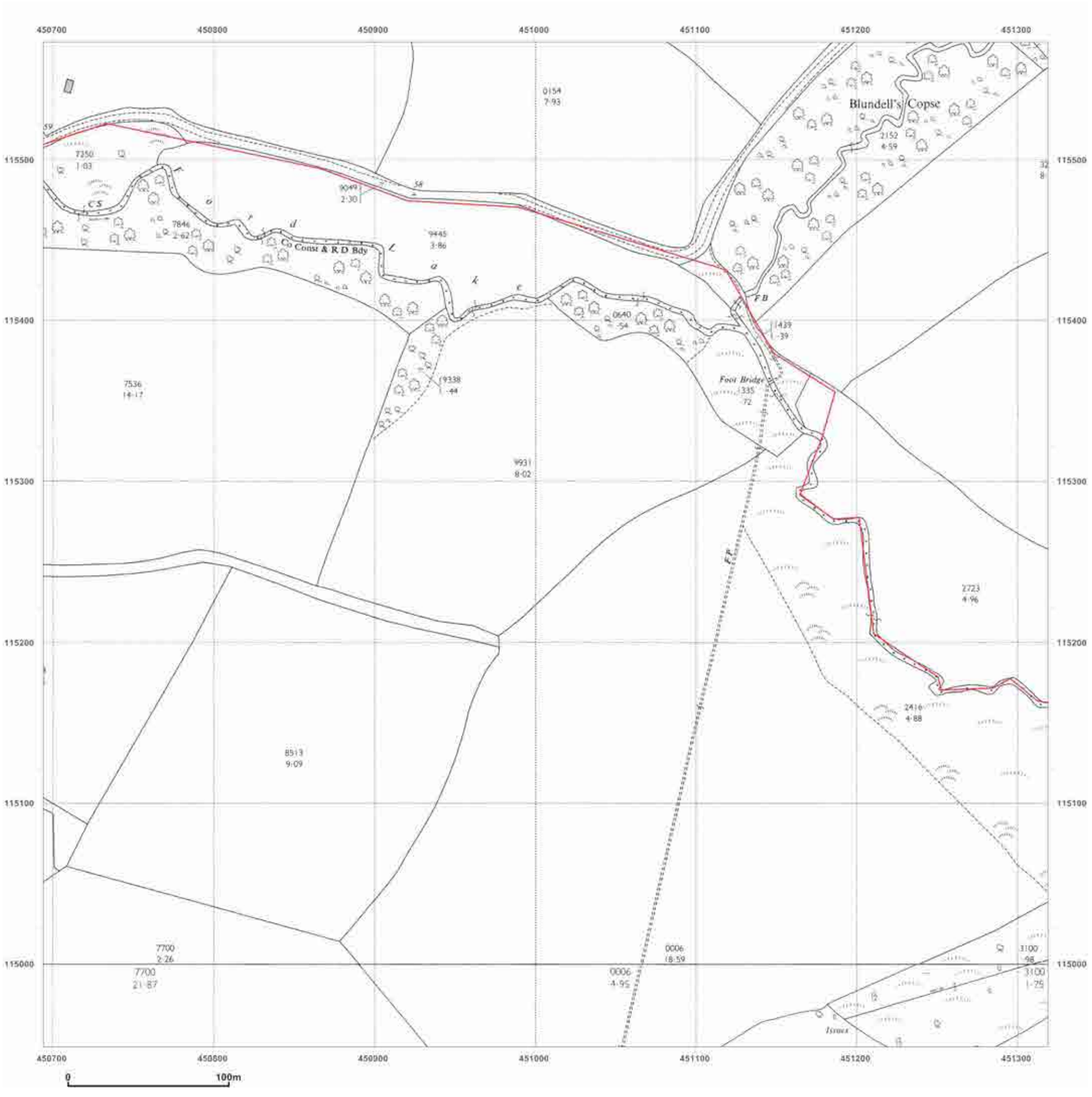
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

Map Name: National Grid

Map date: **1962-1964**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1962
Revised 1962
Edition N/A
Copyright 1963
Levelled 1959

Surveyed 1964
Revised 1964
Edition N/A
Copyright 1965
Levelled 1959

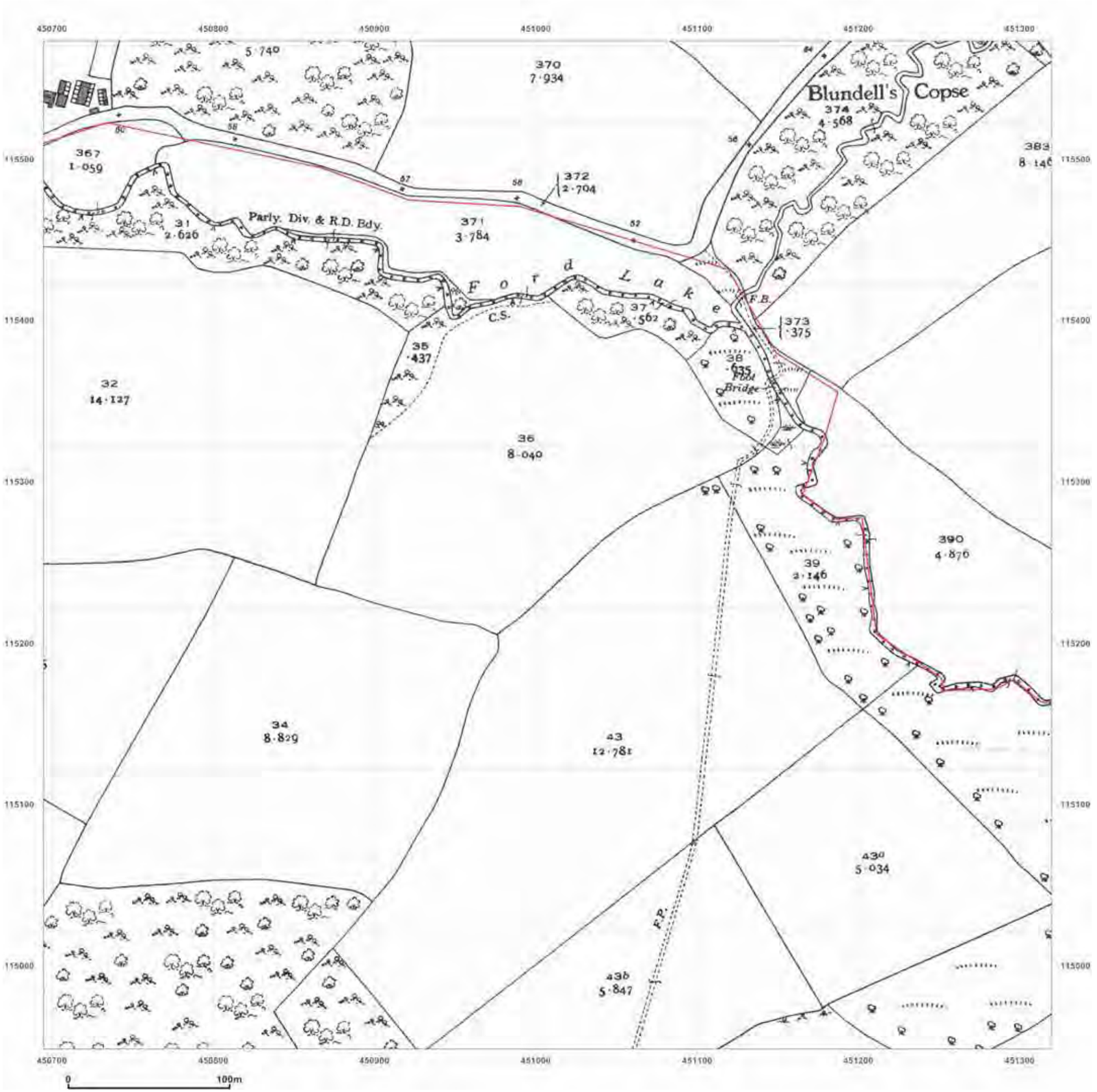
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

Map Name: County Series

Map date: **1940**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1940
Revised 1940
Edition NA
Copyright NA
Levelled NA

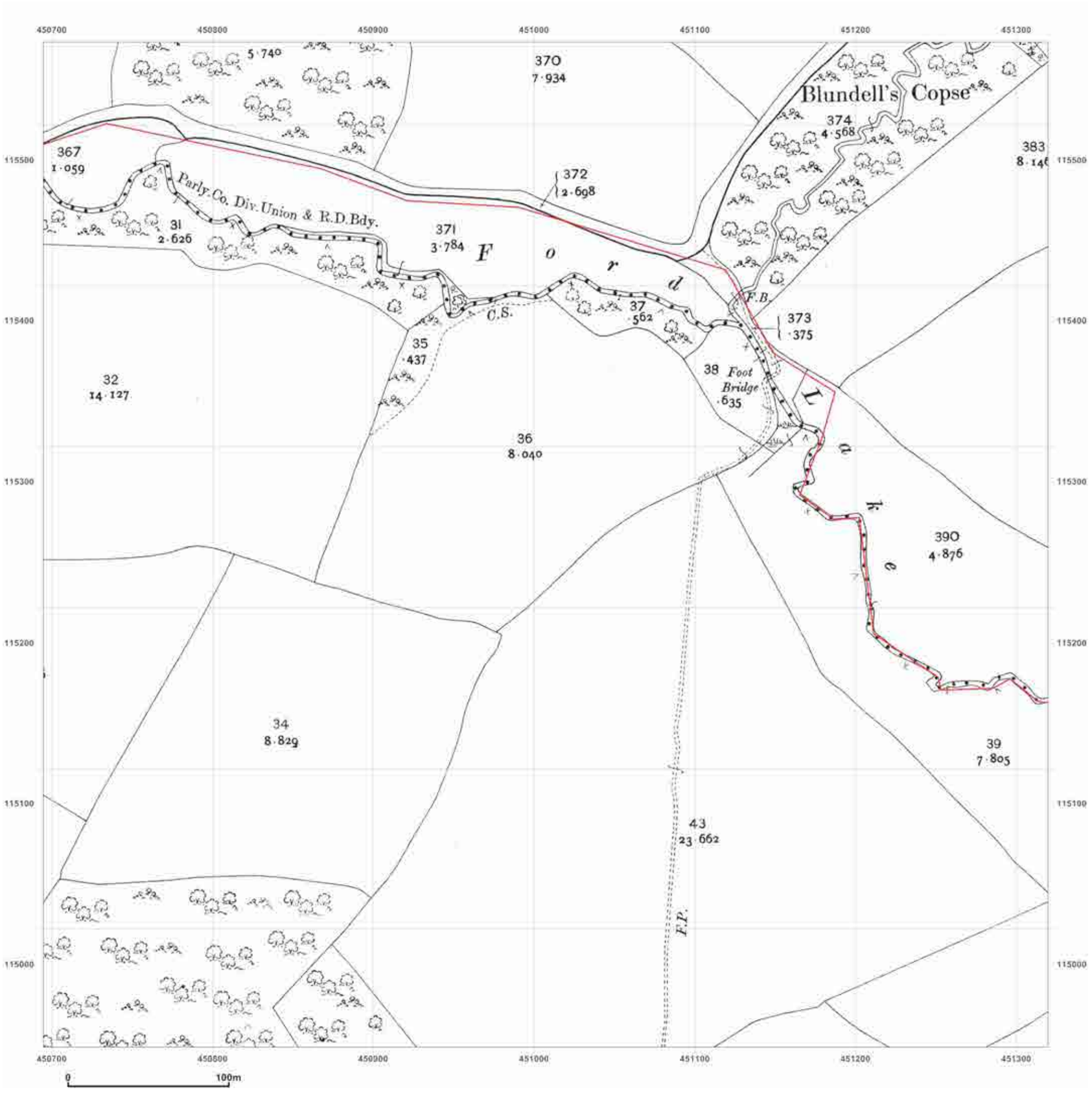
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

Map Name: County Series

Map date: **1909**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1909
Revised 1909
Edition NA
Copyright NA
Levelled NA

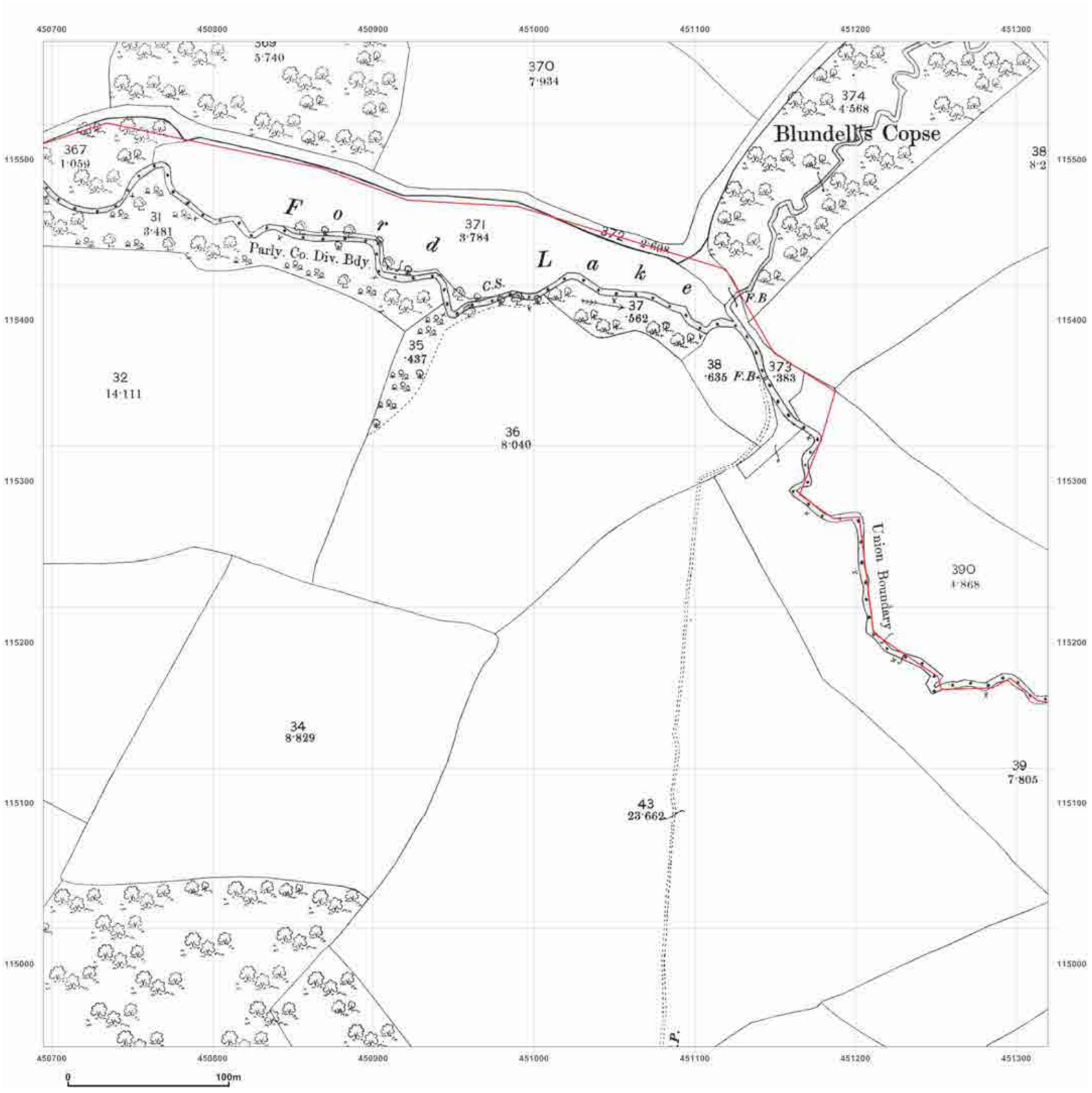
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Site Details:

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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500

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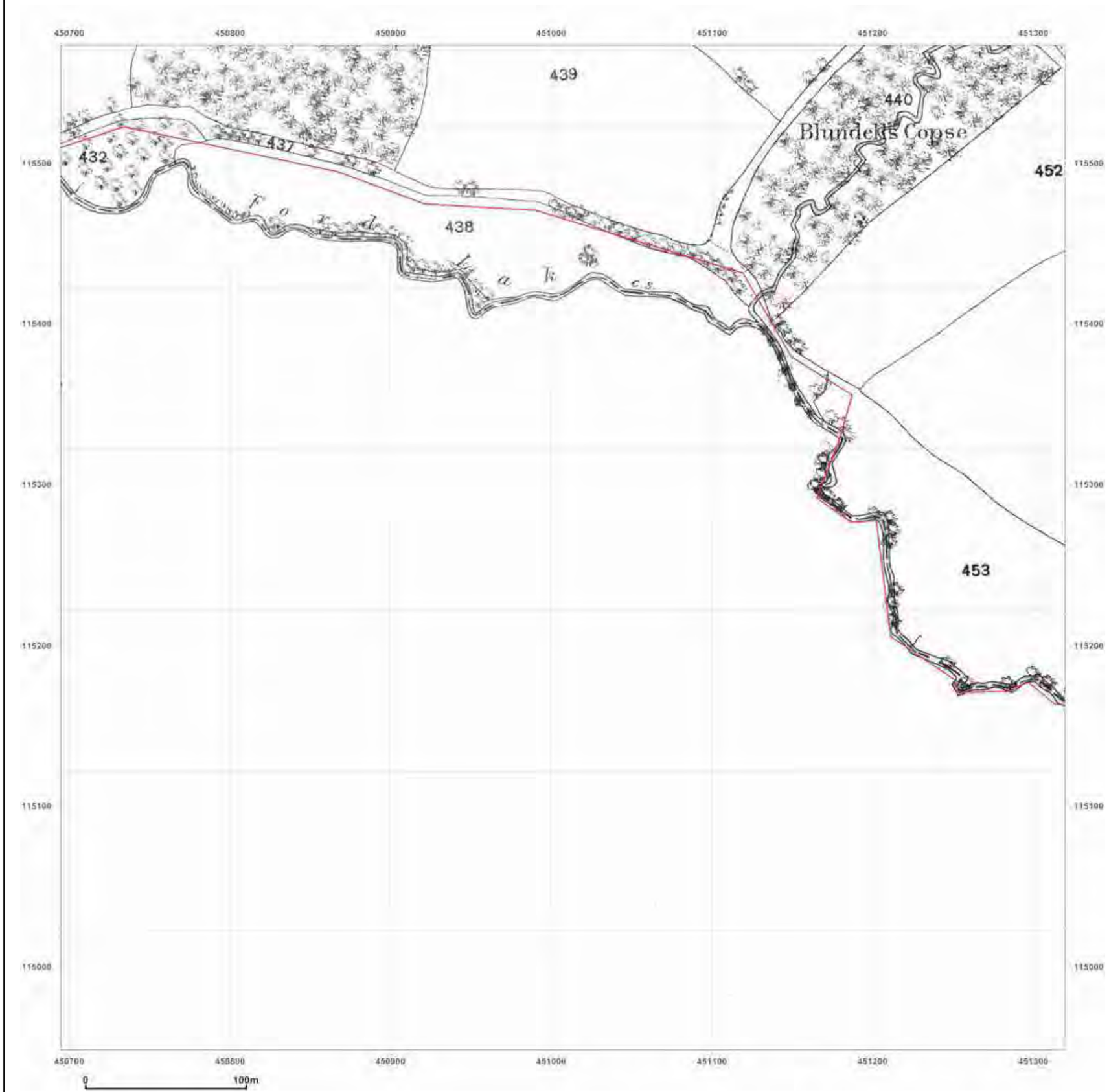
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Site Details:

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CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1868
Revised 1868
Edition NA
Copyright NA
Levelled NA

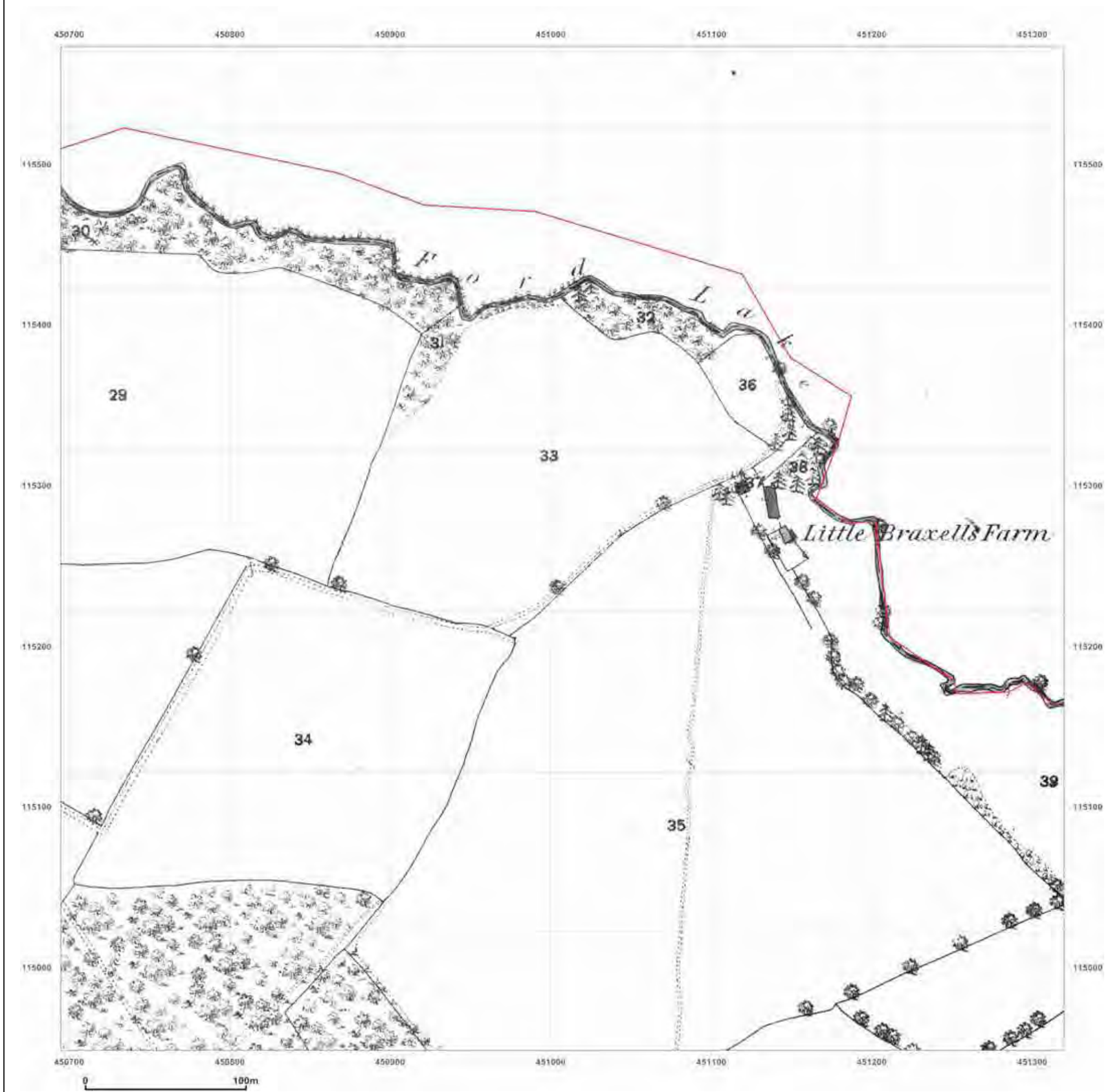
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B1
Grid Ref: 451007, 115261

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

Map Name: MasterMap

Map date: **2011**

Scale: 1:2,500

Printed at: 1:2,500

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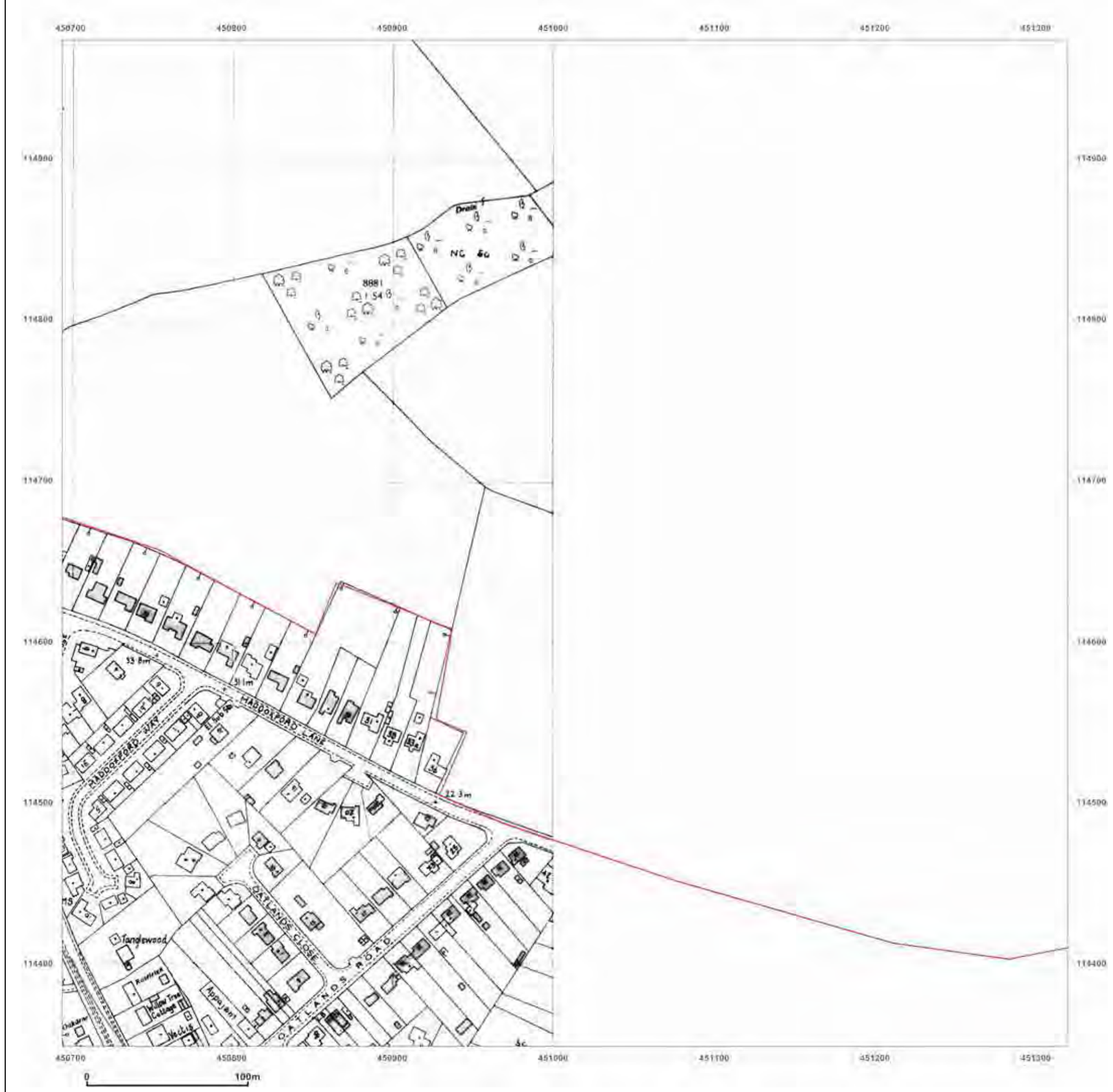
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Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

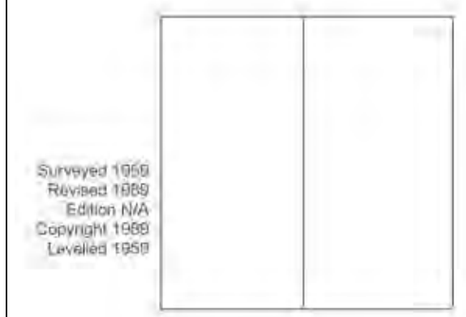
Map Name: National Grid

Map date: **1989**

Scale: 1:2,500

Printed at: 1:2,500

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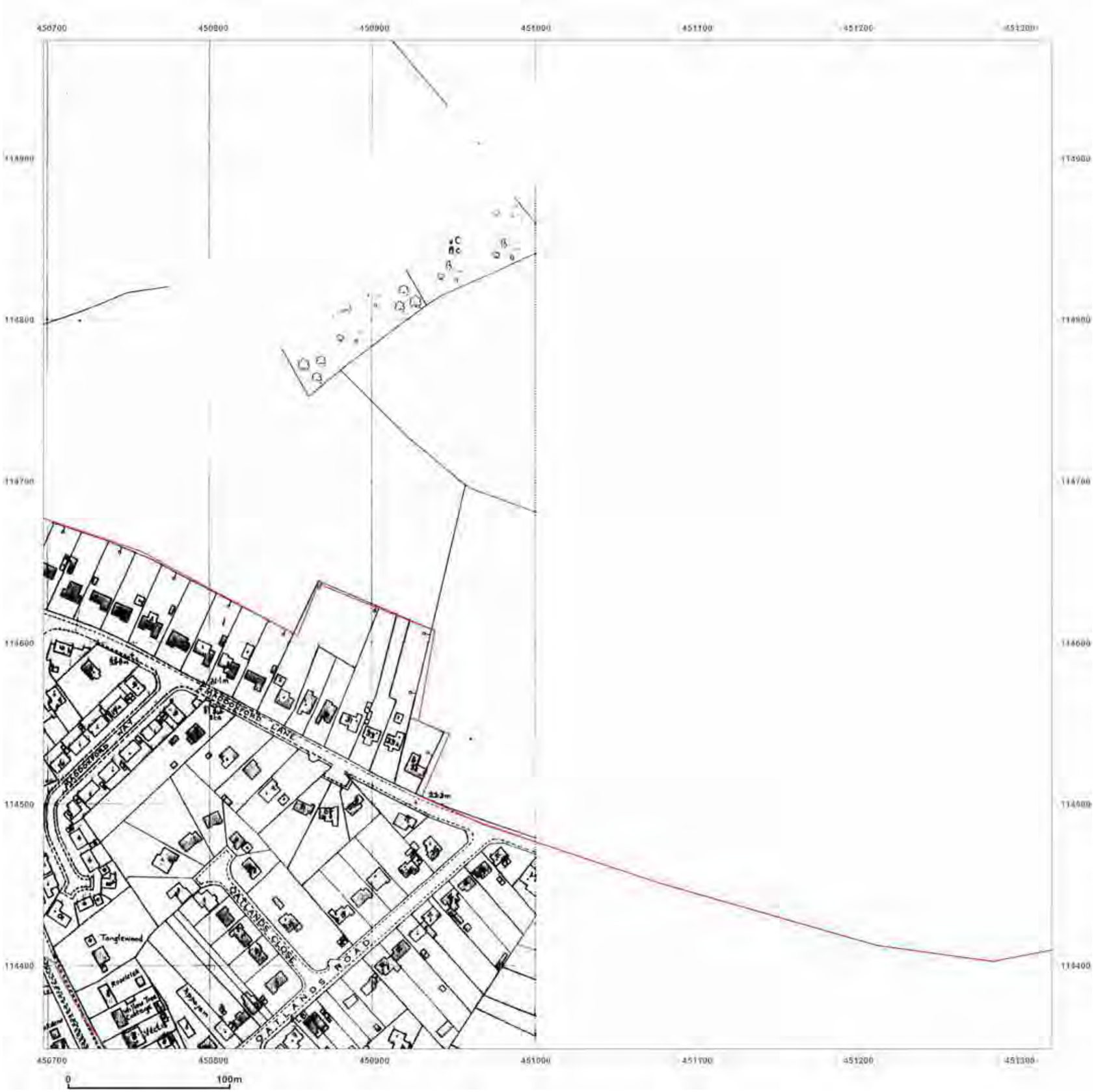
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
CROWS NEST LANE, BOTLEY,
SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

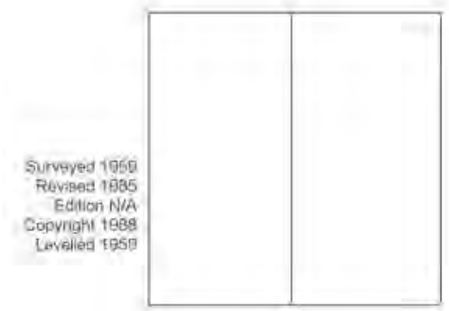
Map Name: National Grid

Map date: **1988**

Scale: 1:2,500

Printed at: 1:2,500

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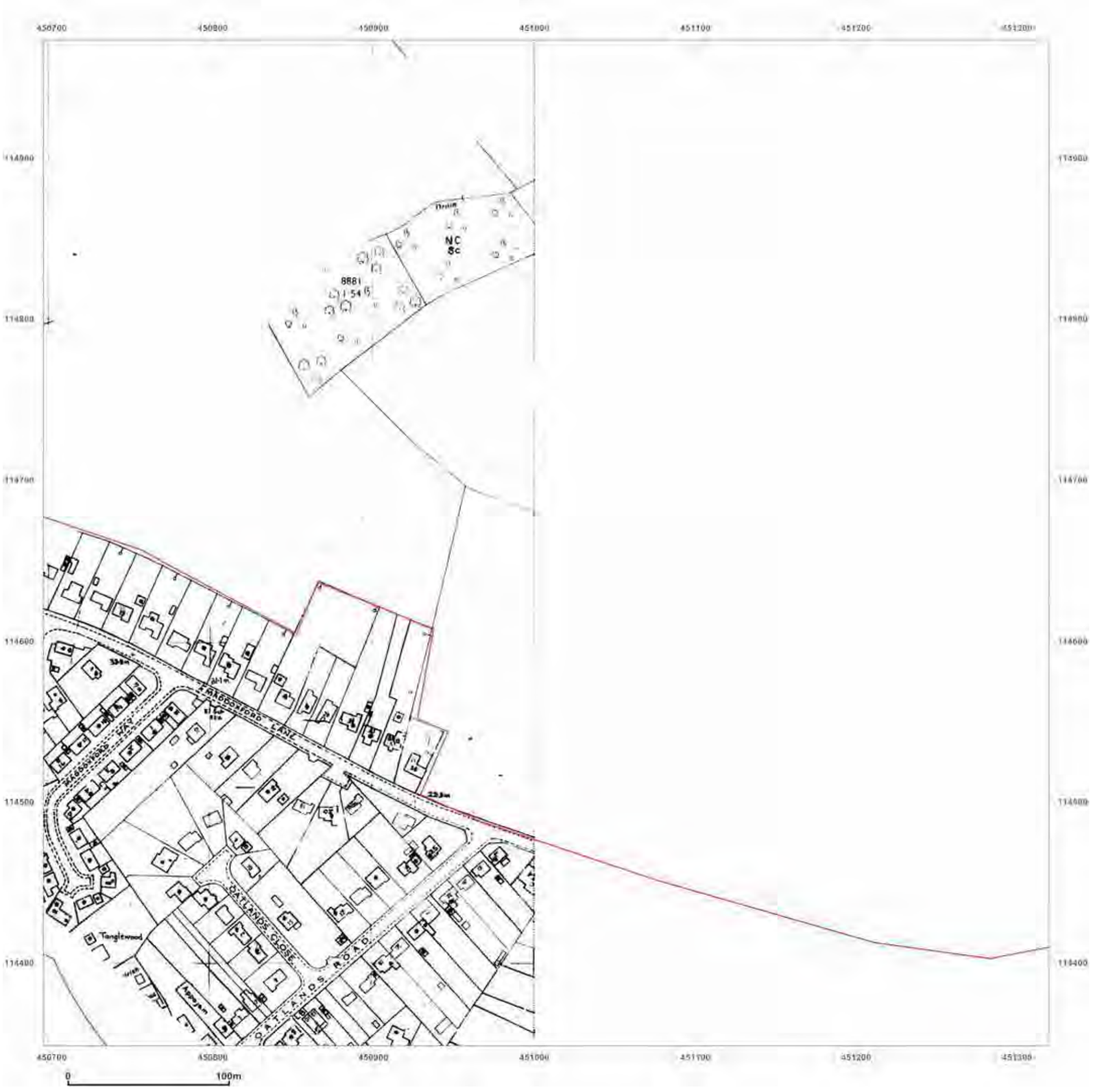
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

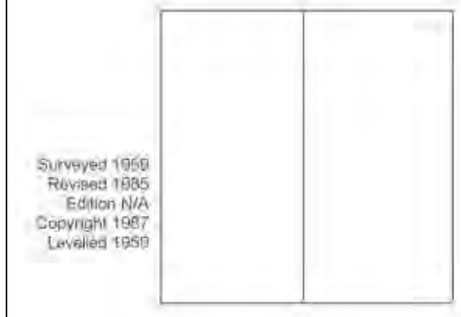
Map Name: National Grid

Map date: **1987**

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Printed at: 1:2,500

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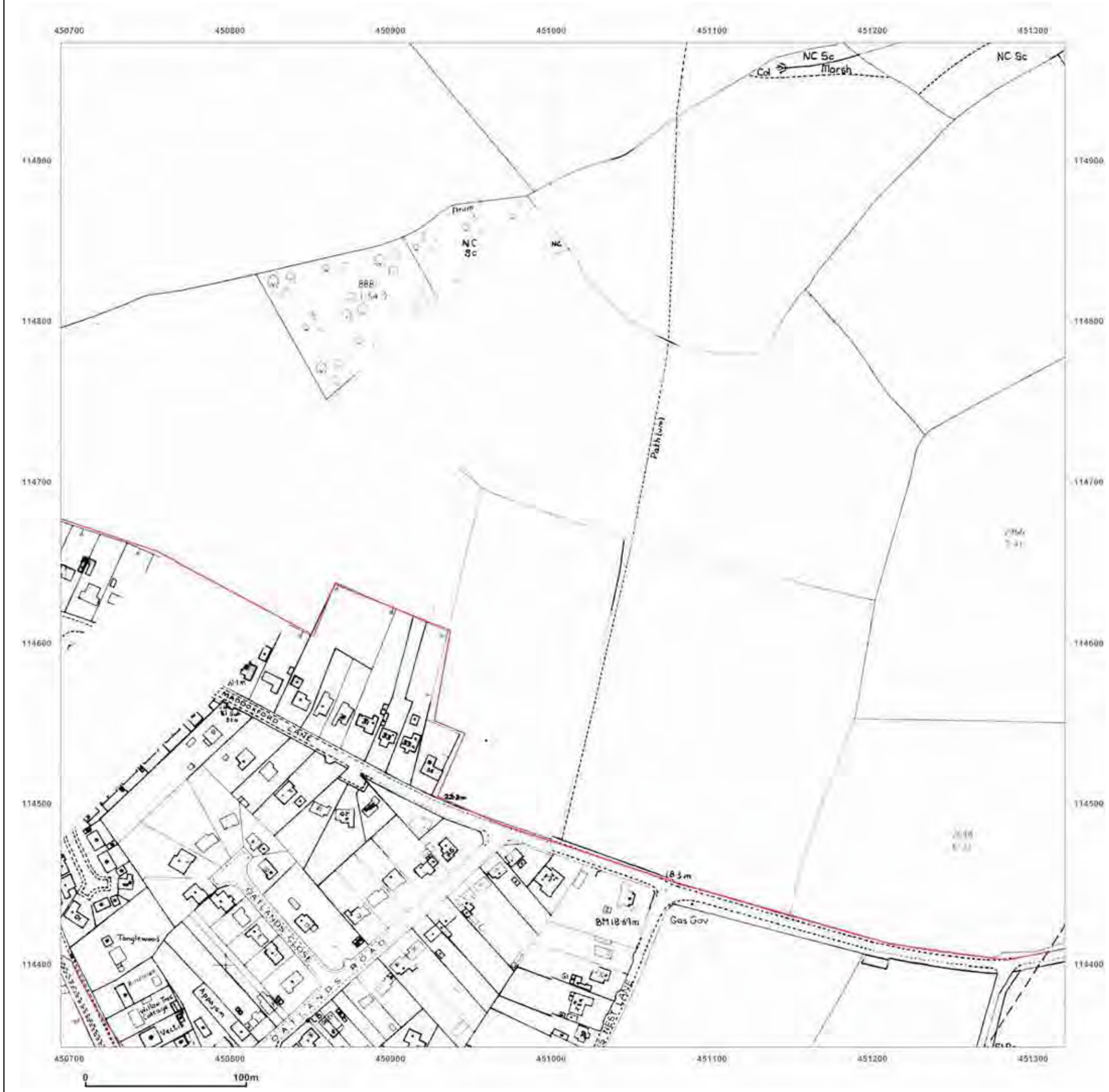
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ENVIRONMENTAL INSIGHT

Site Details:

NORTH BOORLEY GREEN,
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

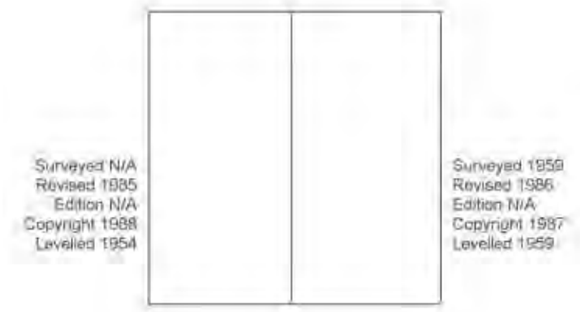
Map Name: National Grid

Map date: **1985-1987**

Scale: 1:2,500

Printed at: 1:2,500

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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

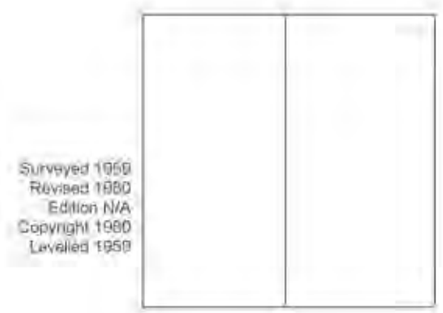
Map Name: National Grid

Map date: **1980**

Scale: 1:2,500

Printed at: 1:2,500

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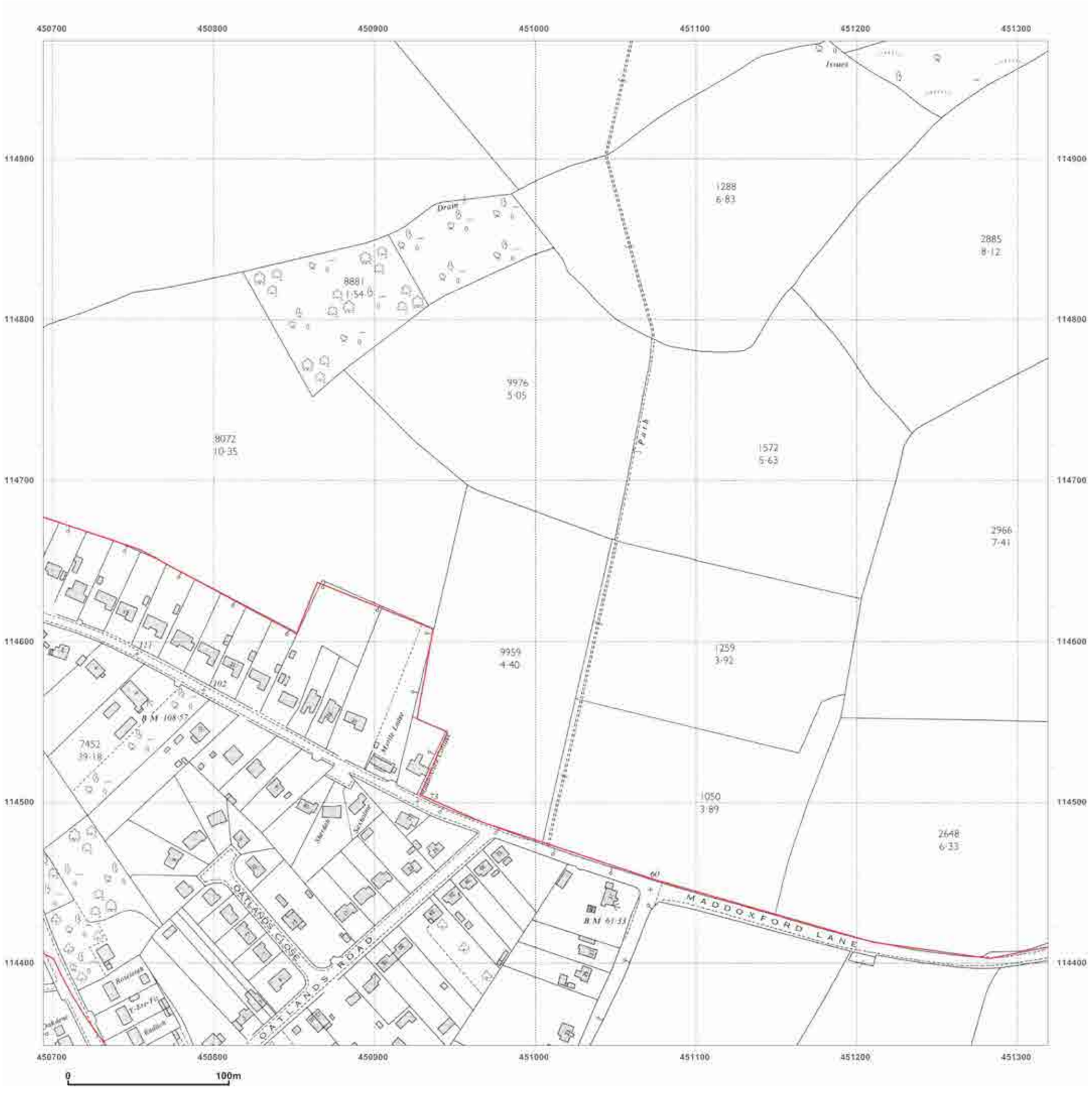
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Site Details:

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Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

Map Name: National Grid

Map date: **1964**

Scale: 1:2,500

Printed at: 1:2,500





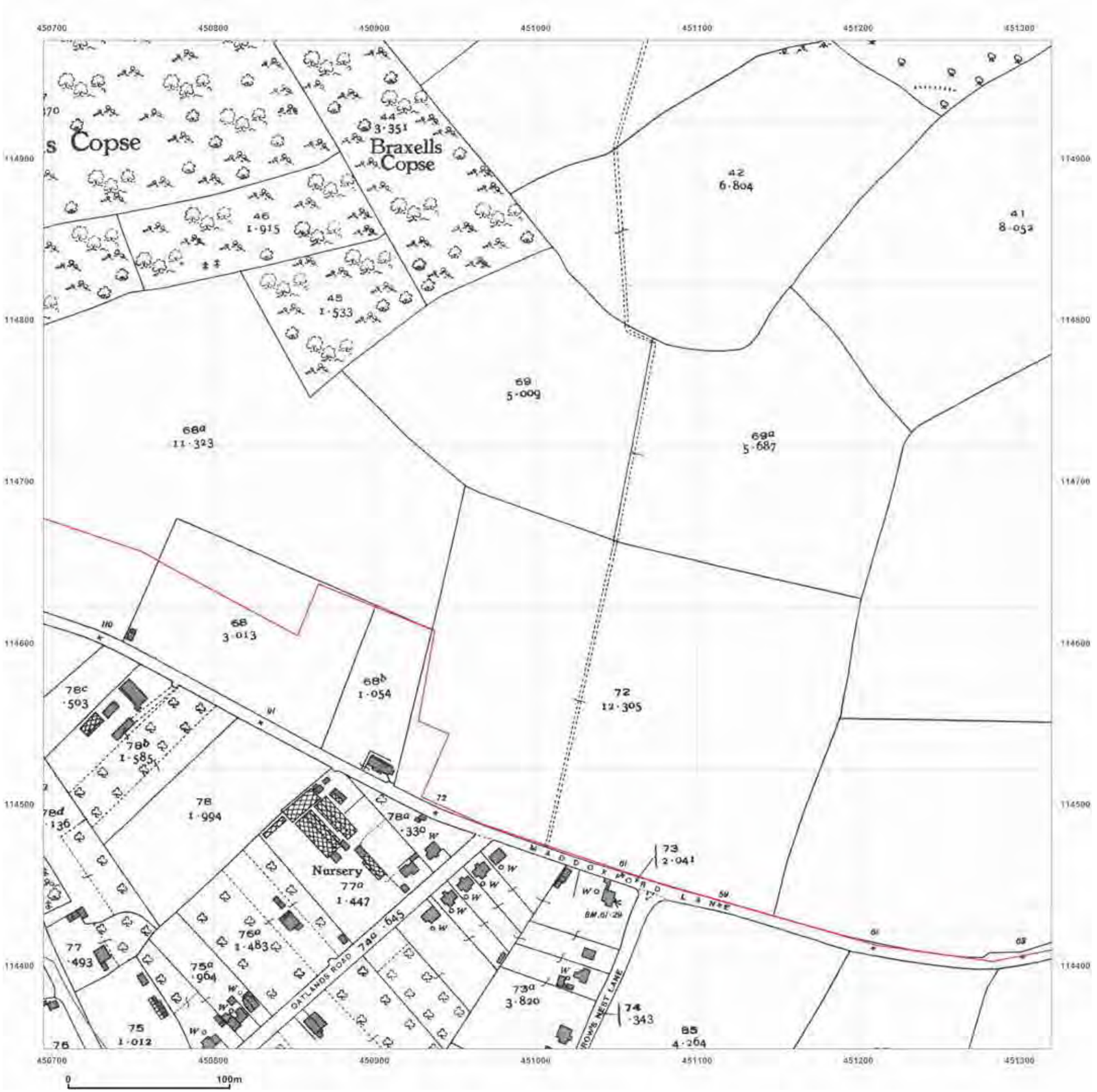
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

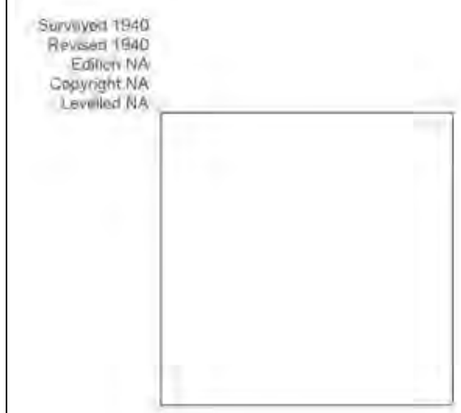
Map Name: County Series

Map date: **1940**

Scale: 1:2,500

Printed at: 1:2,500

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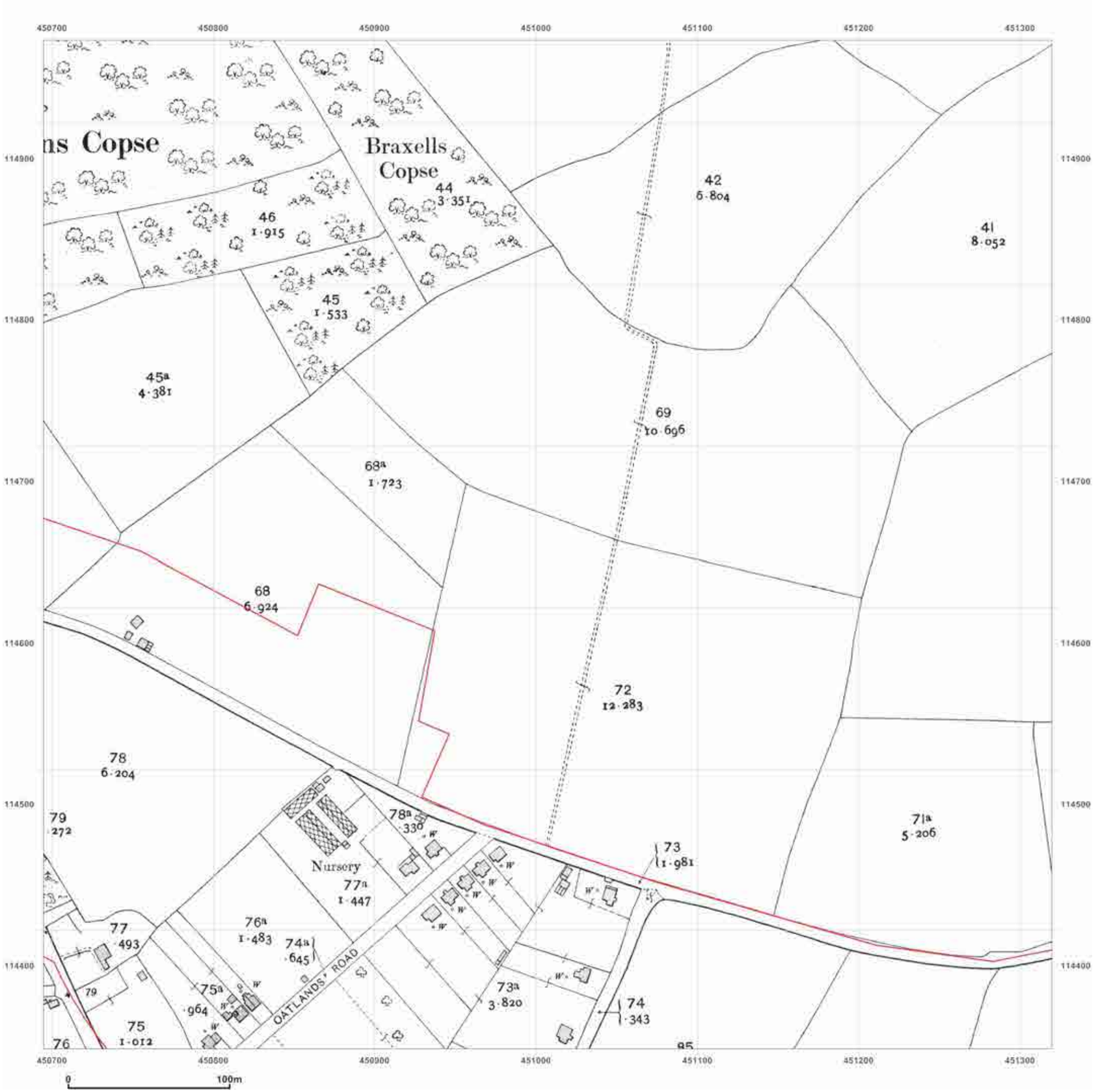
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Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

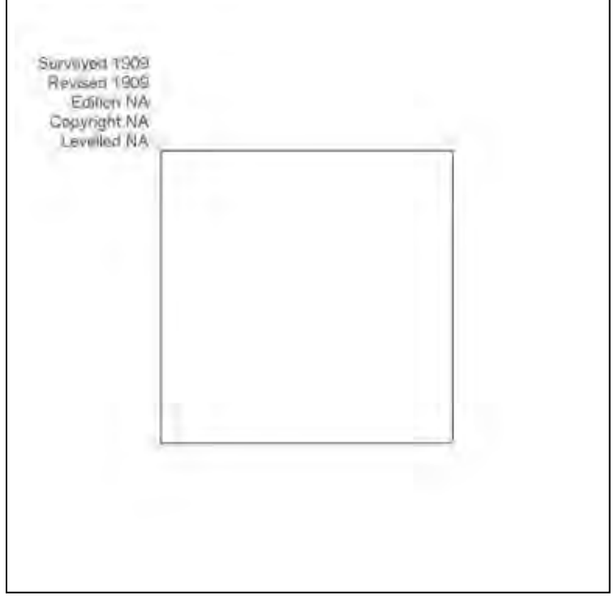
Map Name: County Series

Map date: **1909**

Scale: 1:2,500

Printed at: 1:2,500

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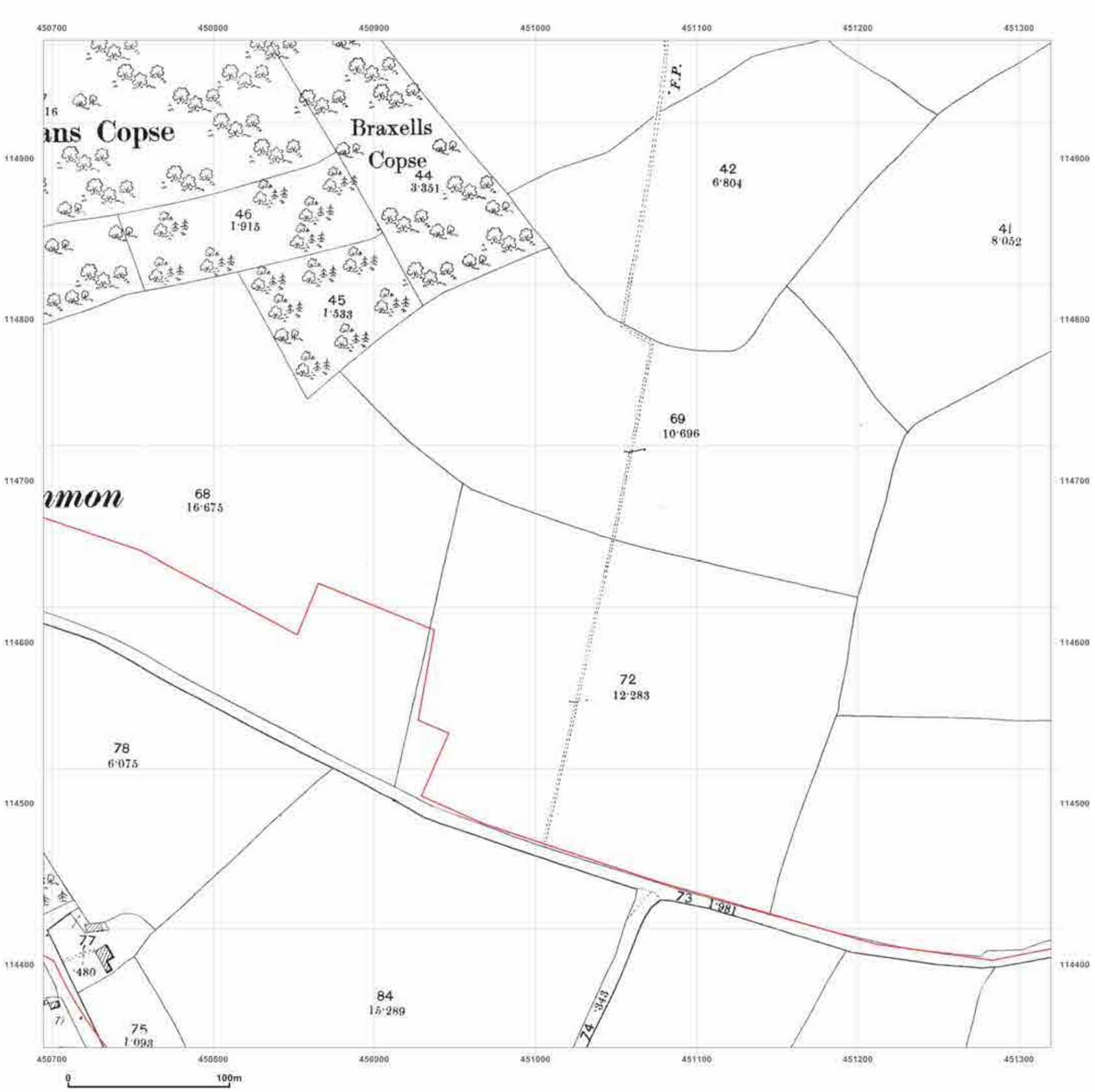
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Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

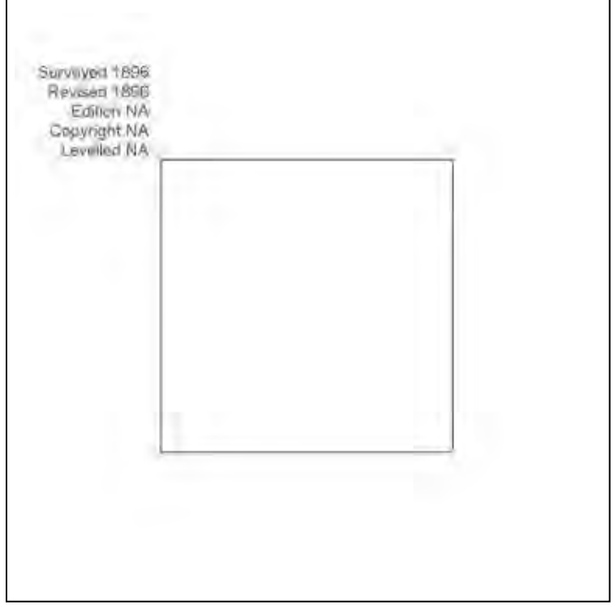
Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500

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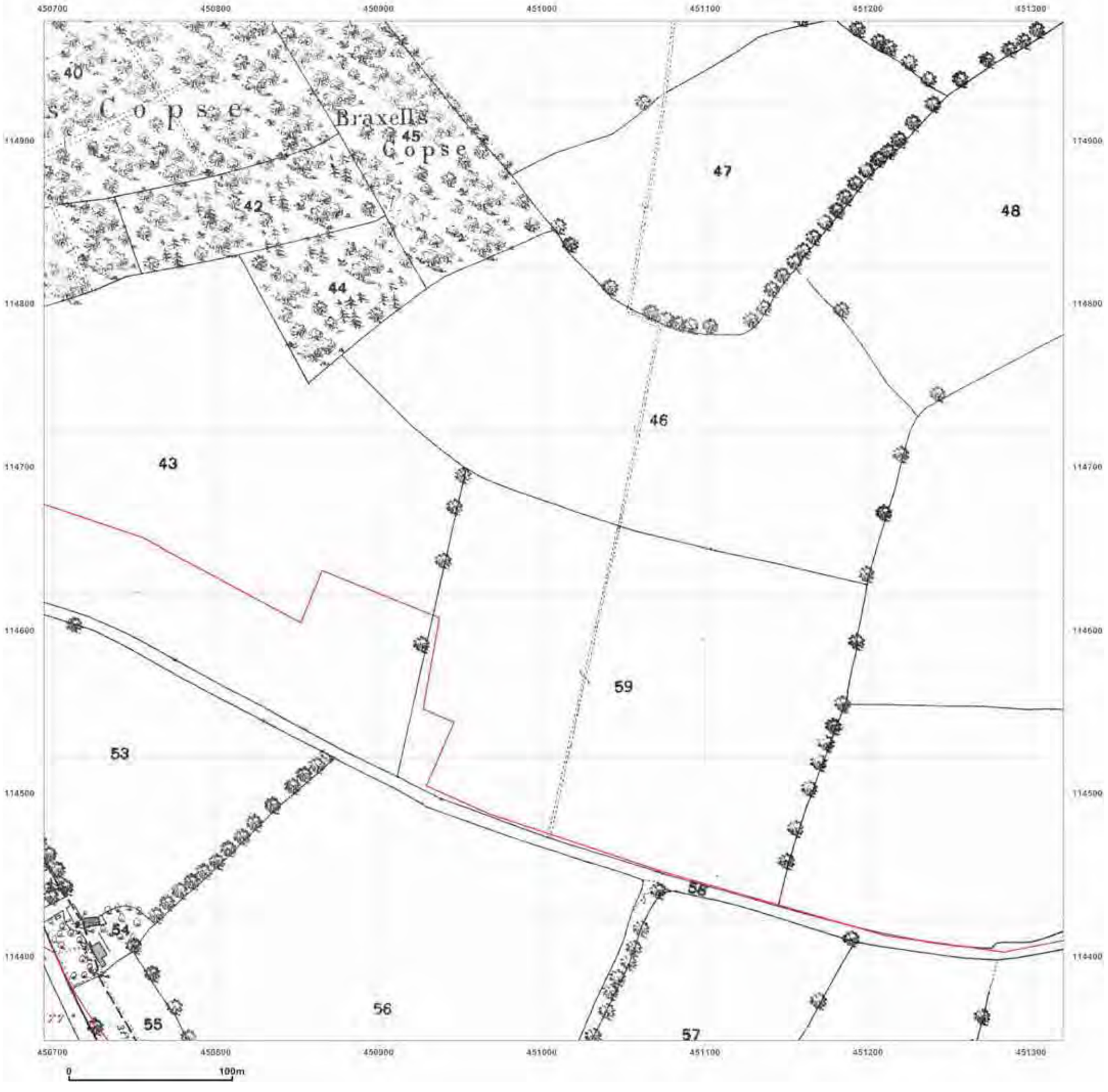
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Client Ref: J10856
Report Ref: HMD-137-204553_B2
Grid Ref: 451007, 114661

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

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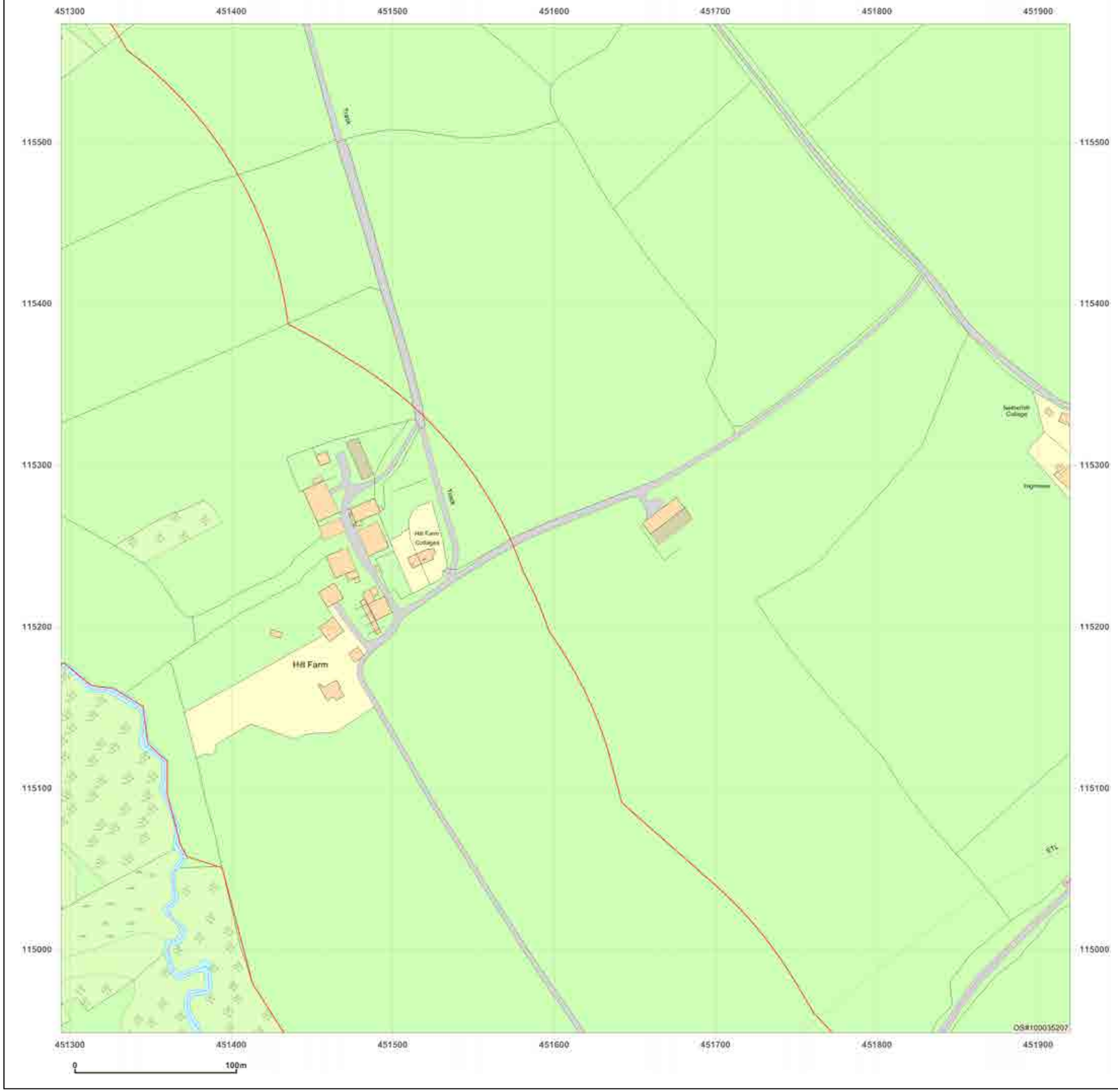
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Site Details:

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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_C1
Grid Ref: 451607, 115261

Map Name: MasterMap

Map date: **2011**

Scale: 1:2,500

Printed at: 1:2,500

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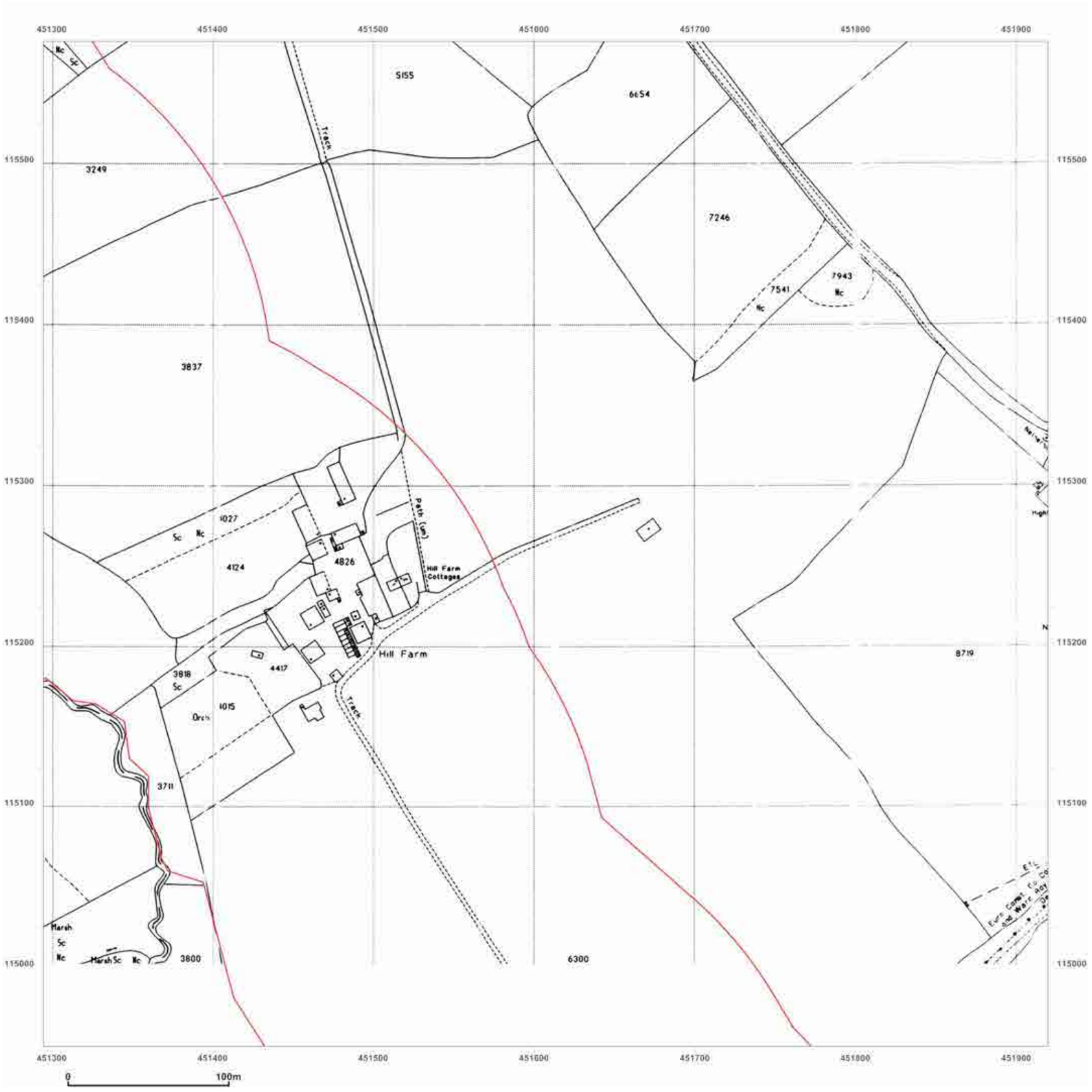
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_C1
Grid Ref: 451607, 115261

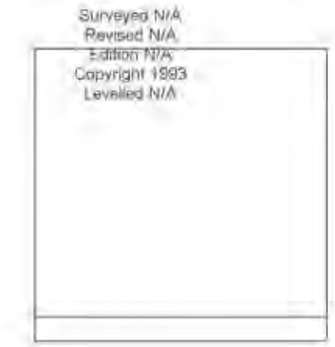
Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

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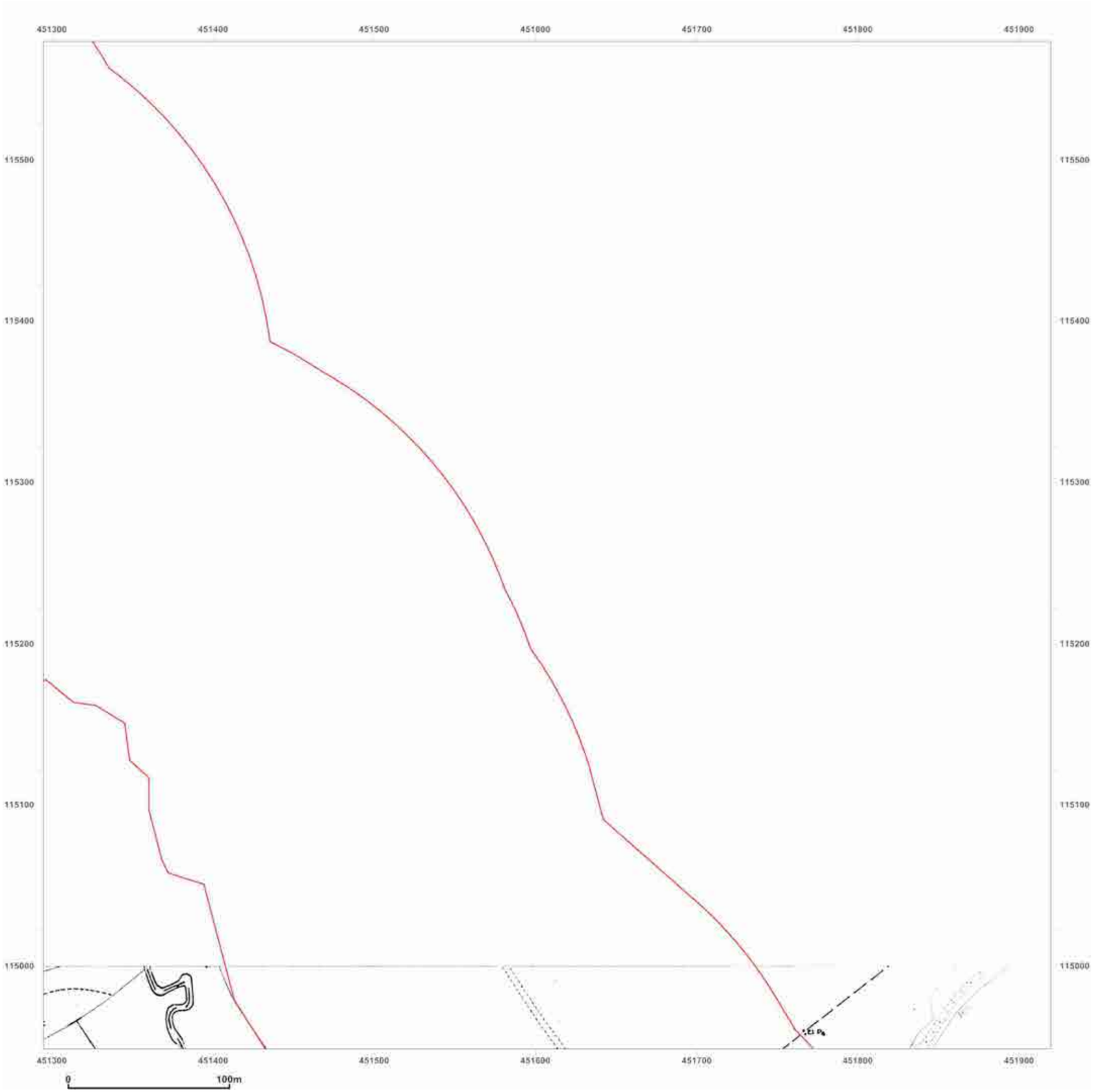
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_C1
Grid Ref: 451607, 115261

Map Name: National Grid

Map date: **1987**

Scale: 1:2,500

Printed at: 1:2,500

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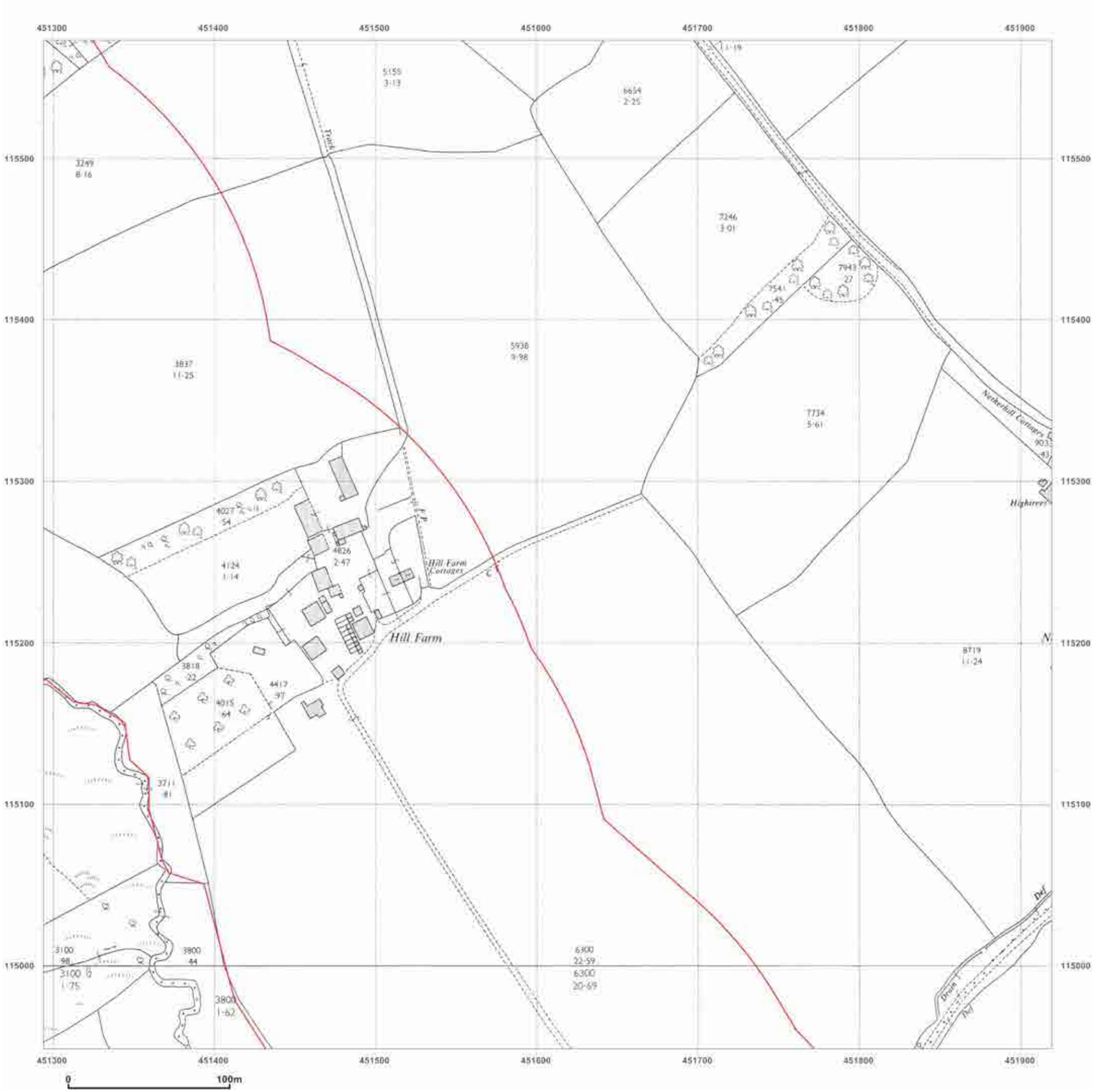
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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_C1
Grid Ref: 451607, 115261

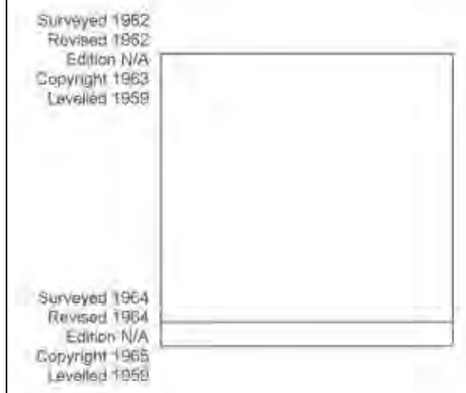
Map Name: National Grid

Map date: **1962-1964**

Scale: 1:2,500

Printed at: 1:2,500

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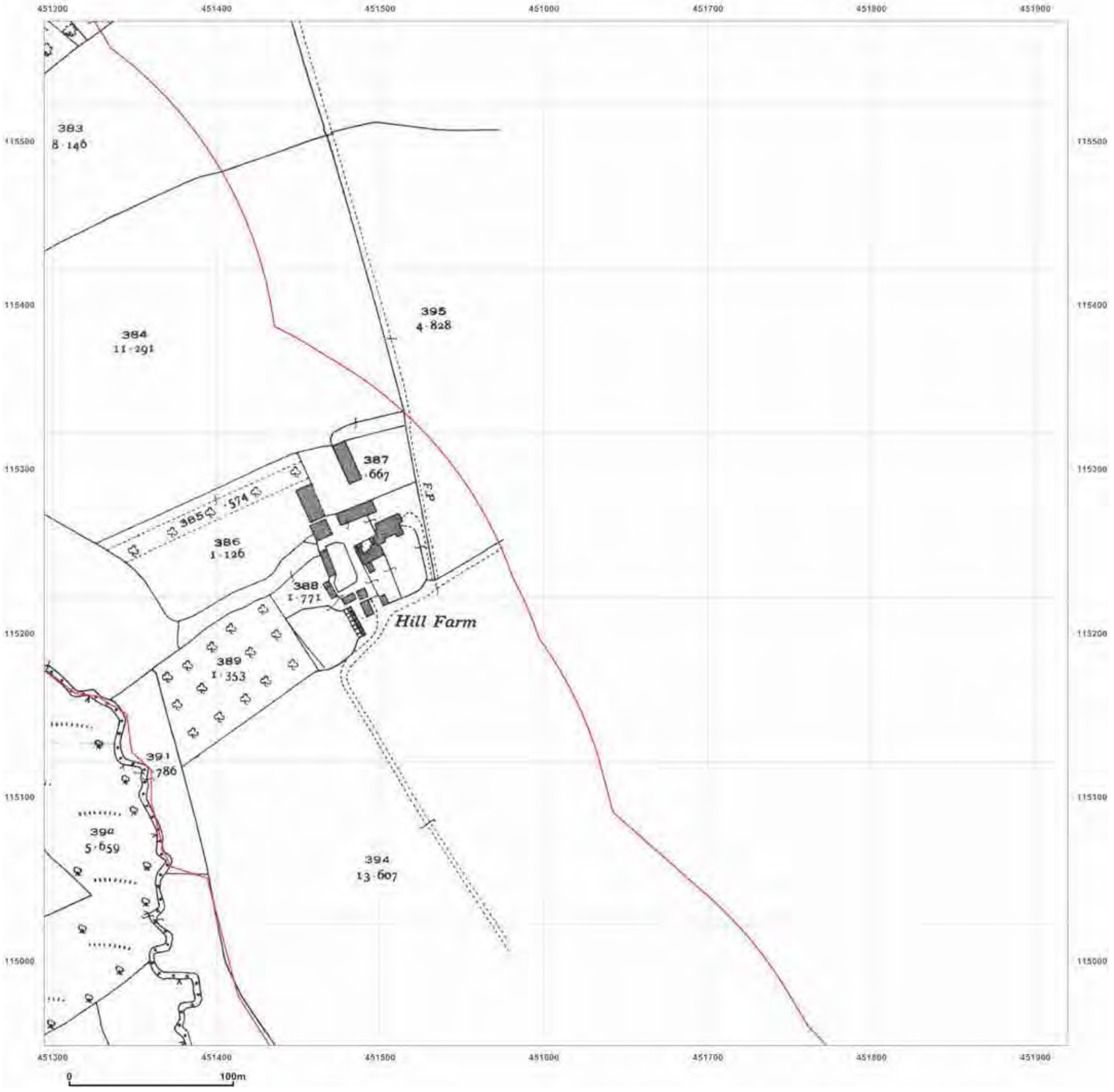
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Site Details:

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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_C1
Grid Ref: 451607, 115261

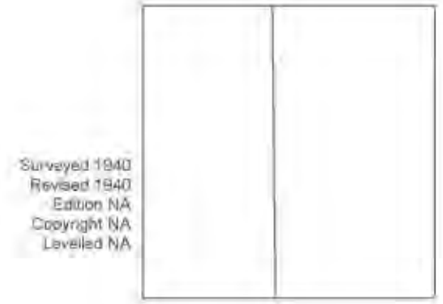
Map Name: County Series

Map date: **1940**

Scale: 1:2,500

Printed at: 1:2,500

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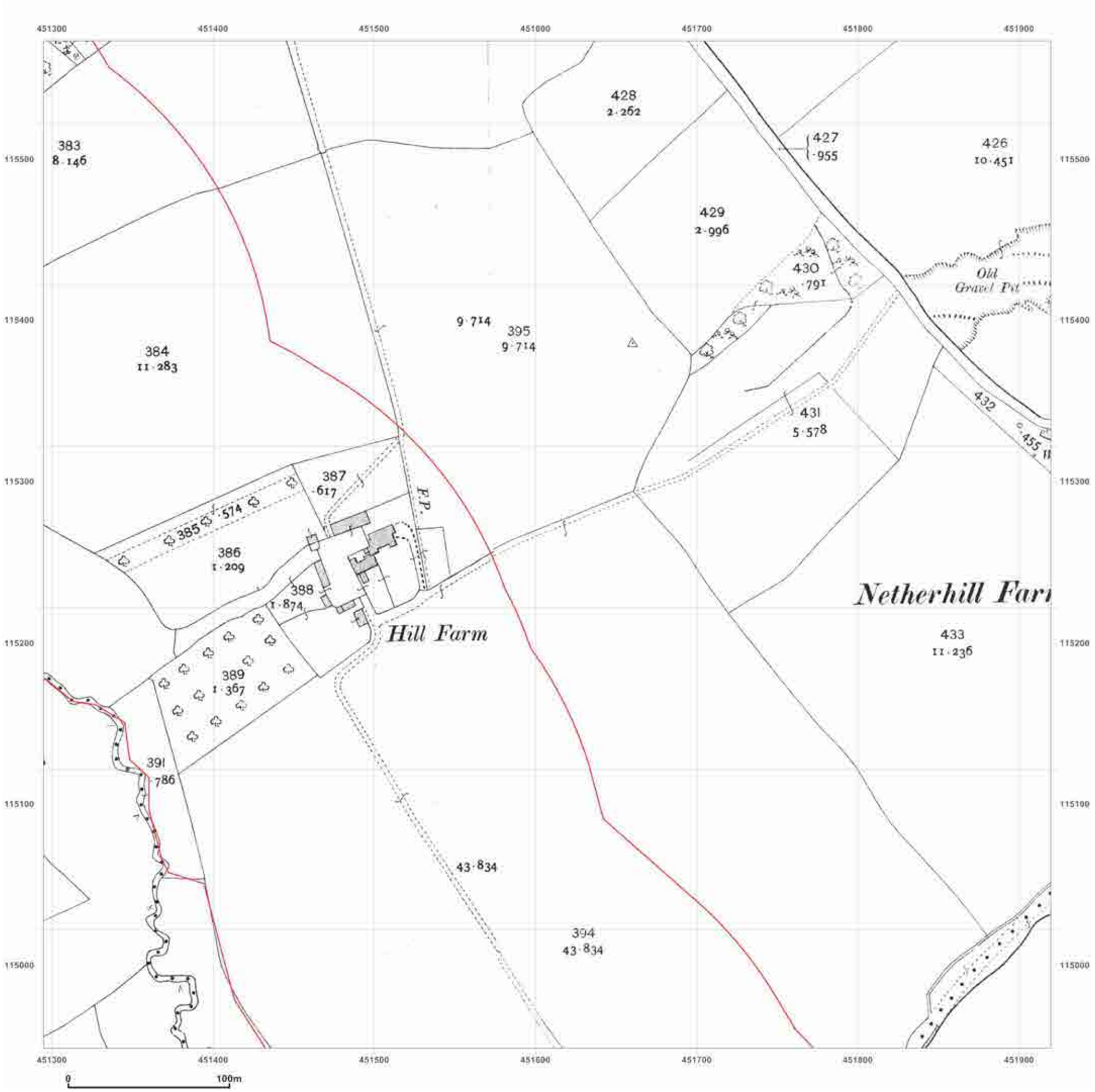
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Site Details:

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SOUTHAMPTON, SO32 2DD

Client Ref: J10856
Report Ref: HMD-137-204553_C1
Grid Ref: 451607, 115261

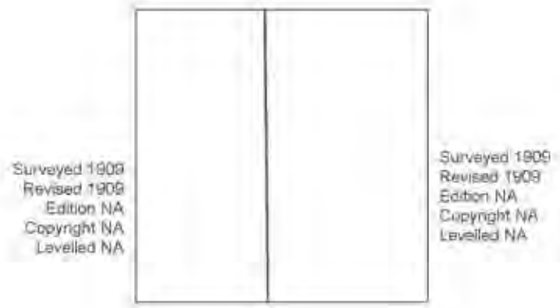
Map Name: County Series

Map date: **1909**

Scale: 1:2,500

Printed at: 1:2,500

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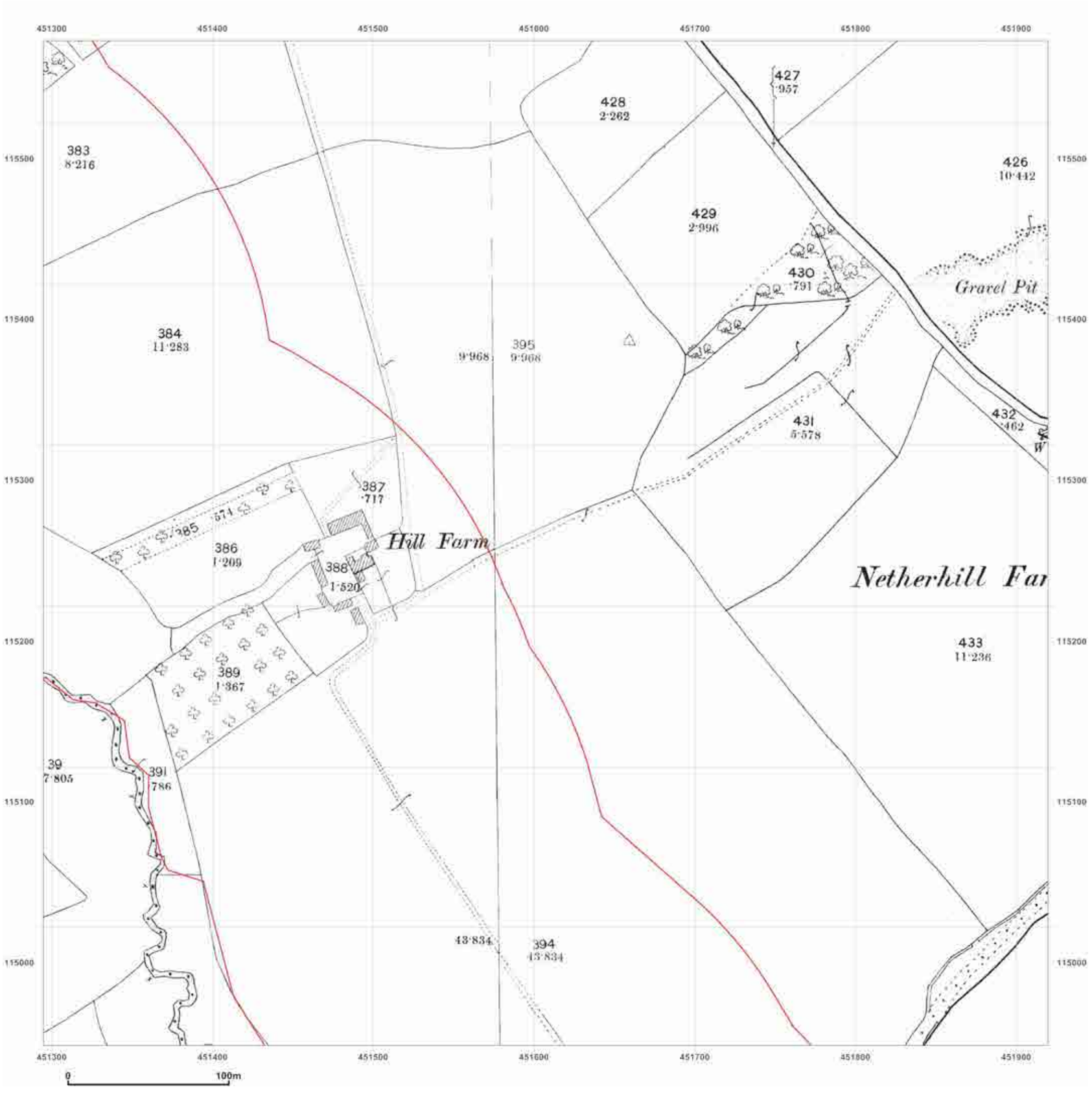
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Client Ref: J10856
Report Ref: HMD-137-204553_C1
Grid Ref: 451607, 115261

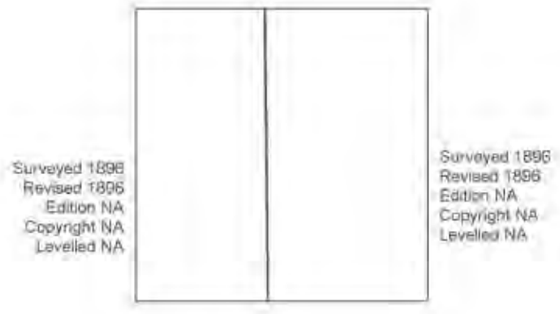
Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500





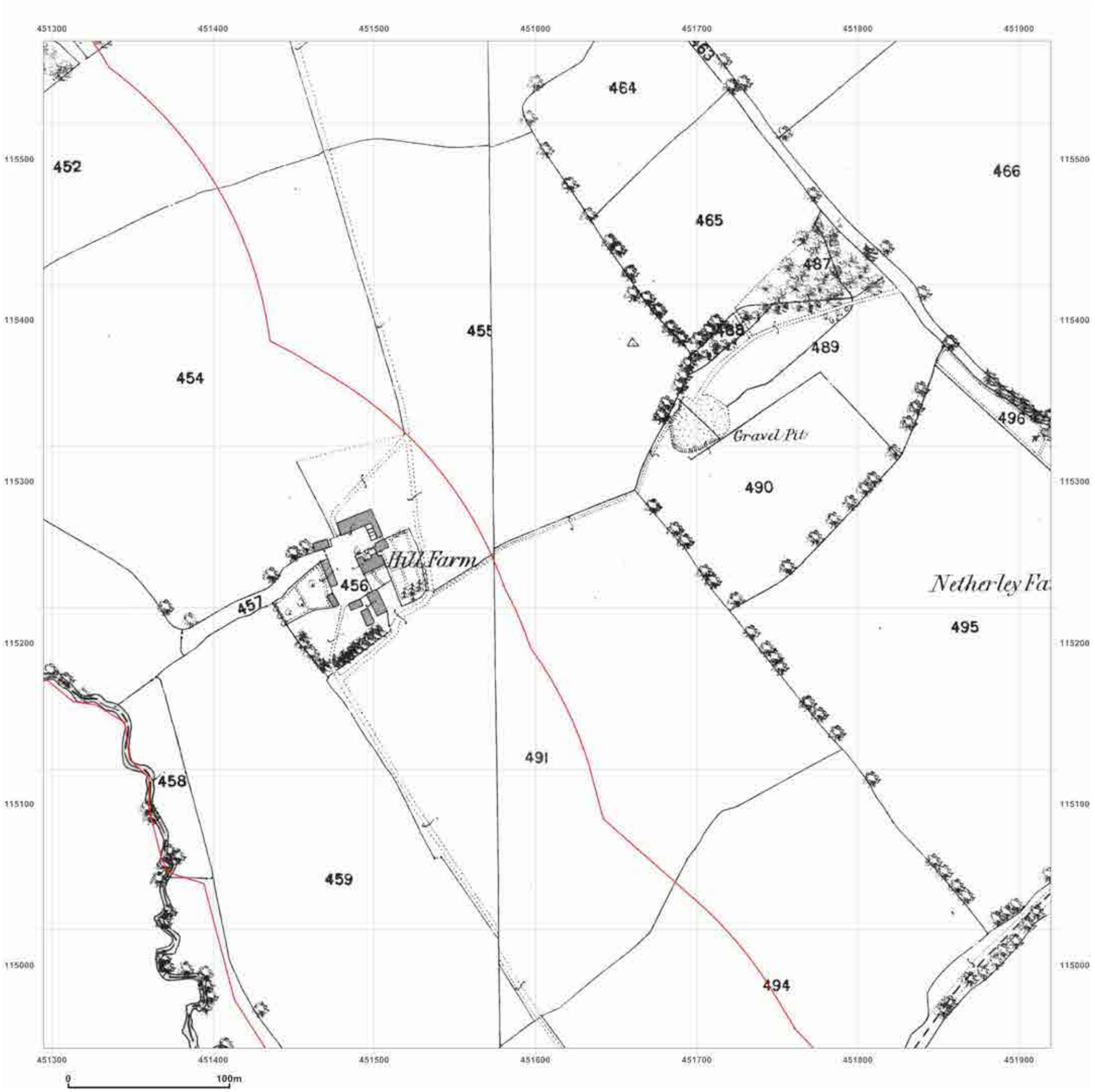
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Client Ref: J10856
Report Ref: HMD-137-204553_C1
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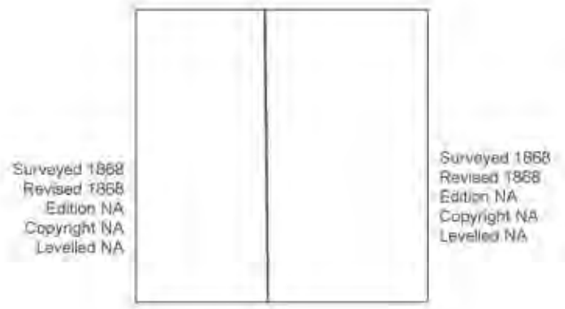
Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

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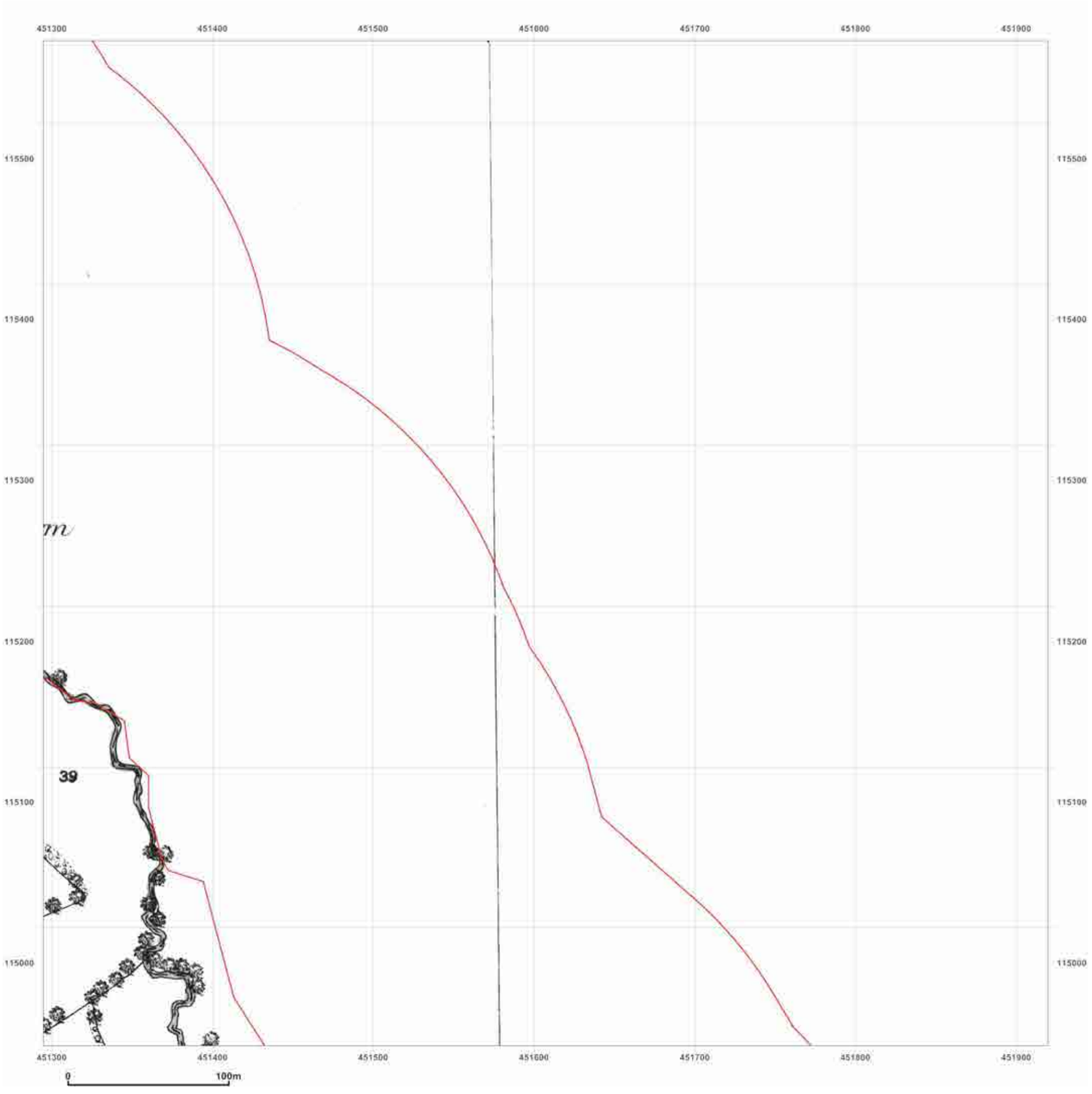
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Client Ref: J10856
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Grid Ref: 451607, 115261

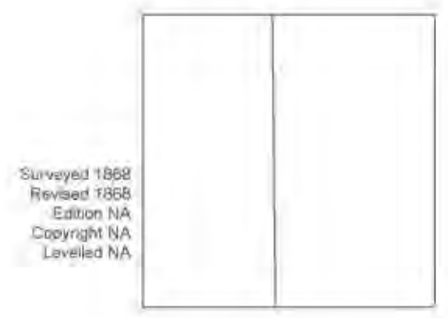
Map Name: County Series

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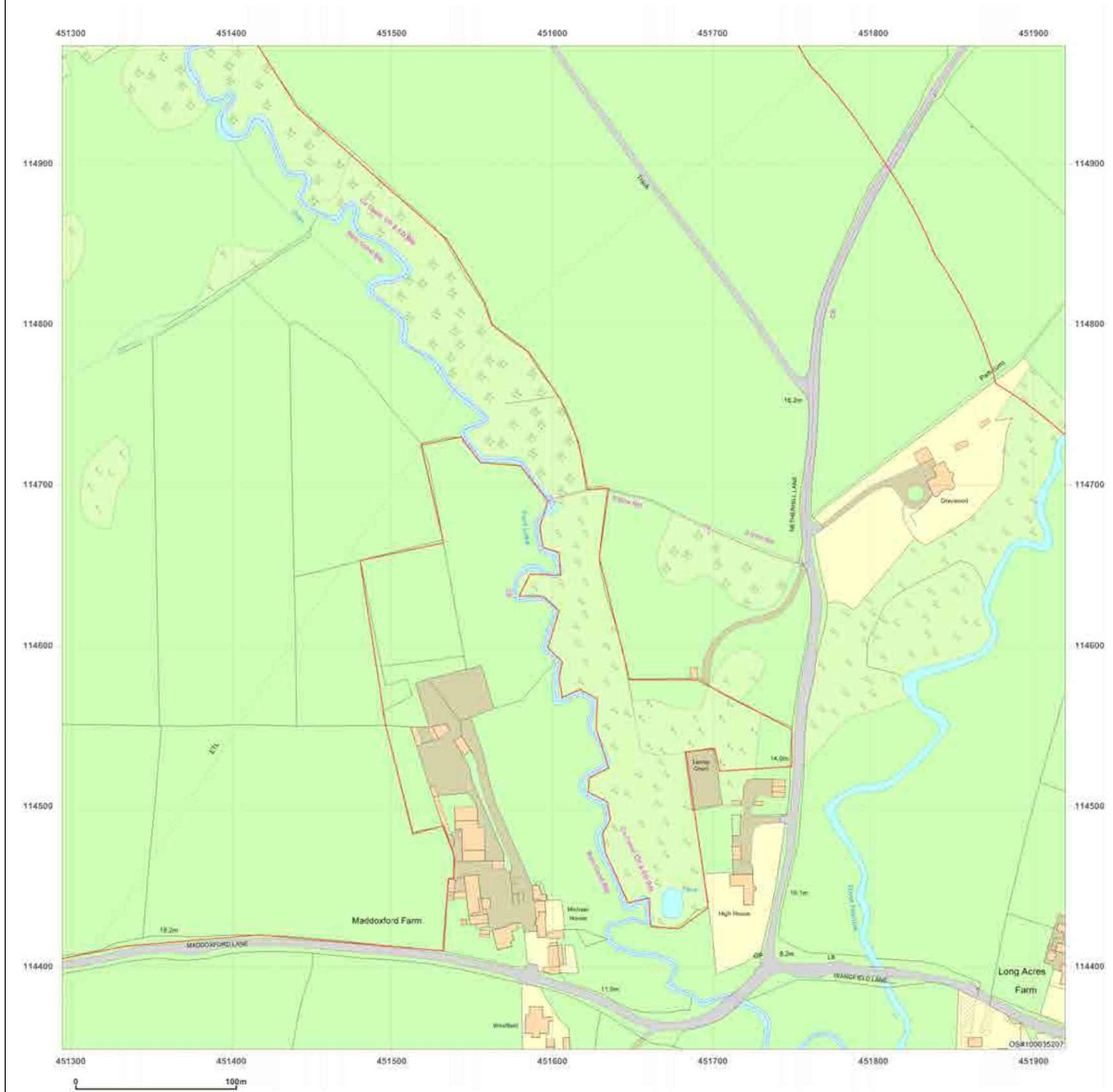
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SOUTHAMPTON, SO32 2DD

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Report Ref: HMD-137-204553_C2
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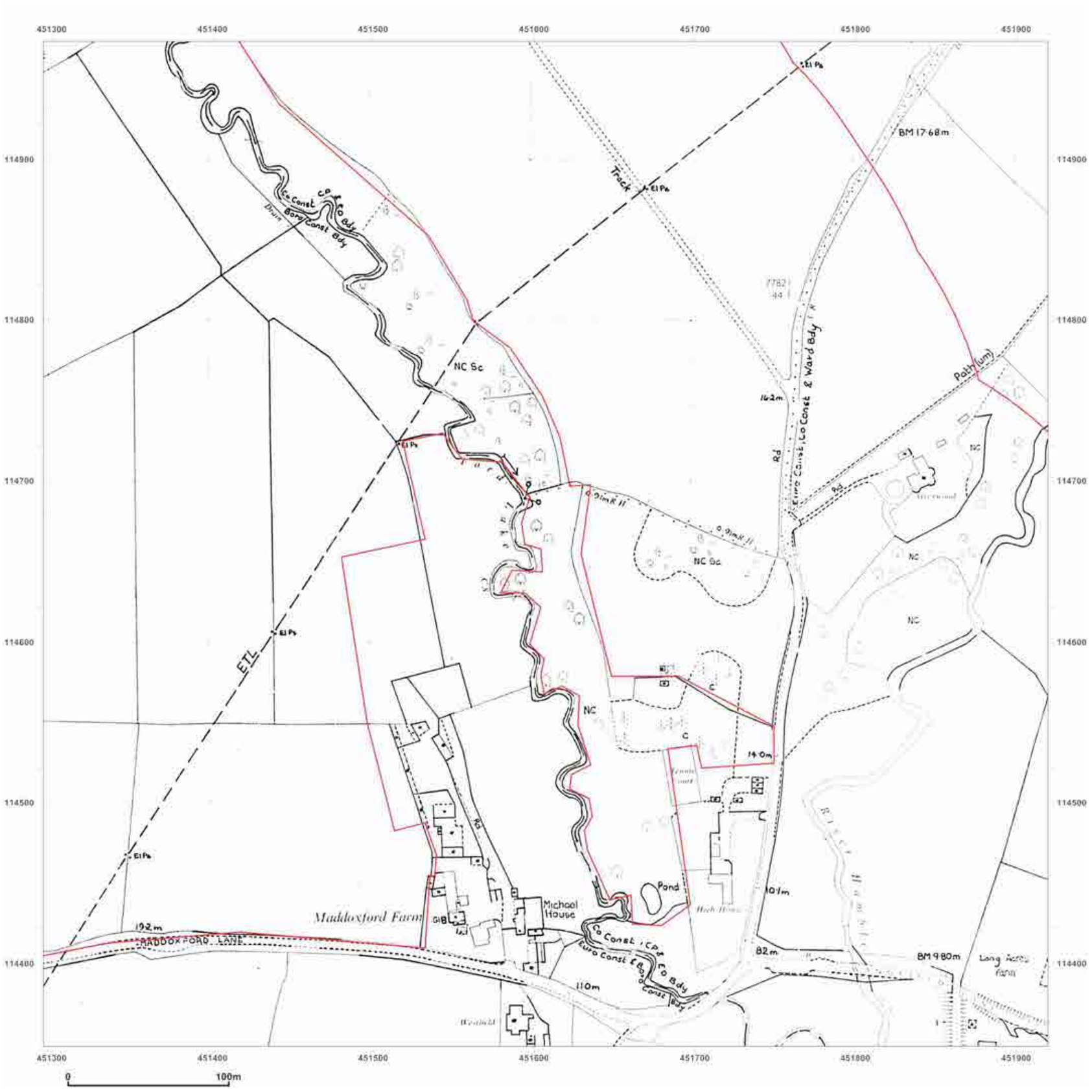
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Client Ref: J10856
Report Ref: HMD-137-204553_C2
Grid Ref: 451607, 114661

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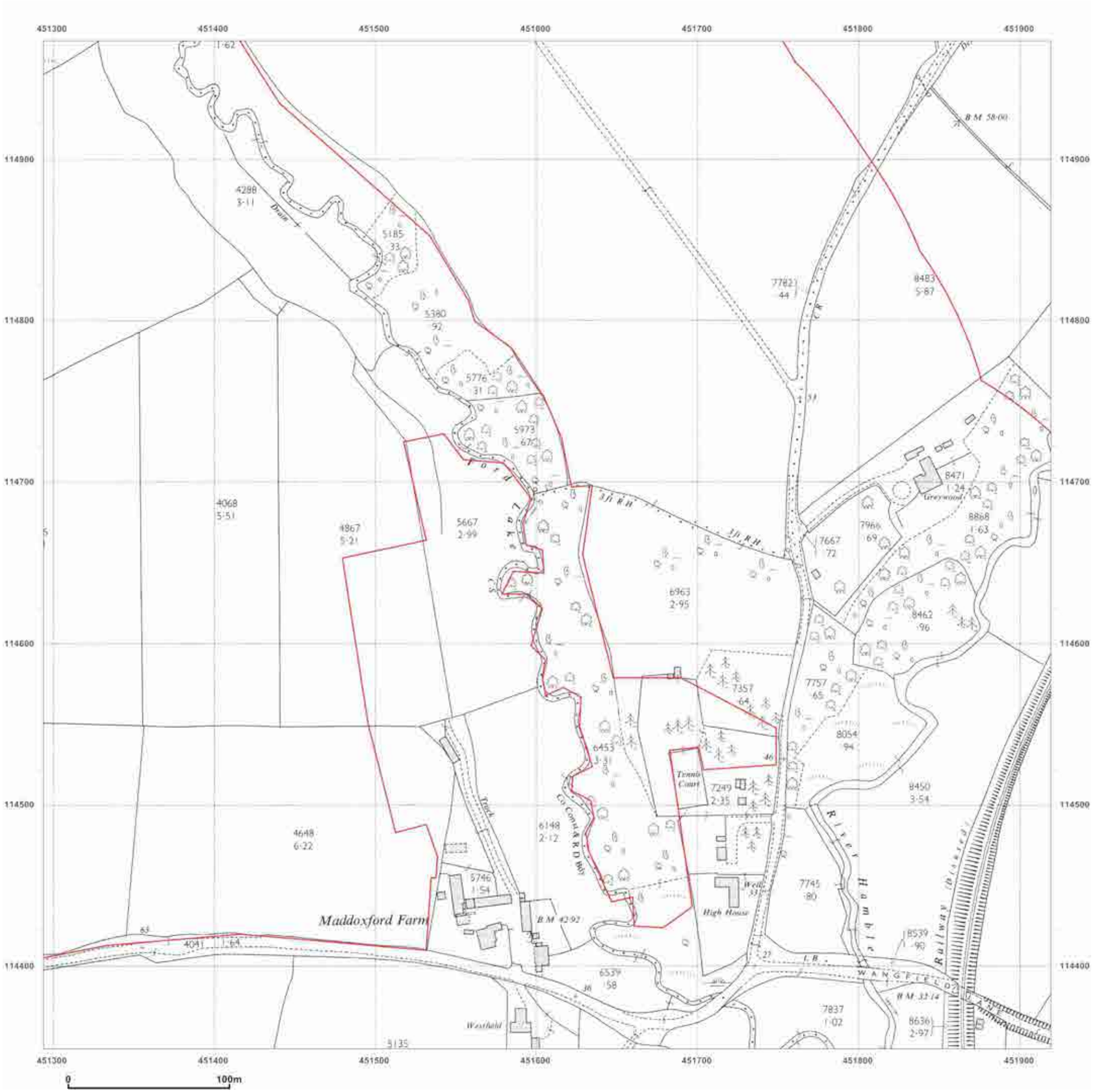
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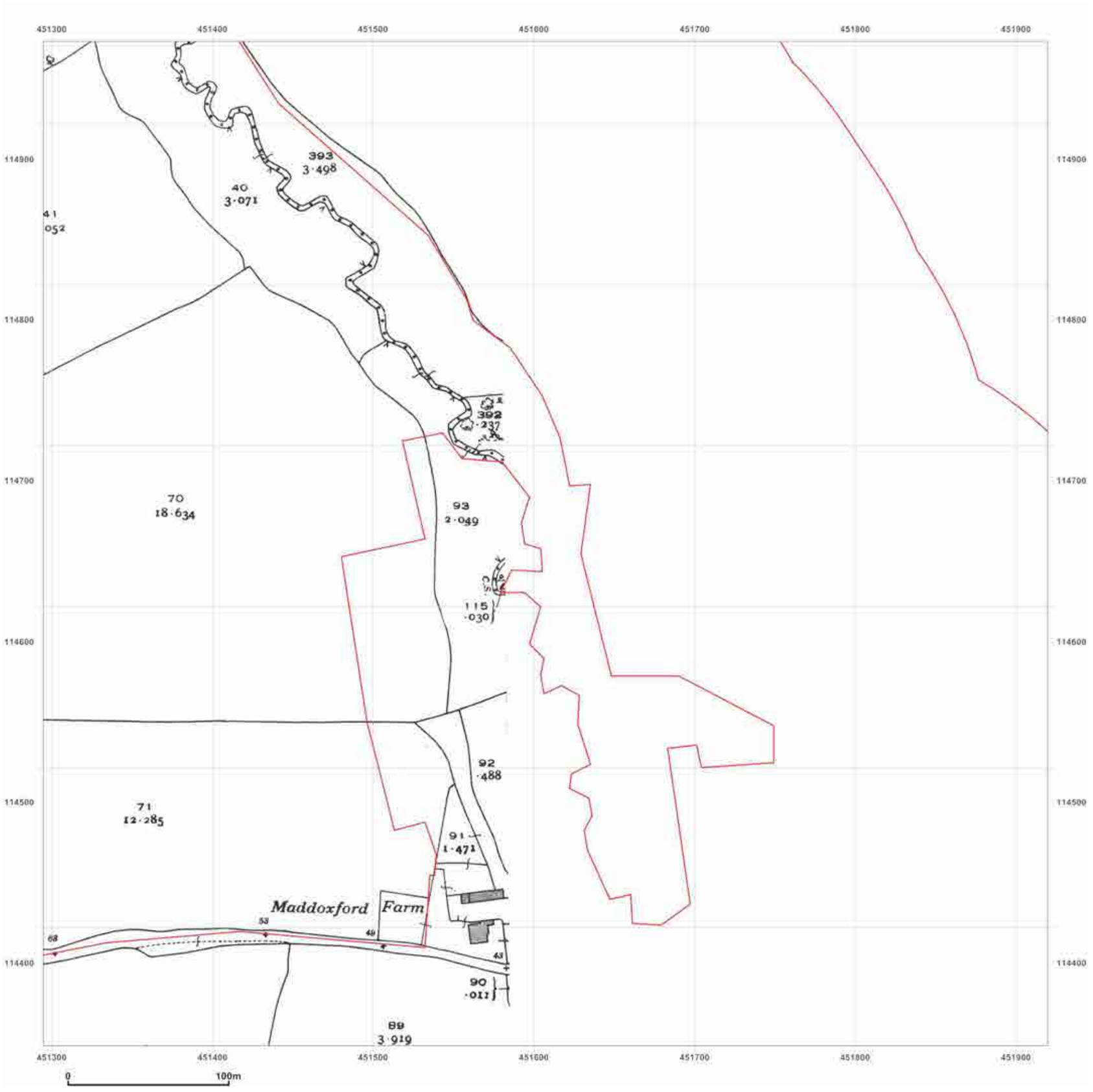
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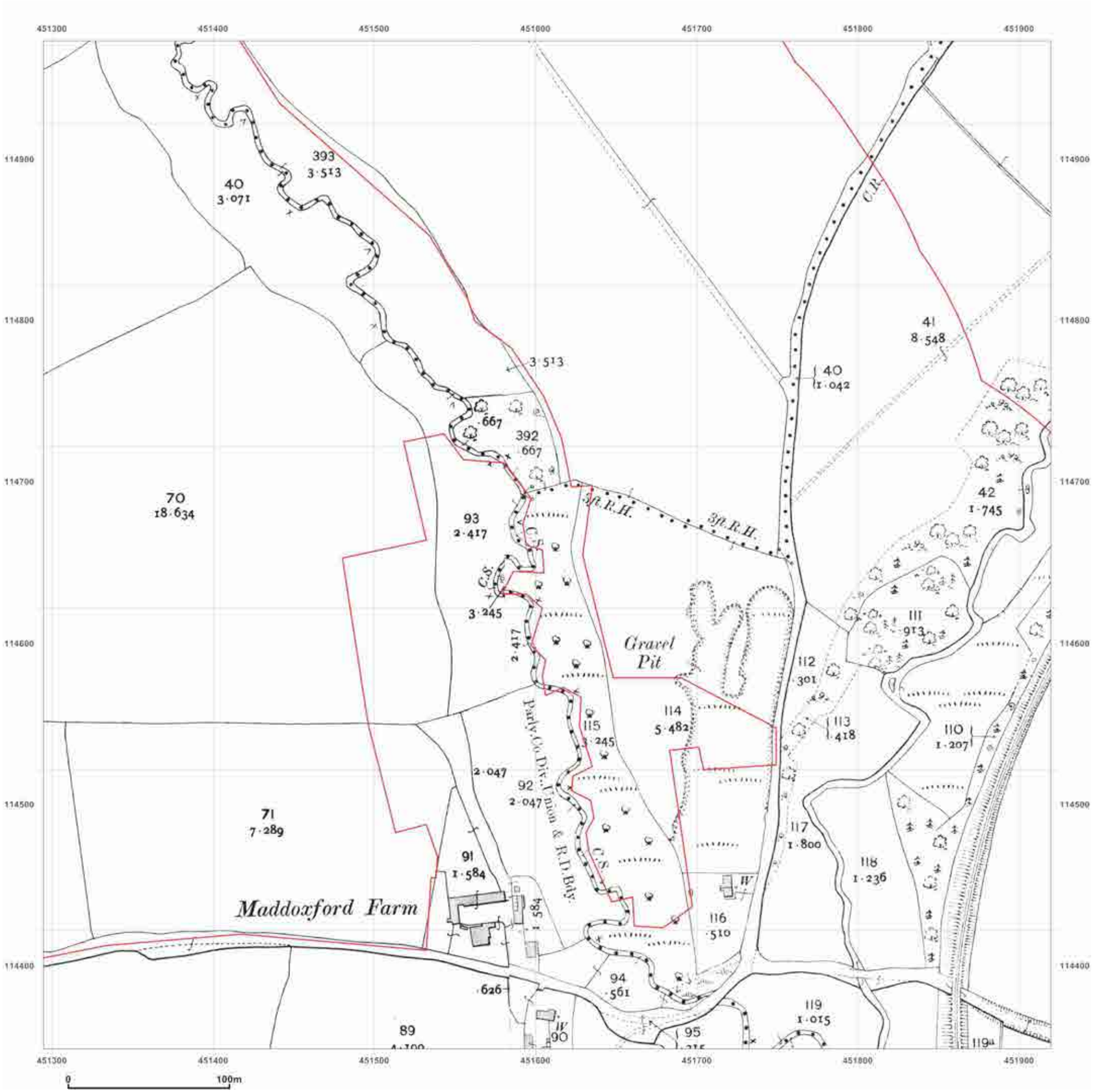
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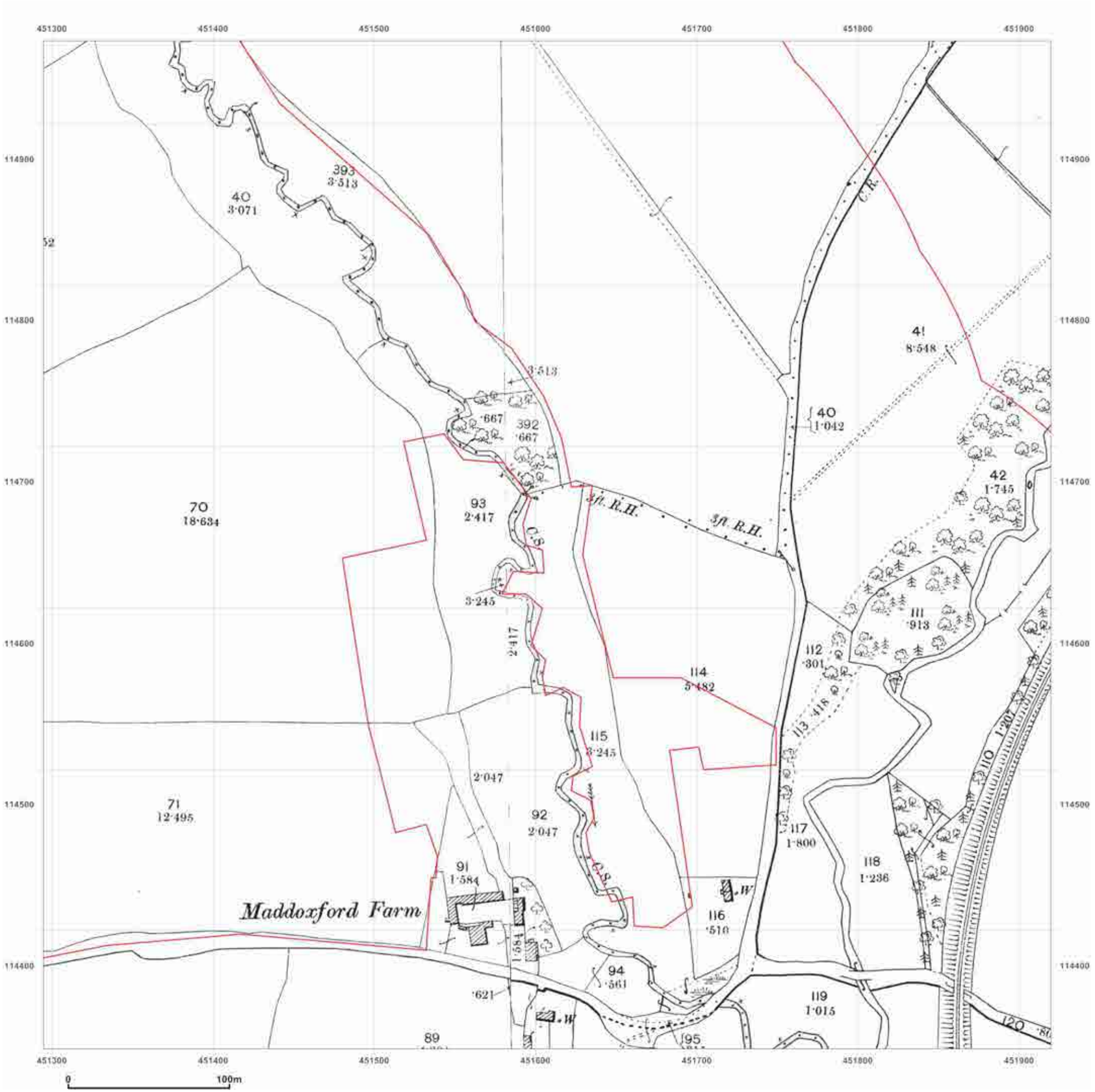
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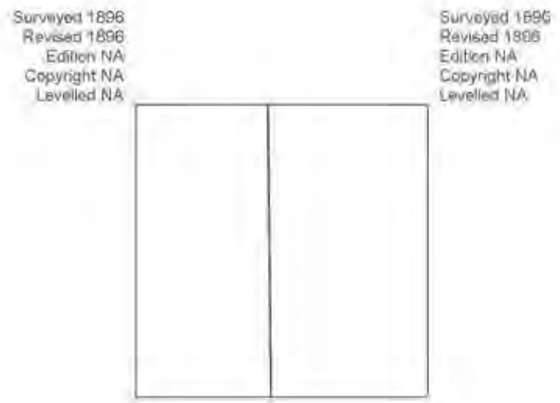
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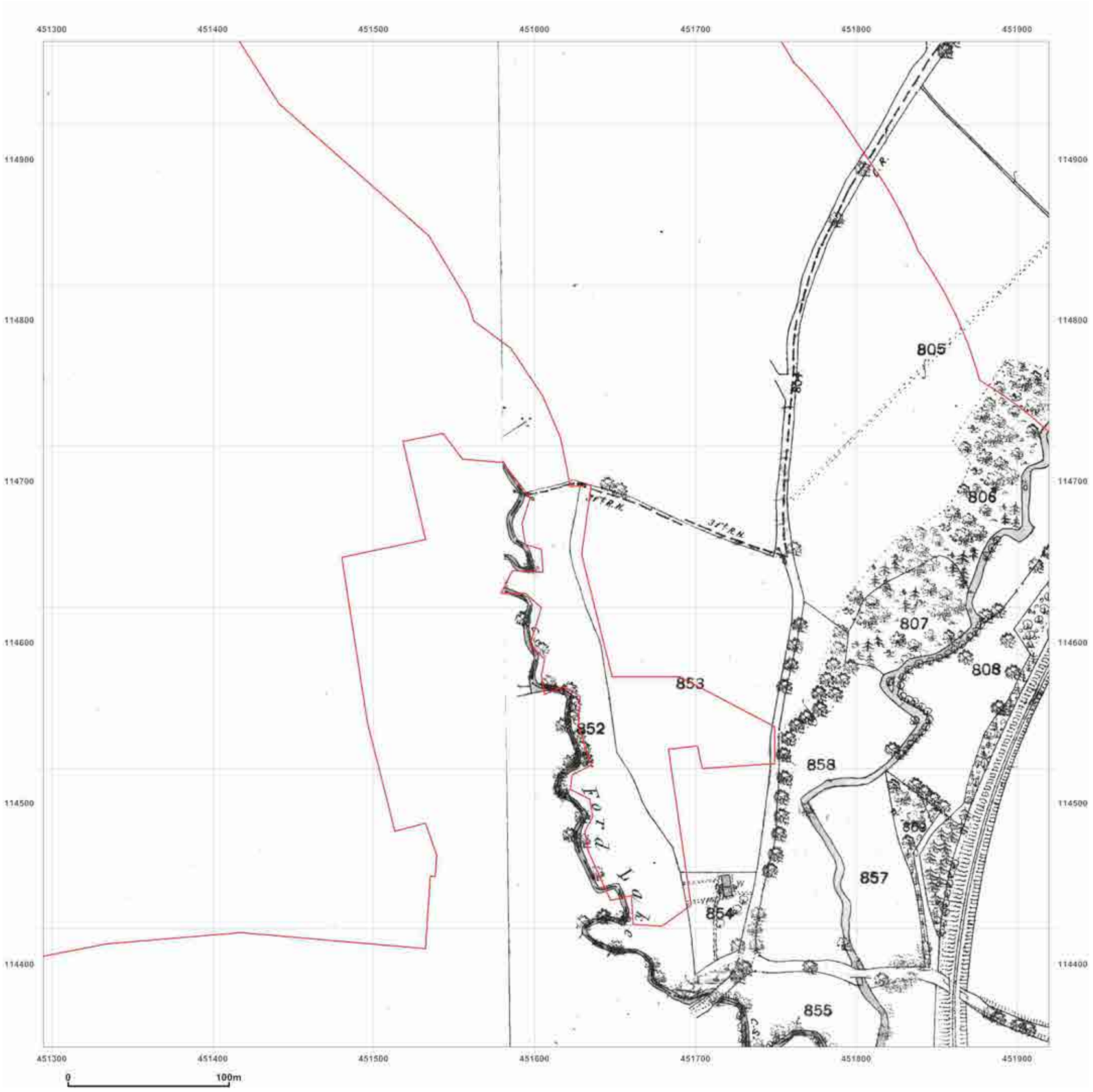
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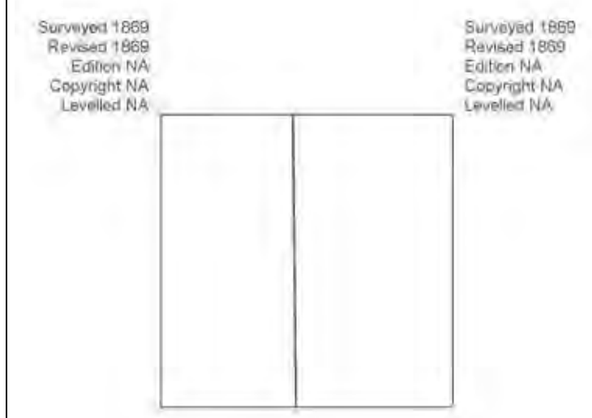
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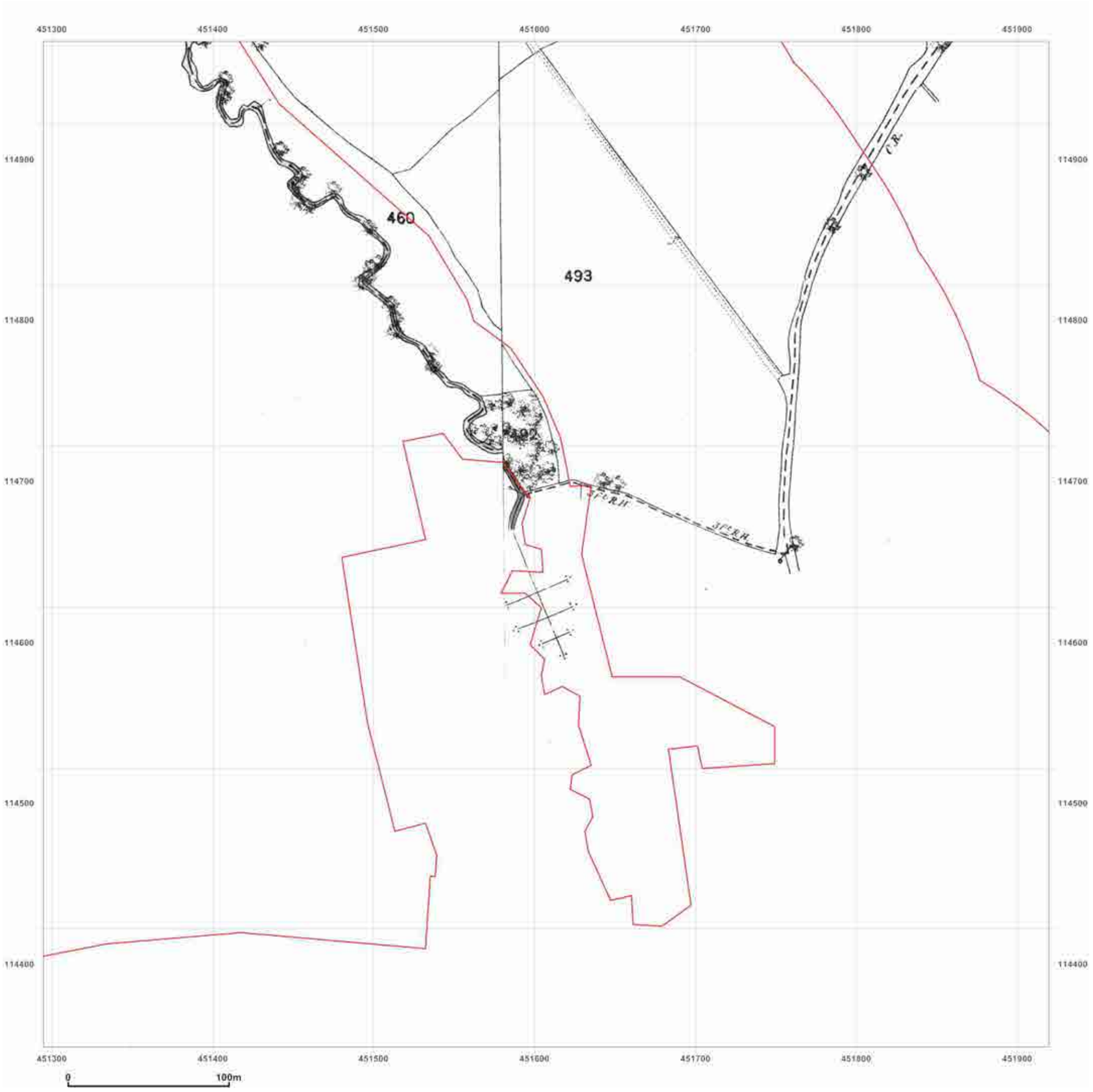
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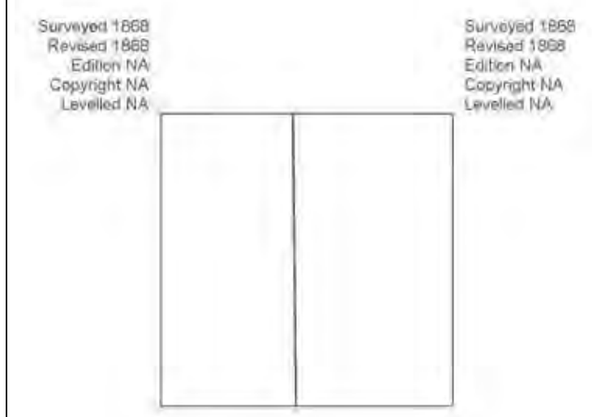
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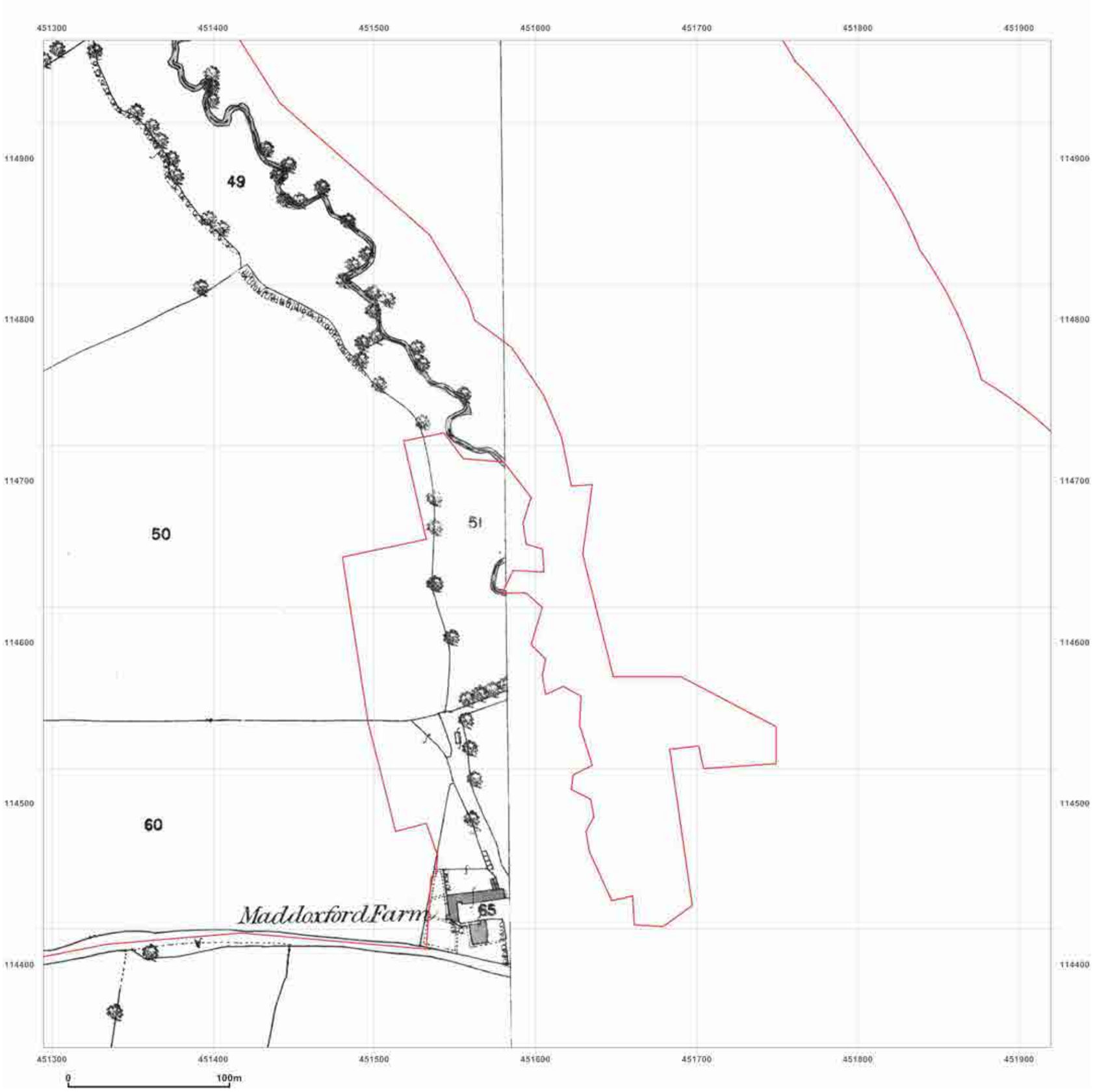
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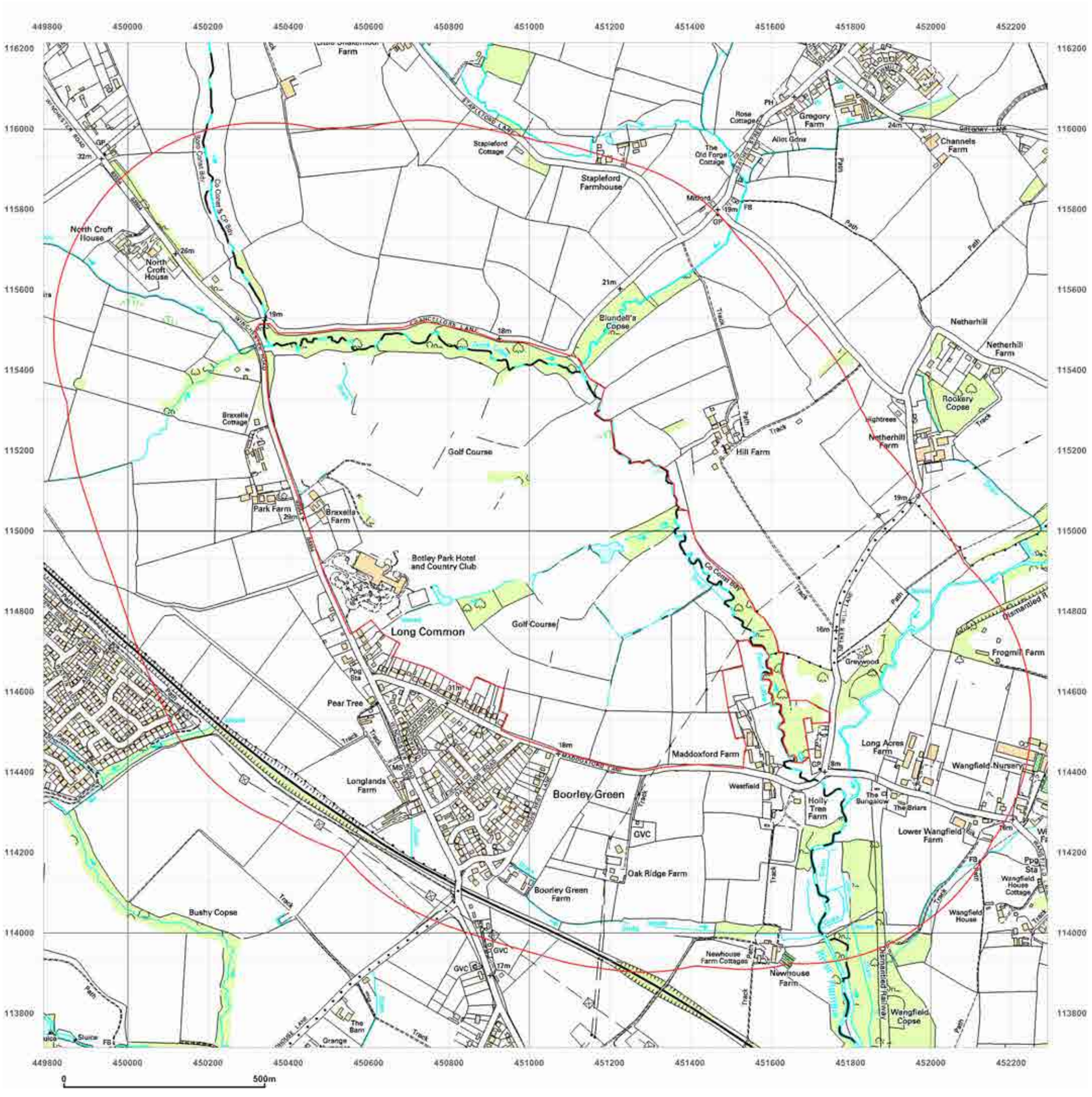
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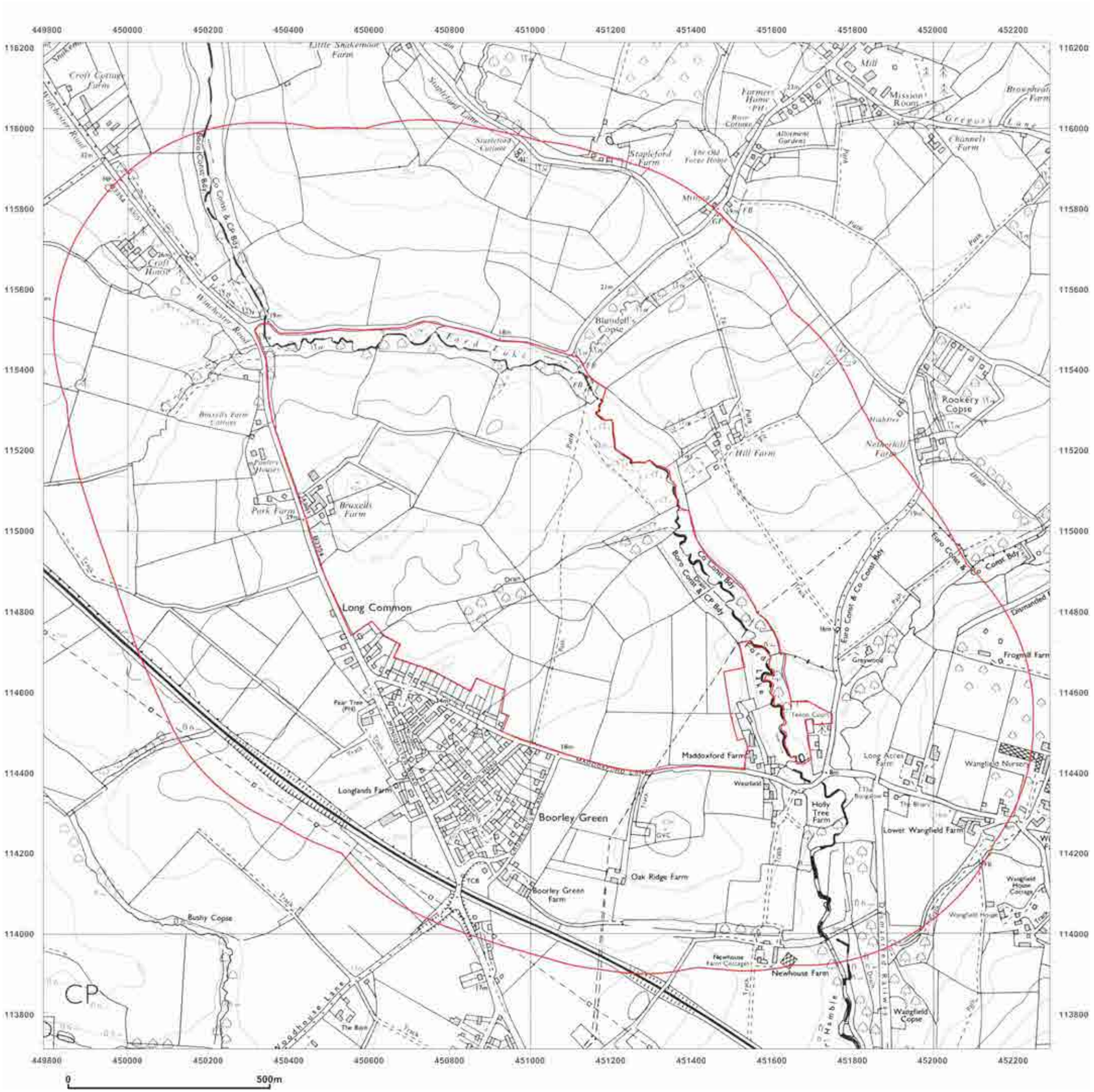
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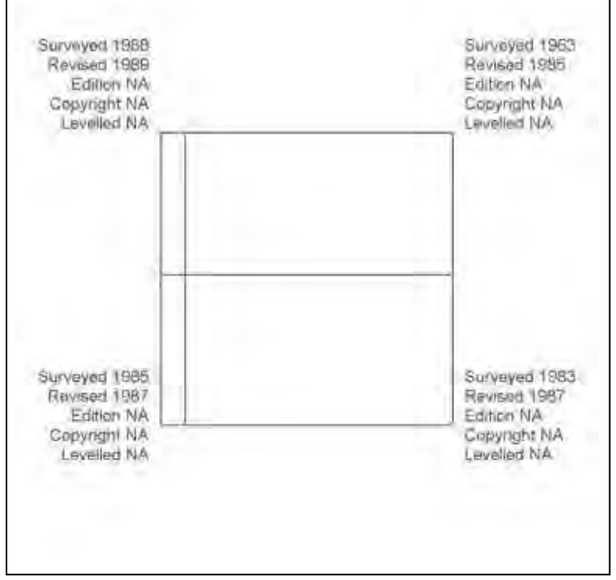
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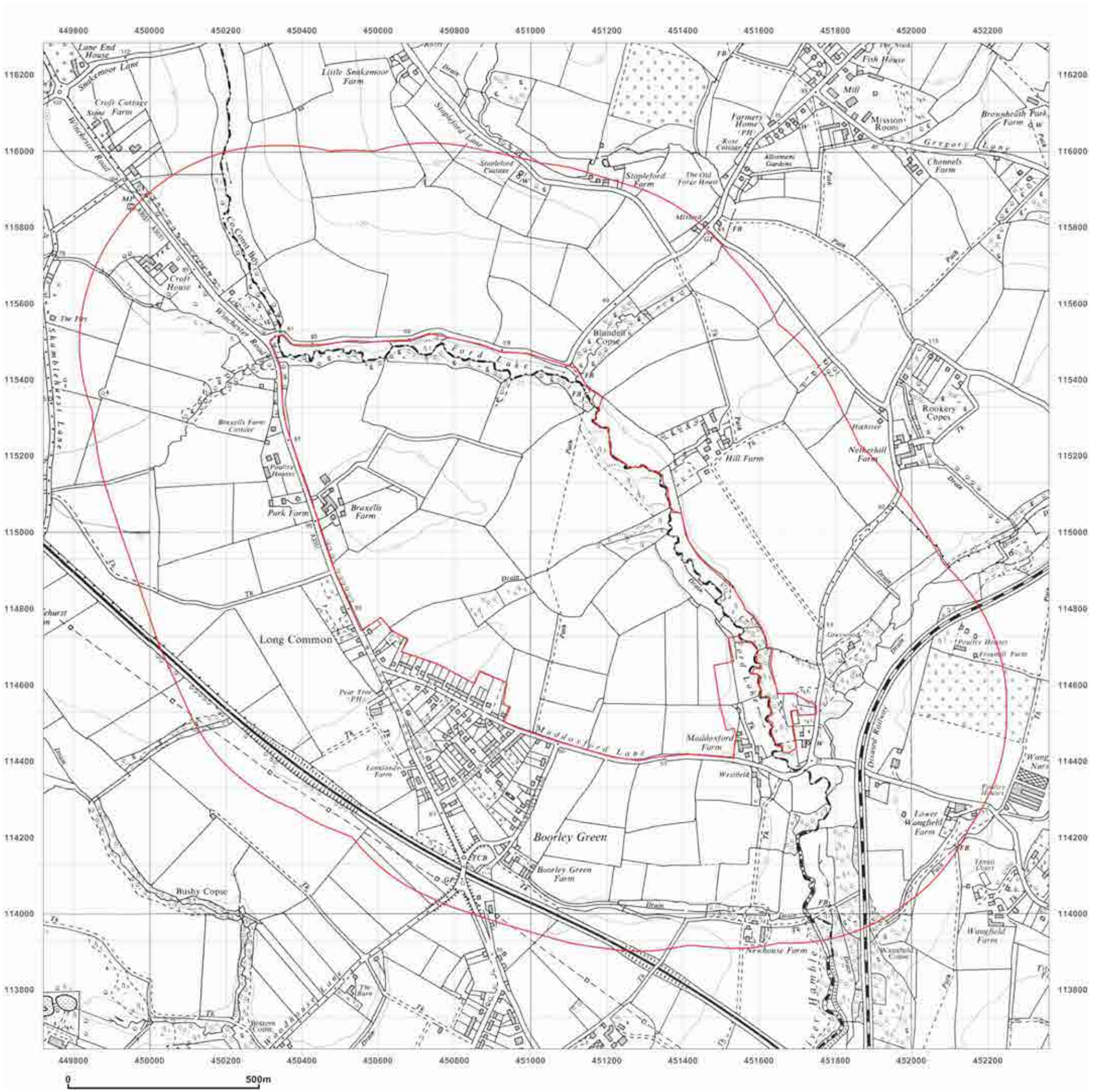
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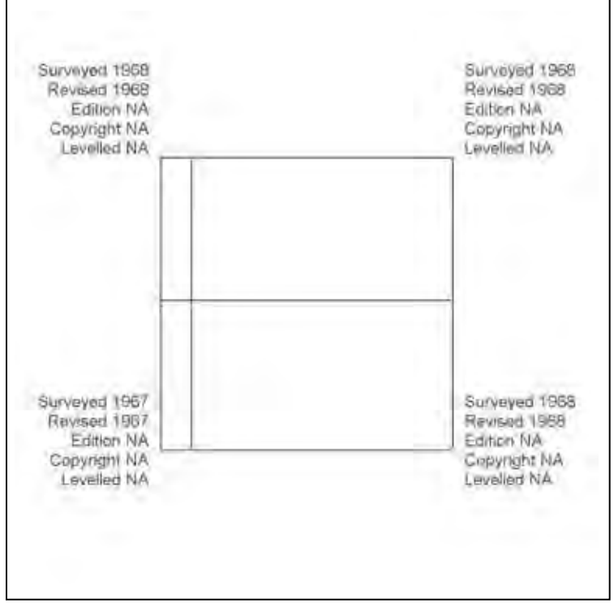
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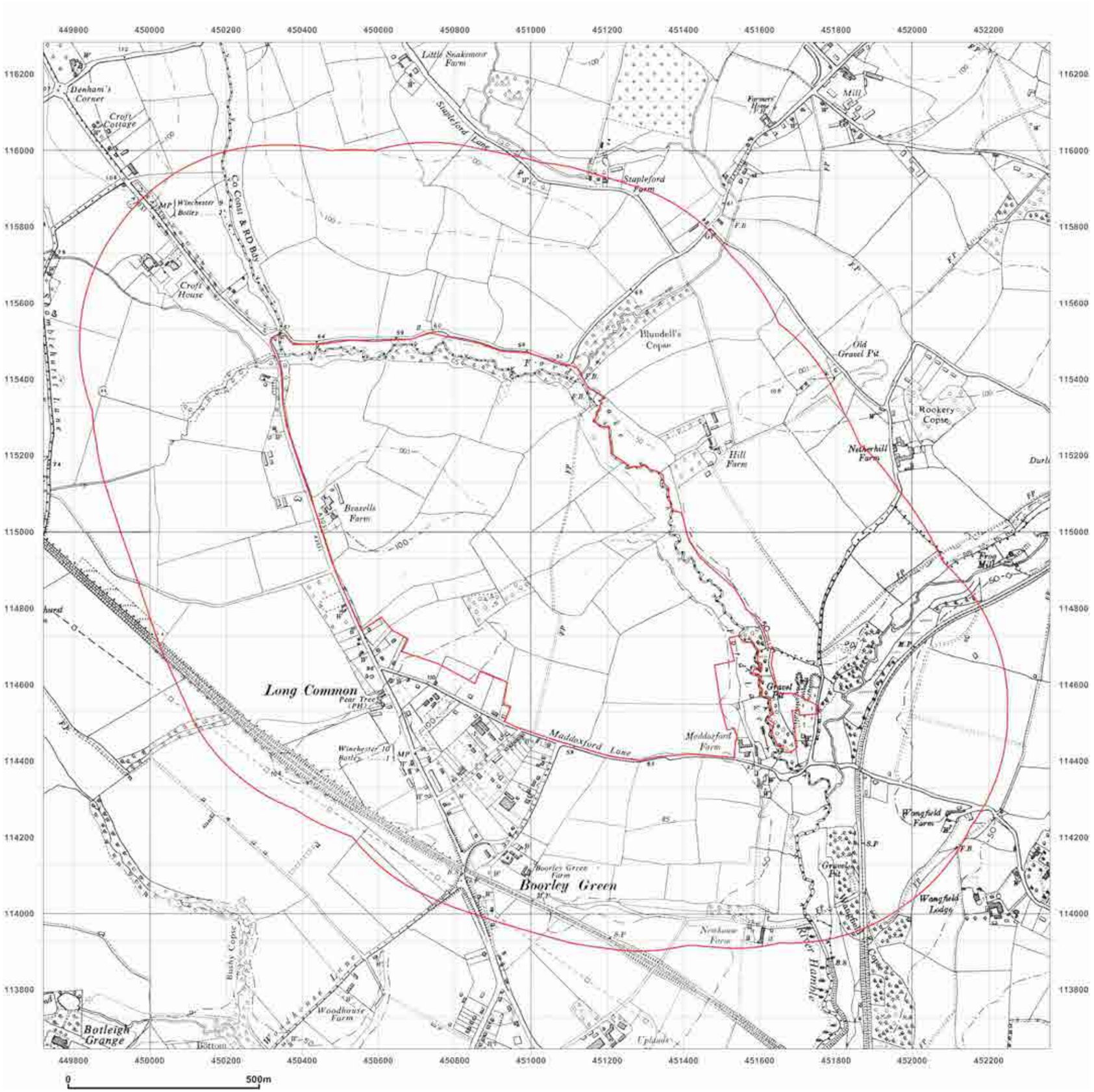
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Client Ref: J10856
Report Ref: HMD-137-204553
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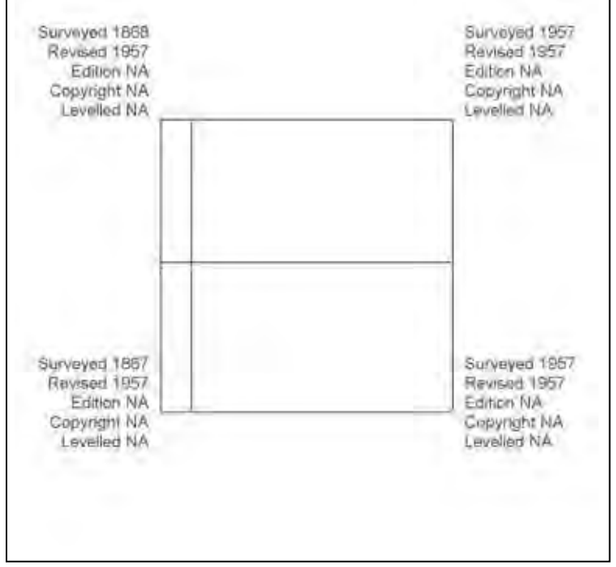
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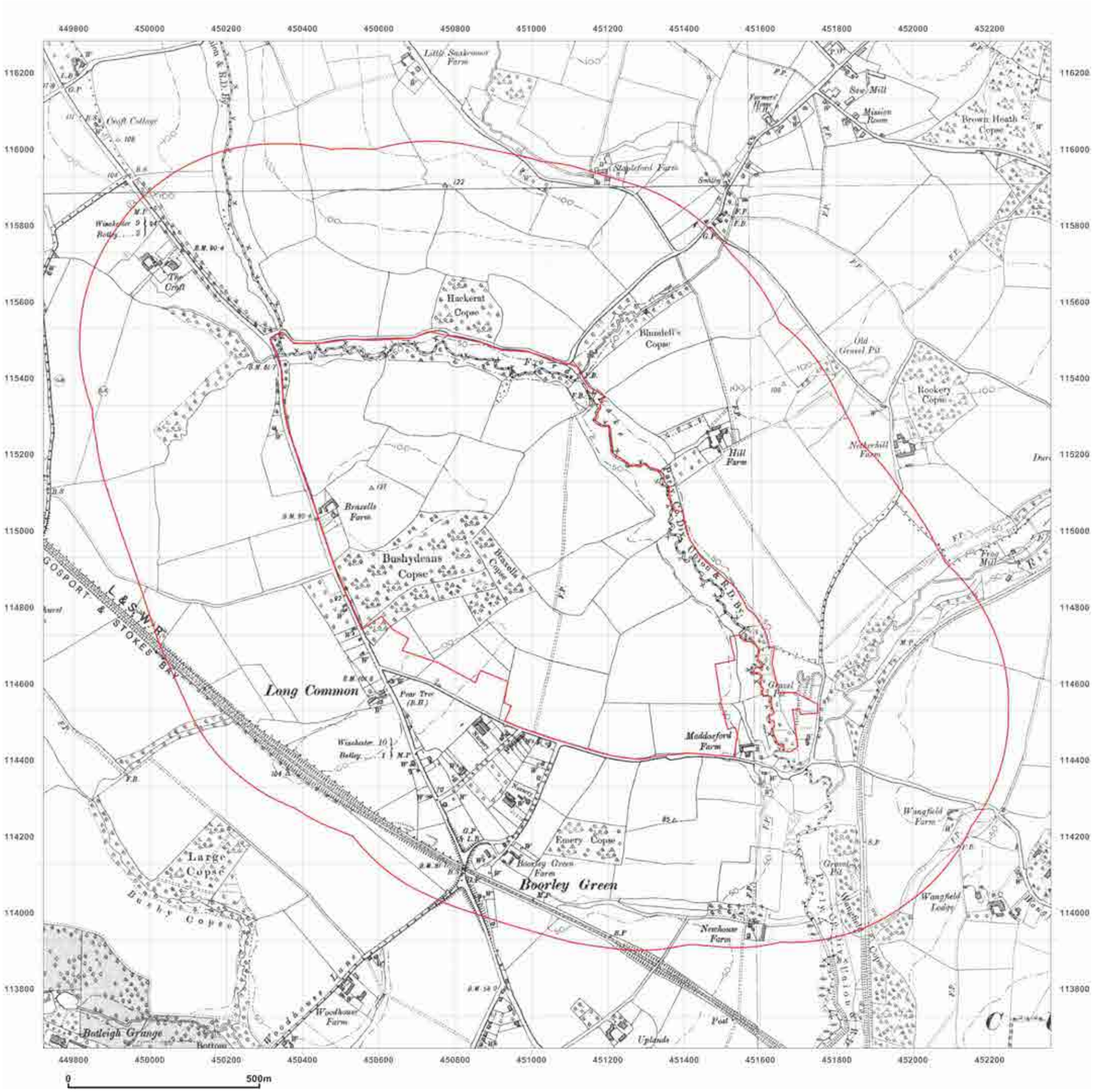
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Client Ref: J10856
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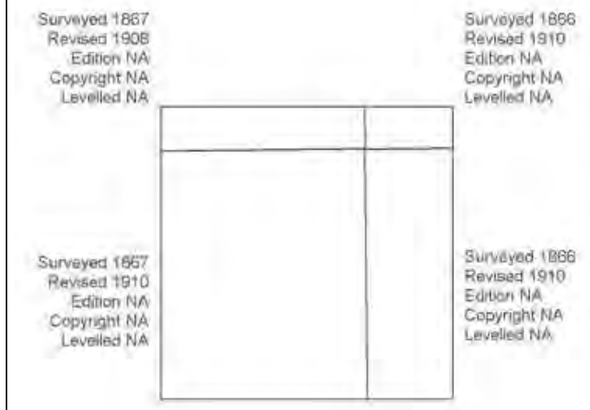
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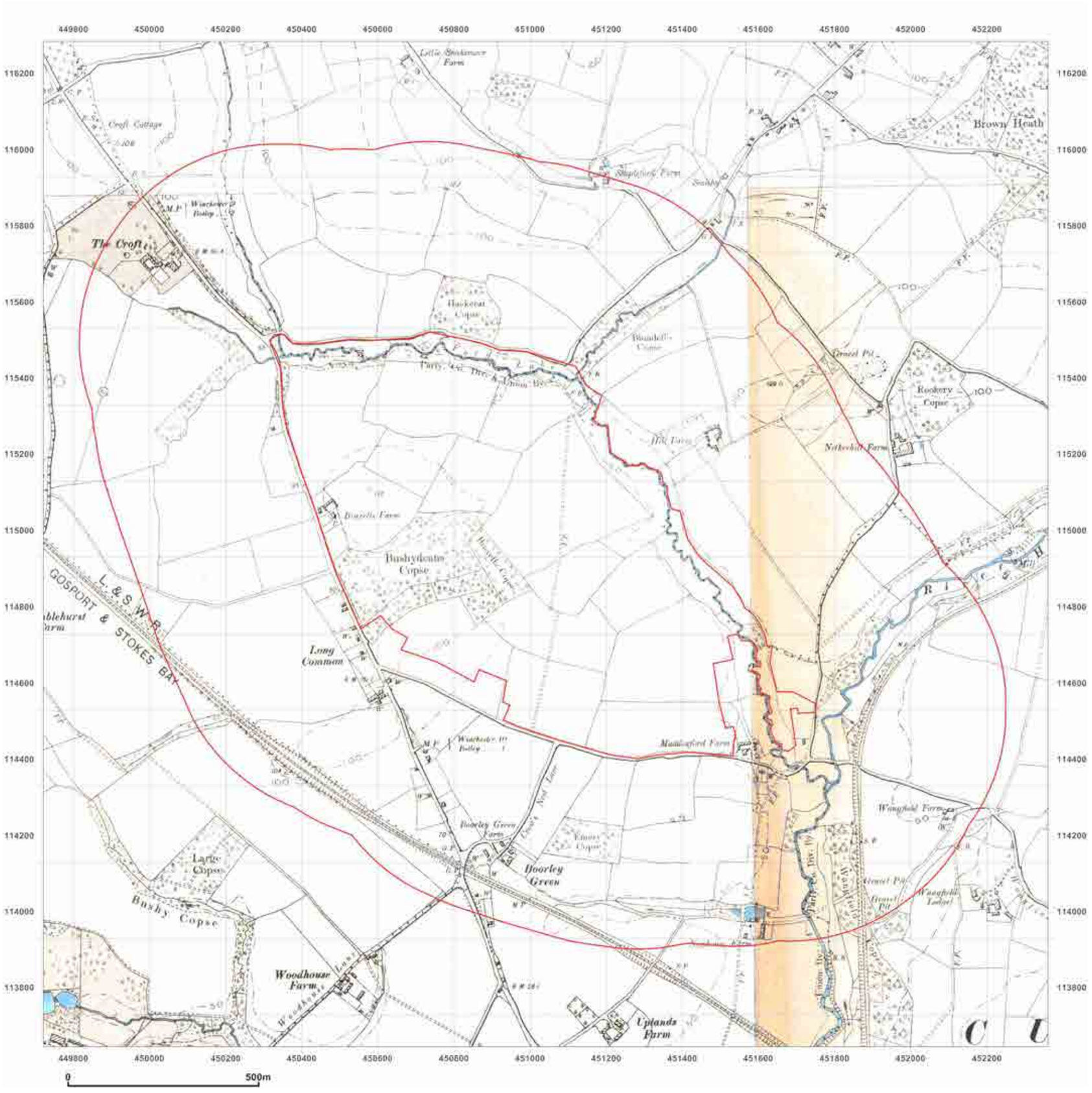
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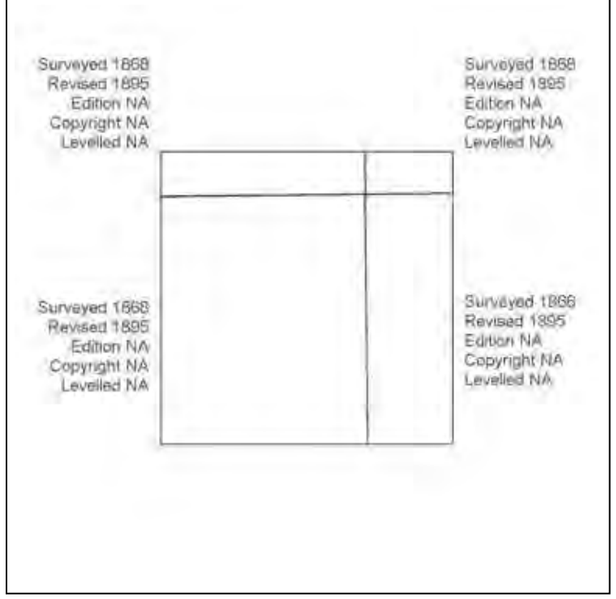
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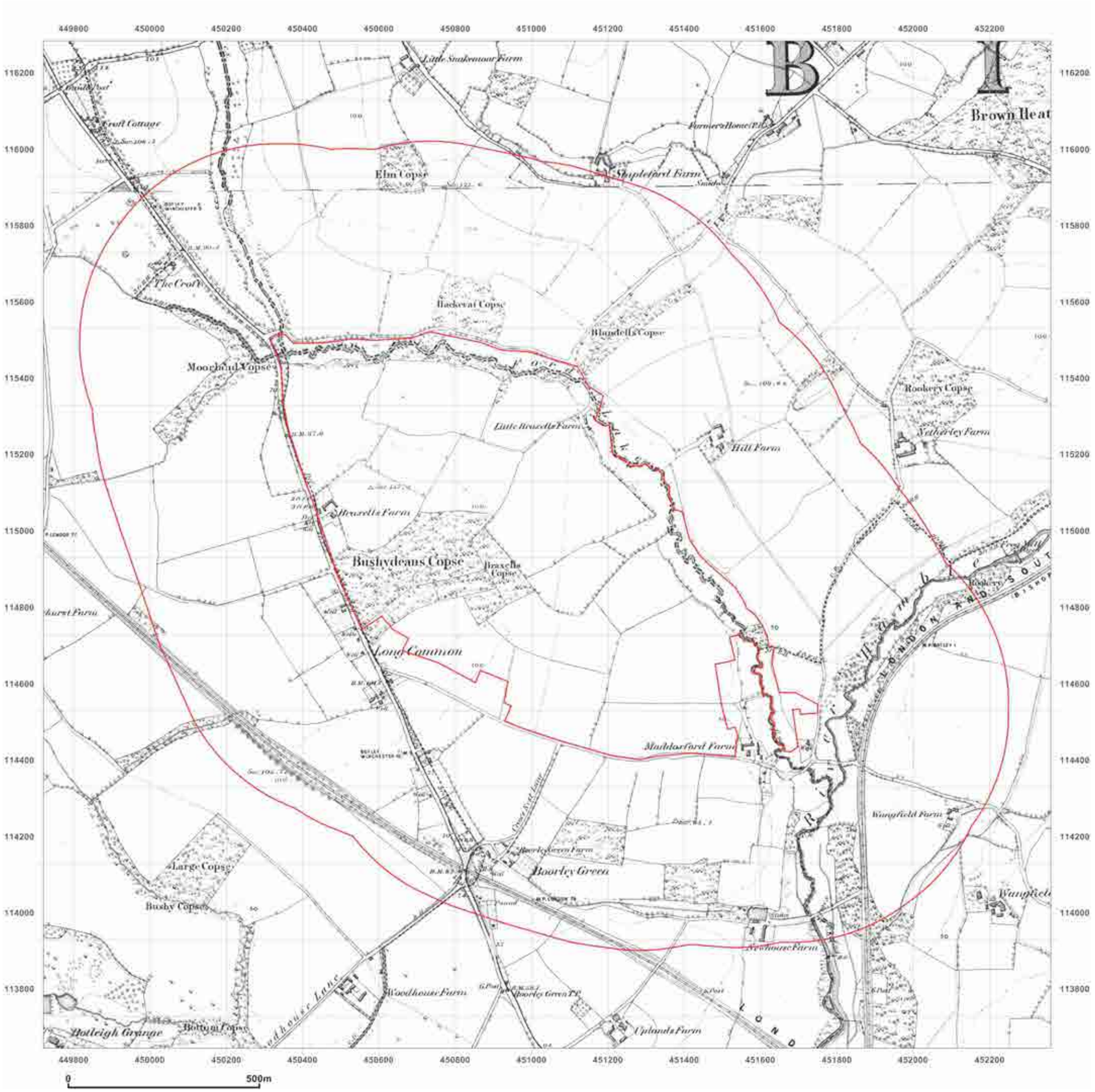
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Map Name: County Series

Map date: **1868**

Scale: 1:10,560

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APPENDIX F

Photographs

J10856 Winchester Road, Botley, Southampton



Botley Hotel and Country Club



Golf Course Clubhouse



Looking south from Hole 1



Looking uphill from Hole 2 Tee off point



Looking downhill from green of hole 2



Green of Hole 2 – Looking down at Hotel Complex

J10856 Winchester Road, Botley, Southampton	
	
Braxells Farm Buildings	Driving Range in distance
	
Looking down towards driving range	View across the driving range
	
Looking north from hole 3 tee off point	Slope down into wooded valley behind Hole 3

J10856 Winchester Road, Botley, Southampton	
	
Ford Lake in the wooded valley	Hole 4 Tee off point looking east
	
Slope toward Ford Lake along northern boundary	River Terrace Deposits exposed in valley
	
Ford Lake, widening	Hole 5 from tee off point

J10856 Winchester Road, Botley, Southampton	
	
Hole 6 from tee off point	Hole 7 from tee off point
	
Hole 8 from tee off point	Area of un landscaped land between hole 5 and 8
	
Hole 9 from tee off point	Hole 9, manmade lake and copse of trees

J10856 Winchester Road, Botley, Southampton



Hole 10 from tee off point



Hole 11 from tee off point



Manmade lake adjacent to green of Hole 11



Hole 12 from tee off point



Hole 13 from tee off point



Hole 14 from tee off point

J10856 Winchester Road, Botley, Southampton



Slope toward Ford Lake along eastern boundary



Hole 15 from tee off point



Slope toward Ford Lake along eastern boundary



Esso Marker Board behind hole 15



Hole 16 from tee off point



Fields adjacent to Maddoxford farm

J10856 Winchester Road, Botley, Southampton	
J10856 Winchester Road, Botley, Southampton	
	
Fields adjacent to Maddoxford farm	Esso Marker Boards
	
Esso Marker Boards	Houses along main road viewed from hole 16

J10856 Winchester Road, Botley, Southampton	
	
Maddoxford Farm buildings	Hole 17 from tee off point
	
Fields to the south of hole 17	Fields to the south of hole 17
	
Esso marker boards along hole 17	Fields to the south of hole 17

J10856 Winchester Road, Botley, Southampton	
	
Hole 18 tee off point	Hole 18 green in distance adj to clubhouse
	
Un used plot of land south of tennis courts	

Macdonald Botley Park Ltd, M A Botley and S&R Developments

Boorley Green – Minerals Safeguarding

Stage 1 – Desk Study and Site Walkover



WYG, 5th Floor, Longcross Court, 47 Newport Road, Cardiff, CF240AD

Tel: 02920 829200

Email: karen.hearnshaw@wyg.com

Document Control

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Client:	MacDonald Botley Park Limited, M A Botley and S & R Developments
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1	January 2013	v1
2		
3		
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2.0 Site Setting....3

3.0 Planning Status in Respect of Minerals Safeguarding....5

4.0 Constraints upon Mineral Development....8

5.0 Conclusions....14

Appendix 1 - Constraints to Mineral Extraction

1.0 Introduction

1.1 WYG has been commissioned by Macdonald Botley Park Limited, M A Botley and S&R Developments to prepare a stage 1 assessment of the minerals safeguarding issues on land north and east of Boorley Green, insofar as they influence the potential for built development on the land.

1.2 Policy BO1 of the pre-submission version of the Eastleigh Borough Local Plan 2011-2029 (August 2012) allocates the land as a strategic location for residential development and associated facilities and services. An outline planning application was submitted to Eastleigh Borough Council in September 2012. The illustrative master plan proposes the development of housing on part of the site which is underlain by sand and gravel.

1.3 Given the presence of a potentially viable sand and gravel resource within part of the site, and in light of the established principle of mineral safeguarding within national planning policy, it is prudent to establish the extent and quality of the resource and the likelihood of being able to work it in an environmentally acceptable way. The results of the assessment will help to inform Eastleigh Borough Council in their consideration of proposals for development which could potentially sterilise the mineral and whether, should the need for residential development be deemed to be of over-riding importance, there is a need to extract some or all of the resource in advance of development taking place.

SCOPE OF THE REPORT

1.4 This report provides an initial assessment of the mineral resources and potential for mineral extraction at this site based on a desk study assessment and a site walkover which was carried out on 14 January 2013.

1.5 The identification of constraints and margins is based on professional knowledge of mineral working/sites and observations during the site visit. At this stage advice has not been sought or detailed assessment undertaken relating to specific technical issues such as ecology, noise and hydrology. However, where relevant, reference has been made to information submitted in support of the outline planning application for residential development.

1.6 The purpose of this report is to set out in broad terms whether there is likely to be a reasonable prospect of viable mineral working at Boorley Green based on indicative margins to mitigate constraints and, where relevant, estimates of quality and tonnage of the mineral resource.

1.7 Should the site be considered suitable for mineral extraction, further assessment would be necessary to better understand the constraints and the extent to which they could be adequately mitigated, which may suggest a variation to the suggested margins. Similarly a more precise assessment of the quality and extent of the mineral resource would only be possible following site investigation.

2.0 Site Setting

Location

2.1 Land to the north and east of Boorley Green is located on the outskirts of Southampton to the north east of Hedge End. It lies approximately 1.6km north of the centre of Botley. The proposed housing site is bounded to the south by Maddoxford Lane, to the west by Winchester Road and to the north by Chancellors Lane. Ford Lake, a tributary of the River Hamble, runs along its eastern boundary.

Access

2.2 Existing access to the site is via Winchester Road (B3354) to Botley Park Hotel Golf and Country Club, and from Maddoxford Lane to Maddoxford Farm. The site is linked to the wider network via the A334 which joins the M27 at junction 7.

Description

2.3 The irregularly shaped site covers an area of some 80 hectares. Most of the site is occupied by the Botley Park County Club and Hotel and its associated golf course. Land within the southeastern part of the site, and south of the site and north of Maddoxford Lane is open pasture.

2.4 The closest residential property is at Maddoxford Farm and beyond the southeastern boundary of the site. Curtilages of properties along Maddoxford Lane on the northern edge of Boorley Green abut the site's southern boundary. A public footpath runs north south linking Maddoxford Lane with Chancellors Lane. Much of the land surrounding the site is in agricultural use.

2.5 The site abuts Ford Lake, a tributary to the River Hamble which is designated as a Site of Interest for Nature Conservation (SINC). A substantial area of established woodland is present along Ford Lake and partially lies within a tree protection zone. Part of the River Hamble itself falls within the Solent and Southampton Water Special Protection Area and Ramsar Site.

2.6 With reference to the Environment Agency website, the site does not lie within a Groundwater Source Protection Zone, but is within a Groundwater Vulnerability Zone (Minor Aquifer Intermediate). The mineral resources appear to be underlain by a secondary aquifer.

2.7 Part of the site adjacent to the tributary lies within flood risk zone 2, and pockets are subject to 1 in 30 year flooding.

Geology

2.8 The geological information for the site has been taken from the British Geological Survey (BGS) OpenGeoscience website.

2.9 This data source indicates that parts of the site are underlain by elements of the Wittering Formation which is part of the Bracklesham Group. This formation was formed between 34 to 65 million years ago in the Palaeogene period. The geological description of these beds is equal proportions of greyish brown laminated clay; wavy- to lenticular-bedded sand interbedded with clay and fine- to medium-grained sparsely glauconitic sand.

2.10 Towards the Ford Lake, which is a tributary to the River Hamble the site is underlain by elements of the London Clay which are also from the Palaeogene period and stratigraphically lie directly below the Wittering Formation in age. The London Clay is predominantly made up of fine, sandy, silty clay/silty clays. Progressing towards the Ford Lake stream, the London Clays are overlain by superficial fluvial deposits which will be a mixture of sands, gravel and clays. These are sometimes known as River Terrace Deposits.

3.0 Planning Status in Respect of Minerals Safeguarding

3.1 The safeguarding of non-renewable resources, such as minerals, is considered to be a key aspect of sustainable development. Para 143 of the National Planning Policy Framework (DCLG 2012) obliges Mineral Planning Authorities to define Mineral Safeguarding Areas (MSAs) when preparing local plans, in order that known locations of specific mineral resources of local or national importance are not needlessly sterilised by non-mineral development, albeit that these carry no presumption that the resource will be worked. Where it is deemed necessary for non-mineral development to take place, prior extraction is to be encouraged where practically and environmentally feasible.

3.2 The adopted Plan for Hampshire comprises the amended Minerals and Waste Core Strategy 2007 and 'saved' policies from The Hampshire, Portsmouth and Southampton Minerals and Waste Local Plan (Dec 1998). The Core strategy includes Policy S15 on the sterilisation of mineral deposits. It states that:

"Proposals for permanent development which would sterilise mineral deposits shown on the Key Diagram, or subsequently in the Hampshire Minerals Plan or on the Proposals Map, will be resisted unless provision is made for extraction prior to the commencement of development, or other planning considerations apply."

3.3 Paragraph 23.5 says that *"Mineral Safeguarding Areas are broad areas of proven mineral deposits which are protected from incompatible permanent development which would sterilise these resources, but there is no presumption that these safeguarded deposits will actually be worked for minerals. Mineral Planning Authorities should be consulted prior to and/or during the consideration of applications for development, that may lead to the permanent sterilisation of mineral deposits shown on the Key Diagram, or subsequently identified as Mineral Safeguarding Areas on detailed plans included within the Hampshire Minerals Plan and shown on the Proposals Map. Mineral Safeguarding Areas for brick-making clay and sand and gravel will be identified in the subsequent Hampshire Minerals Plan, and shown on the Proposals Map. The Mineral Planning Authorities will object to any proposal that is likely to lead to permanent sterilisation of 'commercially viable' mineral deposits where, taking into account other planning considerations, insufficient prior extraction is proposed. In some cases, such as to avoid interfering with groundwater or to reduce the risk of flooding, the Mineral Planning Authorities may allow the partial sterilisation of deposits."*

3.4 Policy DC21 and paragraph 26.59-60 deal with the prior extraction of minerals. Paragraph 26.59 states that *"In order to prevent the sterilisation of mineral resources, as required by Policy S15, it is sometimes possible to extract some or all the mineral before the commencement of the development."* Paragraph 26.60 goes on to say that "*Although the sterilisation of mineral resources should generally be resisted sometimes it is unavoidable. A preferable alternative to sterilisation is prior extraction. In order for mineral extraction to be determined within the context of this policy, the subsequent development will have to be subject to a policy or proposal in a Local Development Framework and/or an application for planning permission. Partial sterilisation may be allowed in the circumstances listed in paragraph 22.5."*

3.5 Policy DC21 sets out that *"The extraction of sand and gravel, prior to construction of permanent planned development, to avoid sterilisation of mineral deposits, will be permitted provided it does not prejudice the timescale and standards of the subsequent development."*

3.6 Hampshire County Council (HCC) is preparing the Hampshire Minerals and Waste Plan (HWMP) which is currently undergoing independent examination. The public hearings were adjourned in June 2012 to allow for an eight week consultation on proposed changes which ended in December 2012. The hearings are to resume in March this year. The Policies Map accompanying the Submitted Plan defines the extent of proposed MSAs.

3.7 Policy 15 of the proposed changes version of the Submitted Plan on the safeguarding of mineral resources states that:

"...Safeguarded mineral resources are defined by a Mineral Safeguarding Area (MSA) illustrated on the Policies Map.

Development without the prior extraction of mineral resources in the MSA may be permitted if:

a) it can be demonstrated that the sterilisation of mineral resources will not occur; or
b) it would be inappropriate to extract mineral resources at that location, with regards to the other policies in the Plan; or
c) the development would not pose a serious hindrance to mineral development in the vicinity; or
d) the merits of the development outweigh the safeguarding of the mineral..."

3.8 Part of the proposed MSA as defined on the Policies Map coincides with the southeastern edge of the Boorley Green strategic housing allocation. The sharp sand and gravel resources extend beyond the boundary of Eastleigh Borough into the administrative area of Winchester City Council.

3.9 The part of the MSA which coincides with the housing allocation, and mineral resources within the vicinity, are not allocated for future land won aggregate under Policy 20 of the HWMP. There are no existing sand and gravel quarries in the vicinity.

3.10 Appendix C of the HWMP provides guidance on how the Plan policies will be implemented, and for Policy 15 says that:

"...In terms of prior extraction, a realistic judgement about the likelihood of the mineral being worked in an environmentally acceptable way will be made in areas where development is proposed within the MSA. The minerals planning authority will not seek to prevent development where it is unlikely that extraction of the mineral would occur in the future. Where mineral deposits are believed to exist but detailed geological information is not available, the existence or otherwise of a potentially workable resource may need to be established by the developer before any application for development that might sterilise the potential deposit is determined."

Mineral resources

3.11 As part of the process of preparing the Minerals and Waste Plan, Hampshire gave consideration to information provided by BGS as well as collating information on known mineral industry interest. This information has been compiled in the Hampshire Safeguarding Study[1].

[1]Version 4 (Submission), February 2012

4.0 Constraints upon Mineral Development

4.1 The site does not lie within an MSA identified in an adopted Plan. However, part of the site coincides with and area of safeguarded sand and gravel deposits shown on the key diagram of the adopted Hampshire Minerals and Waste Core Strategy, and with the proposed MSA defined in the Submission version of the HMWP, the boundary of which is based on BGS mapping.

4.2 In relation to the site at Boorley Green, the primary constraints are as follows:-

- Access;
- Previous mineral working;
- The proximity of residential properties, roads and golf course;
- Utilities;
- Proximity of Site of Importance for Nature Conservation;
- The site ground conditions, including groundwater levels;
- Landownership; and
- The potential for site expansion.

4.3 Appendix 1 of this report shows the boundary of the proposed MSA as far as it coincides with the site and key constraints to mineral extraction as set out below.

4.4 A view is given at the end of the report as to the potential impact of housing development on the area included within the proposed MSA in the vicinity of the site.

Access

4.5 The potential access to the mineral resource would be via Maddoxford Lane, from where it is understood that previous mineral working in the area was accessed, via Maddoxford Farm. Observations during the site walkover suggest that the sight lines may not be adequate for the existing farm junction to be used by HGVs, and that HGVs would be restricted to an approach from the west along Maddoxford Lane requiring a left-in right-out access to and from the site, although this would need to be verified by the Highway Authority. Maddoxford Lane might be technically suitable for use by HGVs and the western section is partly used as a bus route, however, the road passes through the residential area of Boorley Green with residential frontages on both sides of the road.

Previous mineral extraction

4.6 The full planning history was requested from HCC, however, at this stage we have only received drawings and decision notices relating two previous consents in 1961 and 1971. On the basis of this information it is our understanding that planning permission for the extraction of gravel was granted to Hall Aggregates (South Coast) Ltd from land which coincides with the eastern part of the proposed housing allocation. The consented area (1971 permission) is shown in Appendix 1.

4.7 The previous extraction of minerals will have already substantially depleted the resource within this part of the proposed MSA.

4.8 A margin of 50m from the area of previous working has been applied for the purposes of this report.

Residential Properties, Roads and Golf Course

4.9 There is currently no statutory guidance on minimum working distances of mineral sites from houses. However, Technical Guidance to the NPPF states that *"permissions for minerals extraction close to residential property may not provide adequate protection"* and *"In such cases, it may be justified to consider adequate separation distances. Any such distance should be effective but reasonable…"* Paragraph 5.14 of the proposed changes version of the submitted HMWP states that *"It is standard practice in Hampshire for operational mineral extraction and inert waste recycling to have a minimum buffer zone of 100m from the nearest sensitive receptors, such as homes and schools, though this distance will be reviewed on a case-by-case basis."* A stand-off distance of 100m from residential properties is therefore a good starting point in the estimation of a practical minimum for anything other than very short term "borrow-pit" type developments.

4.10 Further weight is afforded to the use of this distance by a report prepared on behalf of Hampshire County Council in June 2008. "*A Review of the Potential for Sand & Gravel extraction at Three Areas in Hampshire*" was carried out by Mineral & Resource Planning Associates and Richard Fox Associates to assist the County in defining the extent of new preferred Areas in the emerging Hampshire Minerals and Waste Plan. Under a section entitled Environmental Considerations, the report proposes, at paragraph 2.7.2, the application of a 100m stand-off around communities, properties and some other environmental assets.

4.11 The site is in close proximity to a number of residential properties predominantly to the south at Boorley Green and east at Maddoxford Farm. The nearest property is Maddoxford Farmhouse which although not listed has been identified as building of local importance. These would present a

significant consideration for any future mineral working proposal in terms of resultant impacts arising from noise, dust, air quality, traffic and visual intrusion.

4.12 In a similar way, the close proximity of Maddoxford Lane to the southern boundary would need to be taken into account when establishing the workable area for any future minerals development. Minimum working distances from infrastructure and utilities are usually based upon cautious geotechnical criteria and would be likely to require an un-worked margin of at least 25m to the north of Maddoxford Lane, between the edge of any proposed mineral working and the public highway.

4.13 Proposals for mineral extraction would need to take account of any potential impact on the amenity of the existing neighbouring golf course, mitigation of which may require additional planting along the boundary of the course. For the purposes of this report a minimum 50m margin has been assumed.

Utilities

4.14 Oil and gas pipelines and an overhead electricity line cross the south eastern corner of site. The Planning Statement accompanying the outline application refers to advice from the Health and Safety Executive to retain an easement of 10ft either side of the pipelines. However, for mineral extraction, a practical protection corridor of 10-15m either side of the centre of the utility would normally be applied and 15m is used for the purposes of this report. It is anticipated that a minimum 10m standoff would be incorporated around any electricity line posts which cross the site. It is very unlikely that diversion of the pipelines would be a practicable option.

Site of Importance for Nature Conservation, Water Course and Tree Protection Zone

4.15 Ford Lake and the associated mature woodland along the eastern boundary fall within a designated SINC which supports flora and fauna characteristic of unimproved and waterlogged conditions. At the northern end and along Ford Lake the proposed MSA coincides with the SINC, the woodland sloping steeply towards the tributary. Paragraph 5.13 of the Planning Statement accompanying the outline planning application refers to a 15m buffer immediately adjacent to the Ford Lake Woodland in accordance with standing advice from Natural England. It is reasonable to suggest that a significantly greater margin would need to be applied in the context of any proposals for future mineral extraction in order to protect the SINC.

4.16 The tributary feeds into the River Hamble which, south of Botley, falls within the Solent and Southampton Water Special Protection Area, the Solent Maritime Special Area of Conservation and the Solent and Southampton Water Ramsar Site. Any potential for mineral extraction to adversely impact the designations would need to be considered as part of an Appropriate Assessment.

4.17 An aerial photograph of the site and surrounding area shows that, as well as providing a backdrop to the existing golf course, the woodland forms part of a wider network of green infrastructure along water courses and field boundaries. The published Landscape Character Assessment prepared by Eastleigh Borough Council refers to two landscape types falling within the study area – 'Undulating Farmland' and 'Golf Course', and refers to the strong hedgerow structure and scattered woodland blocks of the Undulating Farmland landscape type.

Landownership

4.18 It is understood that Area 1 forms part of the larger Maddoxford Farm agricultural holding which is in single ownership and which includes fields to the south and south east of the golf course and north of Maddoxford Lane. The landowner has stated verbally his intention is to continue to operate the farm and that he would not be willing to put forward his land for mineral extraction. Whilst it may be subject to change in the future, the current position of the landowner represents an absolute constraint to the mineral extraction within this part of the proposed MSA, for the foreseeable future.

Ground Conditions

4.19 Small areas of the River Terrace Deposits have been worked to the east of Boorley Green in pits to the east of Netherhill Lane and to the south of Wangfield Lane.

4.20 From planning history details and discussion with a planning officer at HCC, it is understood that deposits within the eastern part of the proposed housing site have also been worked.

4.21 Initial assessment of BGS Logs for boreholes drilled within part of the site during the 1960s shows that the gravel is absent, very thin or of low quality.

4.22 As with the 1971 consent which limited extraction to at least 3ft above the normal water level, the potential implications of mineral working on the hydrology of the area and consequently the health of existing woodland and SINC would be particularly relevant.

4.23 No details about the material used to restore the extracted area have been received from the County. However, potential for the spread of any contamination to the wider area would be a further consideration in weighing up the viability of further mineral working in the vicinity.

Potential for Site Expansion

4.24 The proposed MSA extends beyond the allocated strategic housing site to the boundary of Eastleigh Borough and into the administrative area of Winchester City Council.

4.25 Beyond the site boundary, but within the borough of Eastleigh, the mineral resource falls within the Countryside Gap between Botley and Boorley Green as identified in Strategic Policy S8 of the pre-submission version of the Eastleigh Borough Local Plan 2011-2029. The SINC designation extends into this part of the MSA. This land is also part of the Maddoxford Farm landholding and is within the same ownership. The application of a 100m margin to protect the amenity of the residential buildings at Maddoxford Farm would, in any event, rule out extraction of the majority much of this part of the resource.

4.26 Beyond the Eastleigh Borough boundary, the potential to work the mineral resource would fall under the policy framework of the Winchester District Local Plan. The development of the site for housing is unlikely to impact upon the potential for mineral development on land immediately to the east of the Borough boundary. Any proposals to work land to the east of the tributary would need to incorporate a margin from the water course and the steep sided slopes along the margins of the tributary would render it impractical to cross for the purposes of accessing the mineral to the west of Ford Lake. The masterplan for the site proposes to retain the woodland which would serve as a natural buffer between any future mineral extraction beyond the boundary of Eastleigh and the new housing development.

Potential for mineral working

4.27 A substantial part of the proposed MSA has previously been worked for mineral and subsequently restored. The remainder of the mineral resource to the north falls predominantly within established SINC woodland. It would be necessary to remove the vegetation in order to access the resource, resulting in the loss of a habitat and the associated ecological and landscape value. In any event, appropriate margins along Ford Lake and the boundary of the existing golf course would significantly reduce any potential working area north of the previously worked land. It is considered

that the adverse impacts of extraction and restoration would outweigh any benefits of working the remaining limited mineral resource.

4.28 In the southern part of the proposed MSA, once margins are applied to protect utilities, Maddoxford Lane, the amenity of Maddoxford Farm, and the SINC, the indicative remaining pockets of mineral are too small to be considered viable (see orange cross hatched area on Appendix 1). Potential hydrological implications of mineral working and a possible need to improve access into the site could present further limitations. Moreover, it is understood that the owner of the farmland and the potential access does not have an interest in mineral extraction.

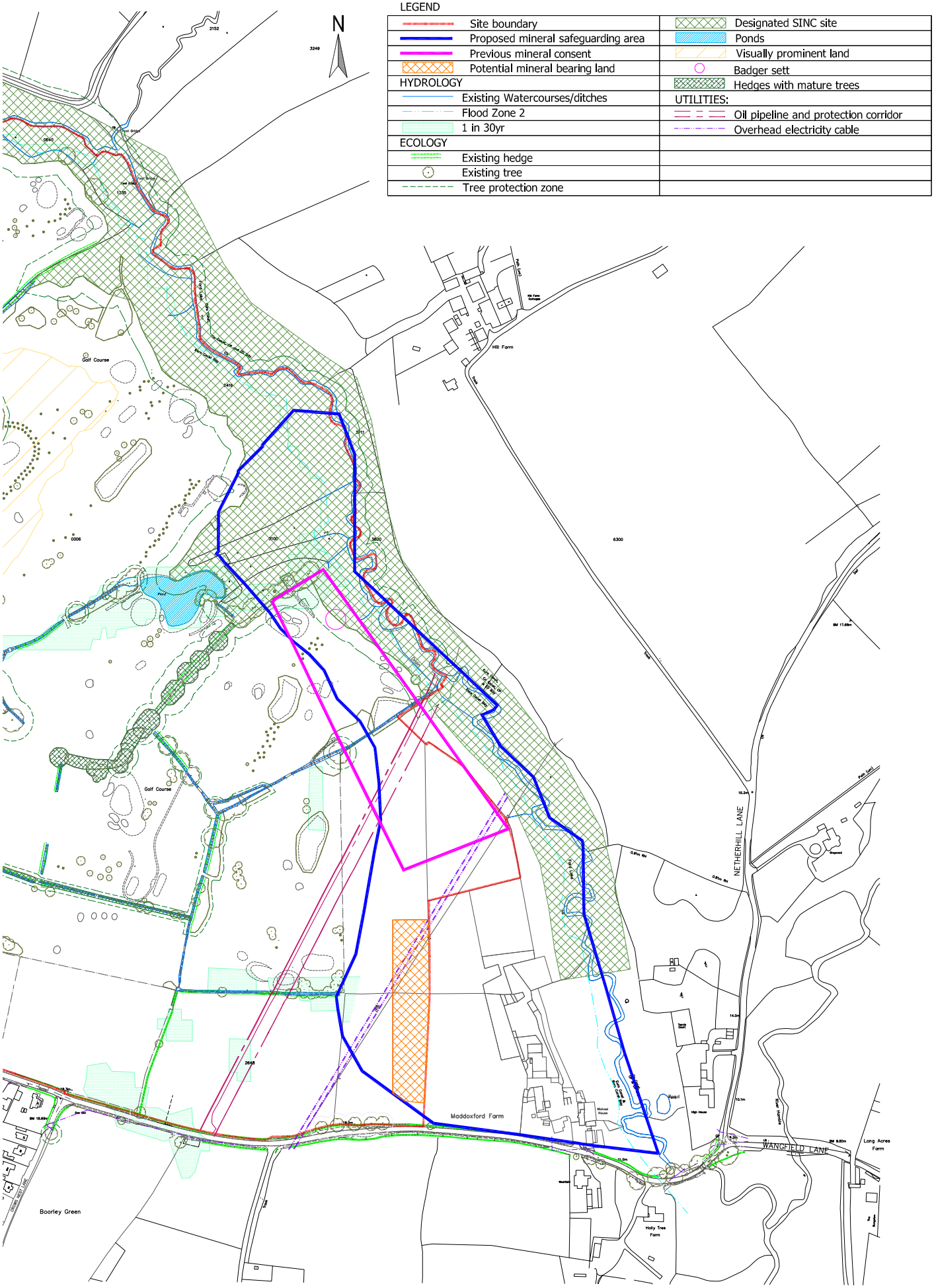
5.0 Conclusions

5.1 The development of land north and east of Boorley Green for housing would sterilise the mineral resources which underlays part of the site.

5.2 On the basis of the constraints outlined in this report and an initial assessment of the quality and presence of the resource from Borehole Logs, it is concluded that it would not be appropriate or viable to extract mineral resources in this location and consequently there would be no need for prior extraction to take place in advance of residential development.

Appendix 1 - Constraints to Mineral Extraction

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS



REV	DESCRIPTION	BY	CHK	APP	DATE

5th FLOOR,LONGCROSS COURT
47 NEWPORT ROAD
CARDIFF
CF24 0AD

TEL: +44 (0)29 2082 9200
FAX: +44 (0)29 2045 5321

Client:
MACDONALD BOTLEY PARK LTD, M A BOTLEY AND S & R DEVELOPMENTS

Project:
BOORLEY GREEN
MINERALS ASSESSMENT

Drawing Title:
CONSTRAINTS TO MINERAL EXTRACTION

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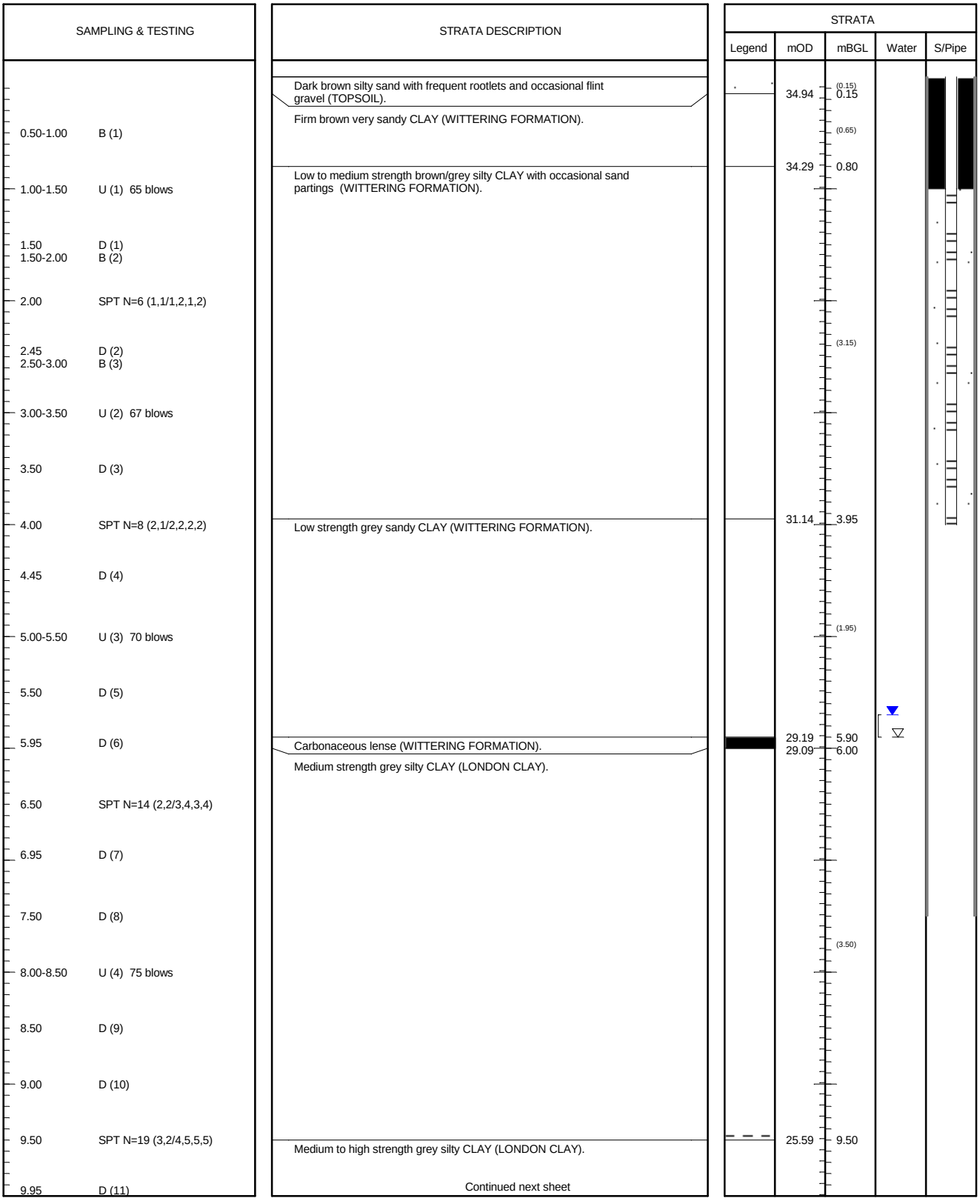
Project No.	Office	Type	Drawing No.	Revision
A074069	48	46	APPENDIX 1	00

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APPENDIX B

Engineering Logs & Sections



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH201
Groundwater: Strike at 5.90m; 5.70 after 20mins	Method: Dando 150	Start: 03/09/2013	Scale: 1:50
		Finish: 03/09/2013	Size:
Casing: 150mm diameter to 7.50mBGL	Project: Boorley Green	Filled: 03/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 35.087mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

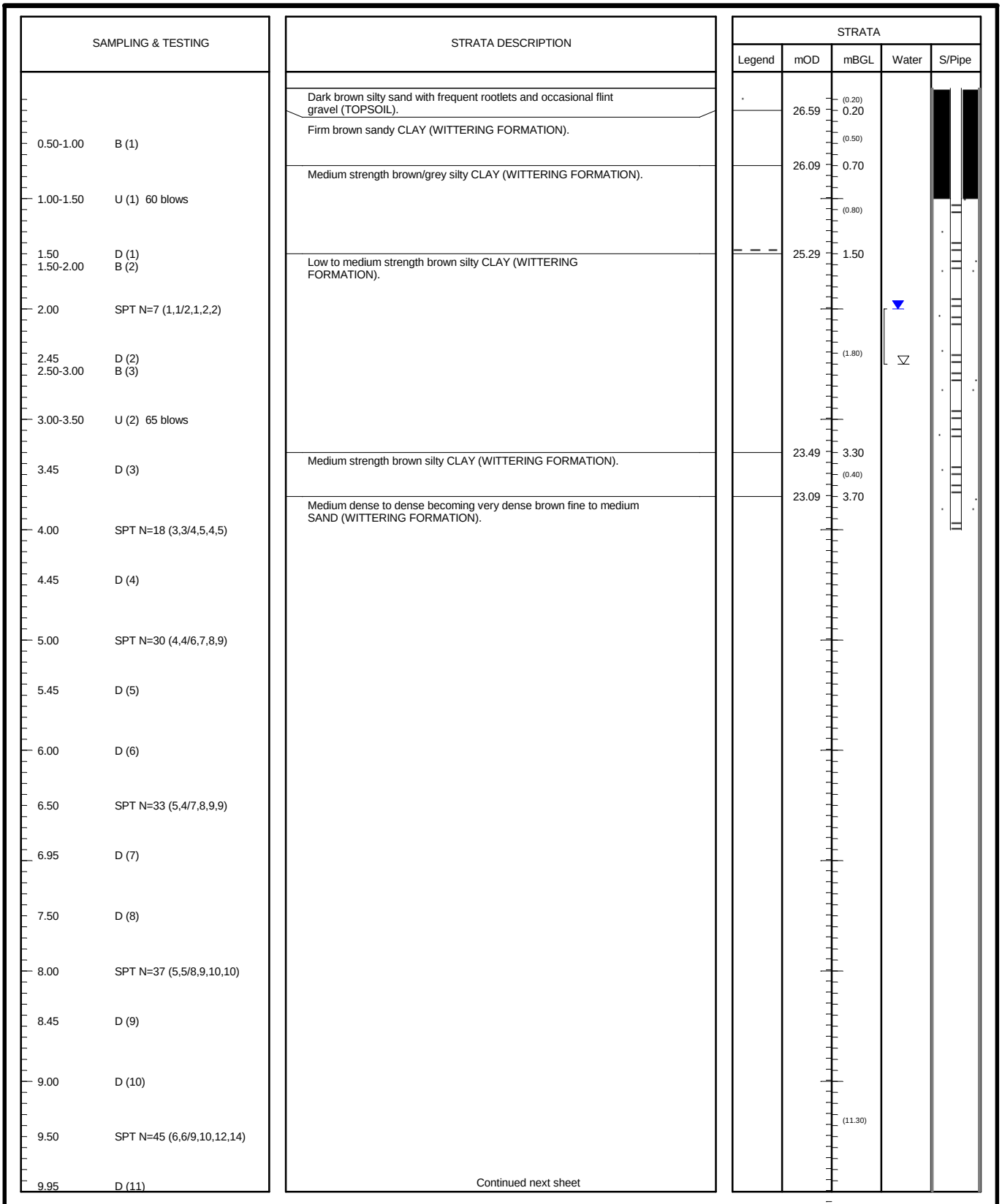
SAMPLING & TESTING		STRATA DESCRIPTION
		Medium to high strength grey silty CLAY (LONDON CLAY).
10.50	D (12)	
11.00-11.50	U (5) 80 blows	
11.50	D (13)	
12.00	D (14)	
12.50	SPT N=24 (3,3/5,6,7,6)	
12.95	D (15)	
13.50	D (16)	
14.00-14.50	U (6) 95 blows	
14.50	D (17)	
15.00	D (18)	End of Borehole at 15.00 m

STRATA				
Legend	mOD	mBGL	Water	S/Pipe
	20.09	15.00		

(5.50)

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH201
Groundwater:	Method: Dando 150	Start: 03/09/2013	Scale: 1:50
		Finish: 03/09/2013	Size:
Casing: 150mm diameter to 7.50mBGL	Project: Boorley Green	Filled: 03/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 35.087mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



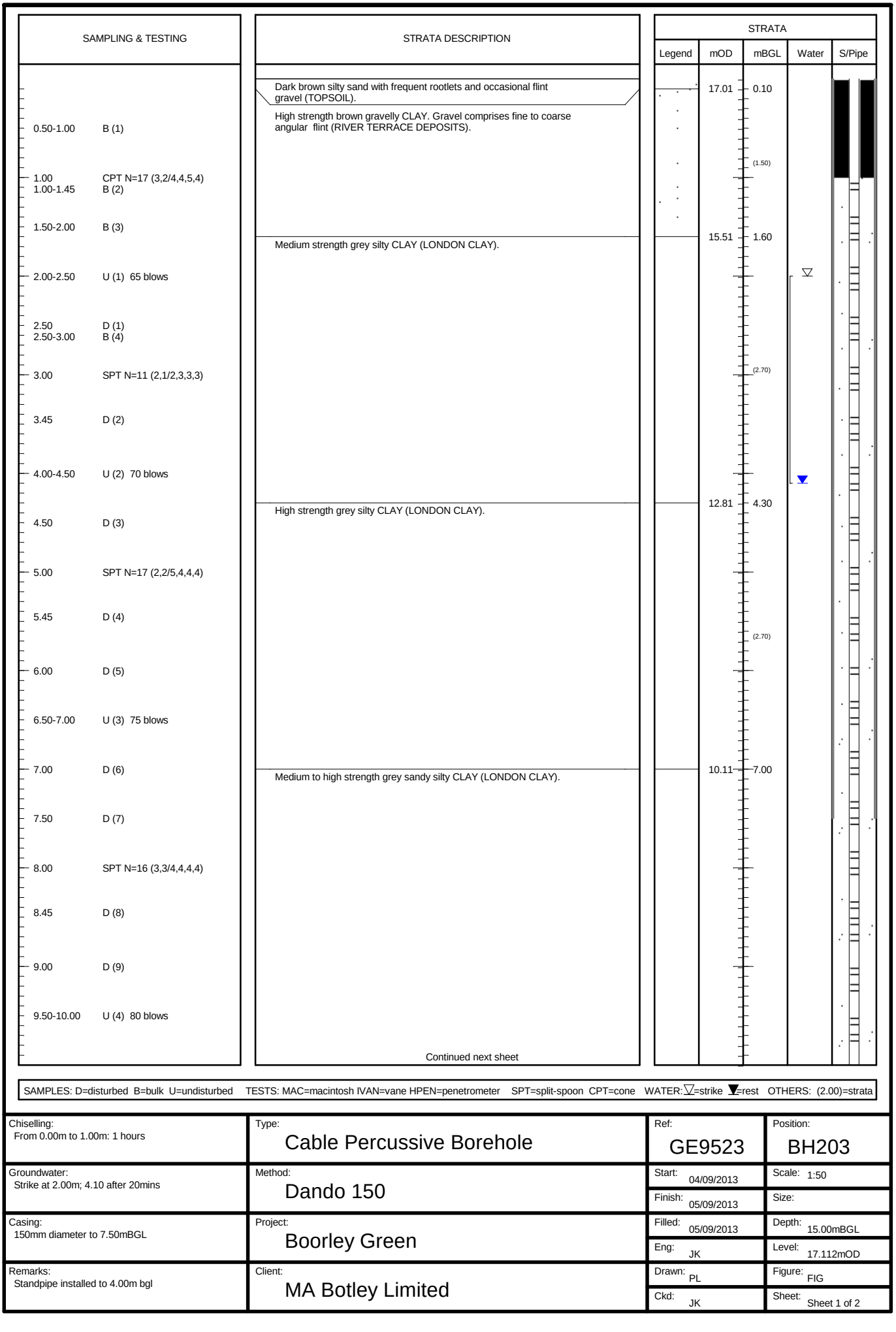
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Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH202
Groundwater: Strike at 2.50m; 2.00 after 20mins	Method: Dando 150	Start: 03/09/2013	Scale: 1:50
		Finish: 04/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 04/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 26.790mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Medium dense to dense becoming very dense brown fine to medium SAND (WITTERING FORMATION).					
10.50	D (12)						
11.00	SPT N=48 (6,5/9,11,13,15)						
11.45	D (13)						
12.00	D (14)						
12.50	SPT N=49 (6,6/10,11,13,15)						
12.95	D (15)						
13.50	D (16)						
14.00	SPT N=58 (7,6/11,13,16,18)						
14.45	D (17)						
15.00	D (18)	End of Borehole at 15.00 m		11.79	15.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH202
Groundwater:	Method: Dando 150	Start: 03/09/2013	Scale: 1:50
		Finish: 04/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 04/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 26.790mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



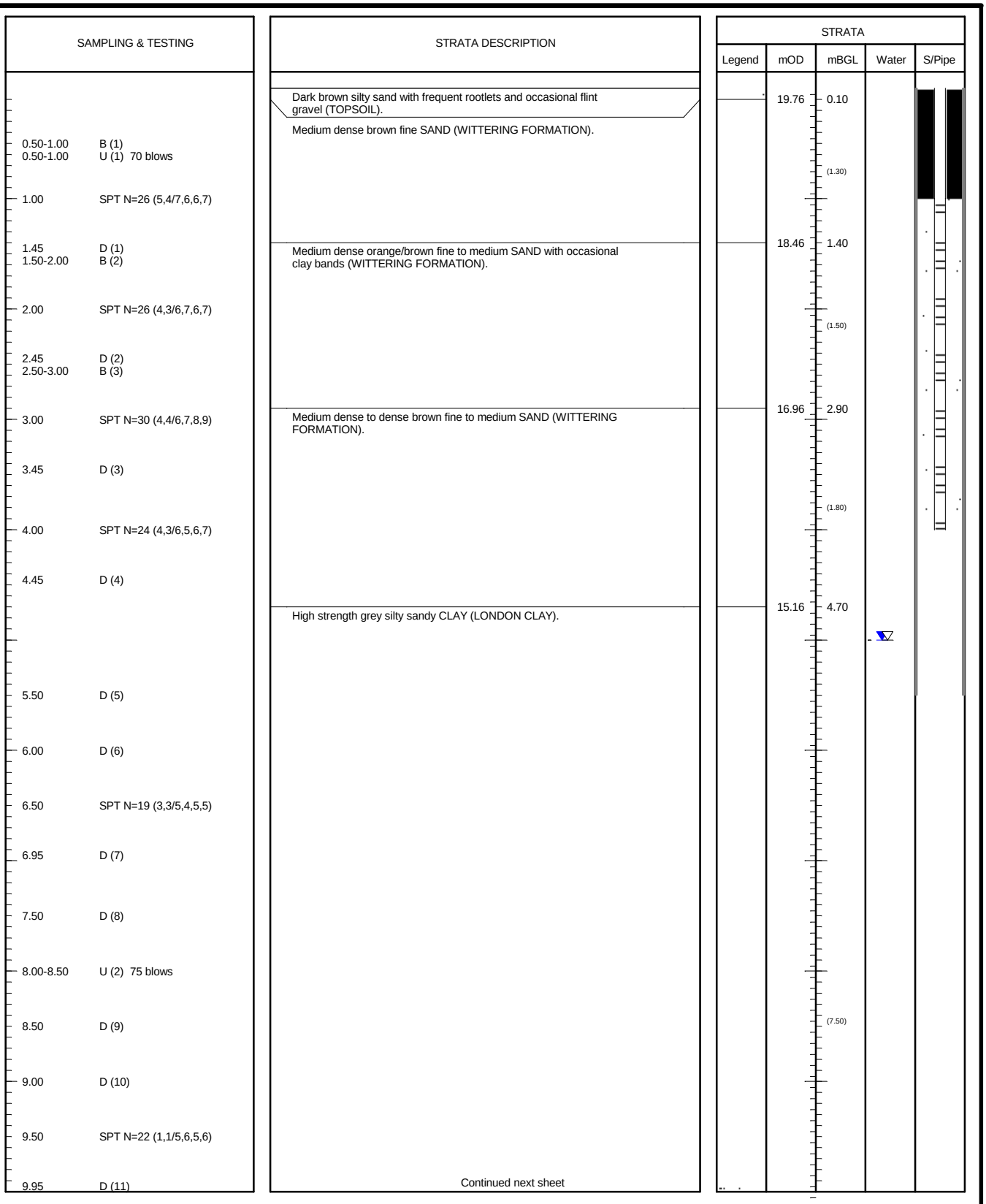
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Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH203
Groundwater: Strike at 2.00m; 4.10 after 20mins	Method: Dando 150	Start: 04/09/2013 Finish: 05/09/2013	Scale: 1:50 Size:
Casing: 150mm diameter to 7.50mBGL	Project: Boorley Green	Filled: 05/09/2013 Eng: JK	Depth: 15.00mBGL Level: 17.112mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL Ckd: JK	Figure: FIG Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
10.00	D (10)	Medium to high strength grey sandy silty CLAY (LONDON CLAY).					
10.50	D (11)						
11.00	SPT N=28 (4,3/6,7,7,8)				(8.00)		
11.45	D (12)						
12.00	D (13)						
12.50-13.00	U (5) 90 blows						
12.95	D (14)						
13.50	D (15)						
14.00	SPT N=32 (5,4/7,8,8,9)						
14.45	D (16)						
15.00	D (17)	End of Borehole at 15.00 m		2.11	15.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH203
Groundwater:	Method: Dando 150	Start: 04/09/2013	Scale: 1:50
		Finish: 05/09/2013	Size:
Casing: 150mm diameter to 7.50mBGL	Project: Boorley Green	Filled: 05/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 17.112mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



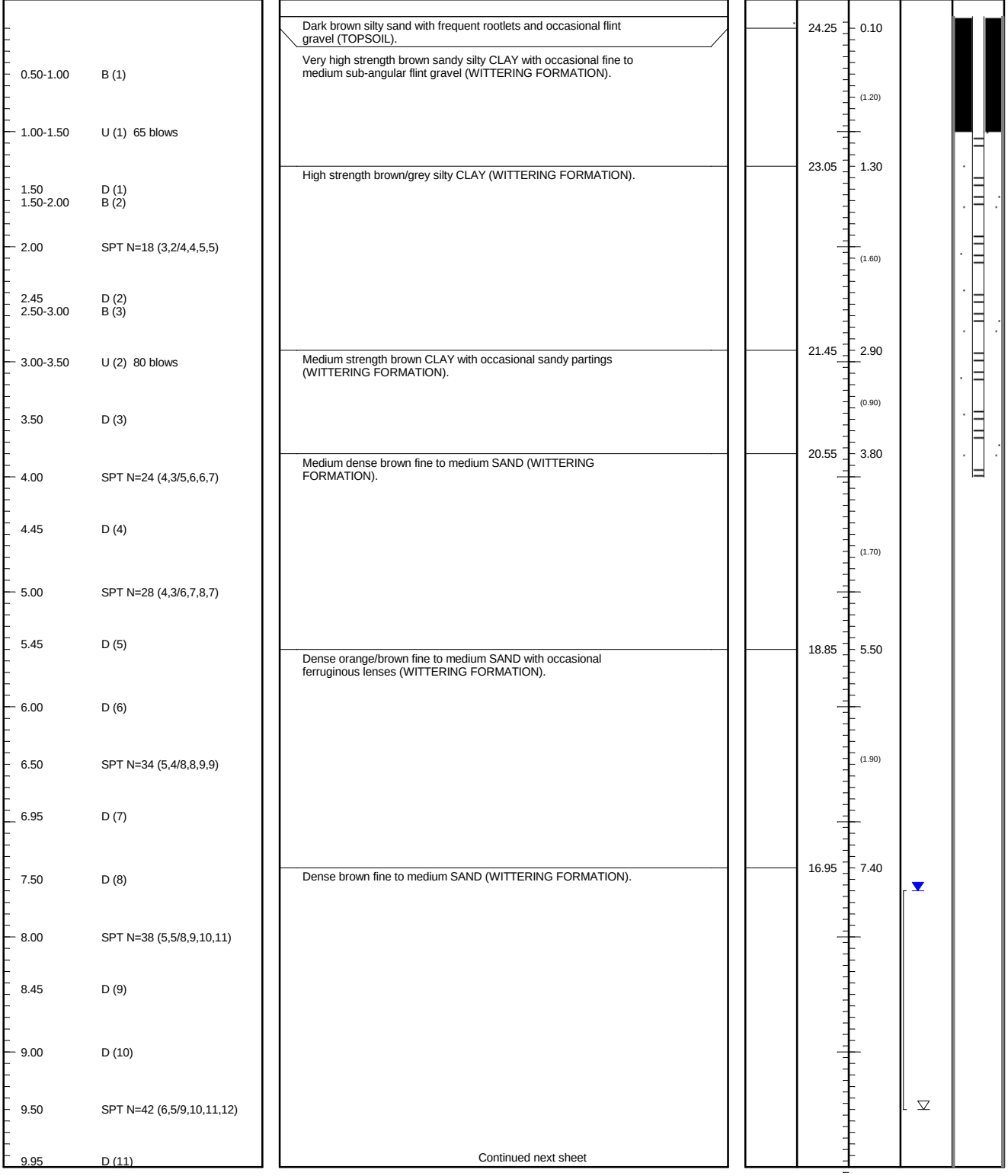
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH204
Groundwater: 5	Method: Dando 150	Start: 05/09/2013	Scale: 1:50
		Finish: 05/09/2013	Size:
Casing: 150mm diameter to 5.50mBGL	Project: Boorley Green	Filled: 05/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 19.856mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		High strength grey silty sandy CLAY (LONDON CLAY).					
10.50	D (12)						
11.00-11.50	U (3) 80 blows						
11.50	D (13)						
12.00	D (14)						
				7.66	12.20		
		High strength becoming very high strength grey silty CLAY (LONDON CLAY).					
12.50	SPT N=26 (4,4/6,7,6,7)						
12.95	D (15)						
13.50	D (16)				(2.80)		
14.10-14.60	U (4) 90 blows						
14.60	D (17)						
15.00	D (18)			4.86	15.00		
		End of Borehole at 15.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH204
Groundwater:	Method: Dando 150	Start: 05/09/2013	Scale: 1:50
		Finish: 05/09/2013	Size:
Casing: 150mm diameter to 5.50mBGL	Project: Boorley Green	Filled: 05/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 19.856mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



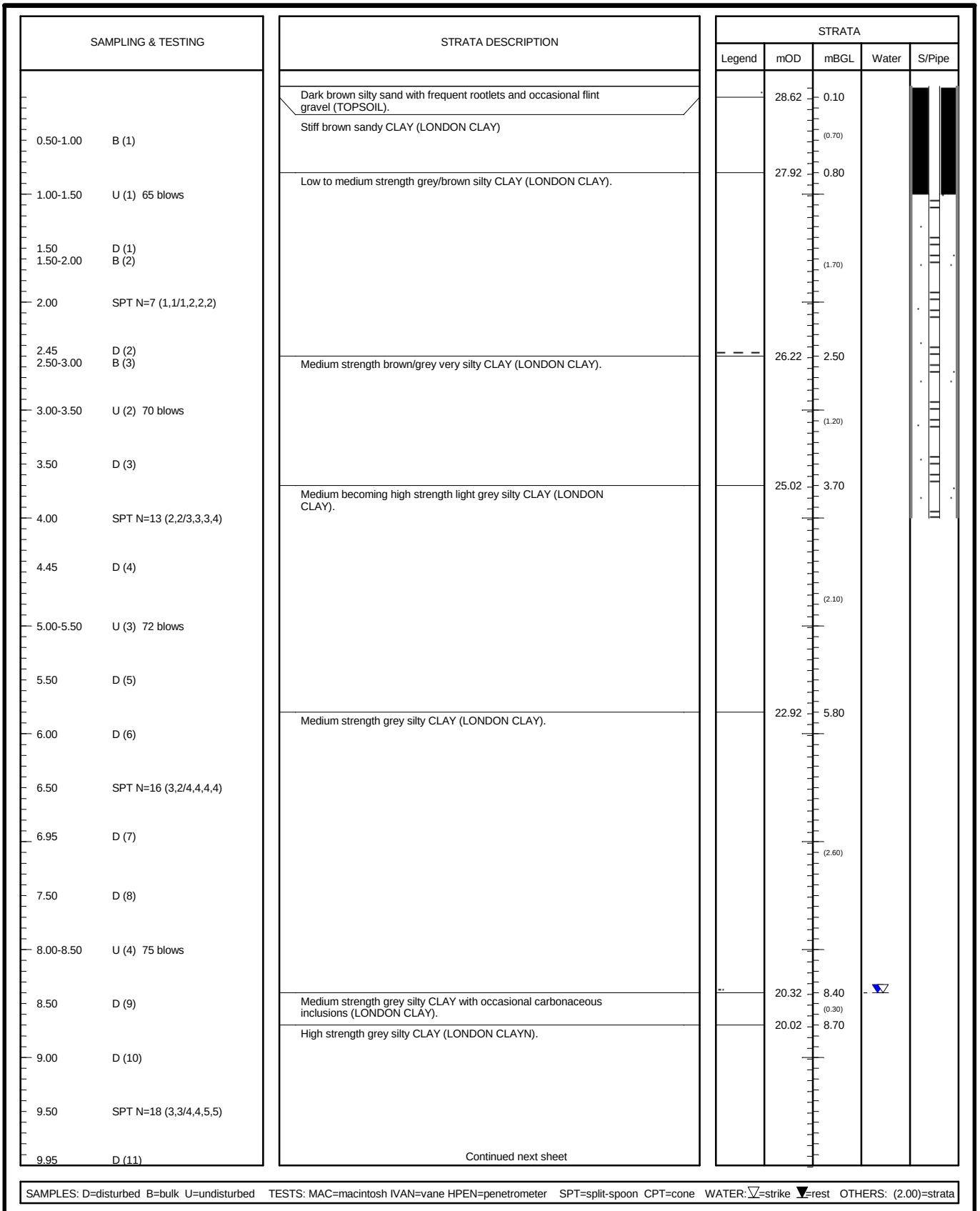
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH205
Groundwater: Strike at 9.50m; 7.60 after 20mins	Method: Dando 150	Start: 06/09/2013	Scale: 1:50
		Finish: 06/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 06/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 24.348mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dense brown fine to medium SAND (WITTERING FORMATION).					
10.50	D (12)						
11.00	SPT N=44 (6,5/10,10,11,13)				(7.60)		
11.45	D (13)						
12.00	D (14)						
12.50	SPT N=49 (6,6/10,11,13,15)						
12.95	D (15)						
13.50	D (16)						
14.10	SPT N=48 (6,5/10,12,14,12)						
14.55	D (17)						
15.00	D (18)	End of Borehole at 15.00 m		9.35	15.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH205
Groundwater:	Method: Dando 150	Start: 06/09/2013	Scale: 1:50
		Finish: 06/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 06/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 24.348mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



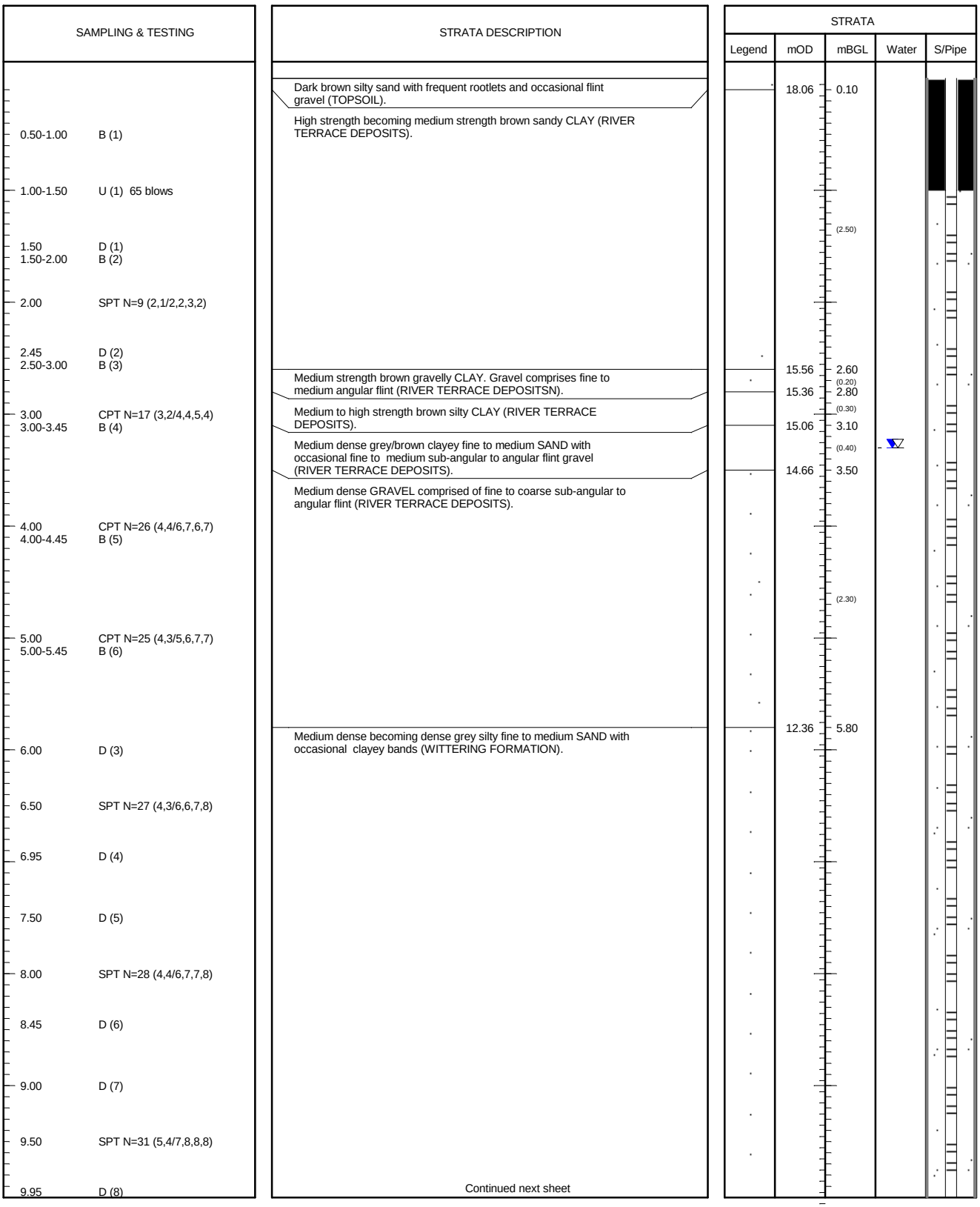
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH206
Groundwater: Slight seepage at 8.40m	Method: Dando 150	Start: 10/09/2013	Scale: 1:50
		Finish: 10/09/2013	Size:
Casing: 150mm diameter to 4.00mBGL	Project: Boorley Green	Filled: 10/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 28.715mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		High strength grey silty CLAY (LONDON CLAYN).					
10.50	D (12)						
11.00-11.50	U (5) 80 blows						
11.50	D (13)						
12.00	D (14)				(6.30)		
12.50	SPT N=28 (4,3/6,7,7,8)						
12.95	D (15)						
13.50	D (16)						
14.00-14.50	U (6) 100 blows						
14.50	D (17)						
15.00	D (18)	End of Borehole at 15.00 m		13.72	15.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH206
Groundwater:	Method: Dando 150	Start: 10/09/2013	Scale: 1:50
		Finish: 10/09/2013	Size:
Casing: 150mm diameter to 4.00mBGL	Project: Boorley Green	Filled: 10/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 28.715mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



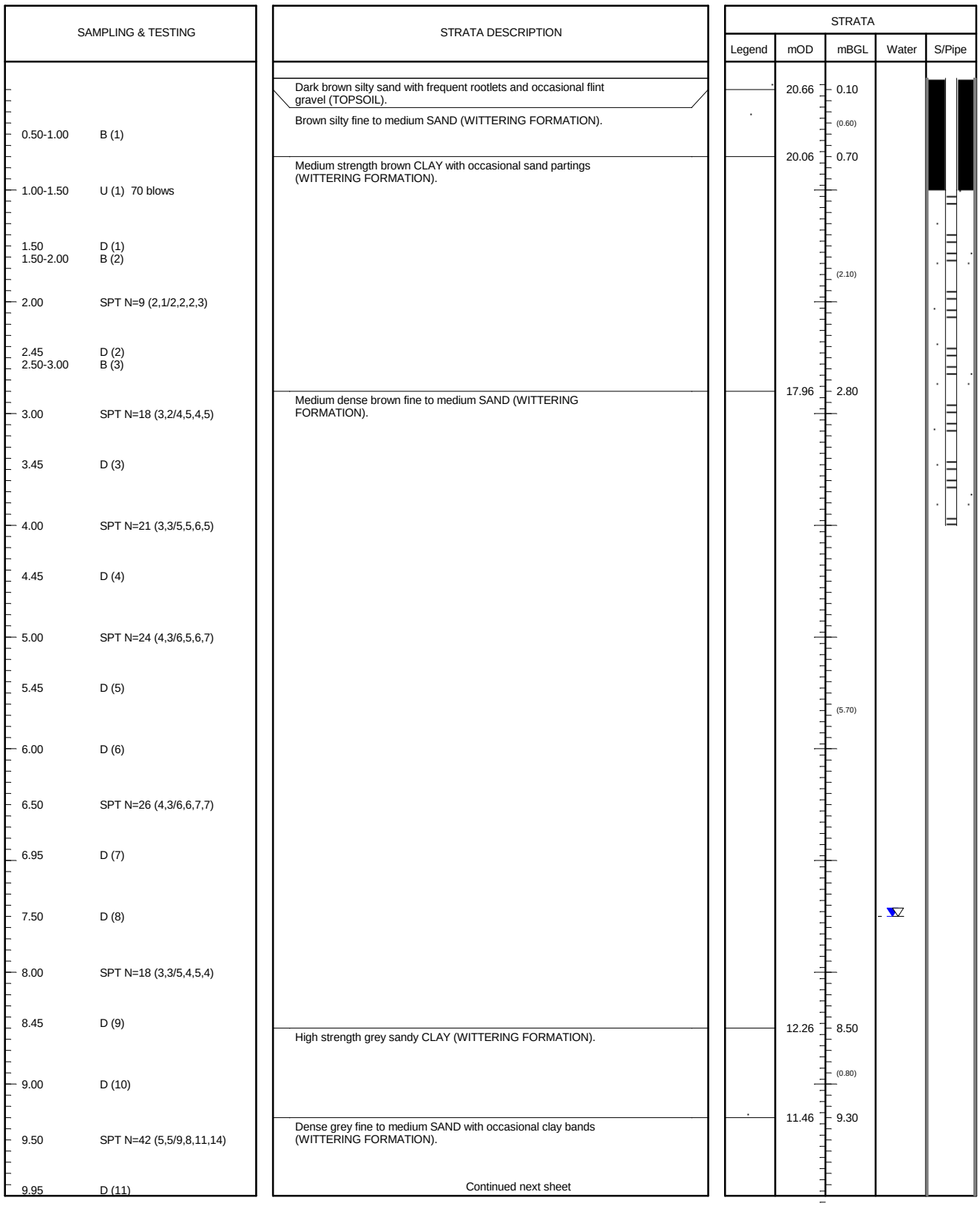
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH207
Groundwater: Strike at 3.30m bgl; no change after 20 mins	Method: Dando 150	Start: 09/09/2013	Scale: 1:50
		Finish: 10/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 10/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 18.155mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Medium dense becoming dense grey silty fine to medium SAND with occasional clayey bands (WITTERING FORMATION).			(9.20)		
10.50	D (9)						
11.00	SPT N=35 (5,4/8,9,9,9)						
11.45	D (10)						
12.00	D (11)						
12.50	SPT N=37 (5,4/8,9,10,10)						
12.95	D (12)						
13.50	D (13)						
14.00	SPT N=38 (5,4/7,8,11,12)						
14.45	D (14)						
15.00	D (15)	End of Borehole at 15.00 m		3.16	15.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH207
Groundwater:	Method: Dando 150	Start: 09/09/2013	Scale: 1:50
		Finish: 10/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 10/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 18.155mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



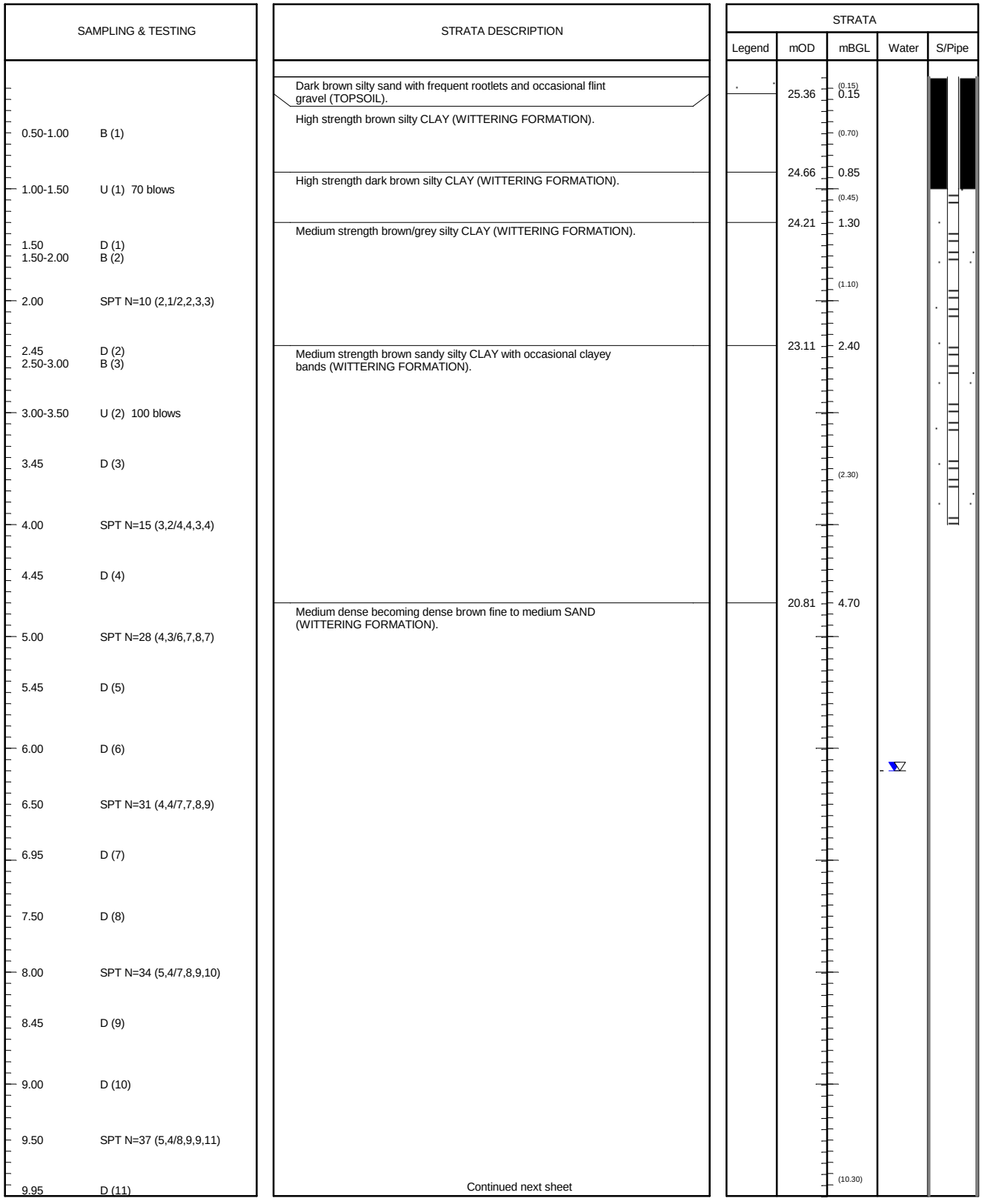
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH208
Groundwater: Strike at 7.50m bgl; no change after 20 mins	Method: Dando 150	Start: 09/09/2013	Scale: 1:50
		Finish: 09/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 09/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 20.757mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dense grey fine to medium SAND with occasional clay bands (WITTERING FORMATION).					
10.50	D (12)						
11.00	SPT N=35 (5,4/7,8,9,11)						
11.45	D (13)						
12.00	D (14)						
					(5.70)		
12.50	SPT N=39 (6,5/9,8,10,12)						
12.95	D (15)						
13.50	D (16)						
14.00	SPT N=45 (6,6/10,11,11,13)						
14.45	D (17)						
15.00	D (18)	End of Borehole at 15.00 m		5.76	15.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH208
Groundwater:	Method: Dando 150	Start: 09/09/2013	Scale: 1:50
		Finish: 09/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 09/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 20.757mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



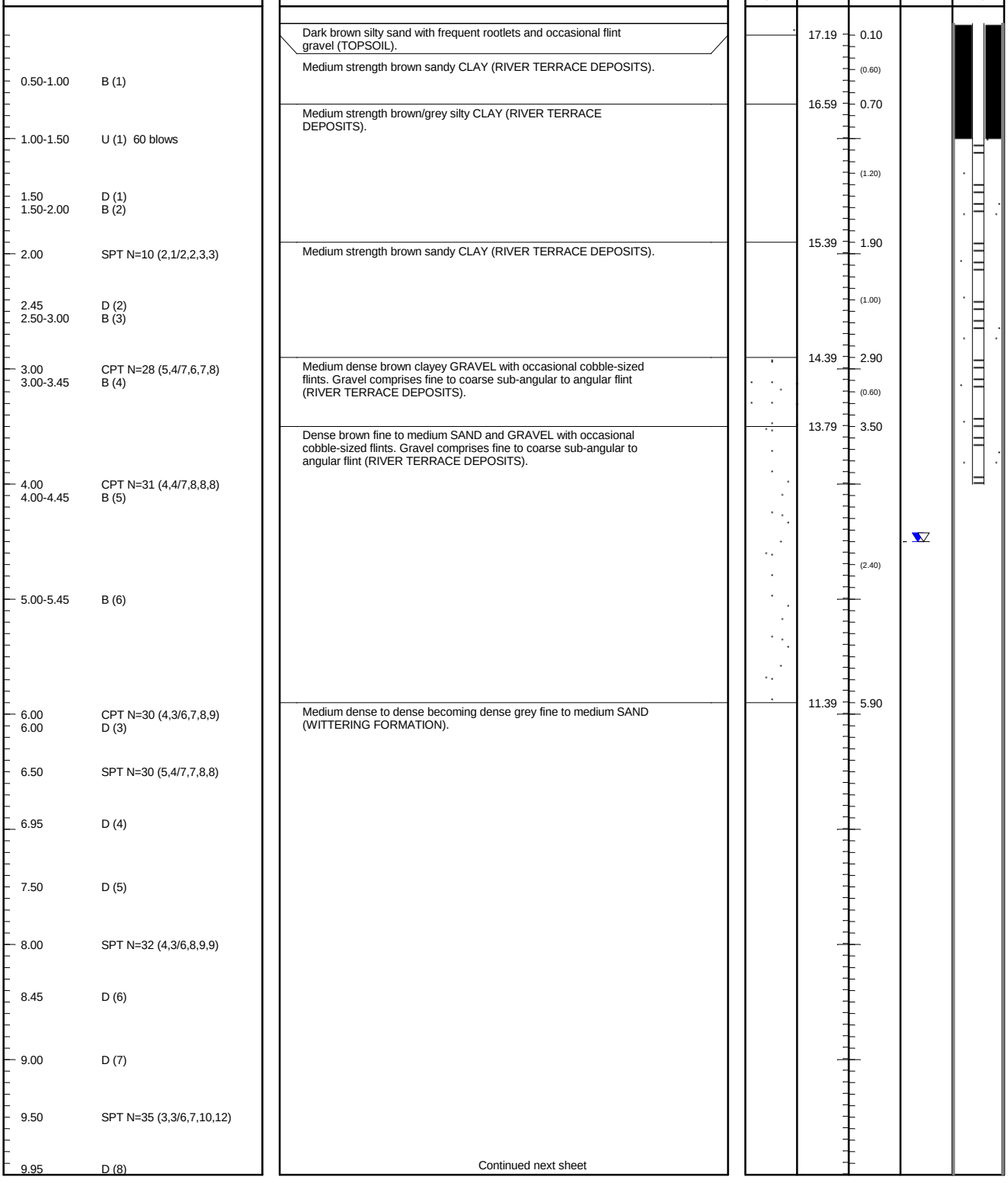
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH209
Groundwater: Strike at 6.20m bgl; no change after 20 mins	Method: Dando 150	Start: 04/09/2013	Scale: 1:50
		Finish: 04/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 04/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 25.508mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Medium dense becoming dense brown fine to medium SAND (WITTERING FORMATION).					
10.50	D (12)						
11.00	SPT N=39 (5,5/9,9,10,11)						
11.45	D (13)						
12.00	D (14)						
12.50	SPT N=43 (5,5/9,10,11,13)						
12.95	D (15)						
13.50	D (16)						
14.10	SPT N=49 (6,6/10,11,13,15)						
14.55	D (17)						
15.00	D (18)	End of Borehole at 15.00 m		10.51	15.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH209
Groundwater:	Method: Dando 150	Start: 04/09/2013	Scale: 1:50
		Finish: 04/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 04/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 25.508mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



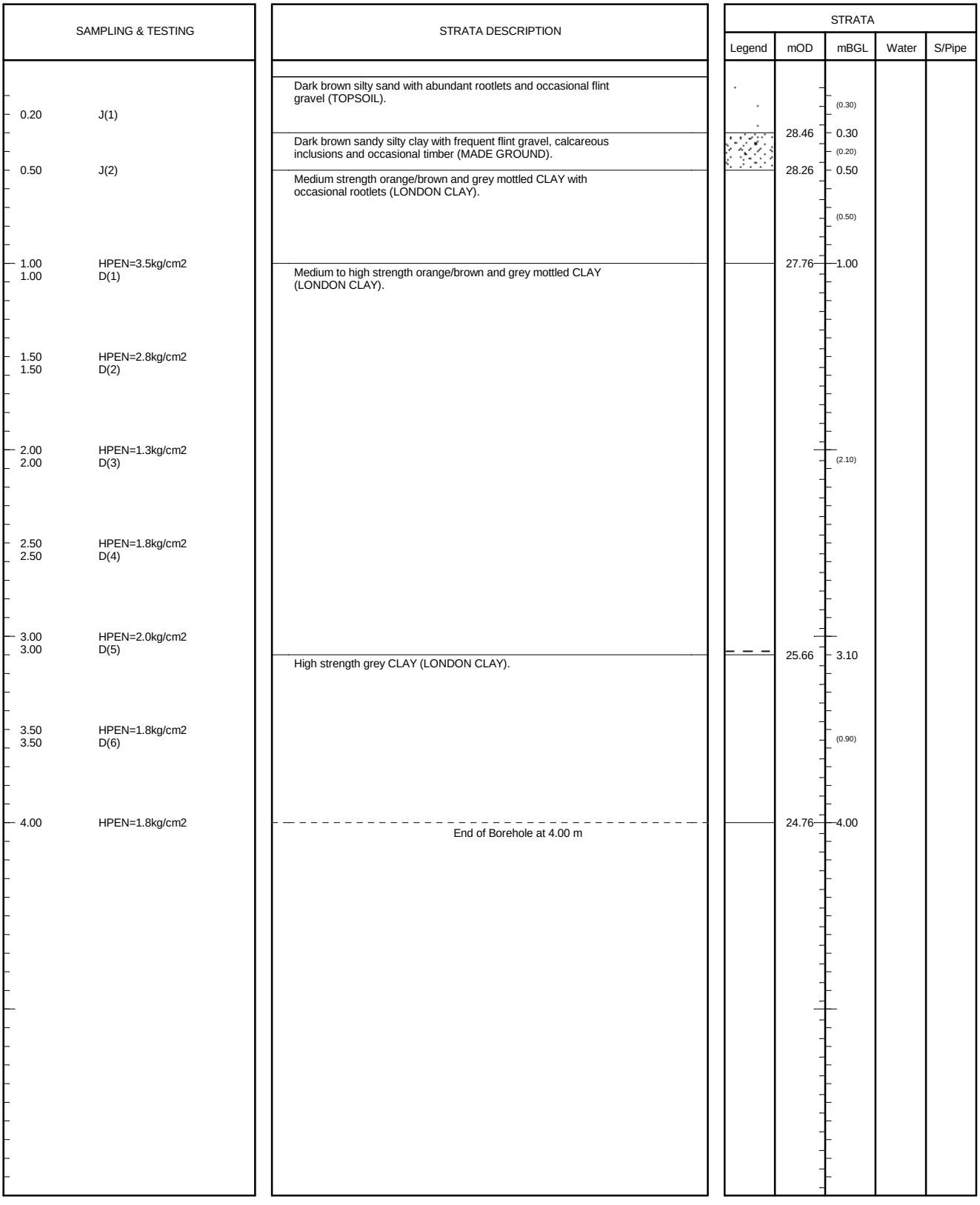
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH210
Groundwater: Strike at 4.50m bgl; no change after 20 mins	Method: Dando 150	Start: 11/09/2013	Scale: 1:50
		Finish: 11/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 11/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 17.292mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 2

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Medium dense to dense becoming dense grey fine to medium SAND (WITTERING FORMATION).			(9.10)		
10.50	D (9)						
11.00	SPT N=39 (4,4/7,8,11,13)						
11.45	D (10)						
12.00	D (11)						
12.50	SPT N=45 (5,4/8,10,12,15)						
12.95	D (12)						
13.95	D (13)						
14.00	SPT N=47 (5,5/9,9,12,17)						
14.45	D (14)						
15.00	D (15)	End of Borehole at 15.00 m		2.29	15.00		

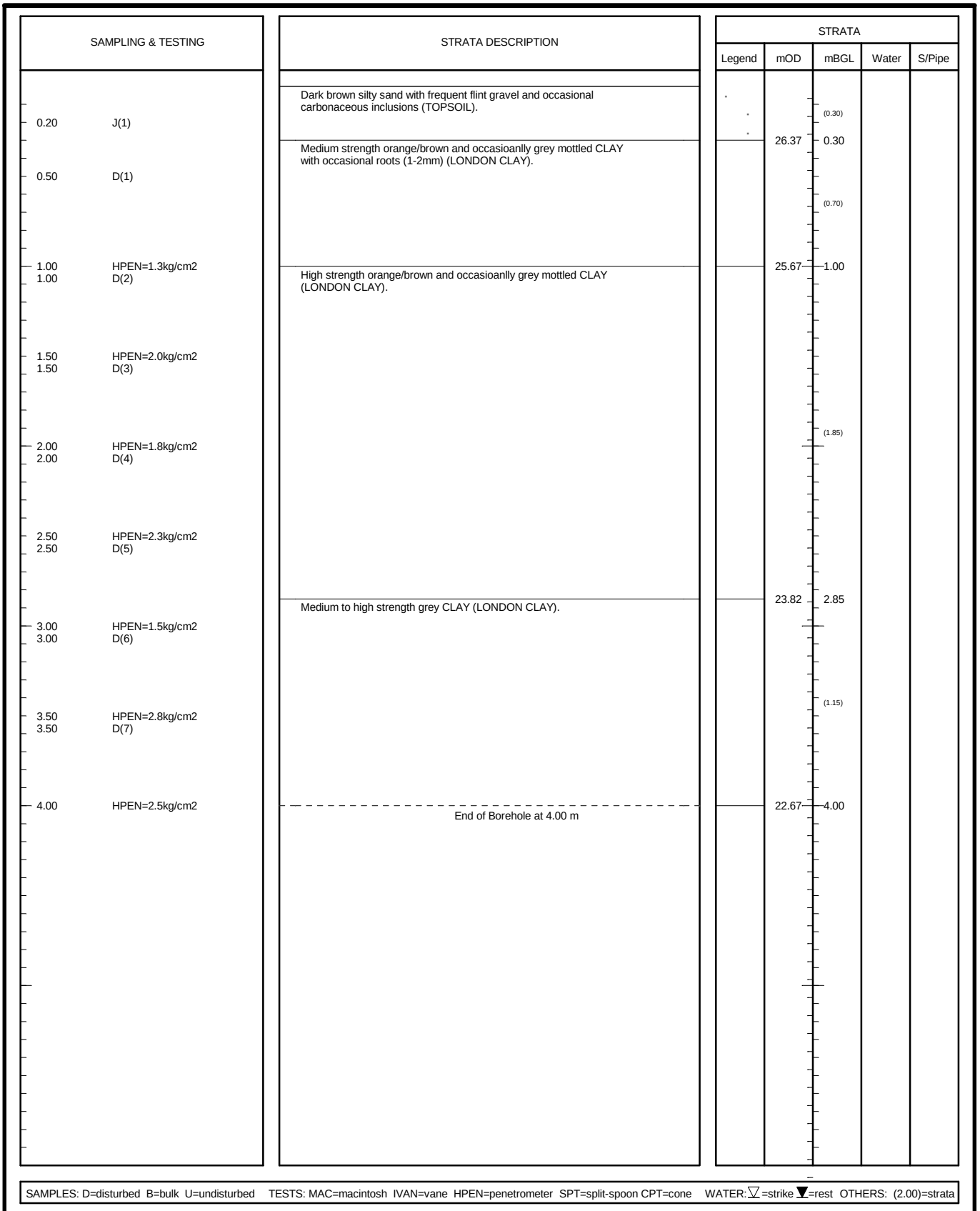
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Chiselling: From 0.00m to 1.00m: 1 hours	Type: Cable Percussive Borehole	Ref: GE9523	Position: BH210
Groundwater:	Method: Dando 150	Start: 11/09/2013	Scale: 1:50
		Finish: 11/09/2013	Size:
Casing: 150mm diameter to 14.00mBGL	Project: Boorley Green	Filled: 11/09/2013	Depth: 15.00mBGL
		Eng: JK	Level: 17.292mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: PL	Figure: FIG
		Ckd: JK	Sheet: Sheet 2 of 2



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS201
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 28.758mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS202
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.667mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown sandy clay with abundant rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			25.90	0.30		
		Very high strength orange/brown and grey CLAY with occasional rootlets (LONDON CLAY).			(0.50)		
0.50	D(1)			25.40	0.80		
		Very high becoming high strength orange/brown and grey CLAY (LONDON CLAY).					
1.00	HPEN=4.3kg/cm2						
1.00	D(2)						
1.50	HPEN=5.0kg/cm2						
1.50	D(3)				(2.30)		
2.00	HPEN=3.8kg/cm2						
2.00	D(4)						
2.50	HPEN=2.0kg/cm2						
2.50	D(5)						
3.00	HPEN=3.0kg/cm2						
3.00	D(6)			23.10	3.10		
		High strength grey CLAY (LONDON CLAY).					
3.50	HPEN=2.3kg/cm2				(0.90)		
3.50	D(7)						
4.00	HPEN=2.0kg/cm2			22.20	4.00		
		End of Borehole at 4.00 m					

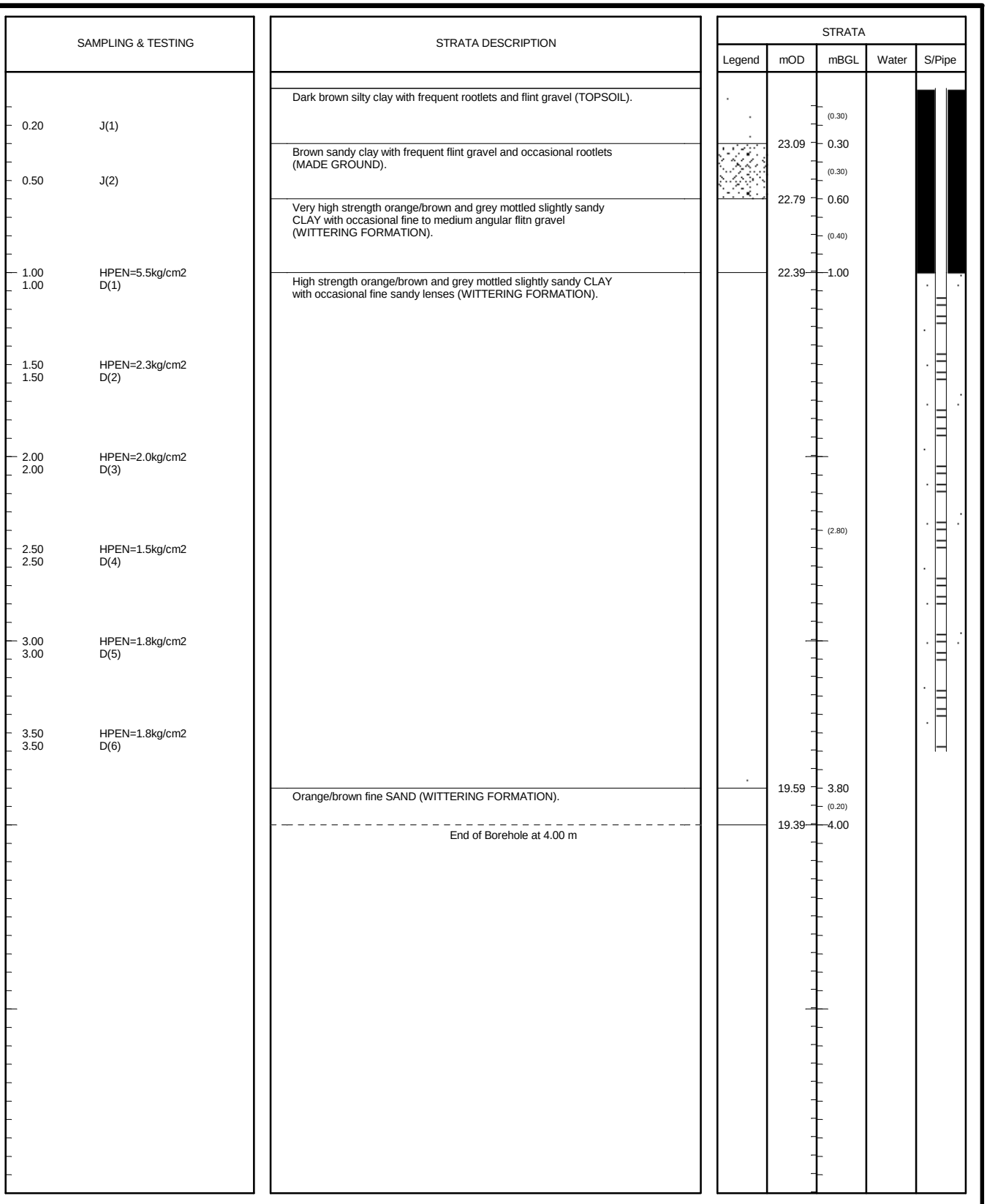
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS203
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.203mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sandy clay with occasional rootlets and flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			25.00	0.30		
		Extremely high strength becoming high strength orange/brown and grey mottled sandy CLAY with occasional medium angular flint gravel (LONDON CLAY).					
0.50	D(1)						
1.00	HPEN=10.3kg/cm2						
1.00	D(2)						
1.50	HPEN=9.3kg/cm2						
1.50	D(3)						
2.00	HPEN=6.0kg/cm2						
2.00	D(4)				(3.70)		
2.50	HPEN=4.5kg/cm2						
2.50	D(5)						
3.00	HPEN=4.8kg/cm2						
3.00	D(6)						
3.50	HPEN=2.5kg/cm2						
3.50	D(7)						
4.00	HPEN=2.5kg/cm2	End of Borehole at 4.00 m		21.30	4.00		

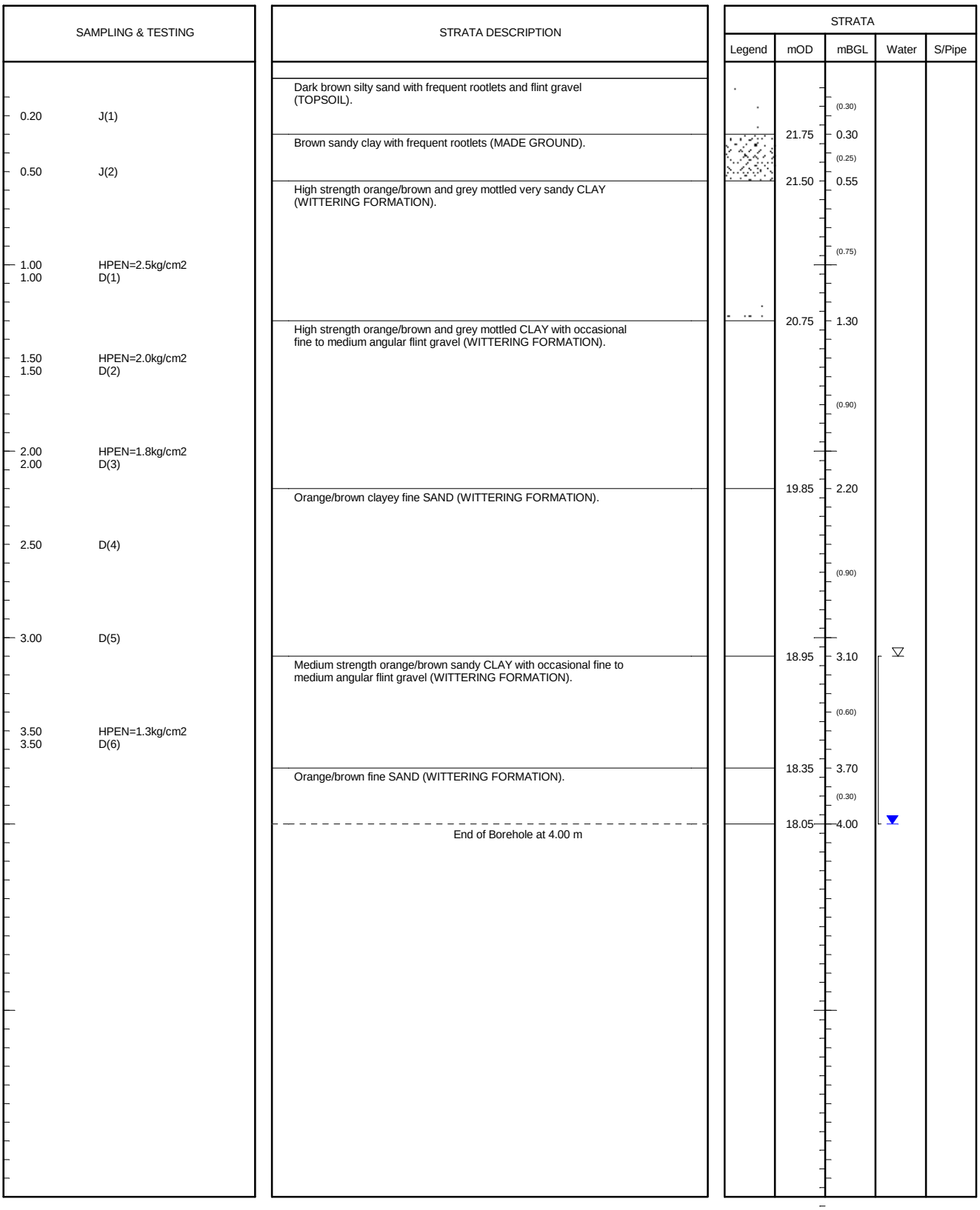
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS204
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 25.297mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



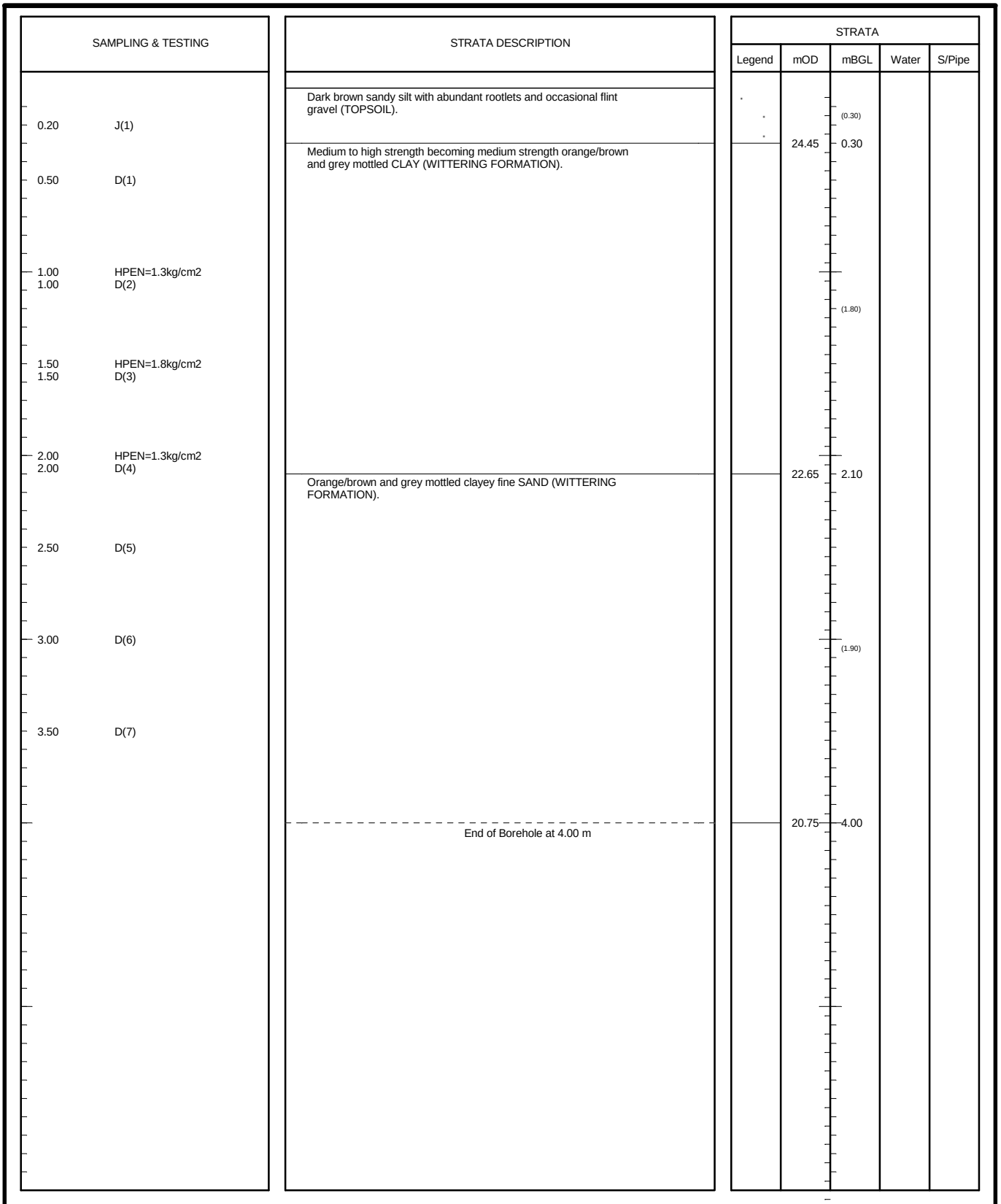
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.60m bgl	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS205
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.393mOD
Remarks: Standpipe installed to 3.60m bgl	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

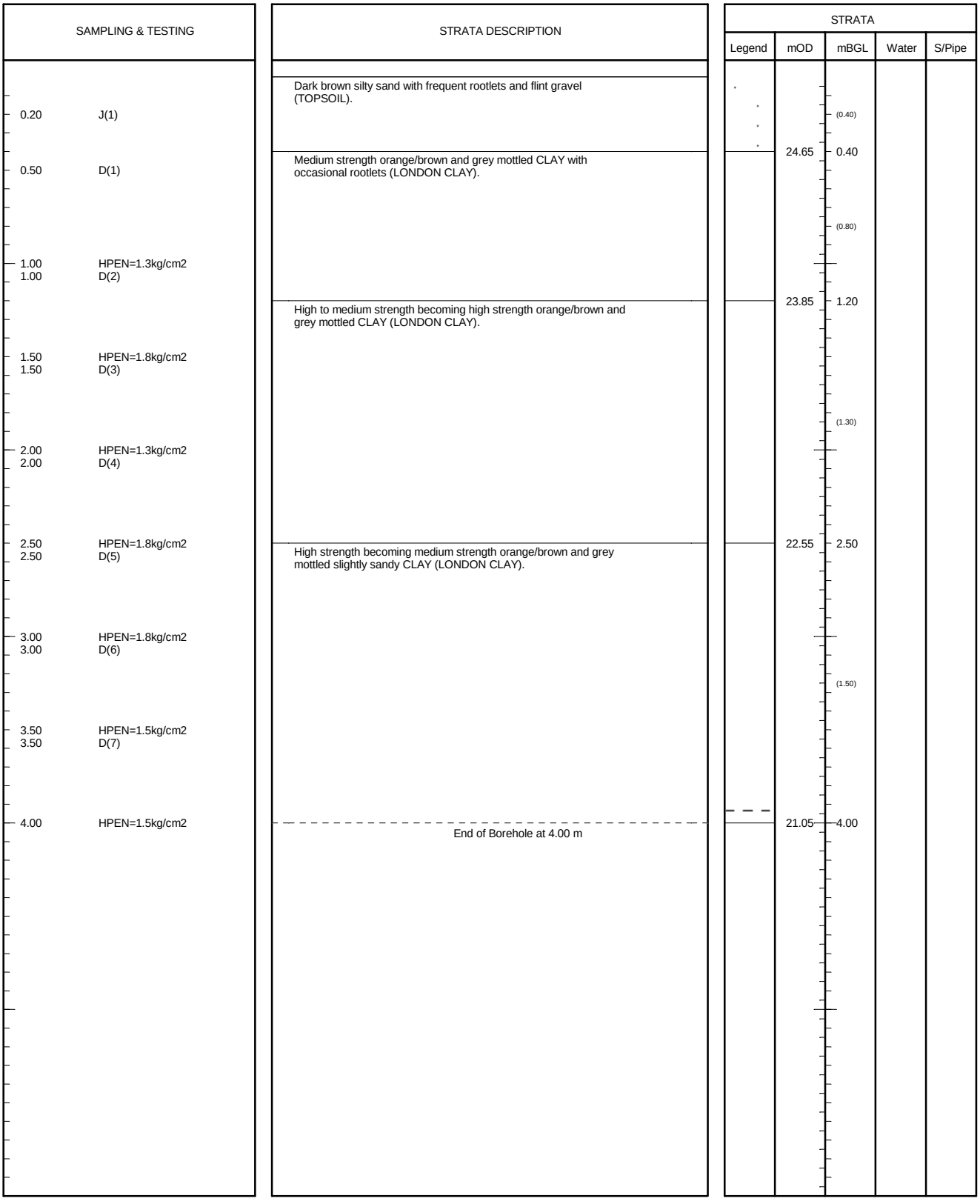


SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS206
Groundwater: Strike at 3.10m; 4.00 after 20mins	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.050mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

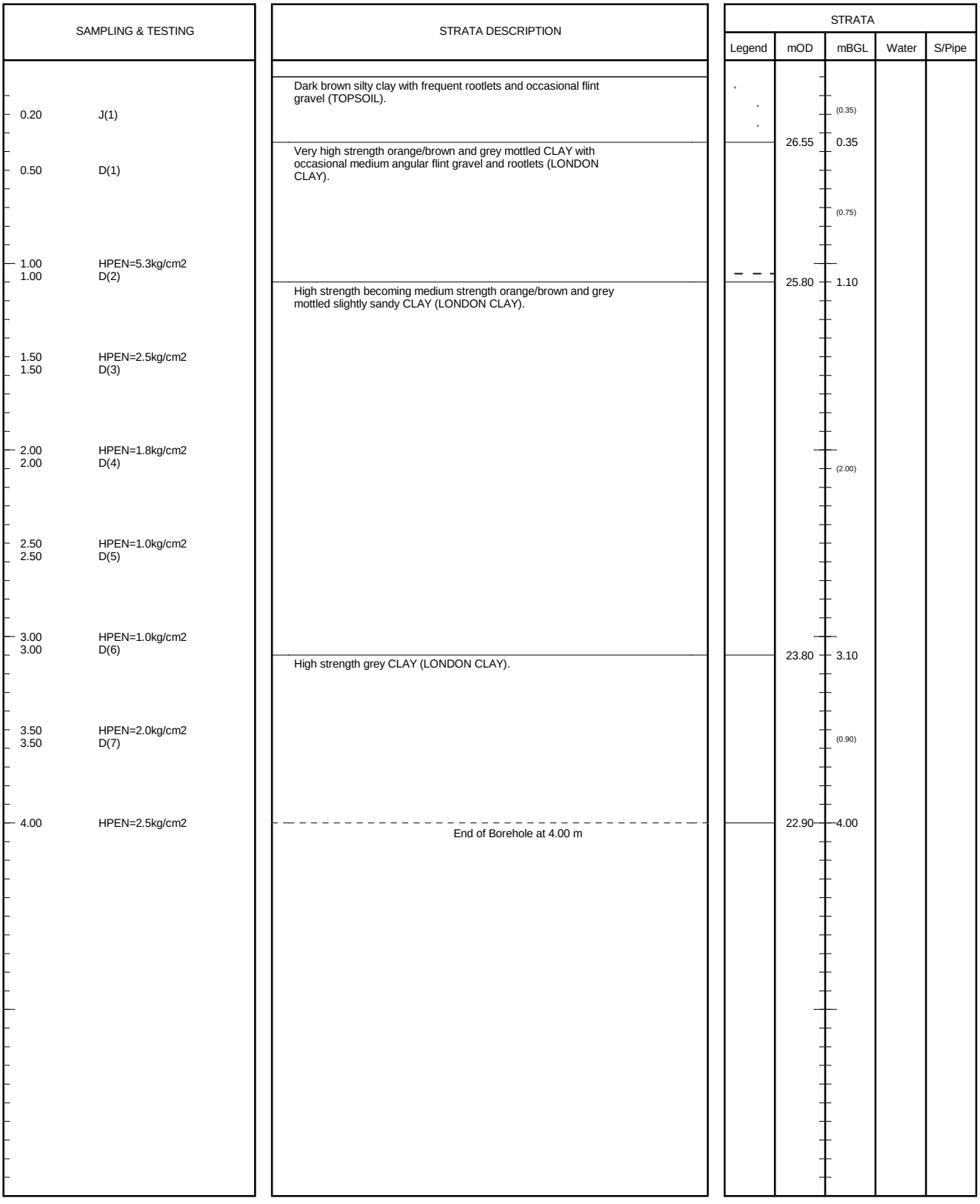


Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS207
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.750mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



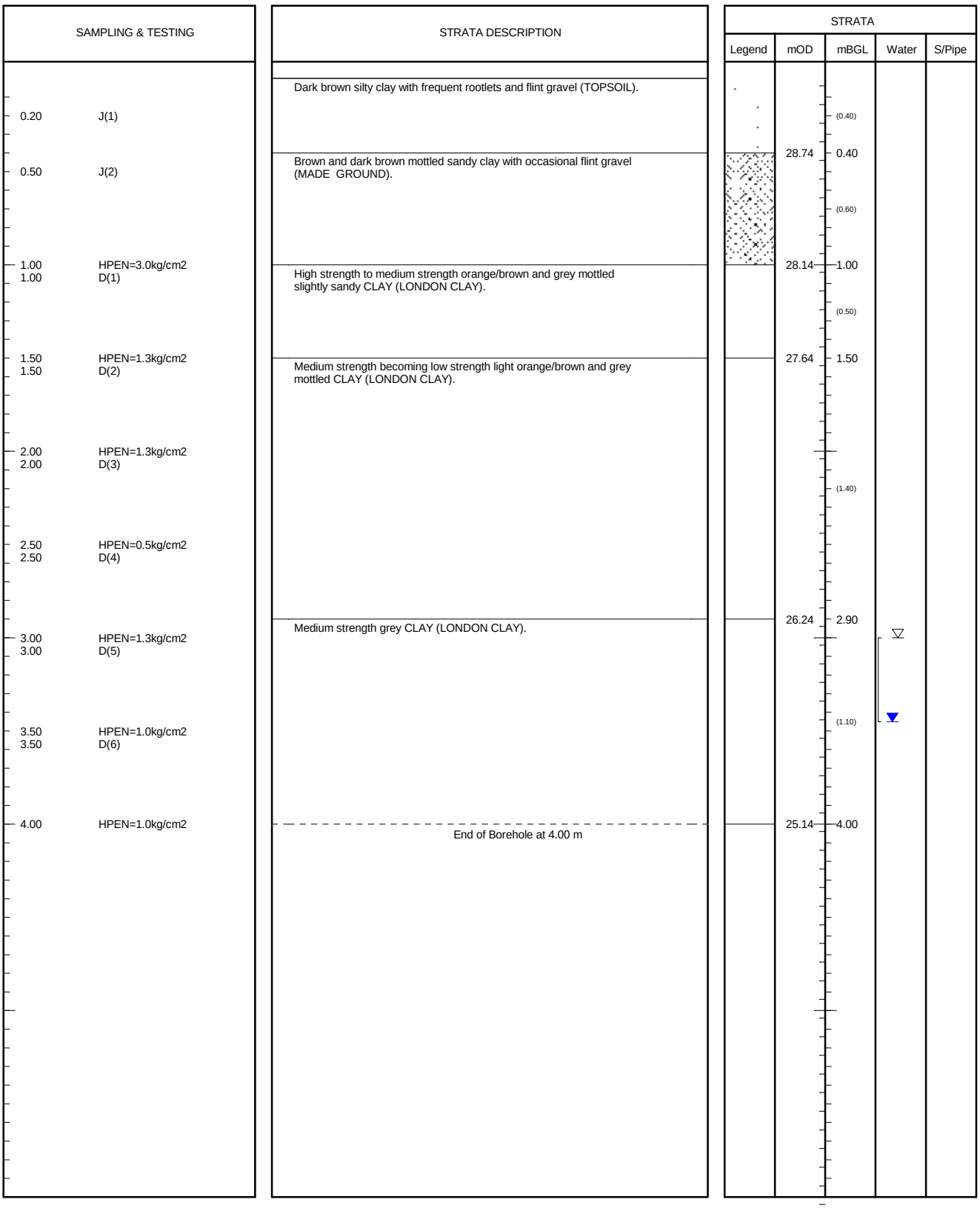
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS208
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 25.050mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



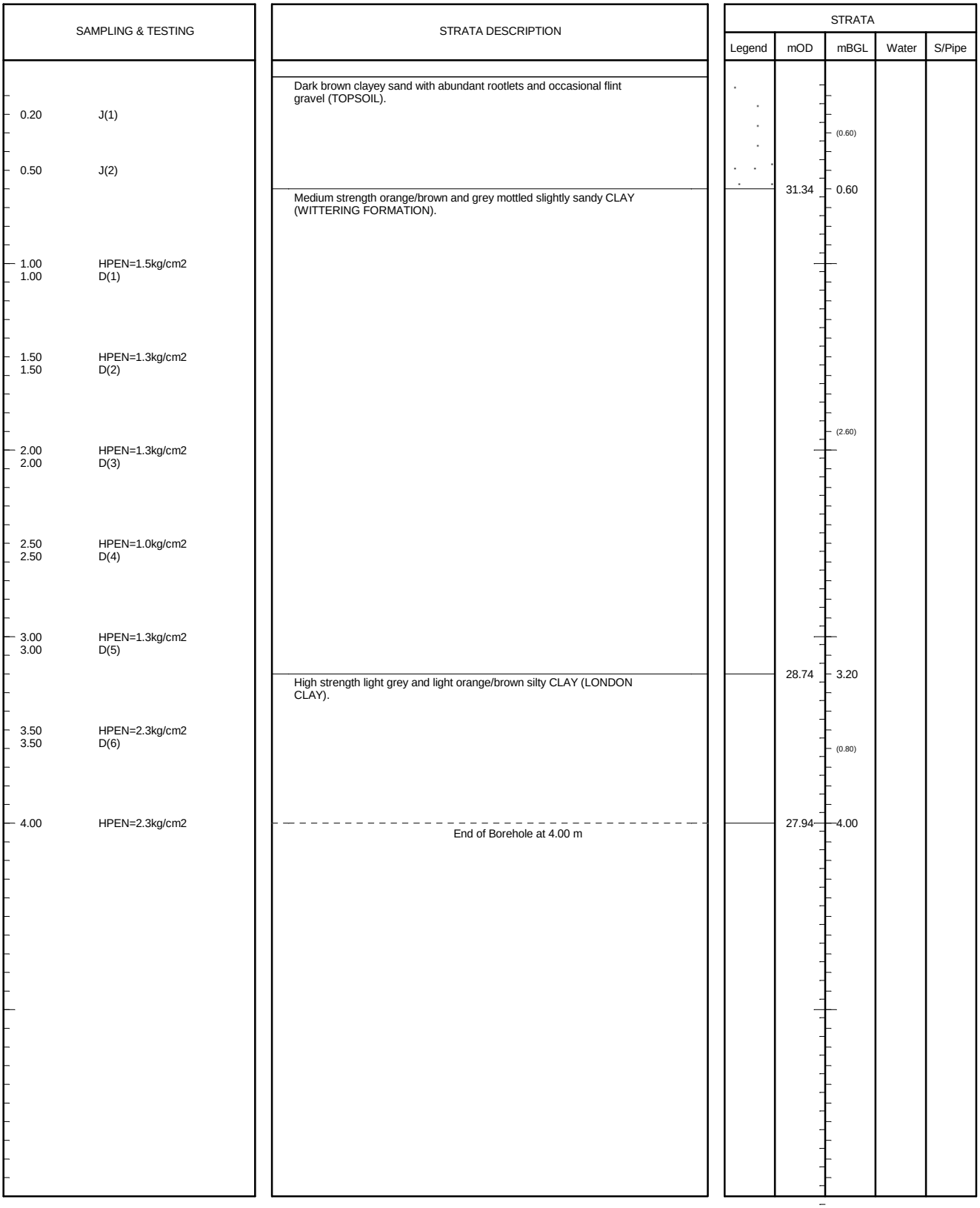
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS209
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.900mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS210
Groundwater: Strike at 3.00m; 3.45 after 20mins	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 29.140mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



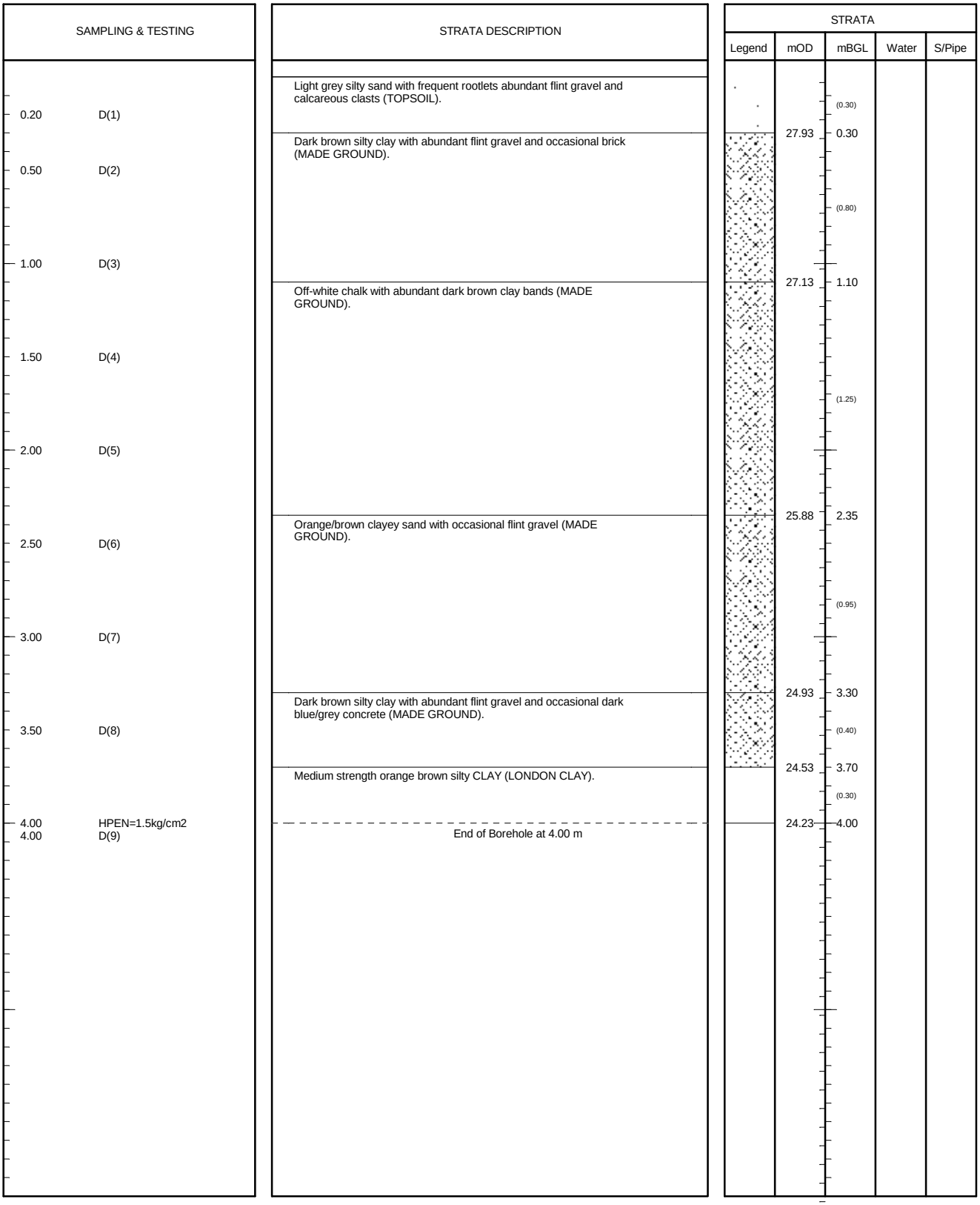
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS211
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 31.943mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown silty sandy clay with frequent rootlets and flint gravel (TOPSOIL).			(0.25)		
0.20	D(1)			31.83	0.25		
		Off-white chalk with occasional dark brown clay bands (MADE GROUND).			(0.30)		
0.50	D(2)			31.53	0.55		
		Brown and red/brown mottled silty sandy clay with frequent flint gravel occasional brick and calcareous clasts (MADE GROUND).					
1.00	D(3)						
1.50	D(4)				(1.85)		
2.00	D(5)						
		White and brown mottled chalk with occasional flint gravel (MADE GROUND).		29.68	2.40		
2.50	D(6)						
3.00	D(7)				(1.10)		
3.50	D(8)			28.58	3.50		
		Orange/brown, dark brown and light brown mottled silty clay (MADE GROUND).			(0.40)		
				28.18	3.90		
4.00	HPEN=2.0kg/cm2	High strength orange/brown and grey mottled silty CLAY (LONDON CLAY).					
4.00	D(9)						
4.50	HPEN=2.0kg/cm2				(1.10)		
4.50	D(10)						
5.00	HPEN=2.3kg/cm2			27.08	5.00		
		End of Borehole at 5.00 m					

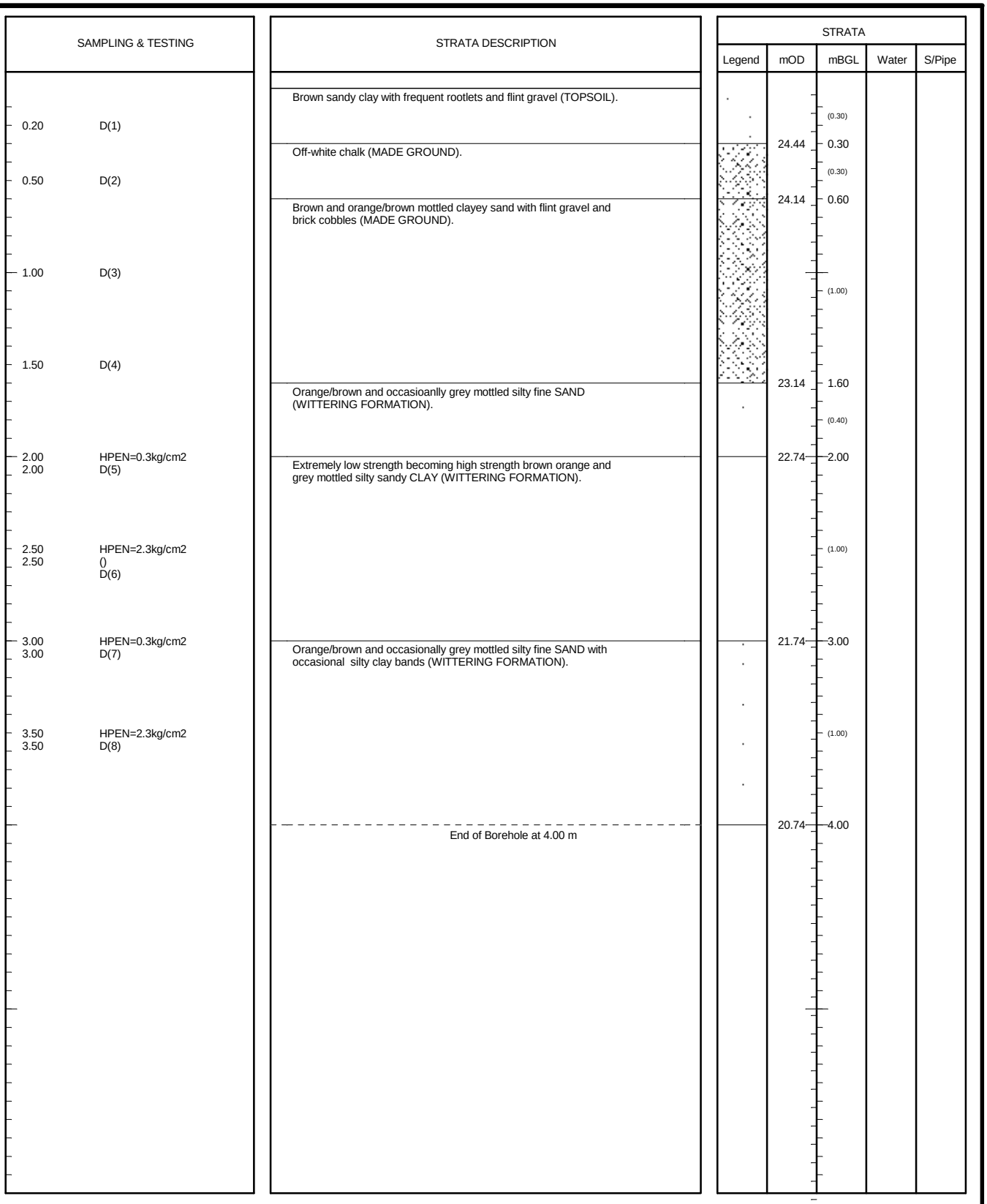
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS212
Groundwater: No Groundwater Encountered	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 5.00mBGL
		Eng: JK	Level: 32.079mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



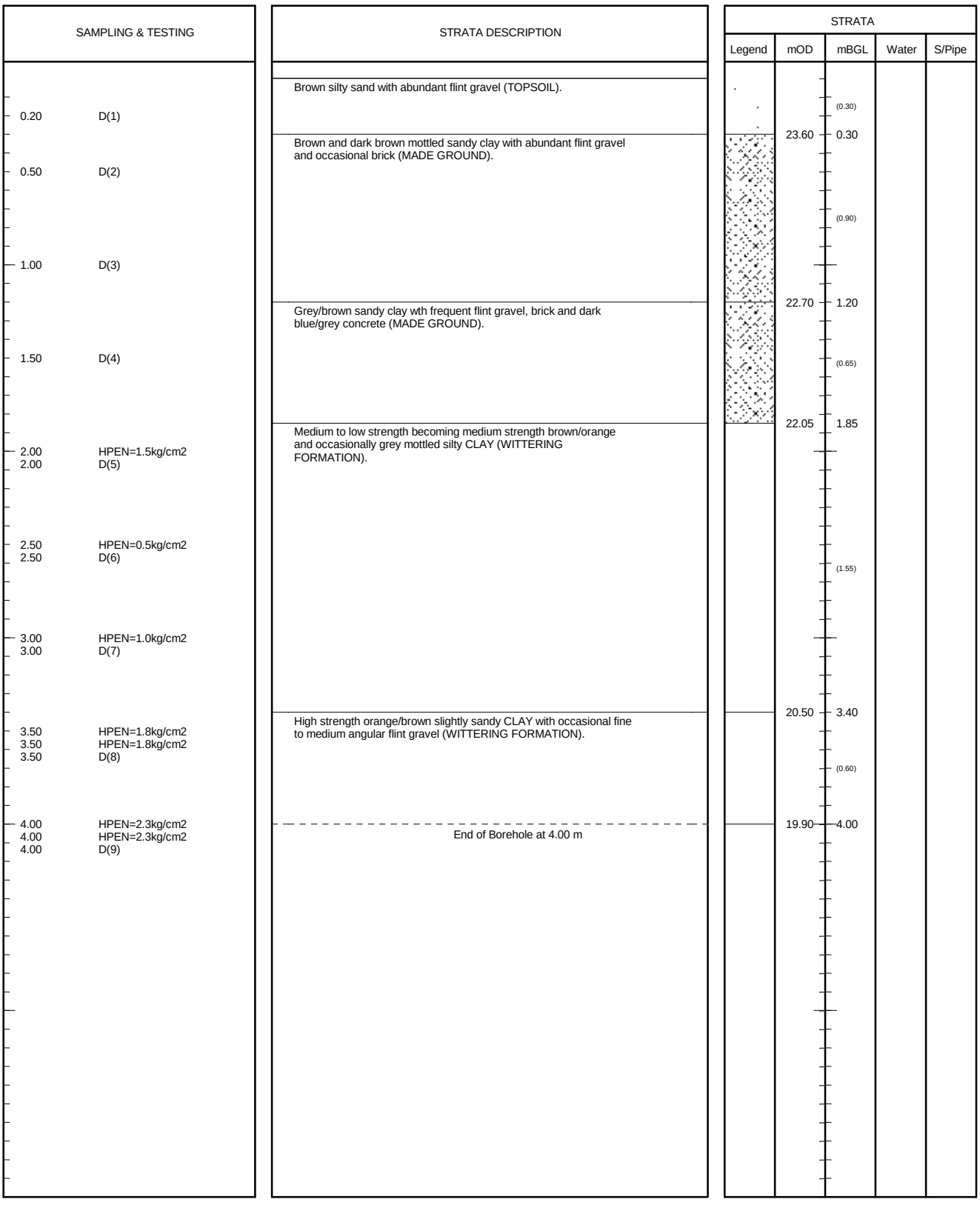
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS213
Groundwater: No Groundwater Encountered	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 28.230mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



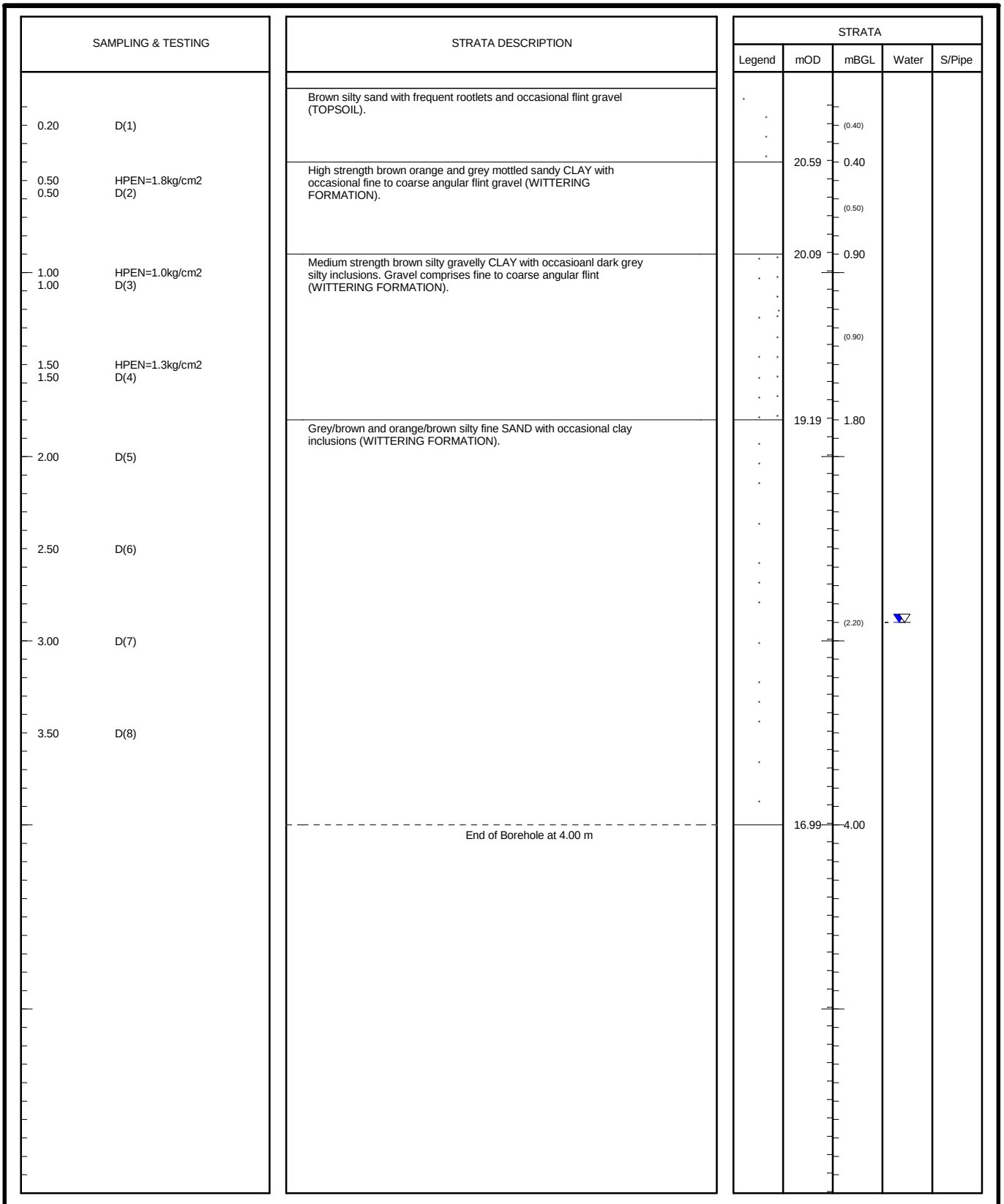
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS214
Groundwater: No Groundwater Encountered	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.735mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS215
Groundwater: No Groundwater Encountered	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.902mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS216
Groundwater: Strike at 2.90m; after 20mins no change.	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.991mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Orange/brown silty sand with frequent flint gravel (TOPSOIL).					
0.20	D(1)				(0.60)		
0.50	D(2)						
		Very high strength orange/brown and grey/brown mottled very sandy CLAY (WITTERING FORMATION).		23.40	0.60		
					(0.40)		
1.00	HPEN=5.0kg/cm2			23.00	1.00		
1.00	D(3)	Orange/brown and grey/brown silty fine SAND with occasional clayey inclusions (WITTERING FORMATION).					
1.50	HPEN=5.0kg/cm2						
1.50	D(4)						
2.00	D(5)						
2.50	D(6)				(3.00)		
3.00	D(7)						
3.50	D(8)						
		End of Borehole at 4.00 m		20.00	4.00		

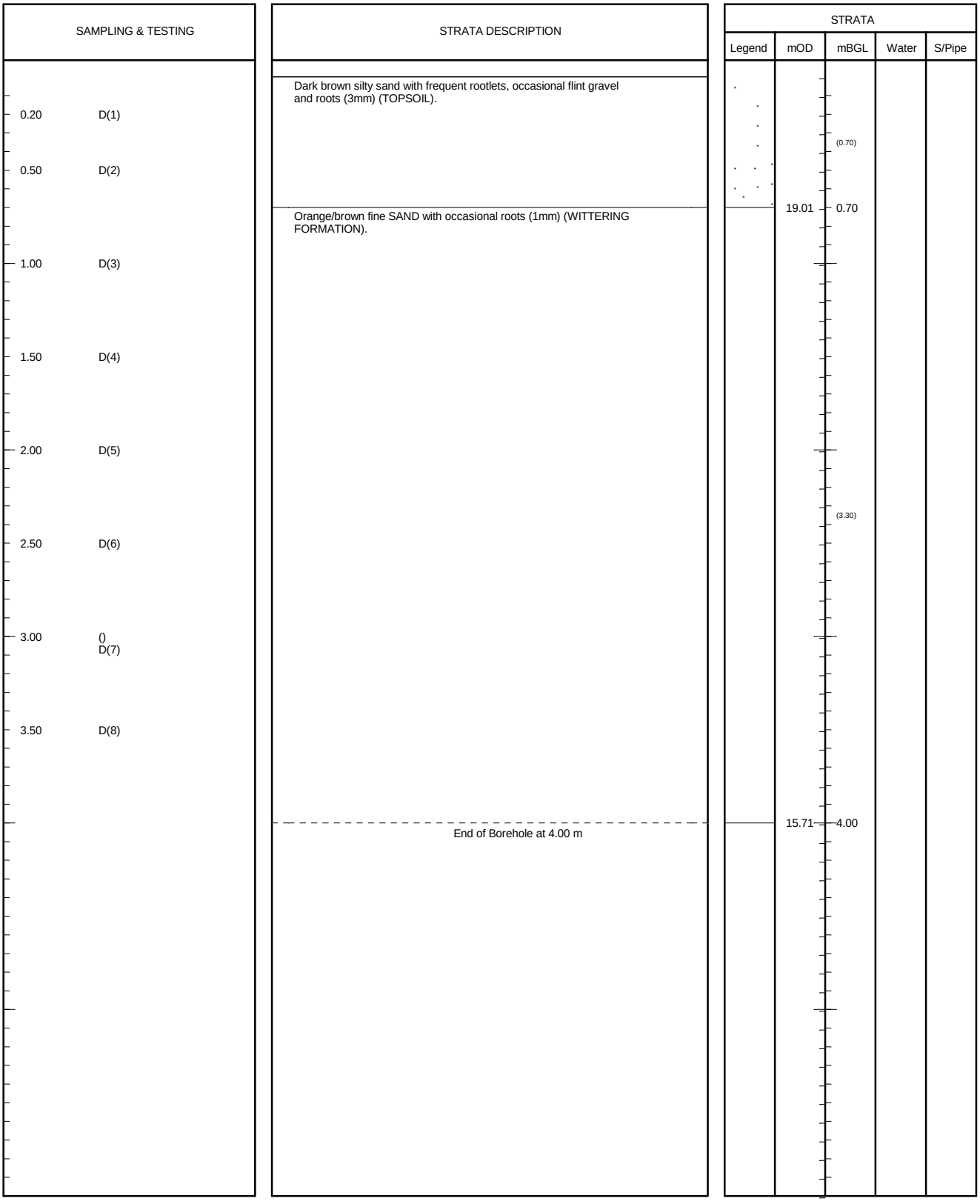
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS217
Groundwater: No Groundwater Encountered	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.997mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown sandy silt with frequent rootlets and occasional flint gravel (TOPSOIL).					
0.20	J(1)				(0.40)		
		High strength orange/brown and grey mottled CLAY with occasional fine to medium sub-angular flint gravel (LONDON CLAY).		27.42	0.40		
0.50	J(2)				(0.80)		
1.00	HPEN=2.3kg/cm2						
1.00	D(1)						
		Medium to high strength becoming very high strength orange/brown and grey mottled CLAY (LONDON CLAY).		26.62	1.20		
1.50	HPEN=1.5kg/cm2						
1.50	D(2)						
2.00	HPEN=2.0kg/cm2						
2.00	D(3)				(2.00)		
2.50	HPEN=3.3kg/cm2						
2.50	D(4)						
3.00	HPEN=3.3kg/cm2						
3.00	D(5)						
		High strength orange/brown and grey mottled CLAY with frequent fine sandy partings (LONDON CLAY).		24.62	3.20		
3.50	HPEN=2.5kg/cm2						
3.50	D(6)				(0.80)		
4.00	HPEN=2.8kg/cm2						
4.00	D(7)	End of Borehole at 4.00 m		23.82	4.00		

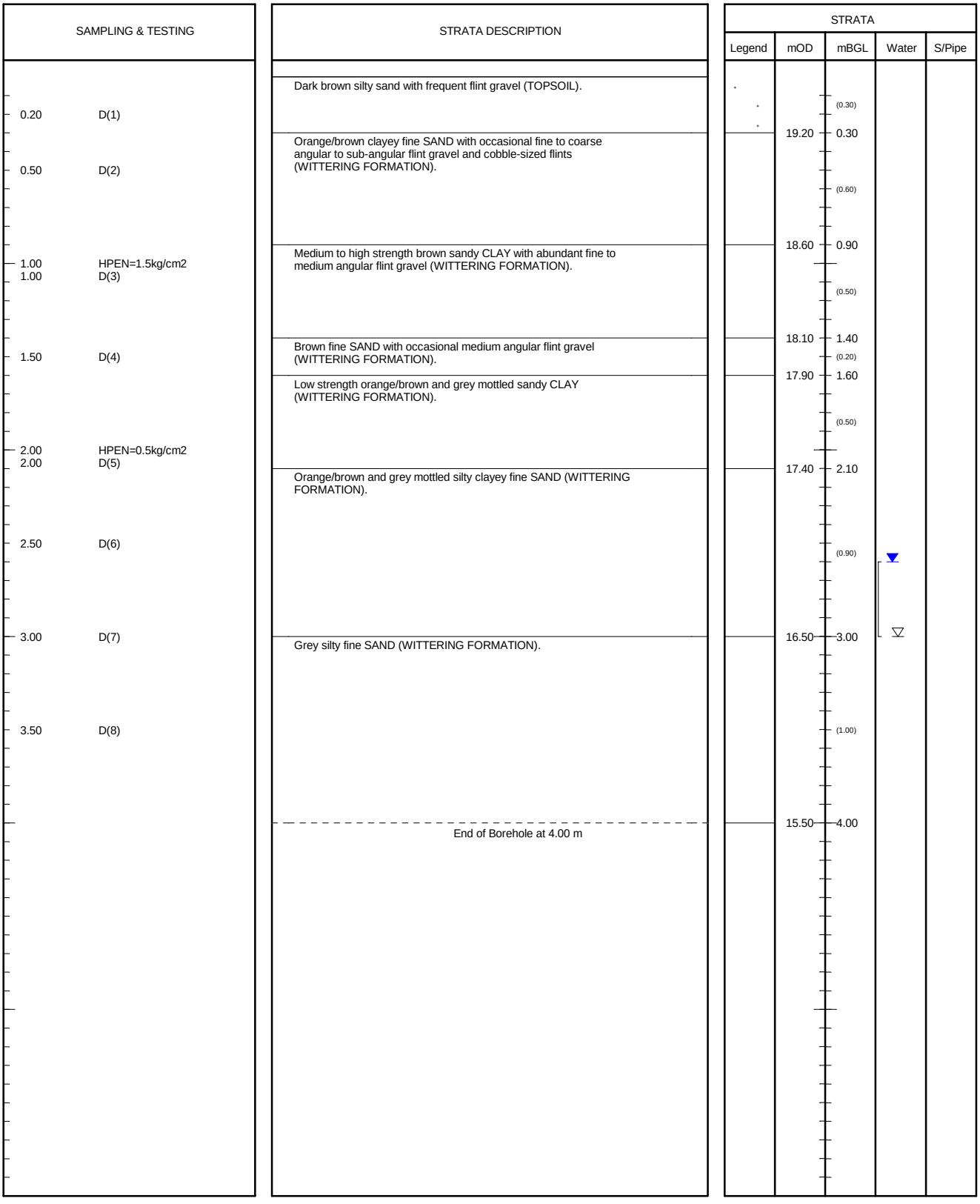
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS218
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 27.819mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



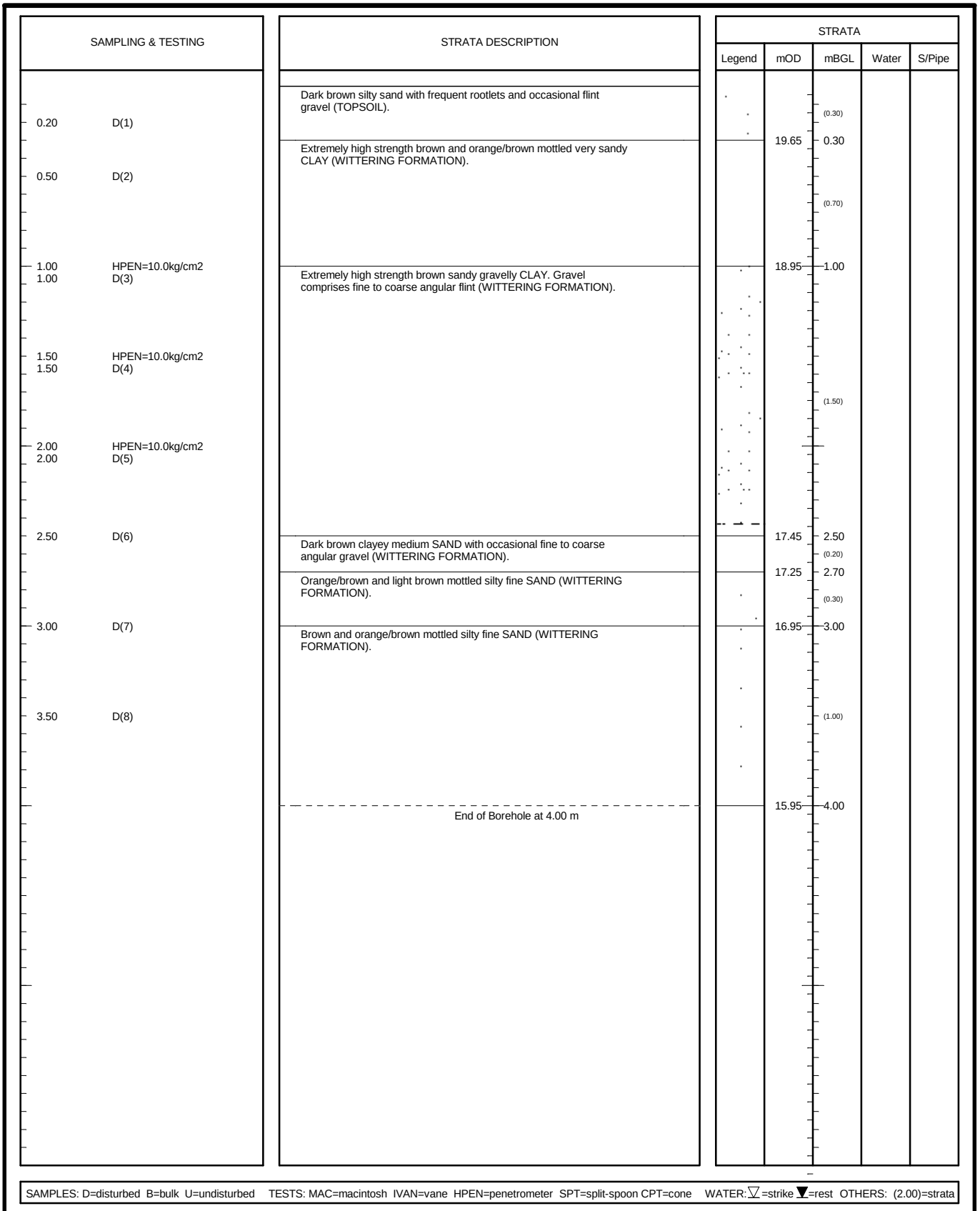
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS219
Groundwater: No Groundwater Encountered	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.710mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



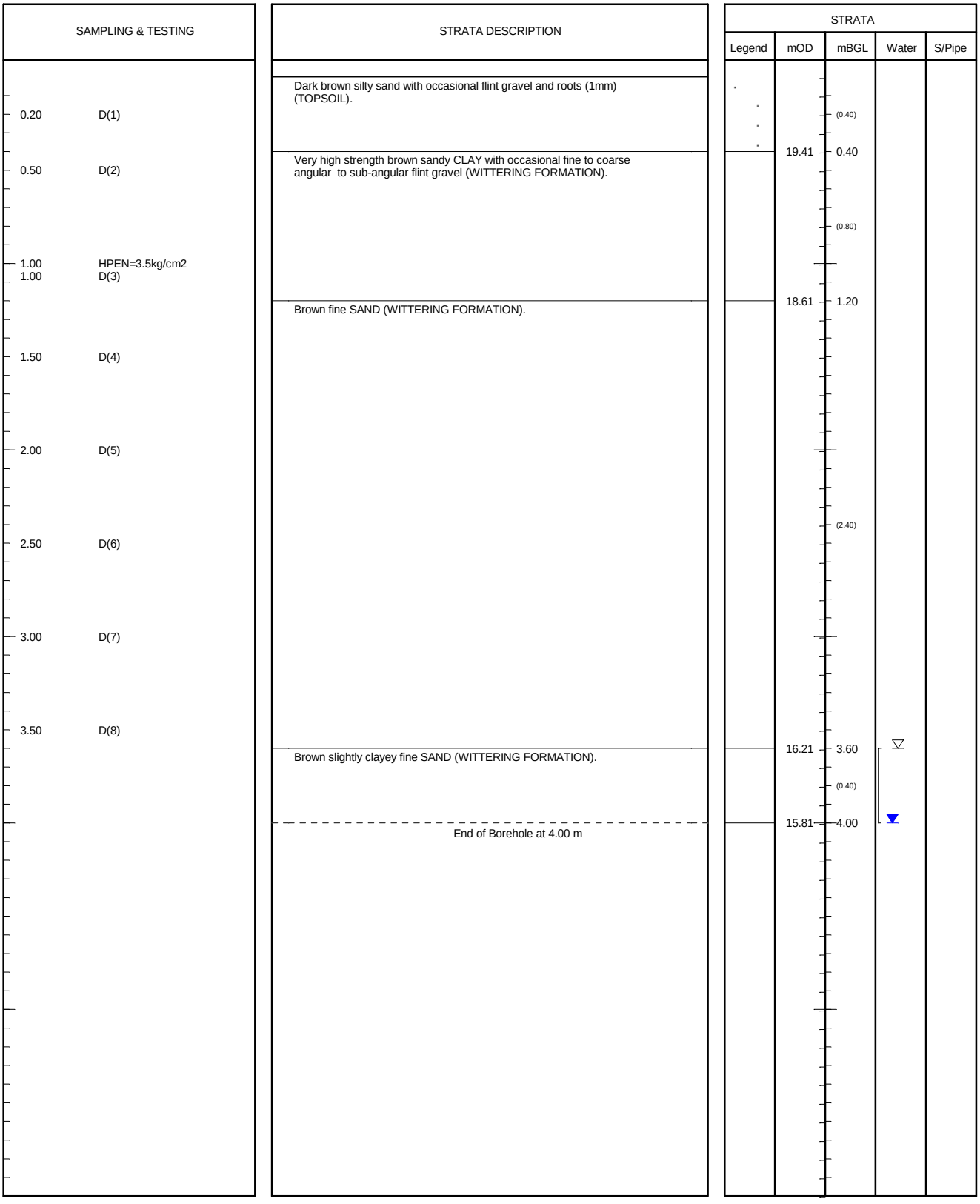
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS220
Groundwater: Strike at 3.00m; 2.60 after 20mins	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.499mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS221
Groundwater: No Groundwater Encountered	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.947mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



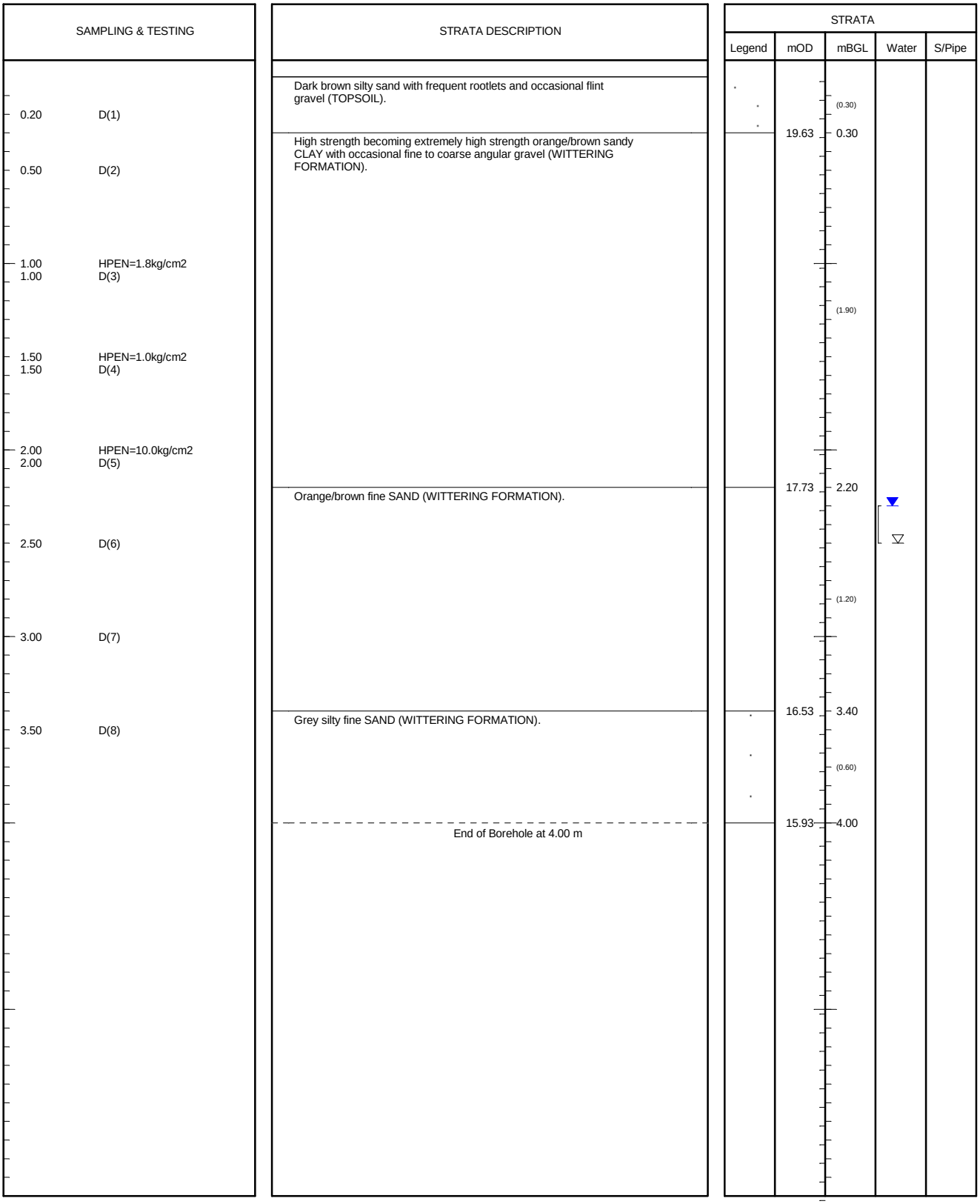
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS222
Groundwater: Strike at 3.60m; 4.00 after 20mins	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.808mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	D(1)			19.74	0.30		
0.50	D(2)	Brown very clayey fine SAND with occasional fine to coarse sub-rounded flint gravel (WITTERING FORMATION).			(0.60)		
1.00	HPEN=10.0kg/cm2			19.14	0.90		
1.00	D(3)	Extremely high strength brown very sandy CLAY with frequent fine to coarse angular flint gravel (WITTERING FORMATION).			(0.90)		
1.50	HPEN=10.0kg/cm2						
1.50	D(4)			18.24	1.80		
2.00	D(5)	Brown and grey mottled silty fine SAND with frequent fine to coarse angular flint gravel (WITTERING FORMATION).			(0.50)		
2.50	D(6)	Brown very clayey medium SAND with frequent clay bands and occasional fine ot coarse angular flint gravel (WITTERING FORMATION).		17.74	2.30		
					(0.70)		
3.00	D(7)			17.04	3.00		
3.50	D(8)	Dark orange/brown, orange/brown and brown mottled silty fine SAND (WITTERING FORMATION).			(1.00)		
		End of Borehole at 4.00 m		16.04	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS223
Groundwater: Strike at 2.90m; after 20mins no change.	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.037mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS224
Groundwater: Strike at 2.50m; 2.30 after 20mins	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.925mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with occasional rootlets and flint gravel (TOPSOIL).					
0.20	D(1)				(0.40)		
0.50	D(2)	Orange/brown and brown mottled fine SAND with occasional fine to coarse sub-rounded to angular flint gravel (WITTERING FORMATION).		19.26	0.40		
1.00	D(3)				(0.70)		
		High strength orange/brown and grey mottled sandy CLAY with occasional fine to coarse angular flint gravel (WITTERING FORMATION).		18.56	1.10		
1.50	HPEN=1.8kg/cm2						
1.50	D(4)				(0.90)		
2.00	D(5)			17.66	2.00		
		Brown very clayey fine to medium SAND with occasional fine to coarse angular flint gravel (WITTERING FORMATION).			(0.40)		
				17.26	2.40		
2.50	HPEN=2.0kg/cm2	High strength brown/orange and grey mottled silty CLAY occasional silty sand lenses (WITTERING FORMATION).					
2.50	D(6)				(0.60)	▽	
3.00	D(7)	Grey sandy SILT (WITTERING FORMATION).		16.66	3.00		
3.50	D(8)				(1.00)		
		End of Borehole at 4.00 m		15.66	4.00		

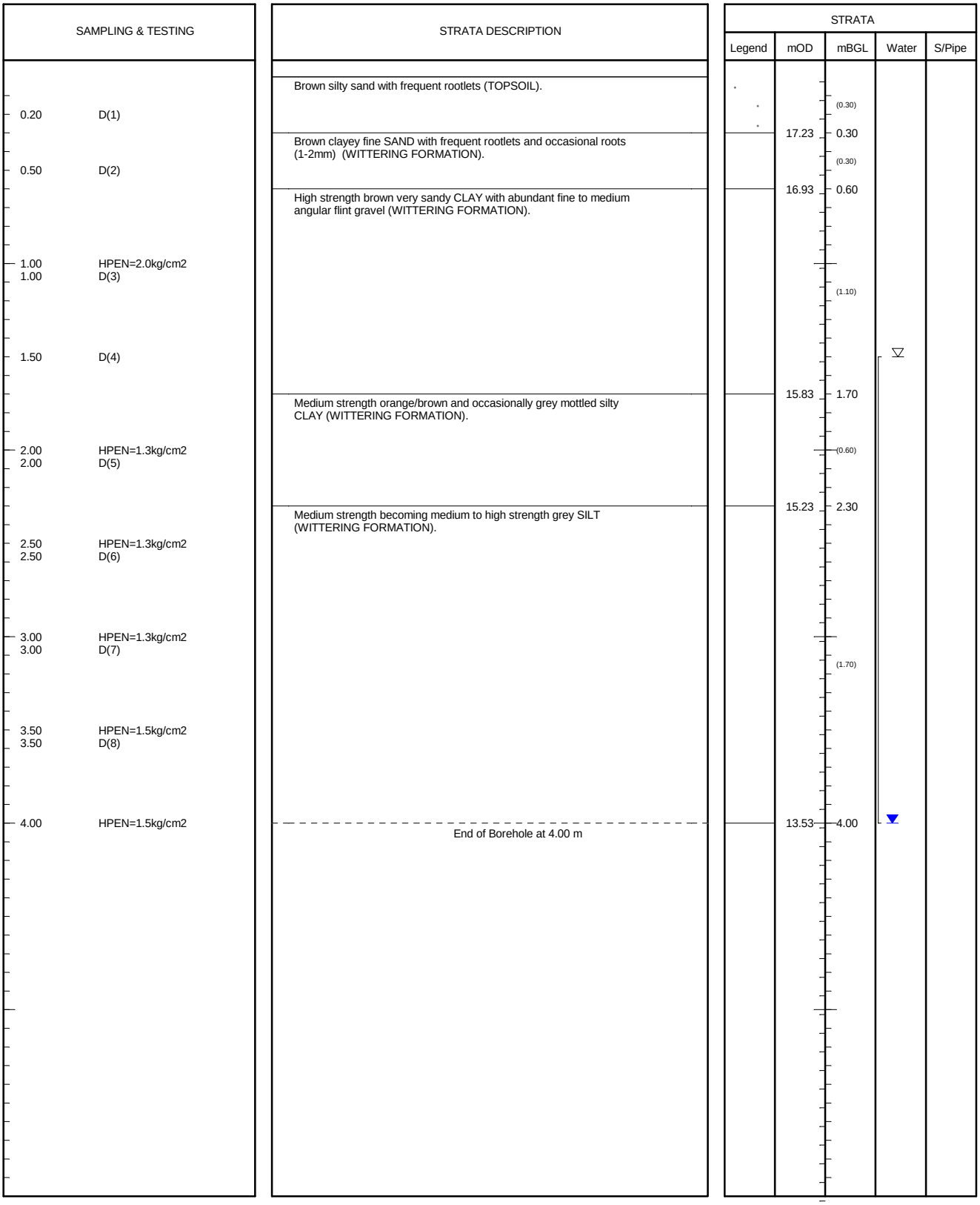
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS225
Groundwater: Strike at 2.80m; after 20mins no change.	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.655mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets, occasional flint gravel and roots (3mm) (TOPSOIL).					
0.20	D(1)				(0.40)		
		Extremely high strength orange/brown sandy CLAY with occasional fine to medium sngular flint gravel and roots (3mm) (WITTERING FORMATION).			0.40		
0.50	HPEN=5.0kg/cm2						
0.50	D(2)				(0.40)		
		Extremely high strength orange/brown sandy CLAY with occasional fine to medium sngular flint gravel (WITTERING FORMATION).			0.80		
1.00	HPEN=7.0kg/cm2						
1.00	D(3)				(0.50)		
		Extremely high strength orange/brown sandy CLAY with abundant fine to medium angular flint gravel (WITTERING FORMATION).			1.30		
1.50	HPEN=10.0kg/cm2						
1.50	D(4)				(0.80)		
2.00	HPEN=10.0kg/cm2						
2.00	D(5)				2.10		
		Low to medium strength becoming high strength orange/brown and grey mottled silty sandy CLAY (WITTERING FORMATION).					
2.50	HPEN=0.8kg/cm2						
2.50	D(6)				(1.00)		
3.00	HPEN=1.8kg/cm2					▽	
3.00	D(7)				3.10		
		Grey silty fine SAND (WITTERING FORMATION).					
3.50	D(8)				(0.90)	▼	
		End of Borehole at 4.00 m			4.00		

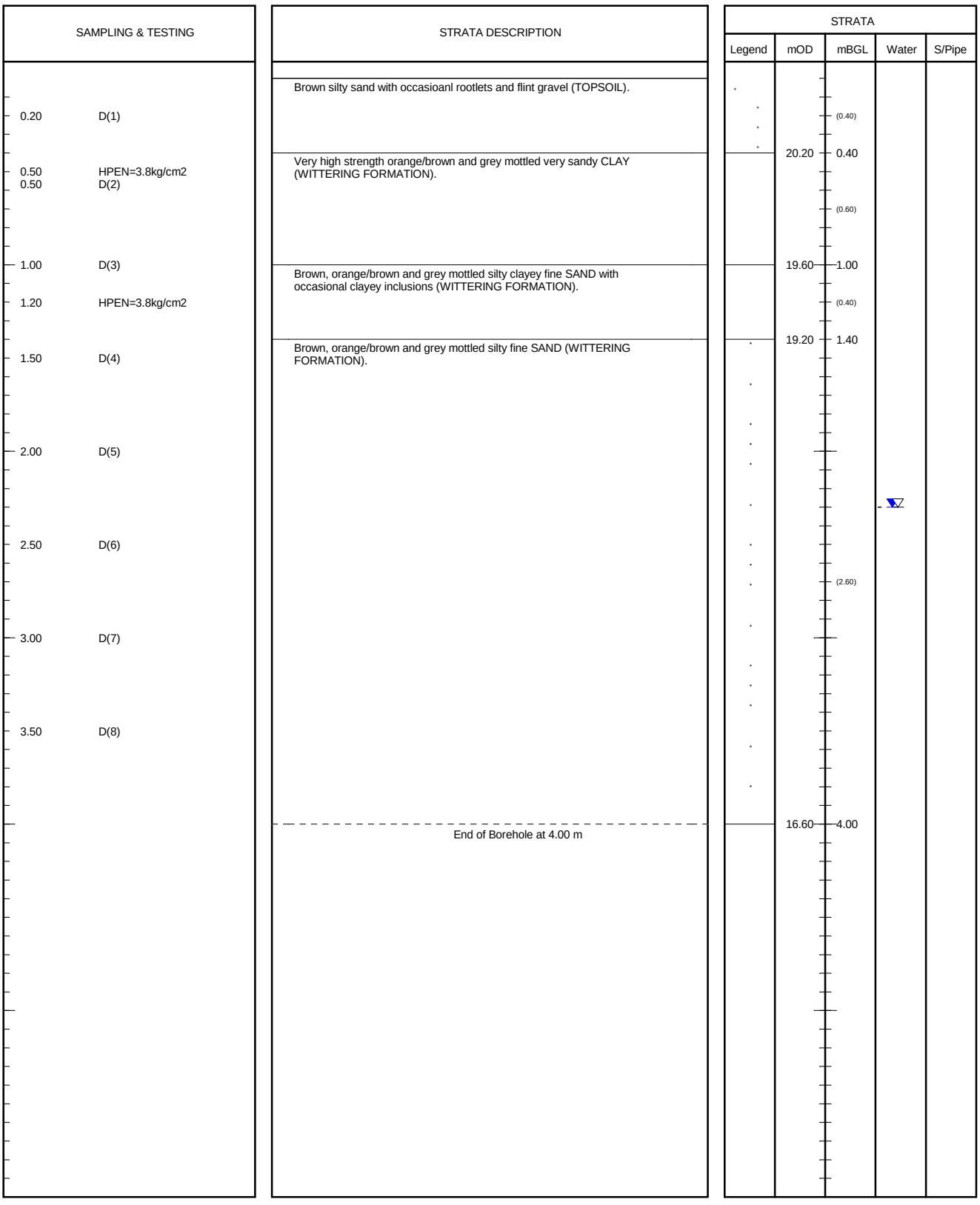
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS226
Groundwater: Strike at 3.00m; 3.80 after 20mins	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: -
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



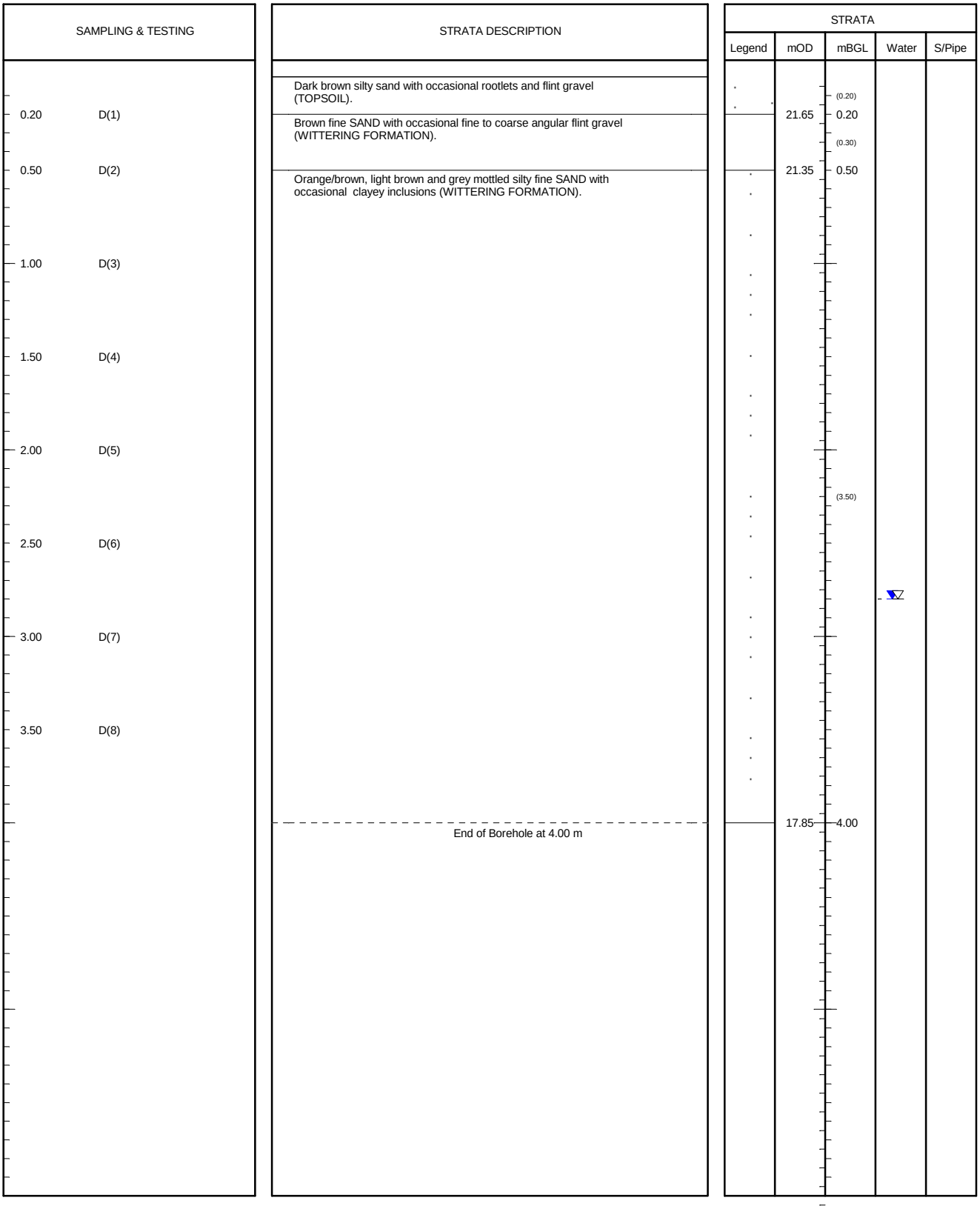
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS227
Groundwater: Strike at 1.50m; 4.00 after 20mins	Method: Archway	Start: 03/09/2013	Scale: 1:30
		Finish: 03/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 03/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 17.526mOD
Remarks: BAck filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



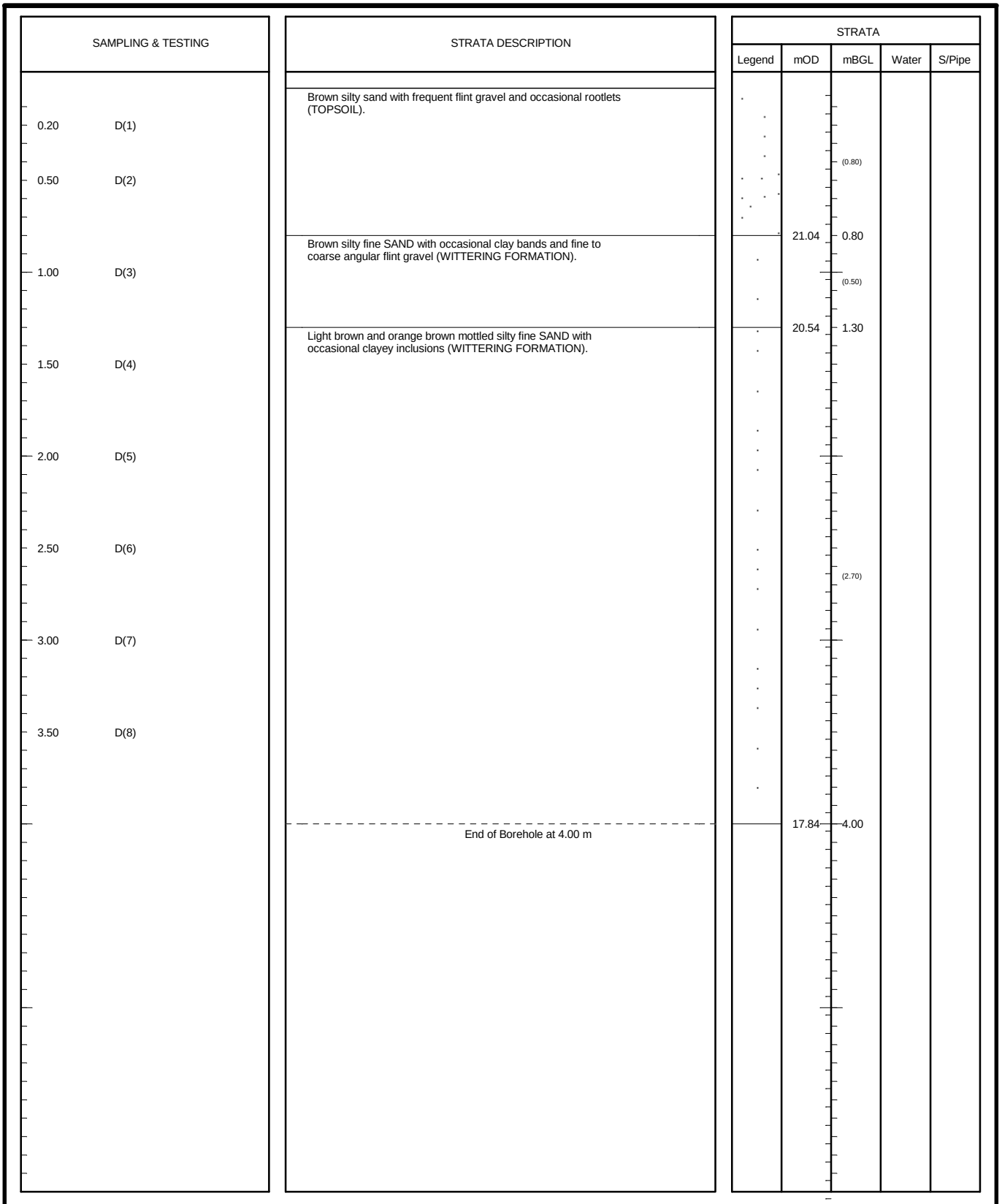
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS228
Groundwater: Strike at 2.30m; after 20mins no change.	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.600mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS229
Groundwater: Strike at 2.80m; after 20mins no change.	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.850mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



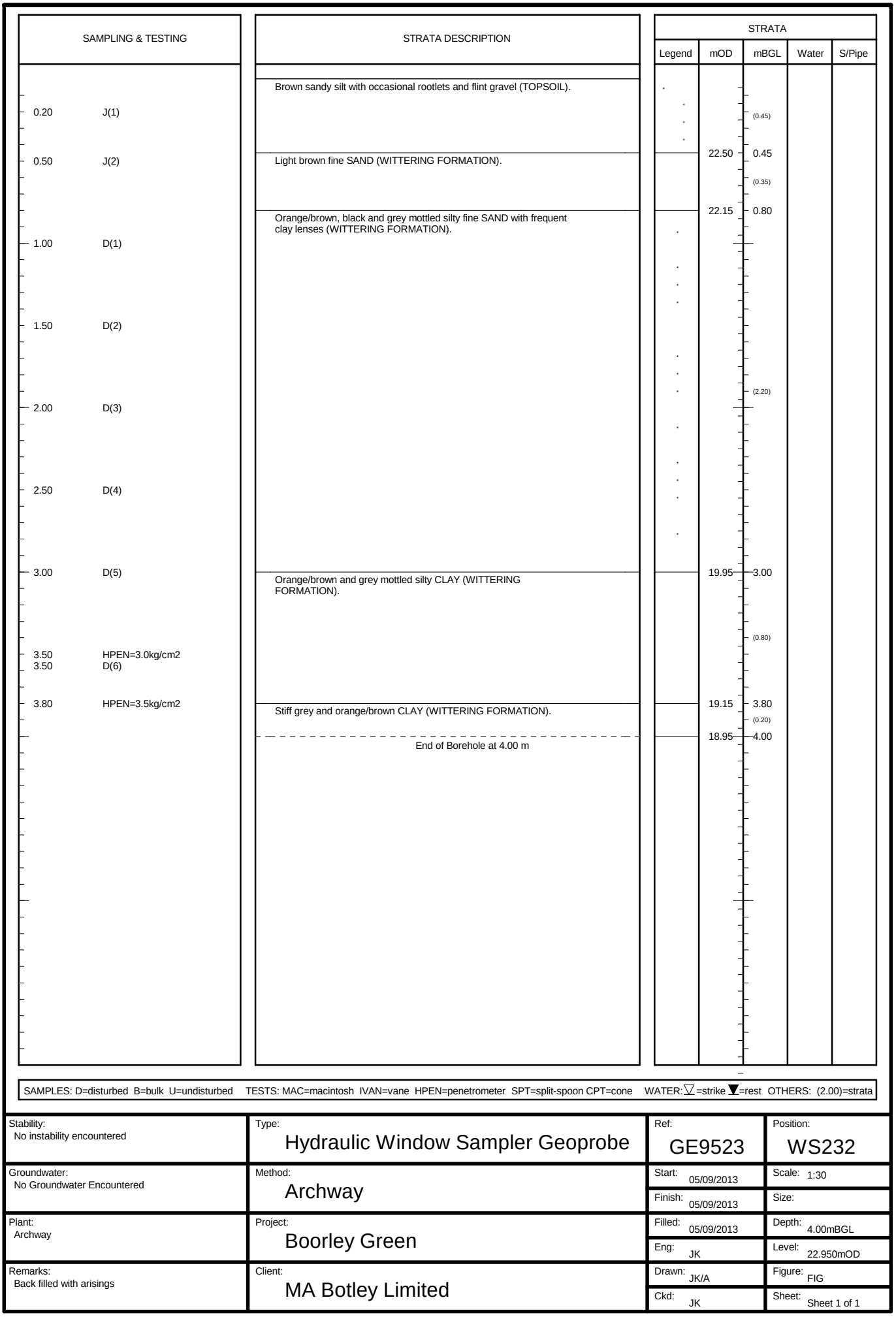
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS230
Groundwater: No Groundwater Encountered	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.839mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

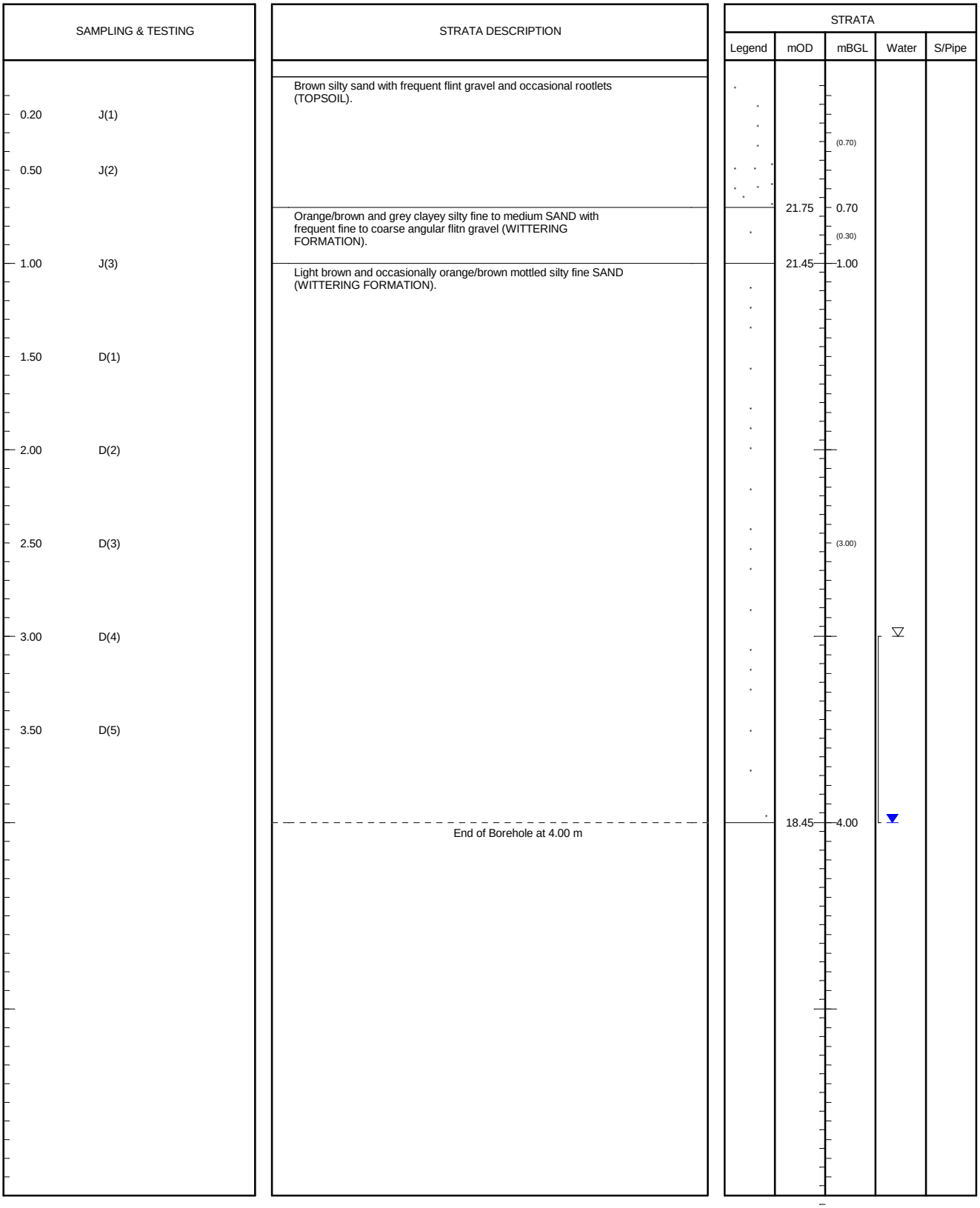
SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown silty sand with occasional rootlets and flint gravel (TOPSOIL).					
0.20	J(1)	Light brown fine SAND with occasional fine to medium sub-rounded flint gravel (WITTERING FORMATION).		22.20	0.10		
0.50	J(2)				(0.80)		
1.00	J(3)	Light brown and orange/brown mottled silty fine SAND with occasional clayey inclusions (WITTERING FORMATION).		21.40	0.90		
1.50	D(1)				(1.10)		
2.00	D(2)	Light grey and orange/brown mottled silty fine SAND with occasional clay lenses (WITTERING FORMATION).		20.30	2.00		
2.50	D(3)				(0.90)		
3.00	D(4)	Light brown, brown and orange/brown mottled silty clayey fine SAND with abundant clayey lenses (WITTERING FORMATION).		19.40	2.90		
3.50	D(5)				(1.10)		
		End of Borehole at 4.00 m		18.30	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS231
Groundwater: Strike at 3.80m; after 20mins no change.	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.300mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

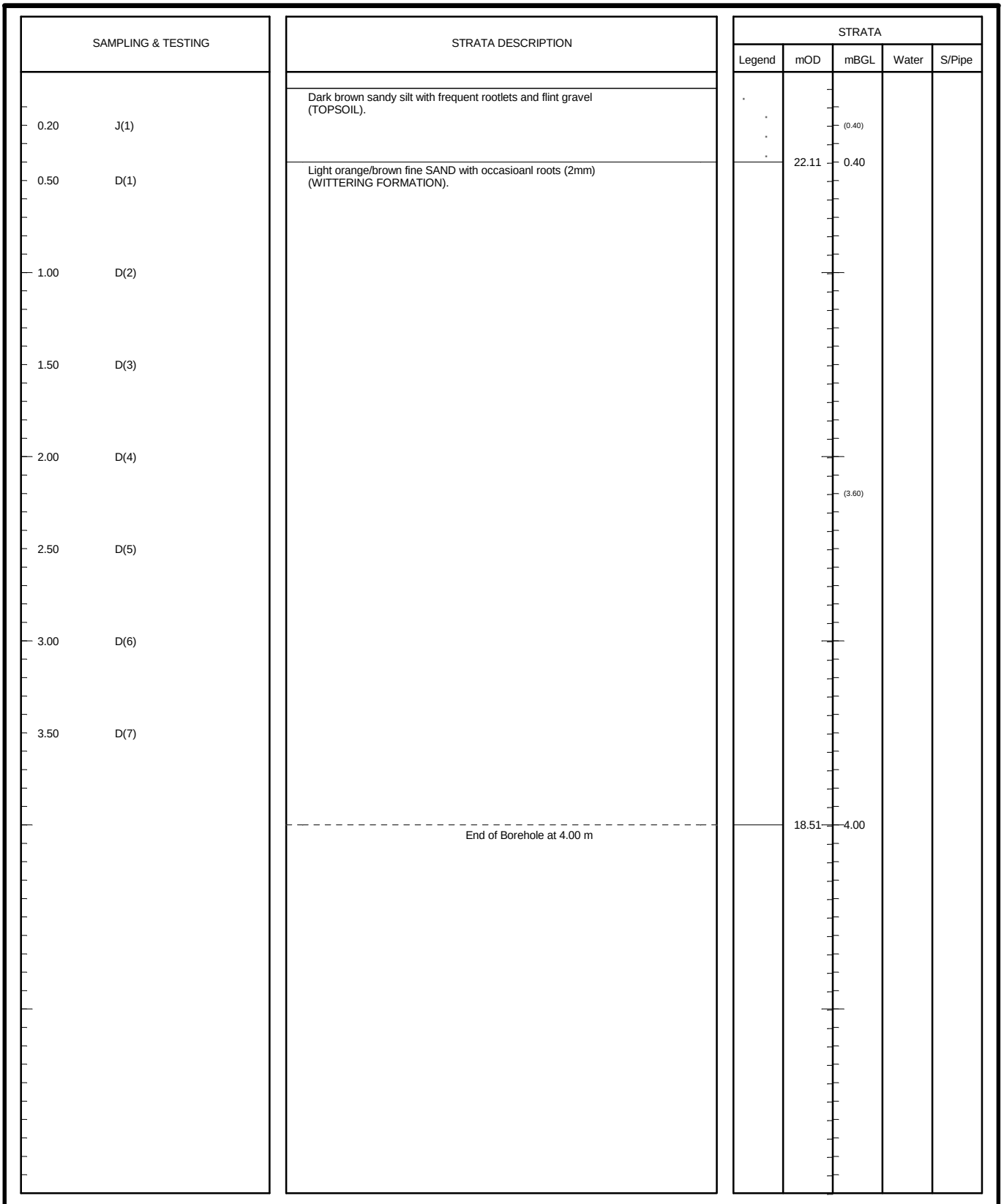


Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS232
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.950mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



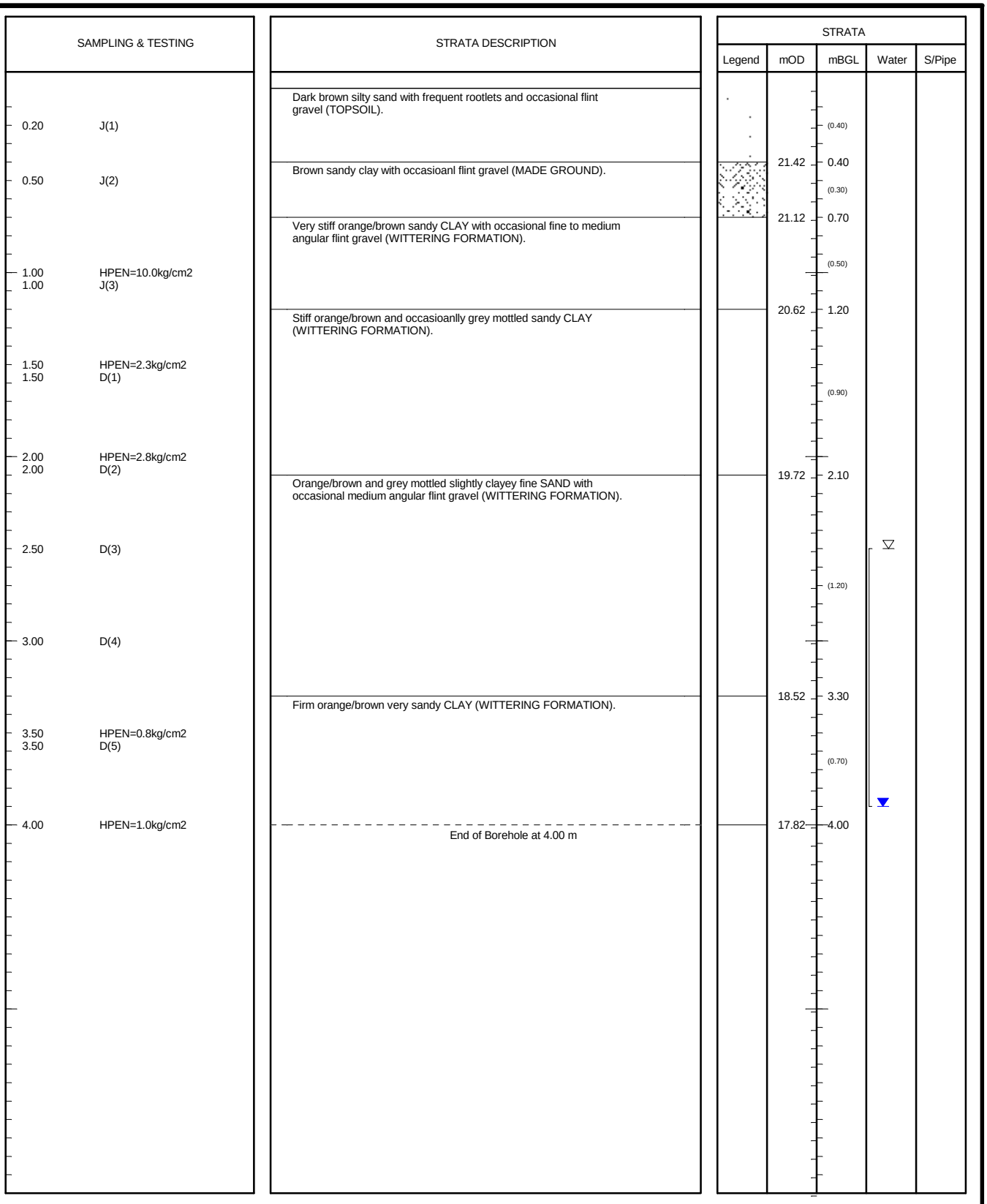
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.0m on completion.	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS233
Groundwater: Strike at 3.00m; 4.00 after 20mins	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.447mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



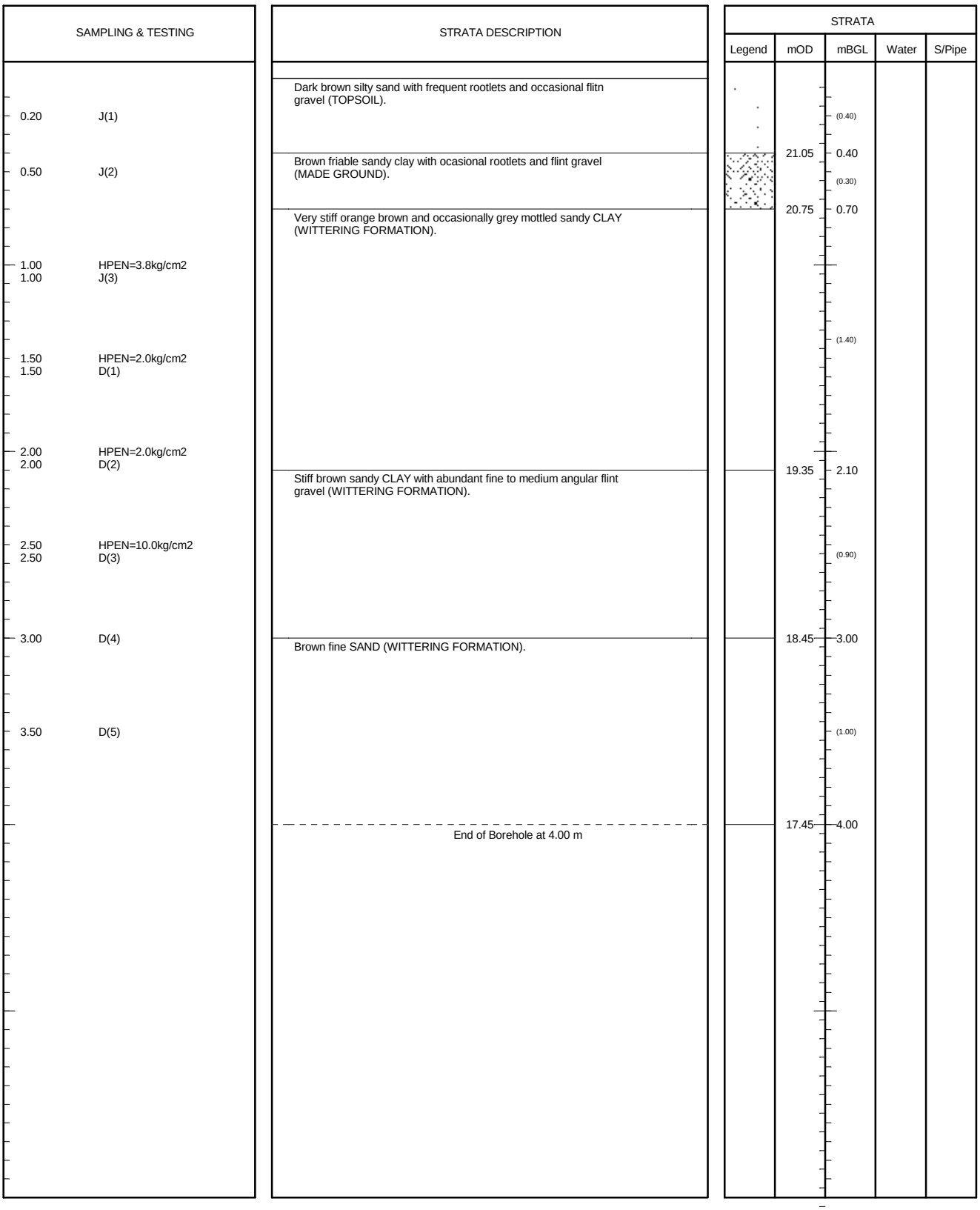
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS234
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.506mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



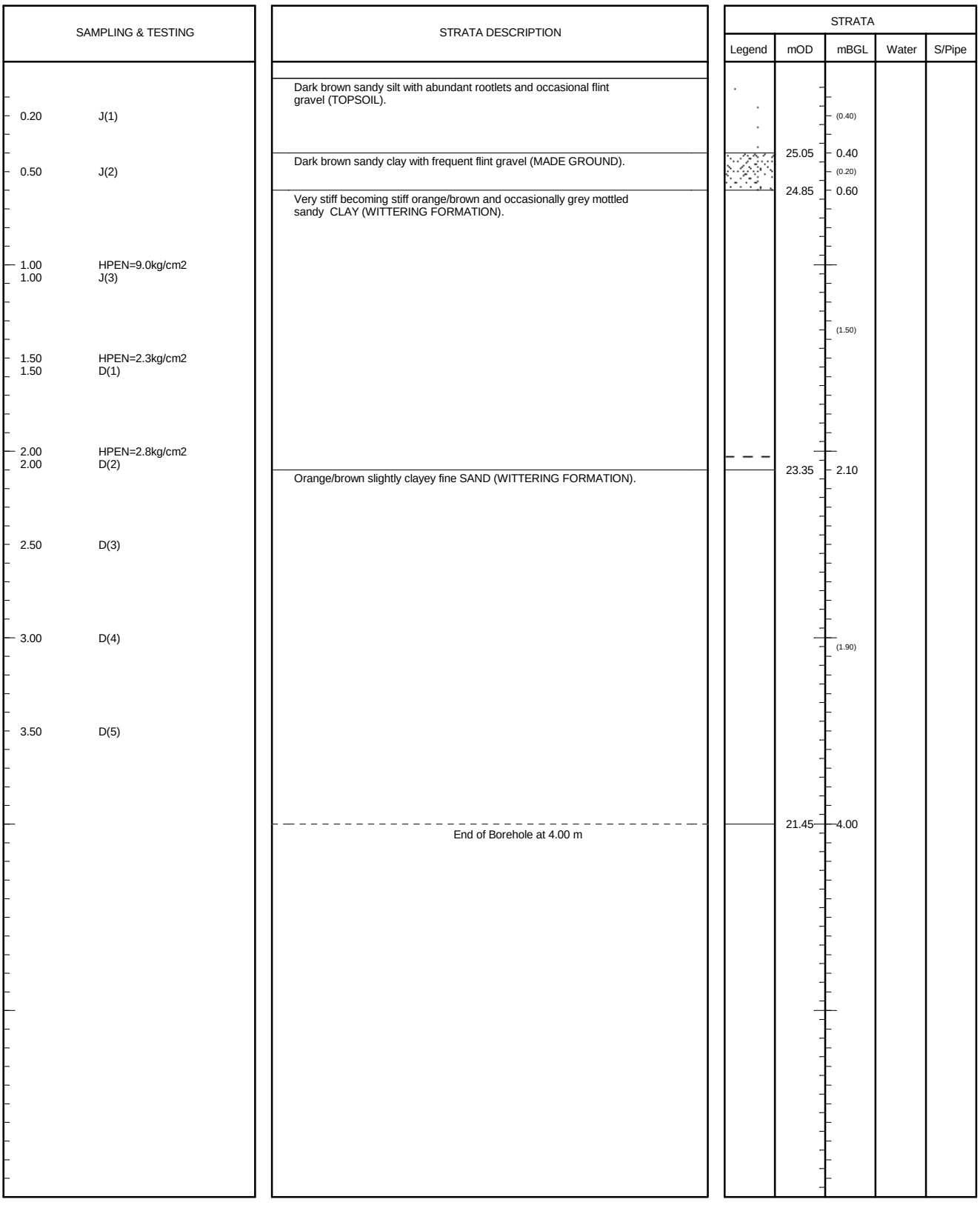
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS235
Groundwater: Strike at 2.50m; 3.90 after 20mins	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.816mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

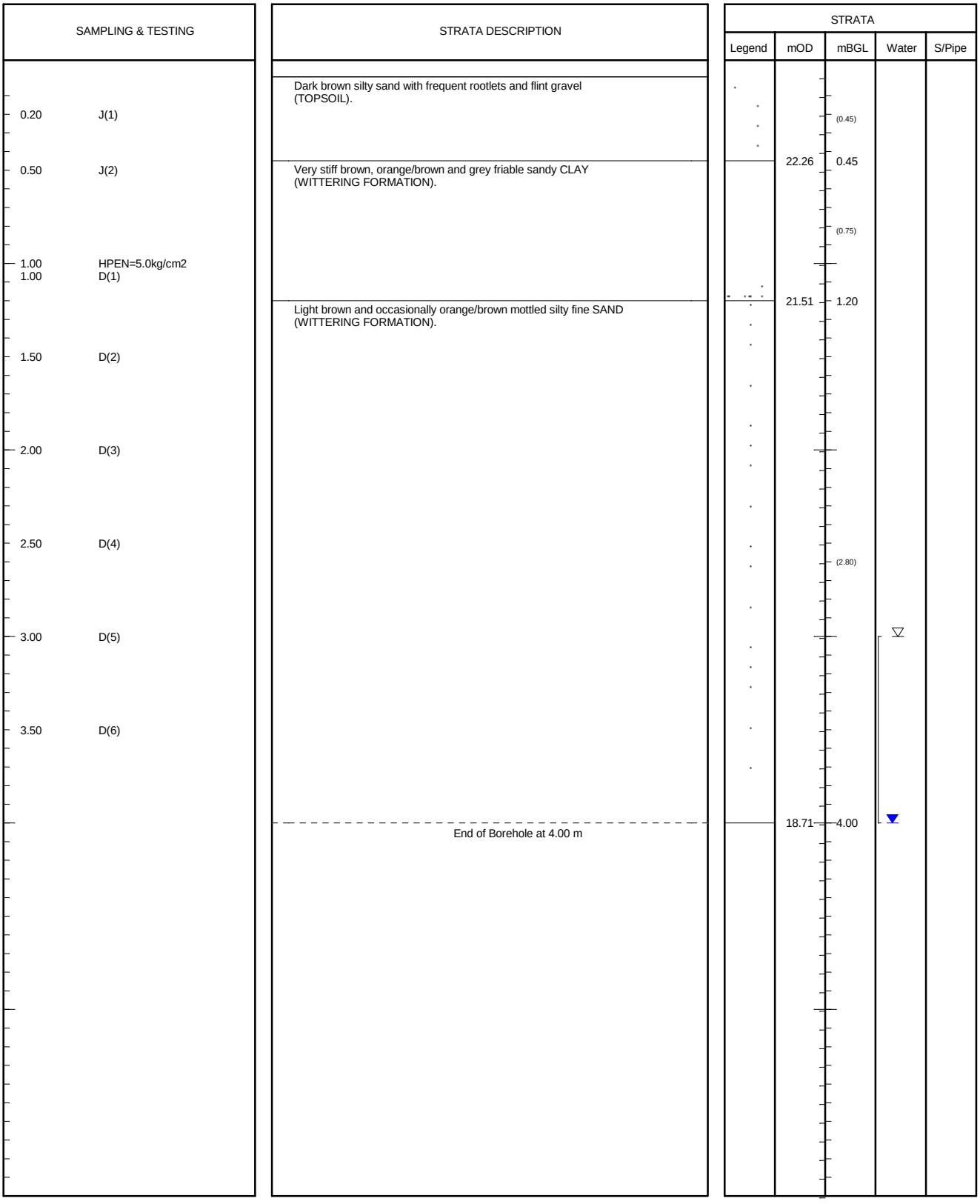


SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS236
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.448mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

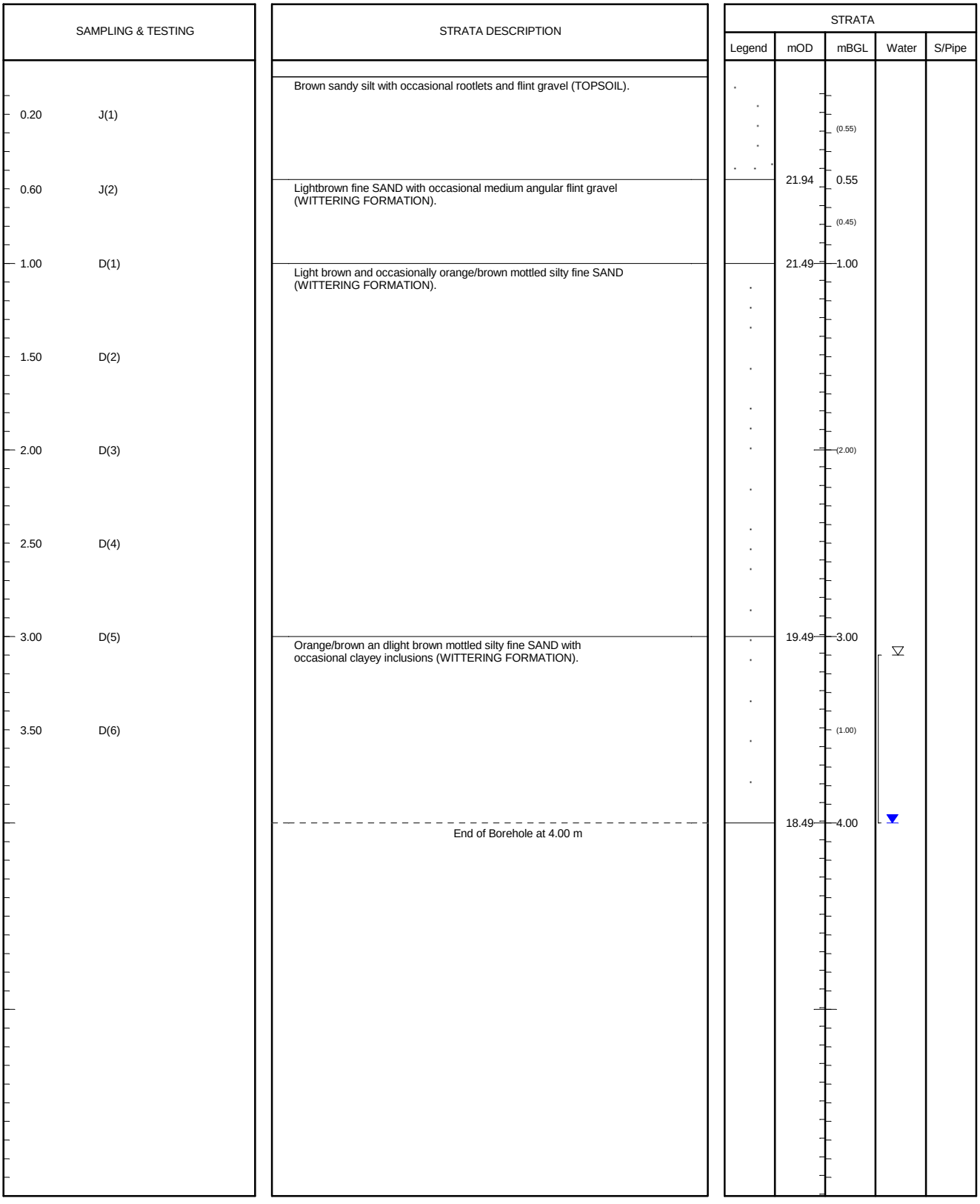


Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS237
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 25.448mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



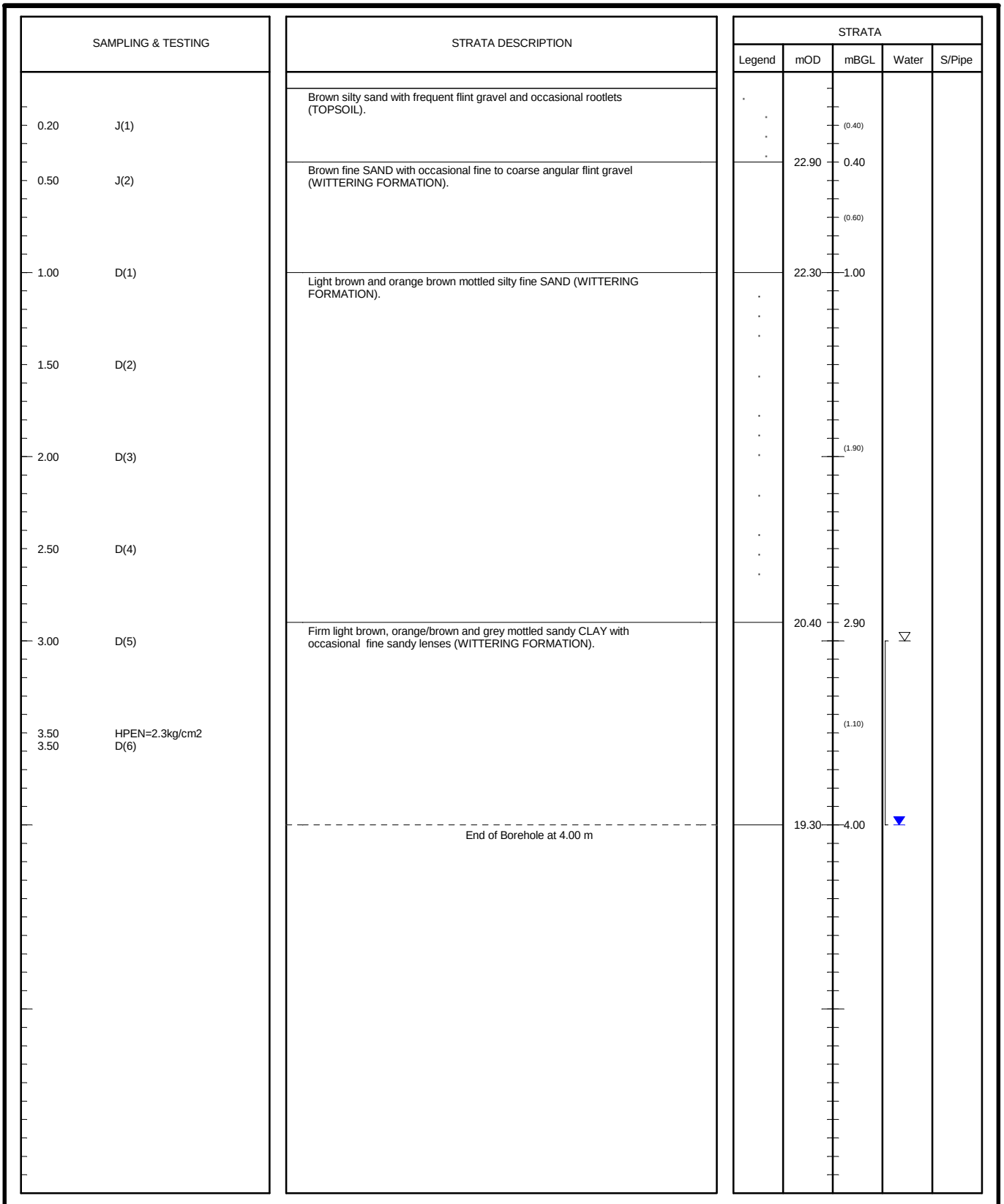
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS238
Groundwater: Strike at 3.00m; 4.00 after 20mins	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.710mOD
Remarks: BAck filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



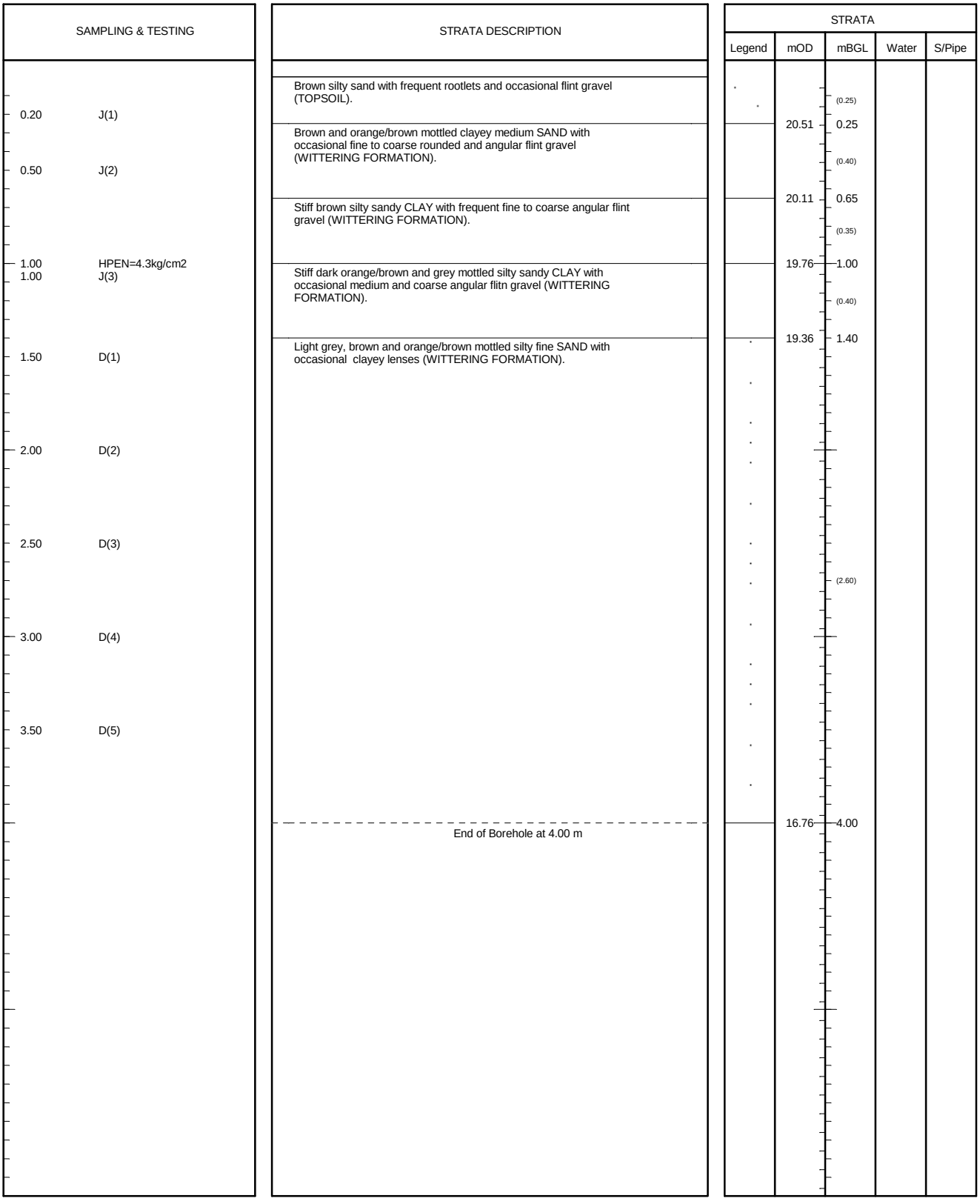
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS239
Groundwater: Strike at 3.10m; 4.00 after 20mins	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.490mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



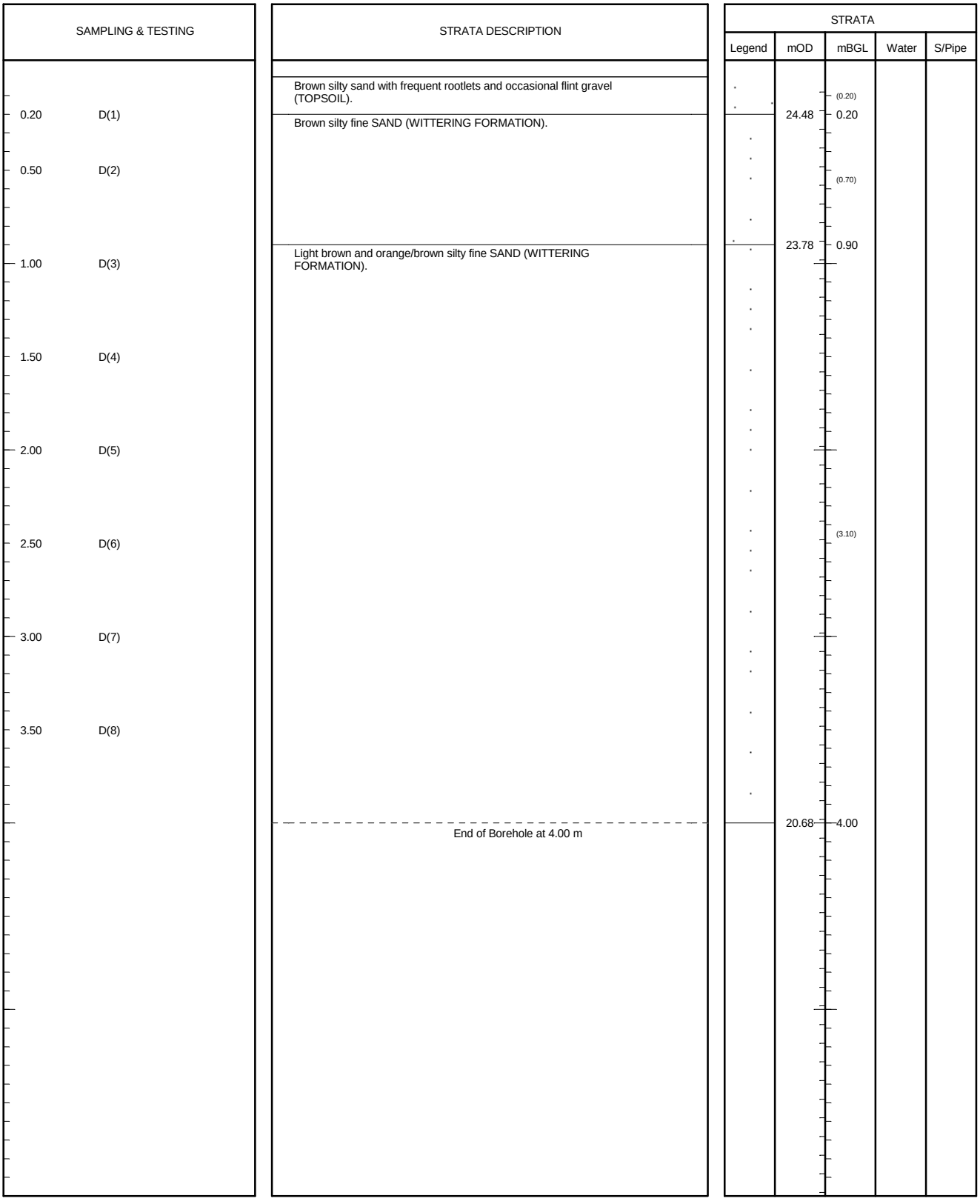
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS240
Groundwater: Strike at 3.00m; 4.00 after 20mins	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.300mOD
Remarks: BAck filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



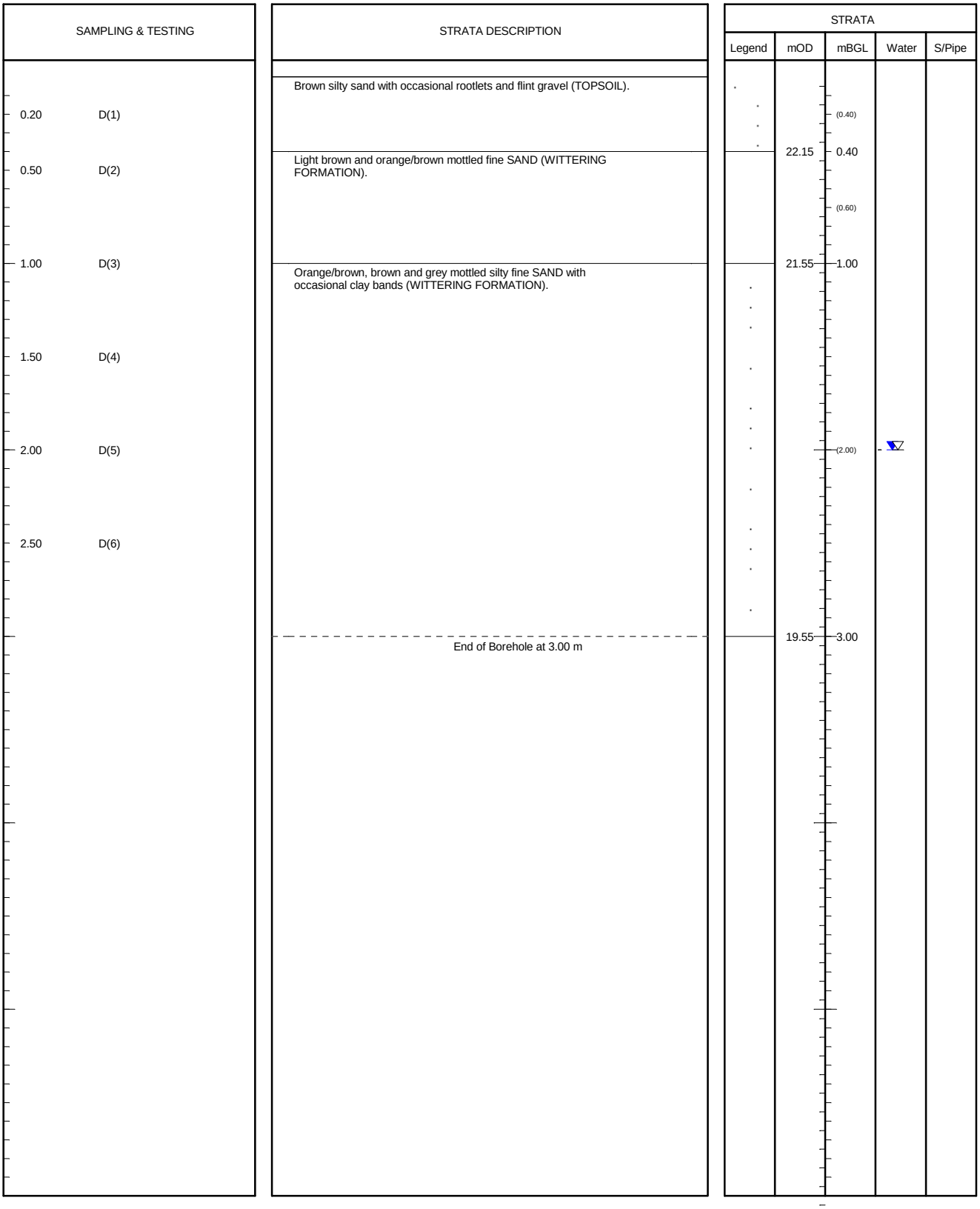
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS241
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.759mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



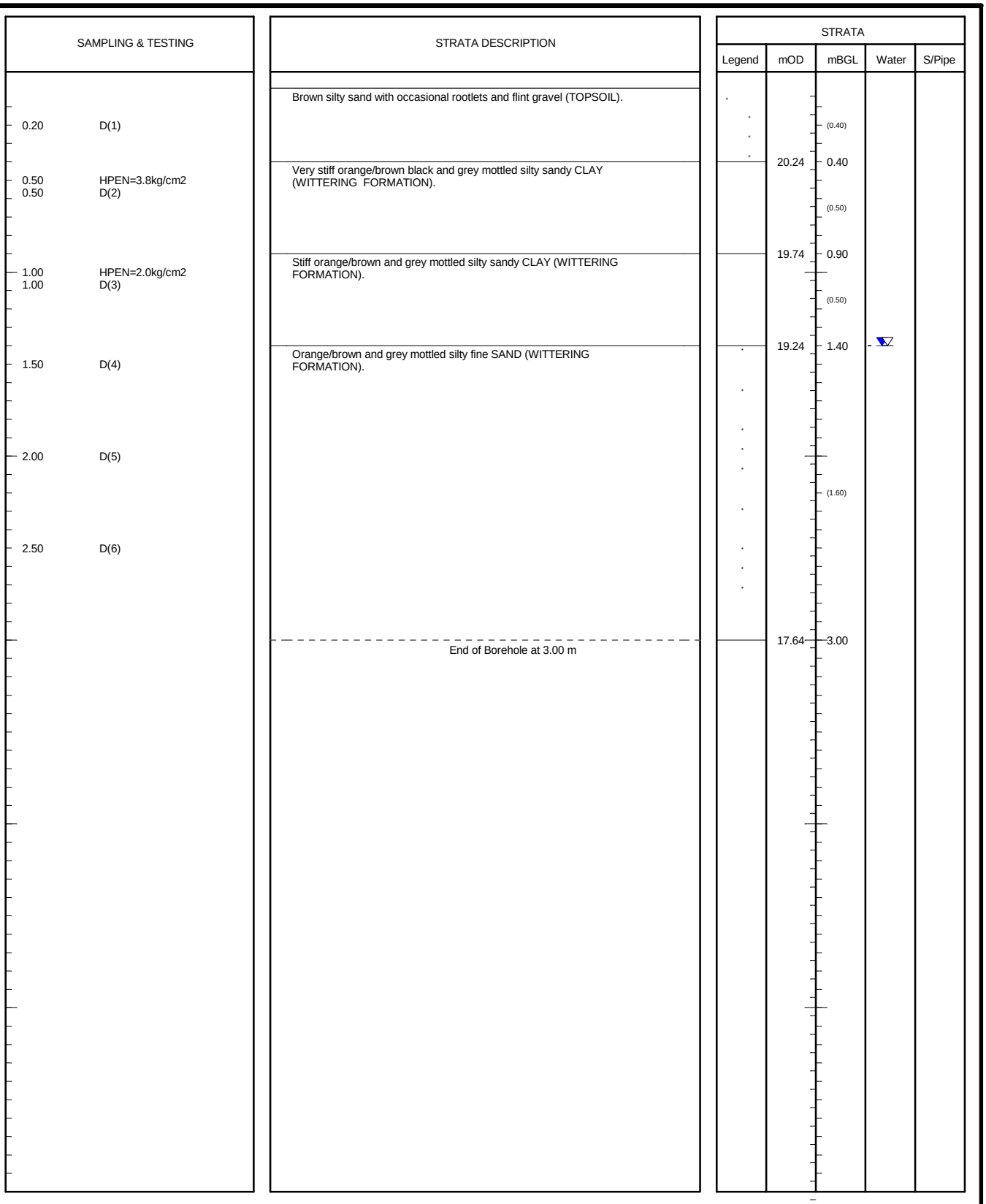
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS242
Groundwater: No Groundwater Encountered	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.681mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



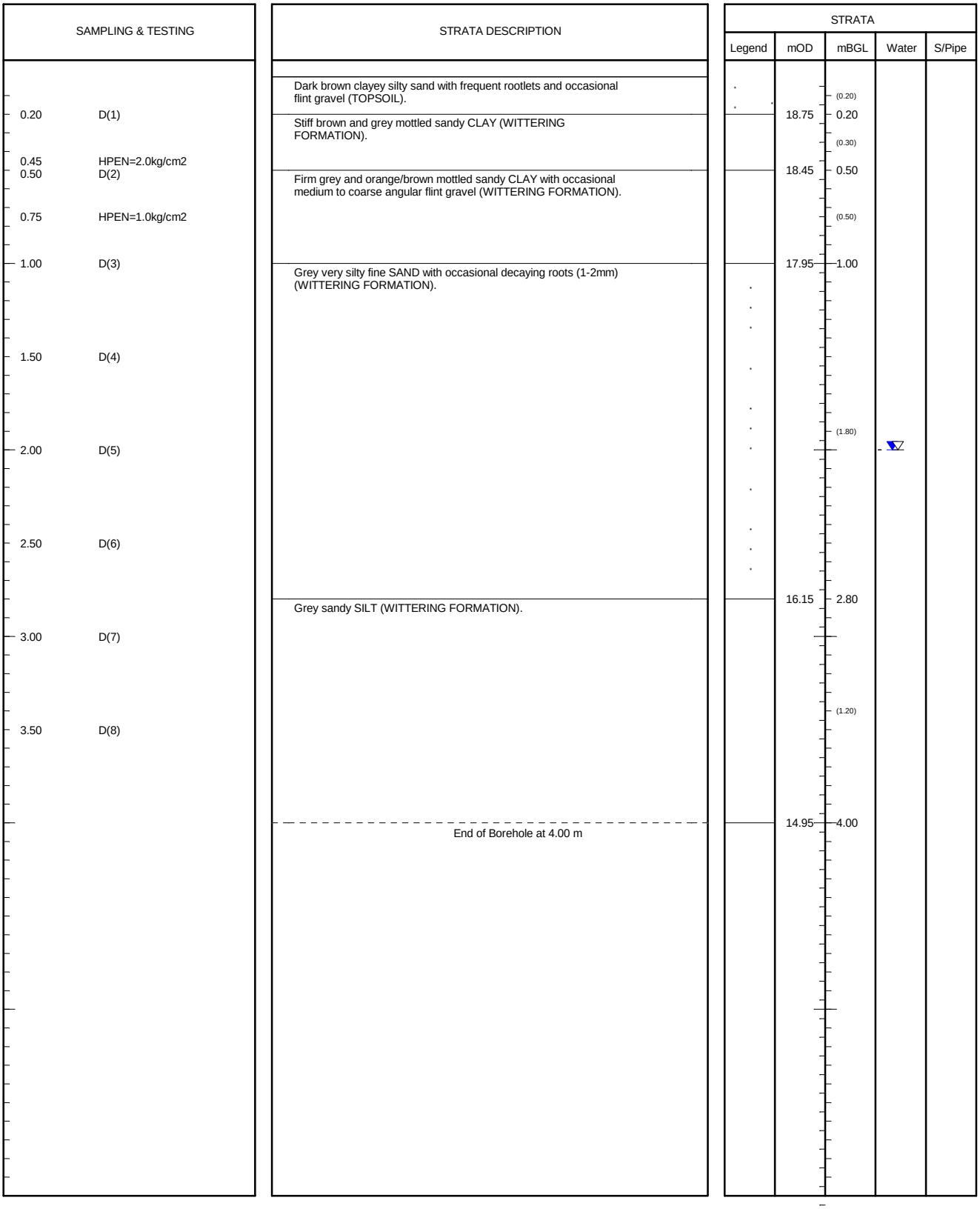
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.00m when hole at 3.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS243
Groundwater: Strike at 2.00m; after 20mins no change.	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 22.550mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



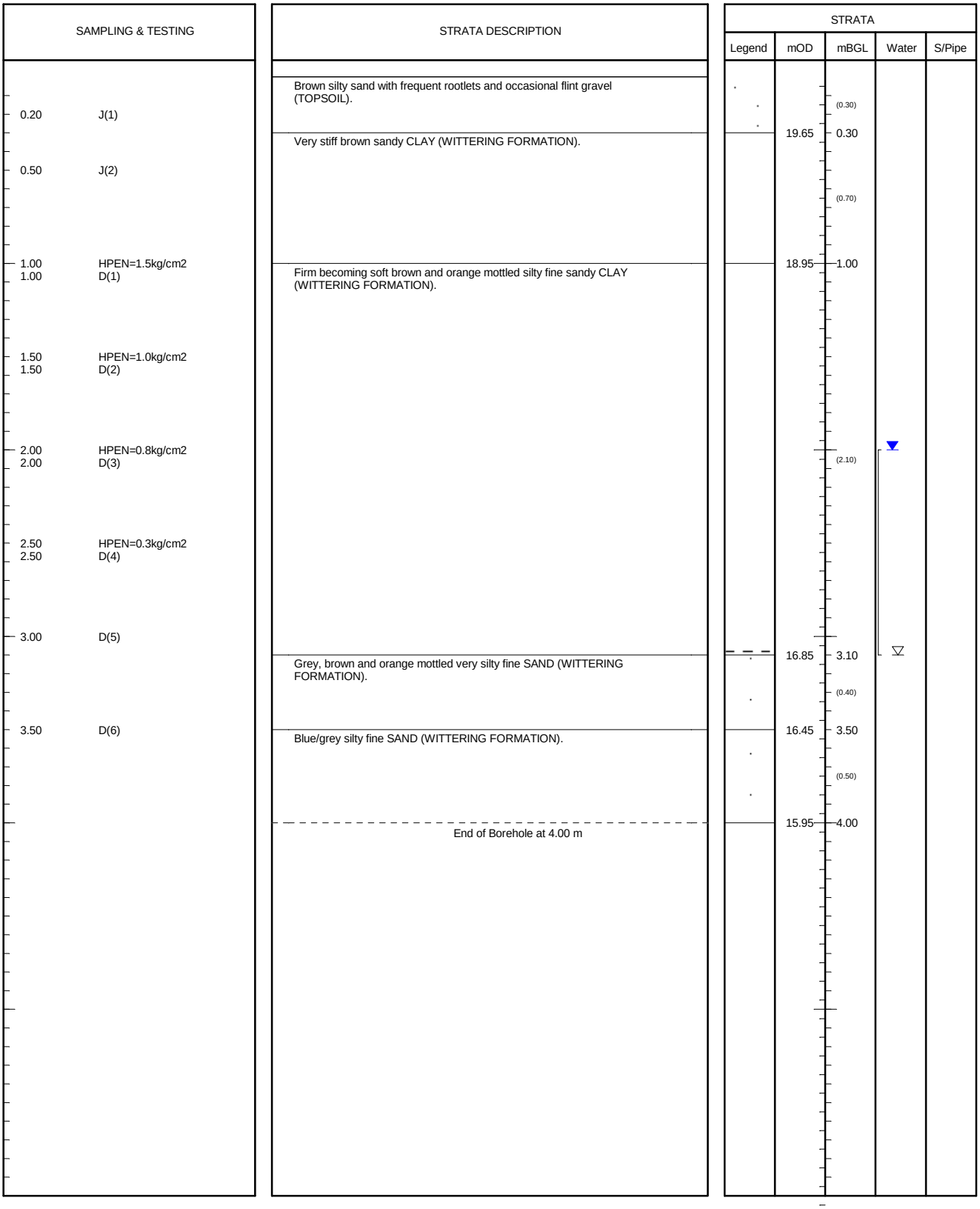
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 1.50m when hole at 3.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS244
Groundwater: Strike at 1.40m; after 20mins no change.	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 20.643mOD
Remarks: Backfilled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



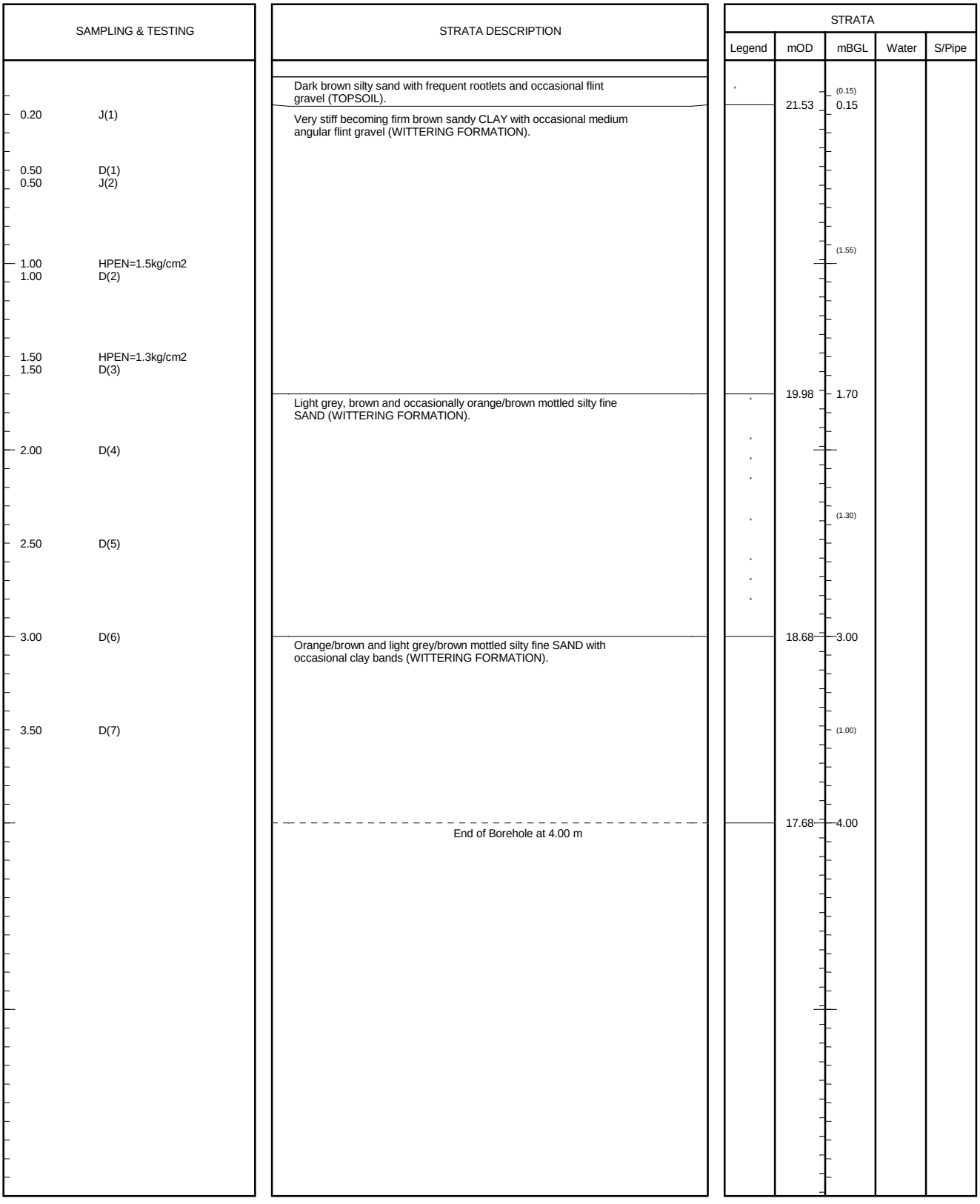
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS245
Groundwater: Strike at 2.00m; after 20mins no change.	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.950mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



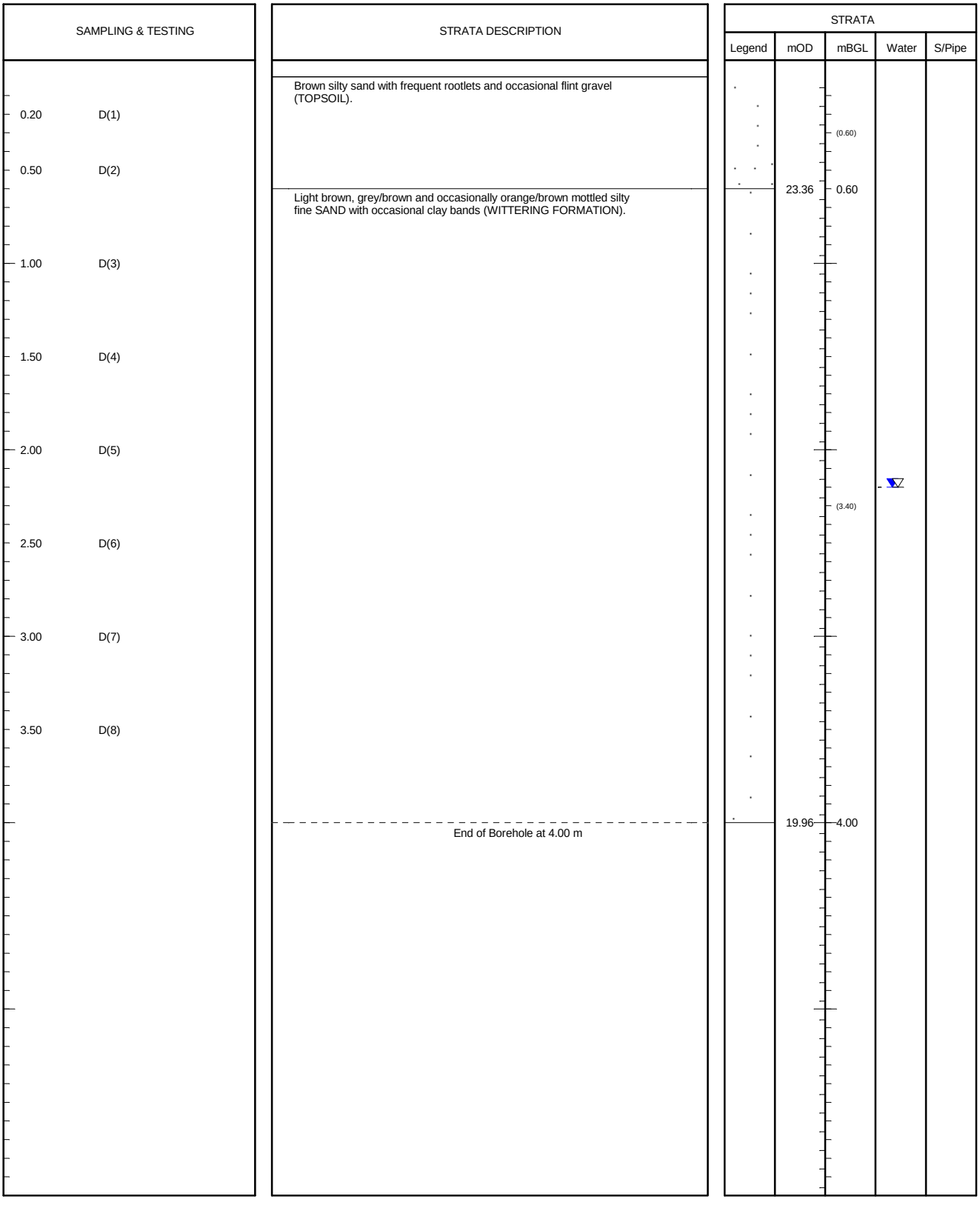
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS246
Groundwater: Strike at 3.10m; 2.00 after 20mins	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.950mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS247
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.680mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS248
Groundwater: Strike at 2.20m; after 20mins no change.	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.958mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	D(1)			24.28	0.30		
		Brown fine SAND with occasional fine to coarse sub-rounded flint gravel (WITTERING FORMATION).			(0.50)		
0.50	D(2)			23.78	0.80		
		Light brown and occasionally orange/brown mottled silty fine SAND (WITTERING FORMATION).					
1.00	D(3)						
1.50	D(4)						
2.00	D(5)						
					(3.20)		
2.50	D(6)						
3.00	D(7)						
3.50	D(8)						
		End of Borehole at 4.00 m		20.58	4.00		

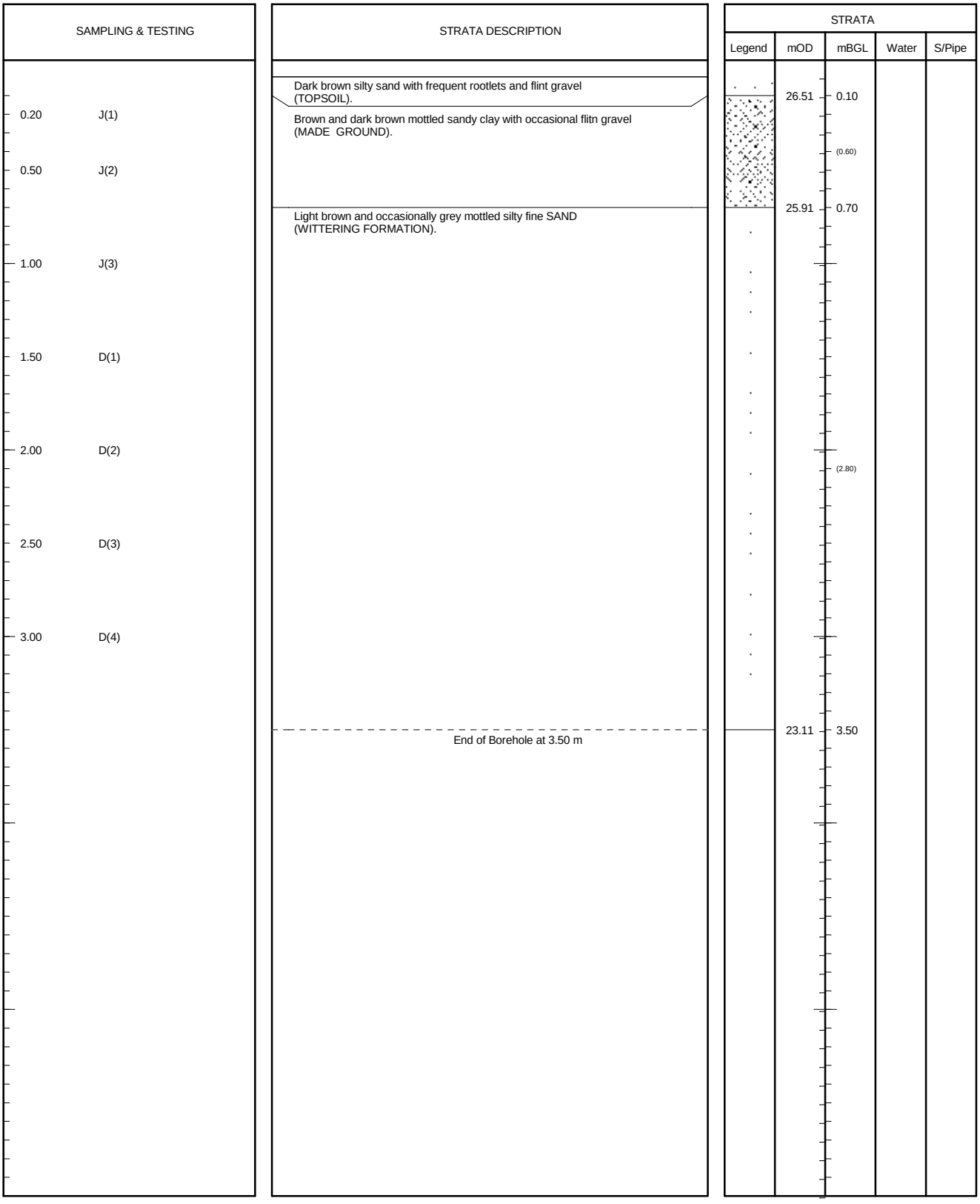
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS249
Groundwater: No Groundwater Encountered	Method: Archway	Start: 04/09/2013	Scale: 1:30
		Finish: 04/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 04/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.580mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown silty sand with frequent flint gravel and occasional rootlets (TOPSOIL).			(0.30)		
0.20	J(1)			23.64	0.30		
		Brown fine SAND with occasional fine to coarse angular flint gravel (WITTERING FORMATION).			(0.50)		
0.50	J(2)			23.14	0.80		
		Light grey/brown and orange/brown silty fine SAND with occasional clayey inclusions (WITTERING FORMATION).					
1.00	J(3)						
1.50	D(4)						
2.00	D(5)						
					(3.20)		
2.50	D(6)						
3.00	D(7)						
3.50	D(8)						
		End of Borehole at 4.00 m		19.94	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS250
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.944mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



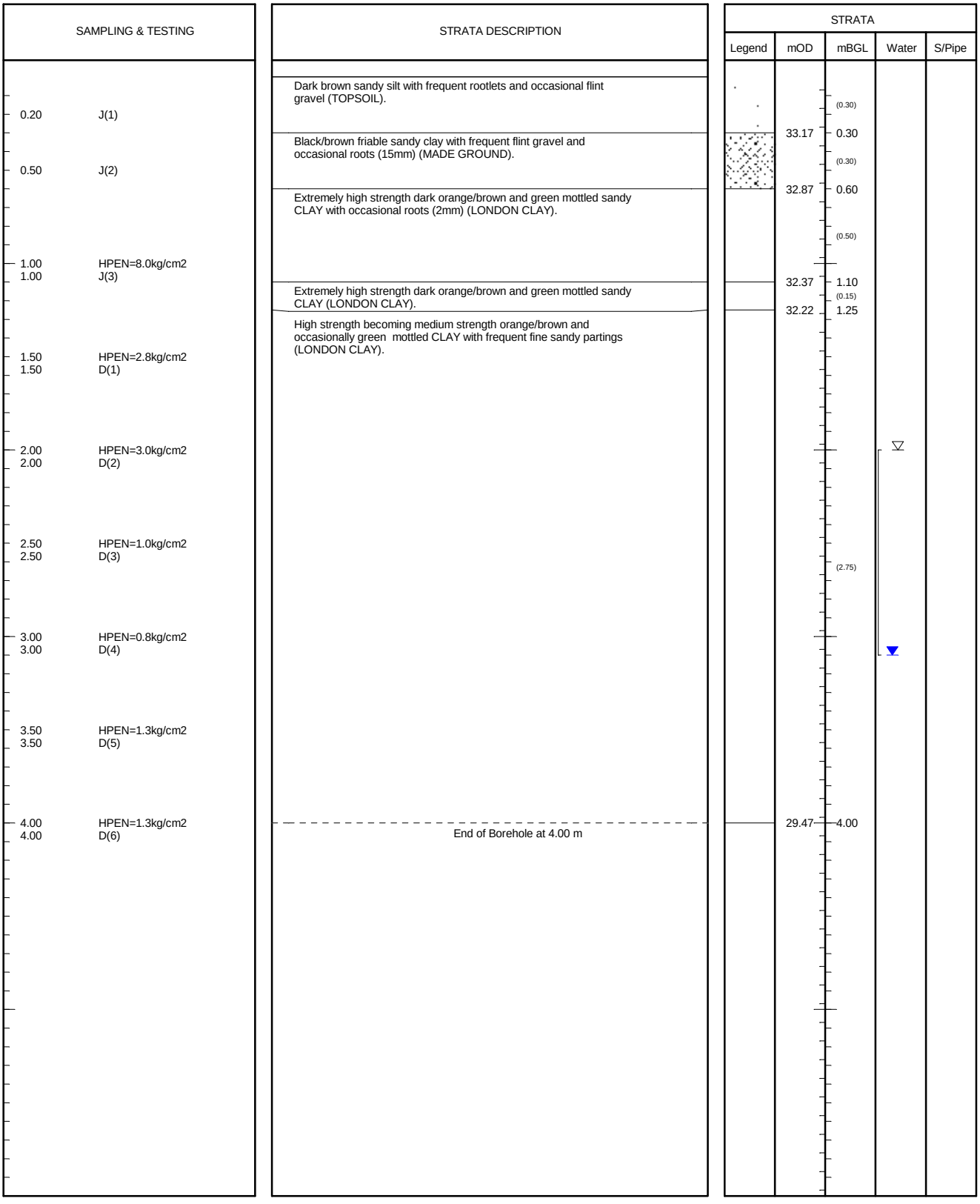
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS251
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 3.50mBGL
		Eng: JK	Level: 26.611mOD
Remarks: Borehole reufsed on dense sands at 3.50m bgl.	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown sandy silt with occasional flint gravel and roots (4mm) (TOPSOIL).					
0.20	J(1)				(0.40)		
		Very stiff orange/brown and occasionally green mottled sandy CLAY with occasional fine to medium angular flint gravel and roots (1mm) (WITTERING FORMATION).		26.30	0.40		
0.50	J(2)						
1.00	HPEN=9.8kg/cm2						
1.00	D(1)				(1.60)		
1.50	HPEN=5.8kg/cm2						
1.50	D(2)						
2.00	HPEN=5.3kg/cm2						
2.00	D(3)	Orange/brown clayey fine SAND with occasional rootlets (WITTERING FORMATION).		24.70	2.00		
2.50	D(4)						
3.00	D(5)				(2.00)		
3.50	D(6)						
		End of Borehole at 4.00 m		22.70	4.00		

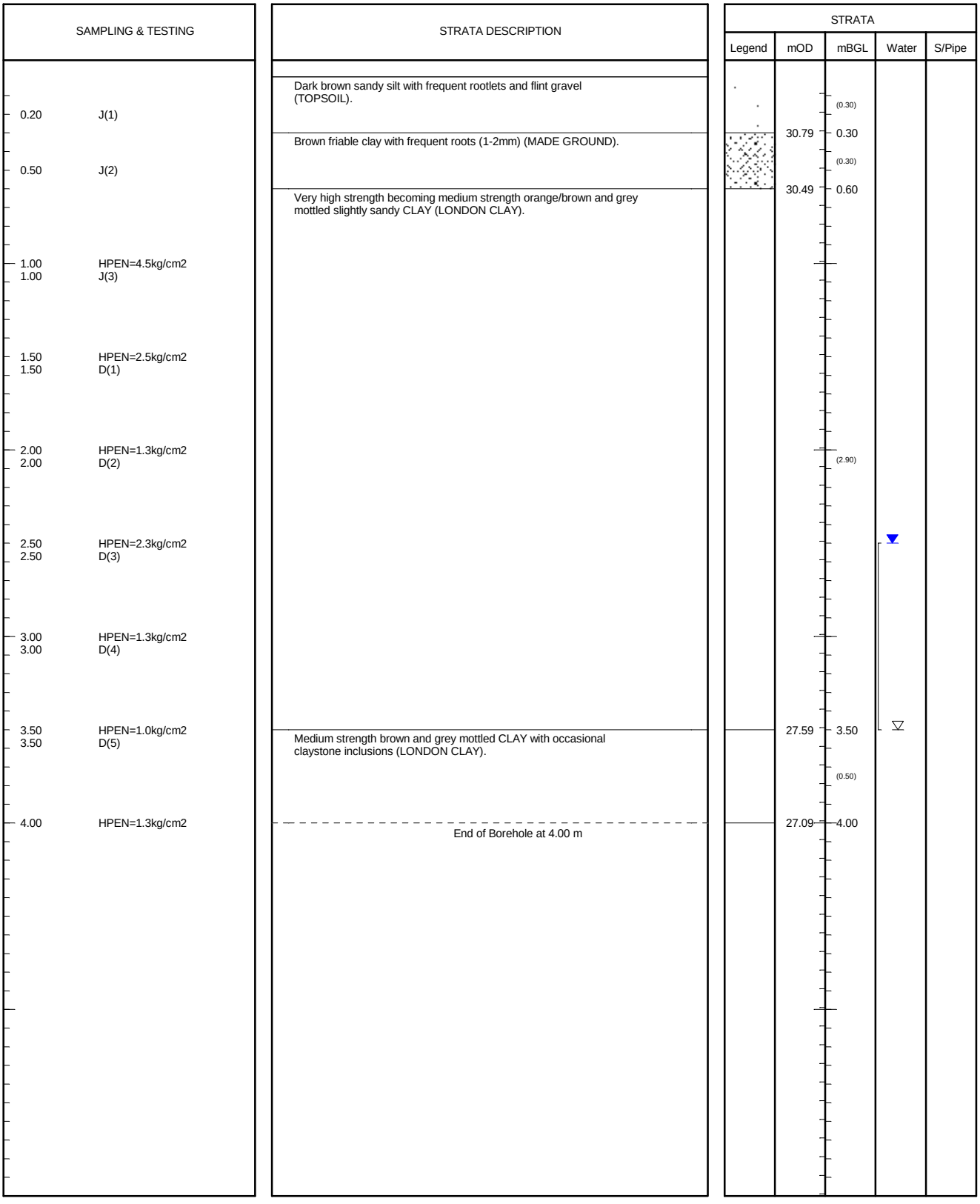
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS252
Groundwater: No Groundwater Encountered	Method: Archway	Start: -	Scale: 1:30
		Finish: -	Size:
Plant: Archway	Project: Boorley Green	Filled: -	Depth: 4.00mBGL
		Eng: JK	Level: 26.702mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn:	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS253
Groundwater: Strike at 2.00m; 3.10 after 20mins	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 33.469mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



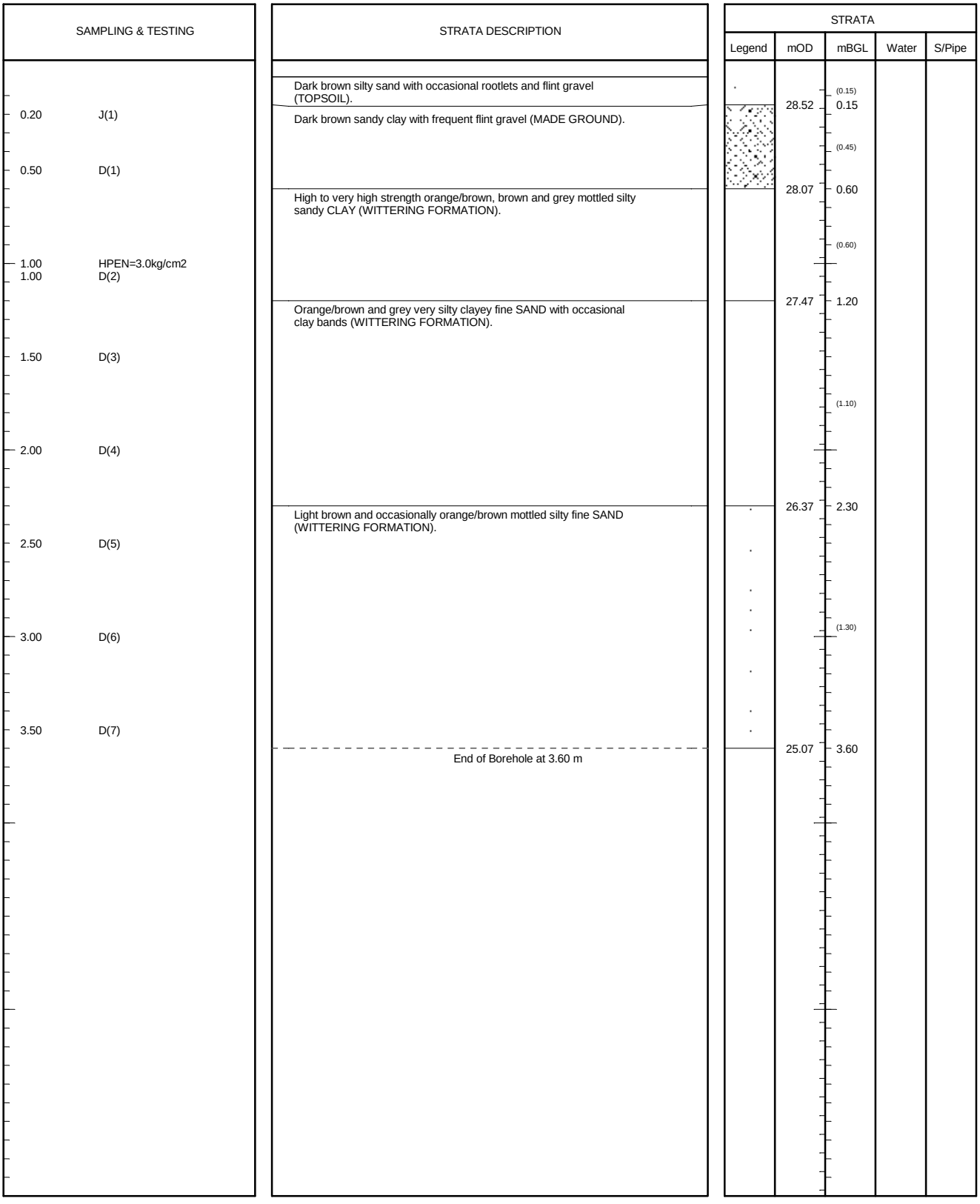
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS254
Groundwater: Strike at 3.50m; 2.50 after 20mins	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 31.089mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			29.10	0.30		
		Very high strength orange/brown, brown and grey mottled silty sandy friable CLAY (WITTERING FORMATION).					
0.50	J(2)				(0.70)		
1.00	HPEN=4.3kg/cm2						
1.00	D(1)	Very high strength orange/brown and grey mottled silty sandy CLAY with occasional fine to medium claystone gravel (WITTERING FORMATION).		28.40	1.00		
					(0.50)		
1.50	HPEN=3.5kg/cm2						
1.50	D(2)	Very high strength grey, orange/brown and brown mottled silty CLAY with occasional claystone bands (WITTERING FORMATION).		27.90	1.50		
2.00	HPEN=3.3kg/cm2						
2.00	D(3)				(1.20)		
2.50	D(4)						
		Stiff grey, brown and orange/brown CLAYSTONE (WITTERING FORMATION).		26.70	2.70		
					(0.20)		
		Grey, brown and orange/brown mottled silty fine SAND with occasional fine to coarse angular claystone gravel (WITTERING FORMATION).		26.50	2.90		
3.00	D(5)						
3.50	D(6)				(1.10)		
		End of Borehole at 4.00 m		25.40	4.00		

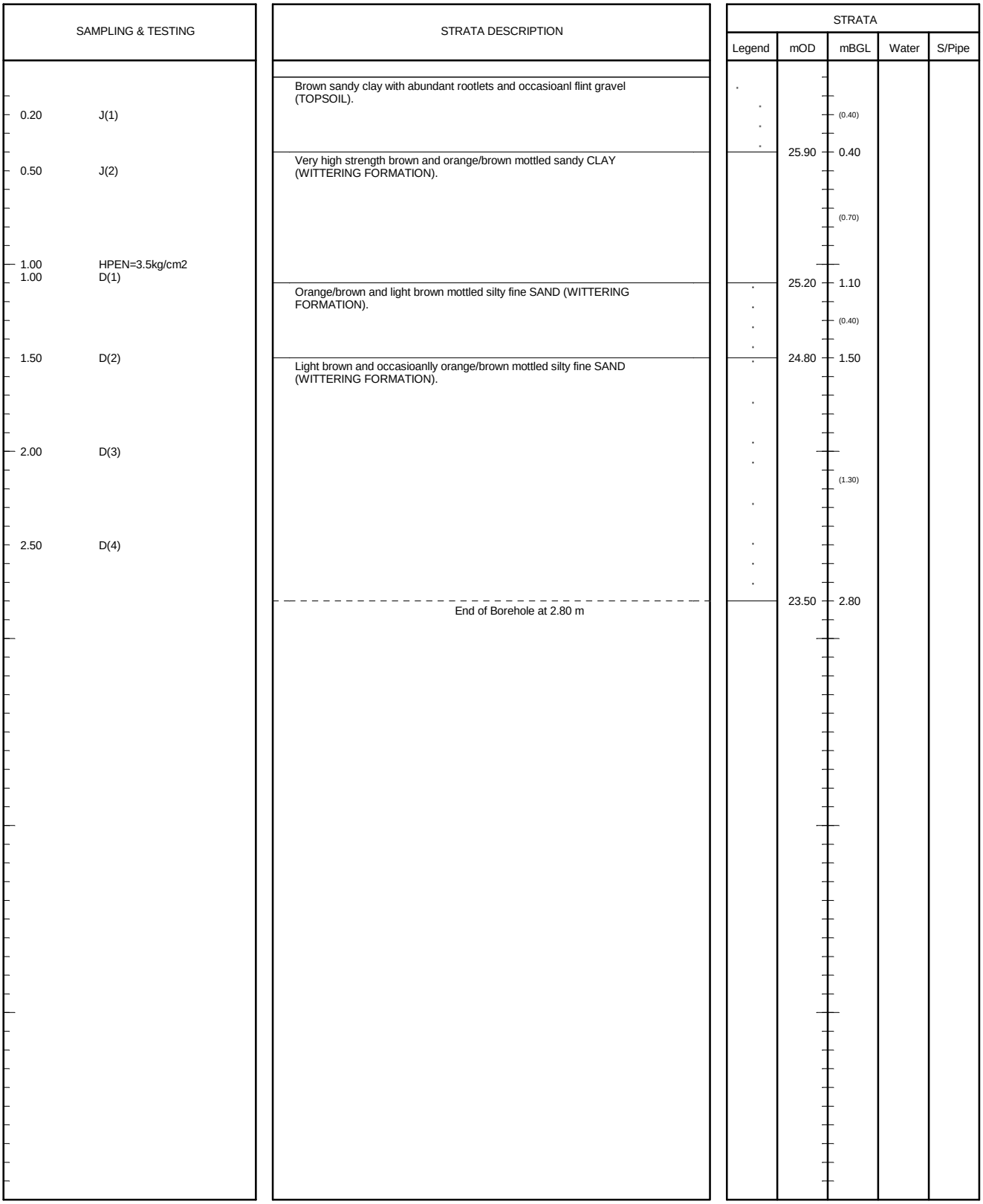
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS255
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 29.397mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



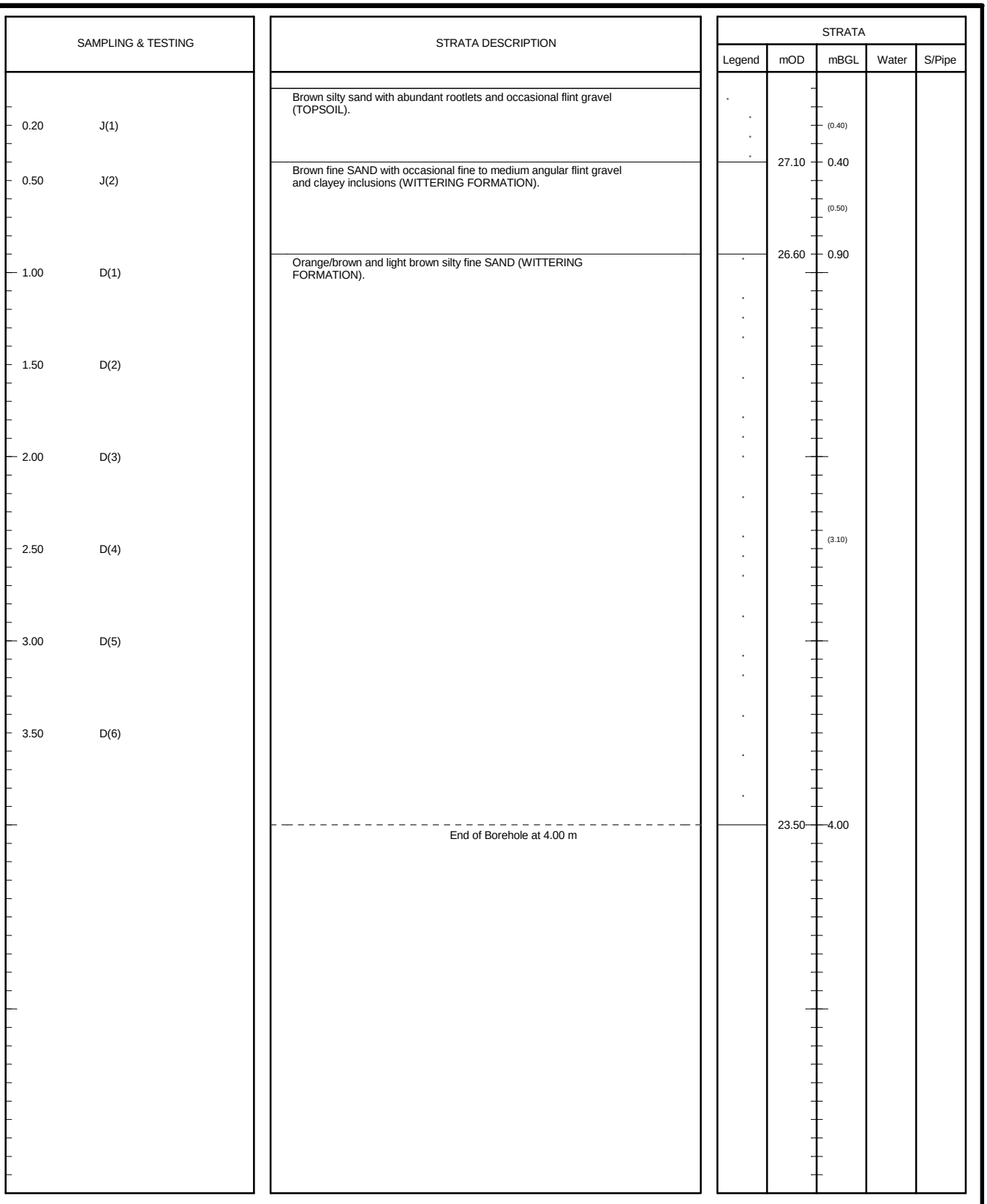
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS256
Groundwater: No Groundwater Encountered	Method: Archway	Start: 05/09/2013	Scale: 1:30
		Finish: 05/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 05/09/2013	Depth: 3.60mBGL
		Eng: JK	Level: 28.669mOD
Remarks: Borehole reufsed on dense sands at 3.60m bgl.	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS257
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 2.80mBGL
		Eng: JK	Level: 26.300mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



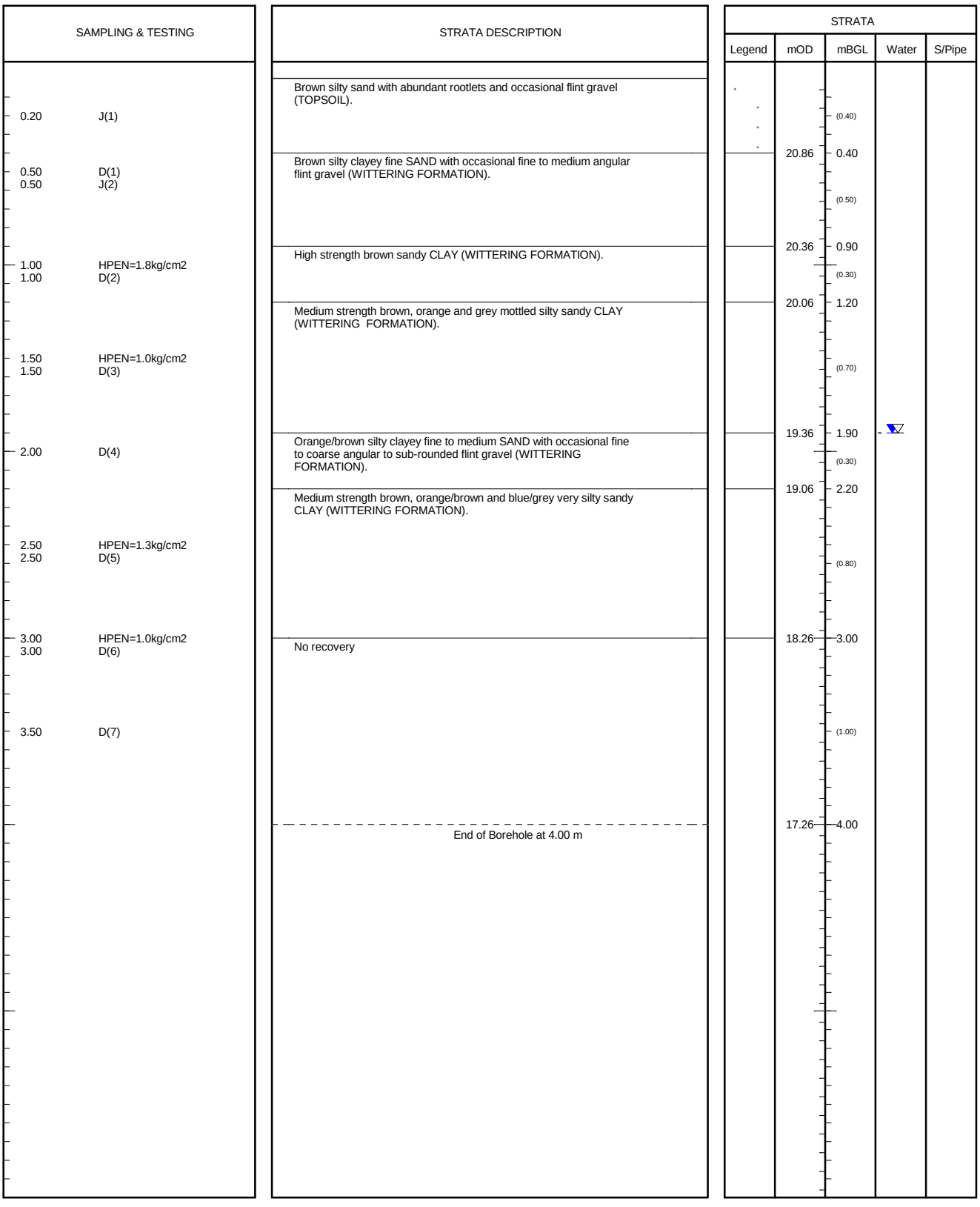
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS258
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 27.500mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown sandy silt with frequent rootlets and flint gravel (TOPSOIL).					
0.20	J(1)				(0.30)		
		Brown fine SAND with occasional fine to medium angular flint gravel (WITTERING FORMATION).		25.00	0.30		
0.50	D(1)				(0.30)		
0.50	J(2)						
		Light brown and occasionally grey and orange/brown mottled silty fine SAND (WITTERING FORMATION).		24.70	0.60		
1.00	D(2)						
1.50	D(3)				(2.20)		
2.00	D(4)						
2.50	D(5)						
		End of Borehole at 2.80 m		22.50	2.80		

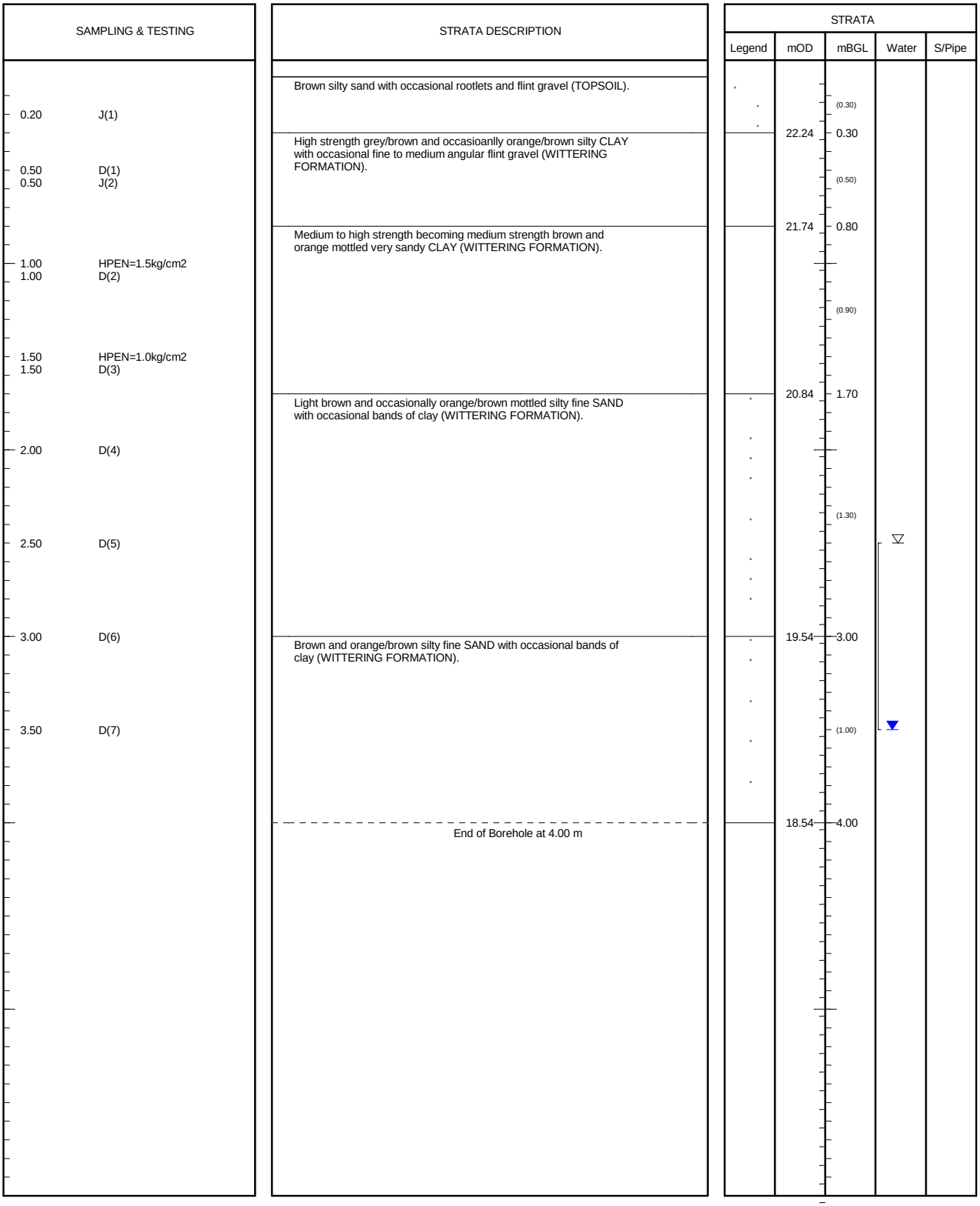
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS259
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 2.80mBGL
		Eng: JK	Level: 25.300mOD
Remarks: Refused on desne sand at 2.80m	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS260
Groundwater: Strike at 1.90m; after 20mins no change.	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.260mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



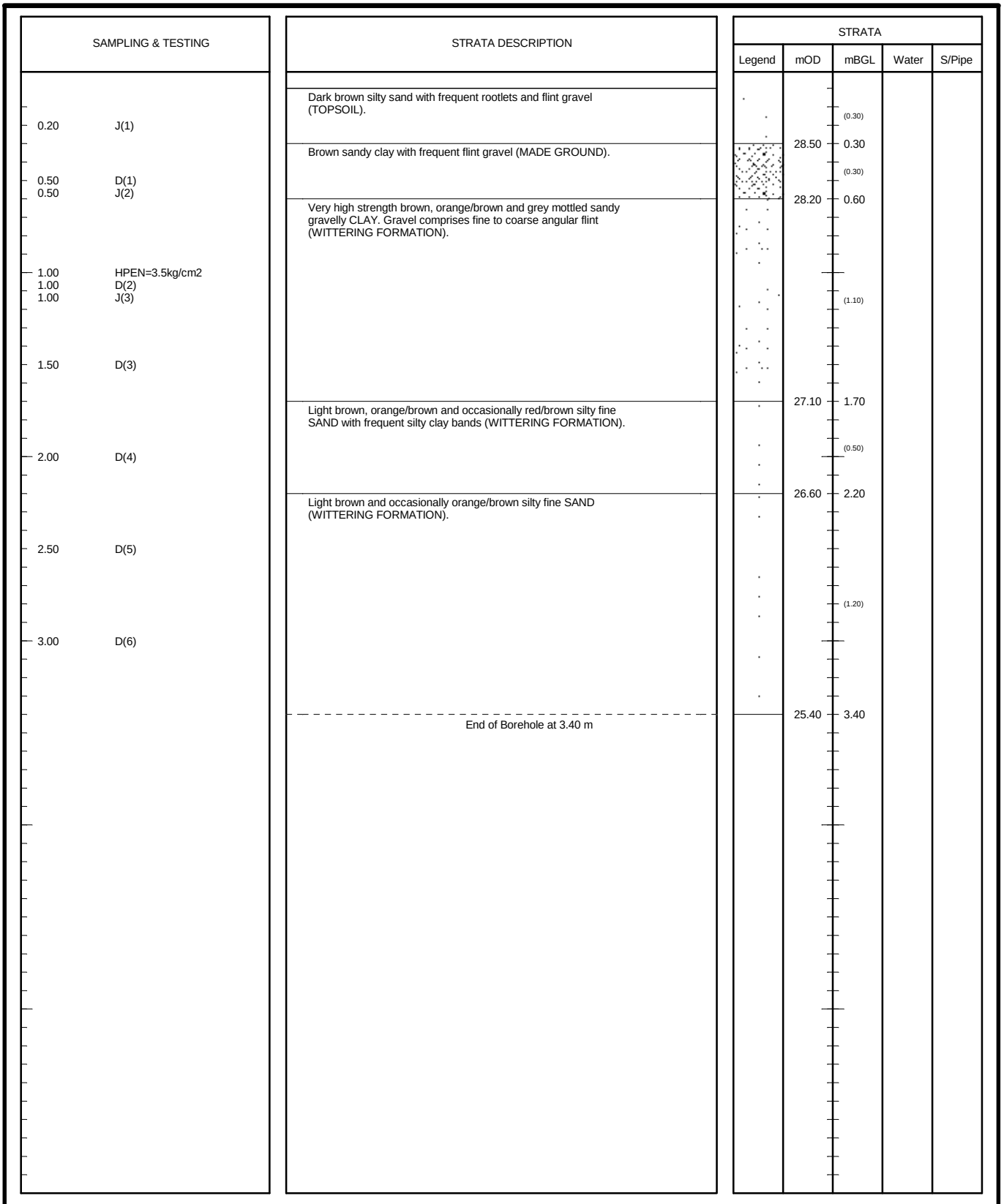
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS261
Groundwater: Strike at 2.50m; 3.50 after 20mins	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.537mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			27.00	0.30		
		High to very high strength brown and orange/brown mottled friable sandy CLAY (WITTERING FORMATION).			(0.50)		
0.50	HPEN=3.0kg/cm2						
0.50	J(2)			26.50	0.80		
		Light brown and occasioanlly orange/brown mottled silty fine SAND (WITTERING FORMATION).					
1.00	D(1)						
1.50	D(2)						
					(2.20)		
2.00	D(3)						
2.50	D(4)						
		End of Borehole at 3.00 m		24.30	3.00		

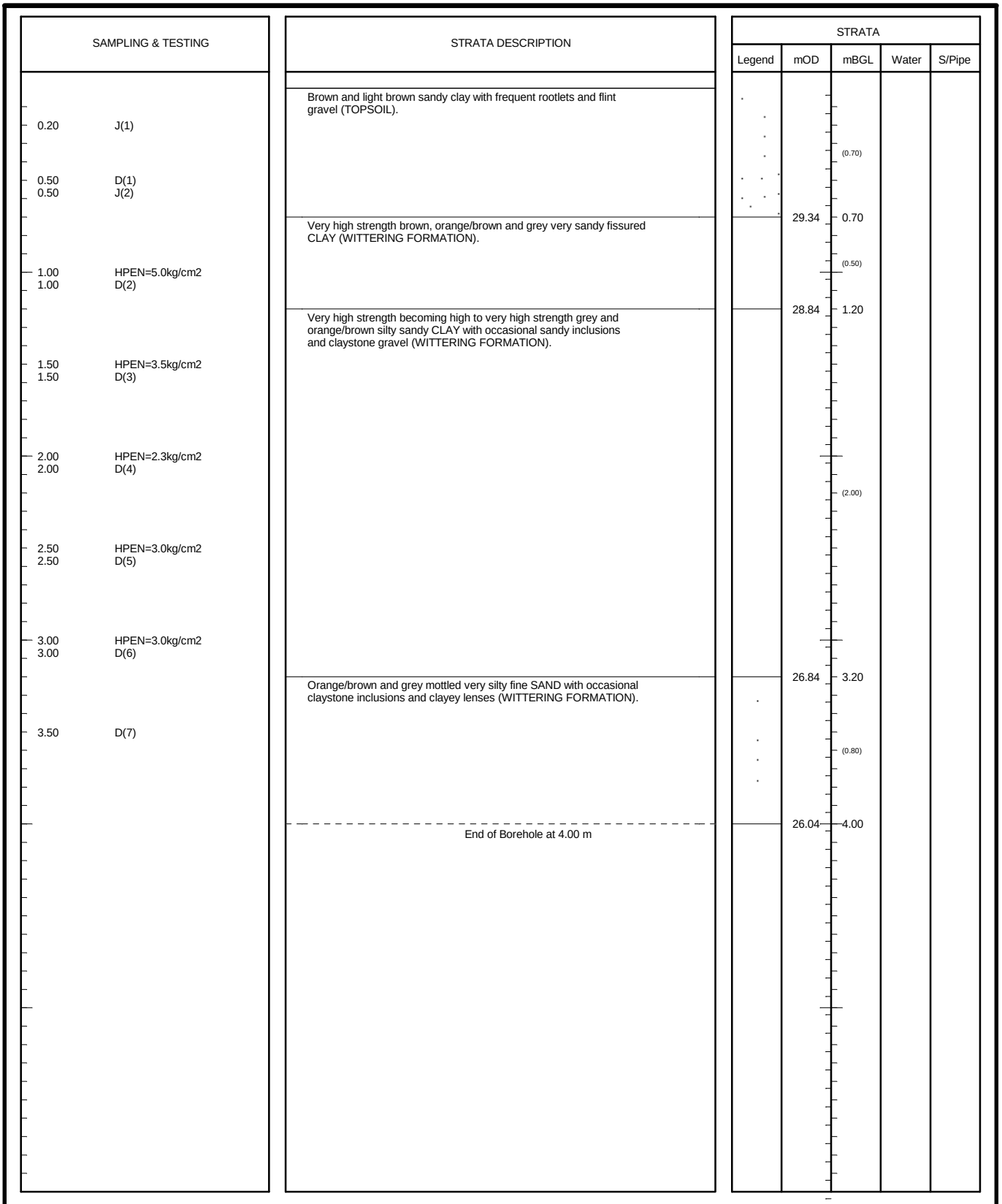
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS262
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 27.300mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS263
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 3.40mBGL
		Eng: JK	Level: 28.800mOD
Remarks: Refused on dense sand at 3.40m	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



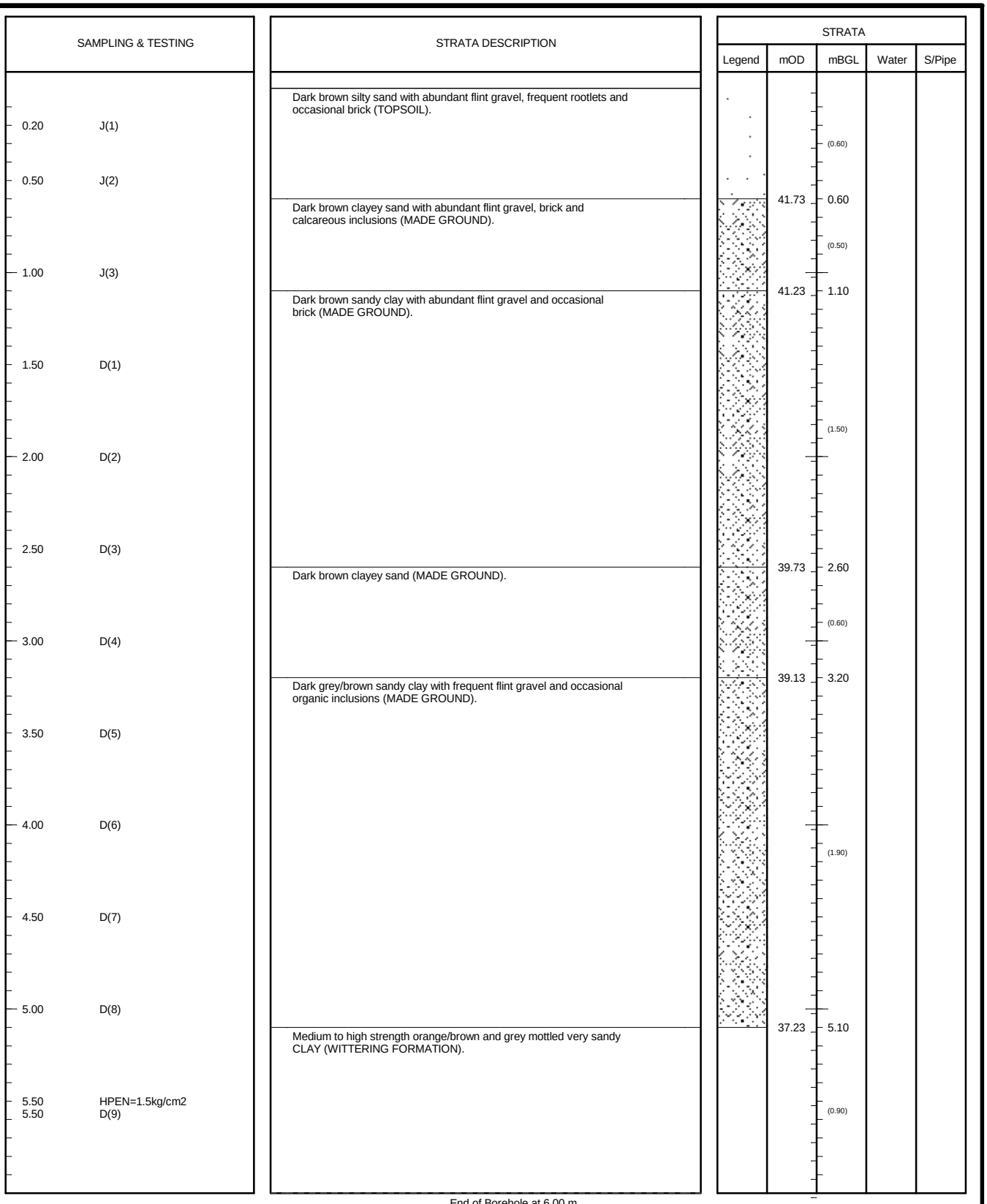
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS264
Groundwater: No Groundwater Encountered	Method: Archway	Start: 06/09/2013	Scale: 1:30
		Finish: 06/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 06/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 30.038mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Light brown sandy silt with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			35.42	0.30		
0.50	HPEN=3.0kg/cm2	High to very high strength brown/orange slightly sandy clayey SILT with rare coarse angular flint gravel and rootlets (WITTERING FORMATION).			(0.60)		
0.50	J(2)						
				34.82	0.90		
1.00	HPEN=2.0kg/cm2	High strength light grey/orange sandy CLAY (WITTERING FORMATION).					
1.00	D(1)				(0.90)		
1.50	HPEN=2.5kg/cm2						
1.50	D(2)						
				33.92	1.80		
		High strength brown/orange and grey mottled sandy CLAY (WITTERING FORMATION).			(0.30)		
2.00	HPEN=1.8kg/cm2						
2.00	D(3)			33.62	2.10		
		High strength brown and orange mottled slightly sandy silty CLAY with abundant ferruginous inclusions (WITTERING FORMATION).			(0.20)		
				33.42	2.30		
		Medium to high strength orange and grey mottled slightly sandy CLAY (WITTERING FORMATION).					
2.50	HPEN=1.5kg/cm2				(0.50)		
				32.92	2.80		
		High strength brown/grey sandy CLAY (WITTERING FORMATION).					
3.00	HPEN=1.8kg/cm2				(0.40)		
3.00	D(4)						
				32.52	3.20		
		Medium to high strength becoming medium strength grey and orange mottled slightly silty CLAY with frequent ferruginous inclusions (WITTERING FORMATION).					
3.50	HPEN=1.5kg/cm2				(0.80)		
3.50	D(5)						
4.00	HPEN=1.3kg/cm2			31.72	4.00		
4.00	D(6)	End of Borehole at 4.00 m					

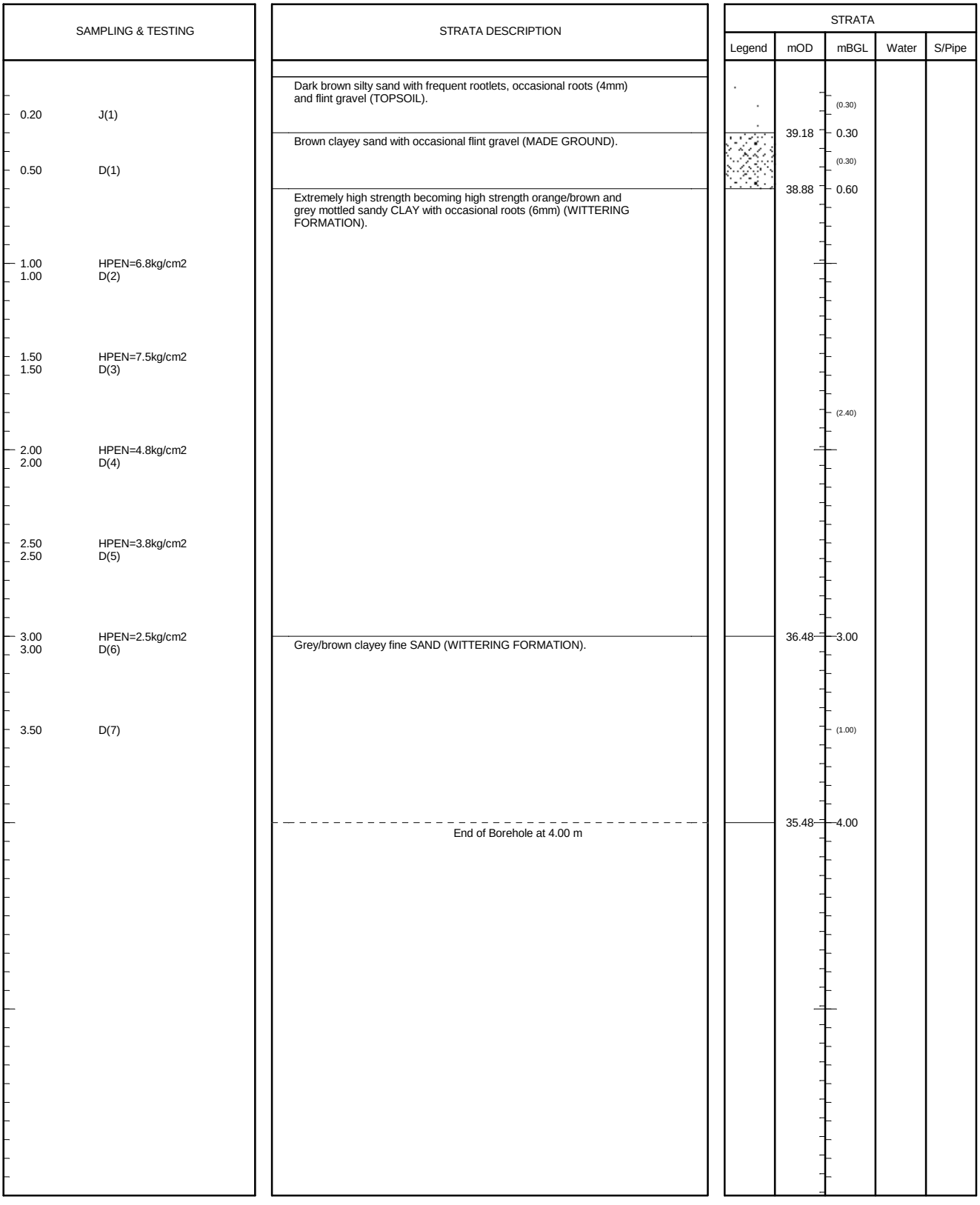
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS265
Groundwater: No Groundwater Encountered	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 35.716mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: AB	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS266
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 6.00mBGL
		Eng: JK	Level: 42.325mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



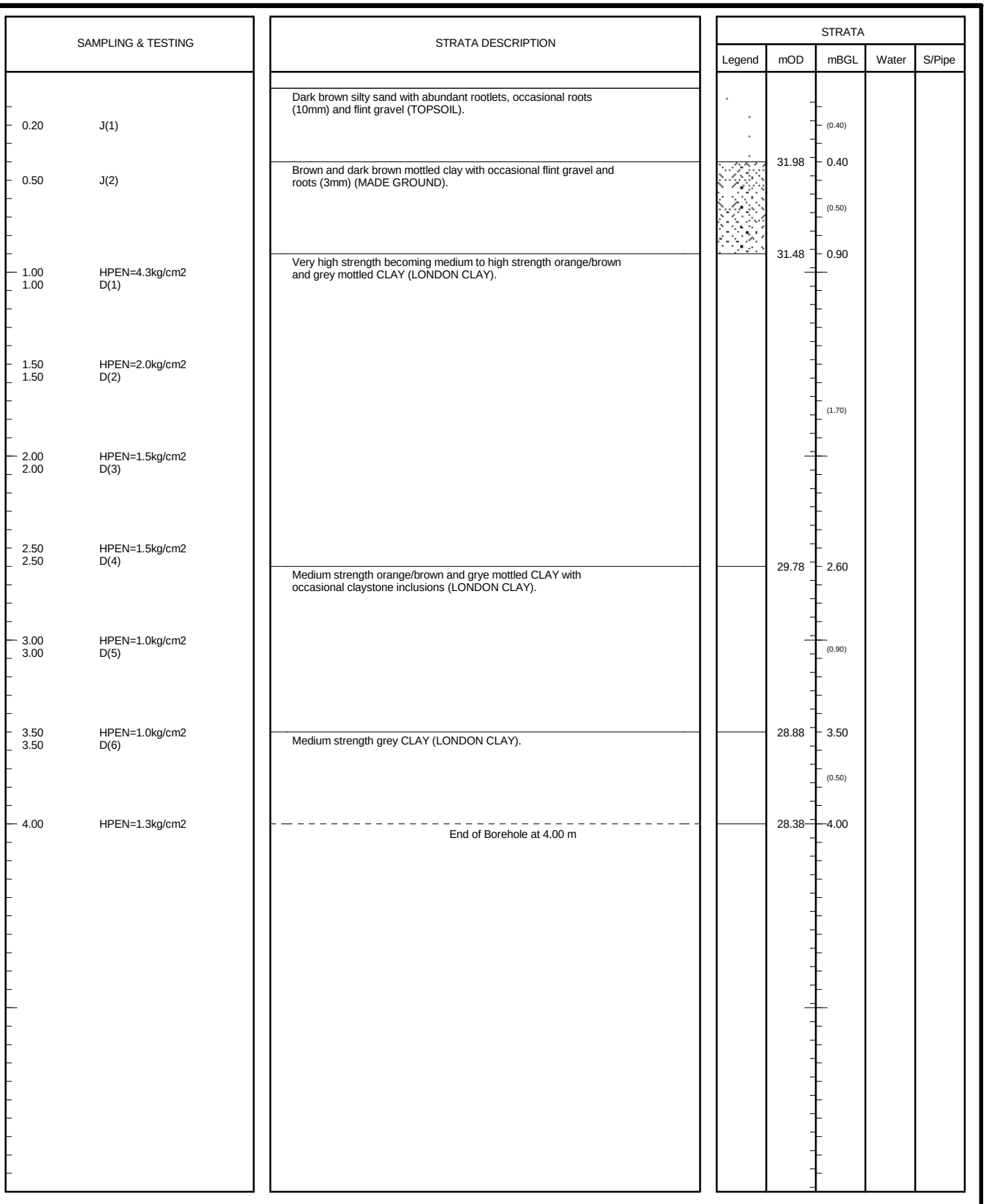
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS267
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 39.483mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			36.33	0.30		
		Medium strength orange/brown and grey mottled CLAY (LONDON CLAY).					
0.50	D(1)				(0.80)		
1.00	HPEN=1.3kg/cm2						
1.00	D(2)			35.53	1.10		
		High strength becoming medium strength orange/brown and grey mottled CLAY with occasional bands of fine sand and claystone inclusions (LONDON CLAY).					
1.50	HPEN=2.0kg/cm2						
1.50	D(3)						
2.00	HPEN=2.0kg/cm2						
2.00	D(4)						
					(2.70)		
2.50	HPEN=2.0kg/cm2						
2.50	D(5)						
3.00	HPEN=2.3kg/cm2						
3.00	D(6)						
3.50	HPEN=1.3kg/cm2						
3.50	D(7)						
		High strength grey CLAY (LONDON CLAY).		32.83	3.80		
					(0.20)		
4.00	HPEN=2.0kg/cm2			32.63	4.00		
		End of Borehole at 4.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS268
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 36.626mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



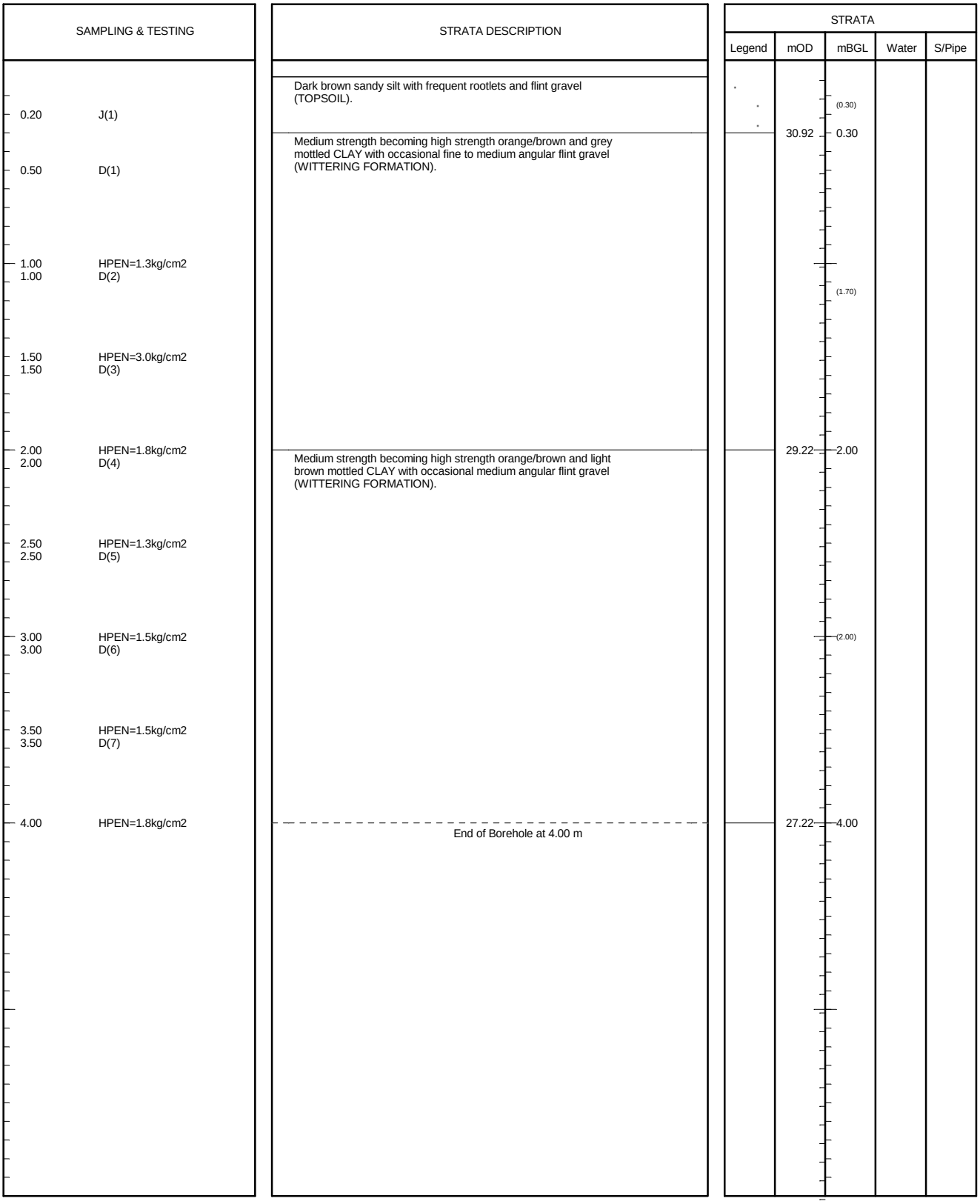
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS269
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 32.376mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).					
0.20	J(1)				(0.40)		
		Very high strength orange/brown and occasionally grey mottled CLAY with occasional rootlets (LONDON CLAY)		30.20	0.40		
0.50	HPEN=3.5kg/cm2						
0.50	D(1)				(0.40)		
0.50	J(2)						
		High strength orange/brown and occasionally grey mottled CLAY (LONDON CLAY)		29.80	0.80		
					(0.20)		
1.00	HPEN=2.3kg/cm2	High strength becoming medium to high strength orange/brown and brown CLAY with occasional claystone gravel (LONDON CLAY).		29.60	1.00		
1.00	D(2)						
1.50	HPEN=1.3kg/cm2						
1.50	D(3)						
2.00	HPEN=2.0kg/cm2						
2.00	D(4)						
					(2.70)		
2.50	HPEN=1.8kg/cm2						
2.50	D(5)						
3.00	HPEN=2.5kg/cm2						
3.00	D(6)						
3.50	HPEN=1.5kg/cm2						
3.50	D(7)						
		Medium strength grey CLAY (LONDON CLAY).		26.90	3.70		
					(0.30)		
4.00	HPEN=1.0kg/cm2	End of Borehole at 4.00 m		26.60	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS270
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 30.601mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS271
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 31.219mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown clayey sand with frequent rootlets, roots (6mm) and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			28.60	0.30		
		Very high strength becoming high to very high strength orange/brown and grey mottled slightly sandy CLAY with occasional roots (12mm) (WITTERING FORMATION).					
0.50	D(1)						
1.00	HPEN=5.0kg/cm2						
1.00	D(2)						
					(2.30)		
1.50	HPEN=5.5kg/cm2						
1.50	D(3)						
2.00	HPEN=3.3kg/cm2						
2.00	D(4)						
2.50	HPEN=3.0kg/cm2						
2.50	D(5)						
		Orange/brown and grey mottled clayey fine SAND (WITTERING FORMATION).		26.30	2.60		
3.00	D(6)						
					(1.40)		
3.50	D(7)						
		End of Borehole at 4.00 m		24.90	4.00		

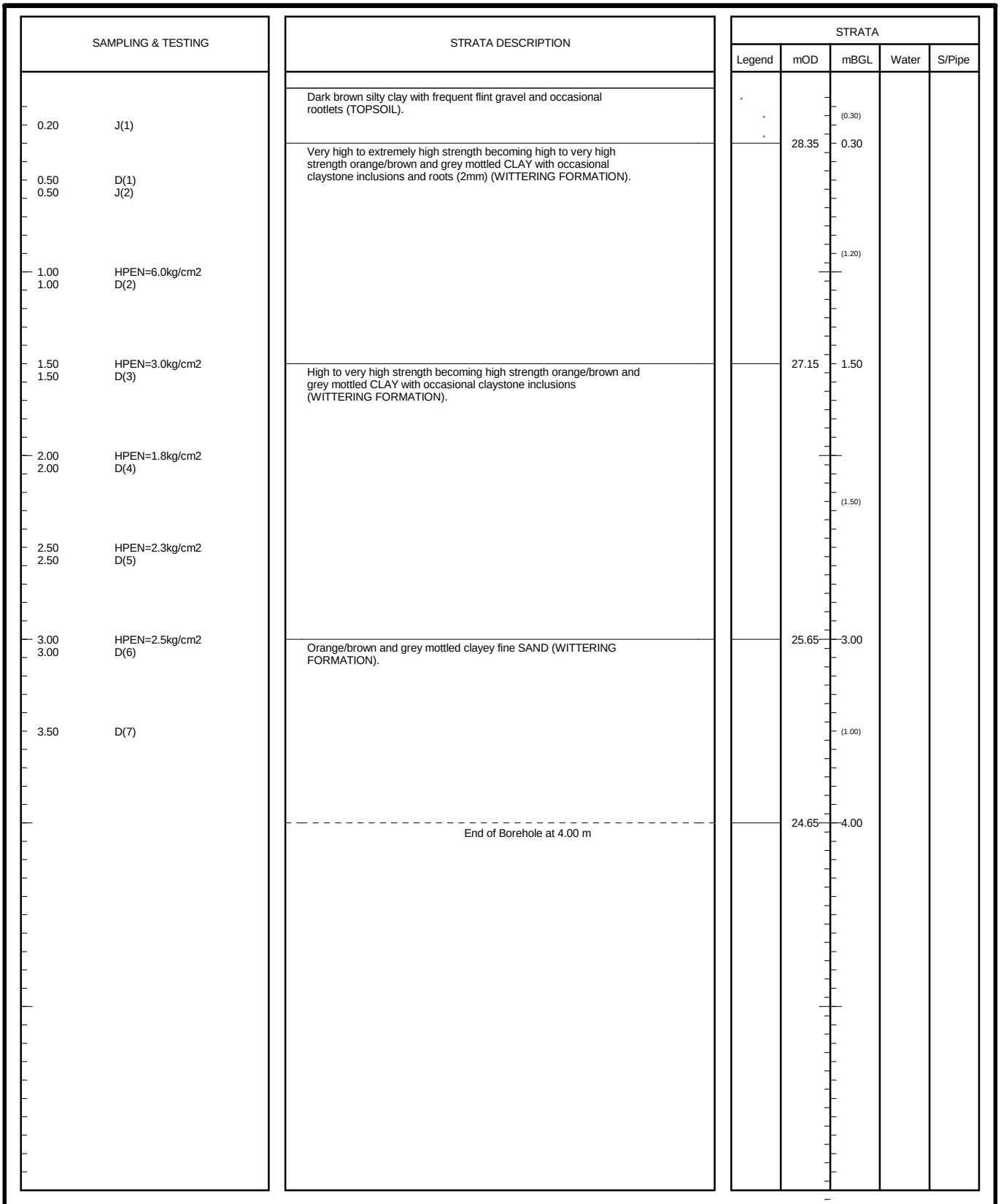
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS272
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 28.900mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			27.30	0.30		
		Very high strength orange/brown and grey mottled slightly sandy CLAY with occasional rootlets (WITTERING FORMATION).					
0.50	D(1)				(0.60)		
		Extremely high strength orange/brown and grey mottled slightly sandy CLAY (WITTERING FORMATION).		26.70	0.90		
1.00	HPEN=6.5kg/cm2				(0.20)		
1.00	D(2)			26.50	1.10		
		Orange/brown and grey mottled slightly clayey fine SAND (WITTERING FORMATION).					
1.50	D(3)				(0.90)		
2.00	D(4)	Light grey/brown fine SAND (WITTERING FORMATION).		25.60	2.00		
2.50	D(5)						
3.00	D(6)				(2.00)		
3.50	D(7)						
		End of Borehole at 4.00 m		23.60	4.00		

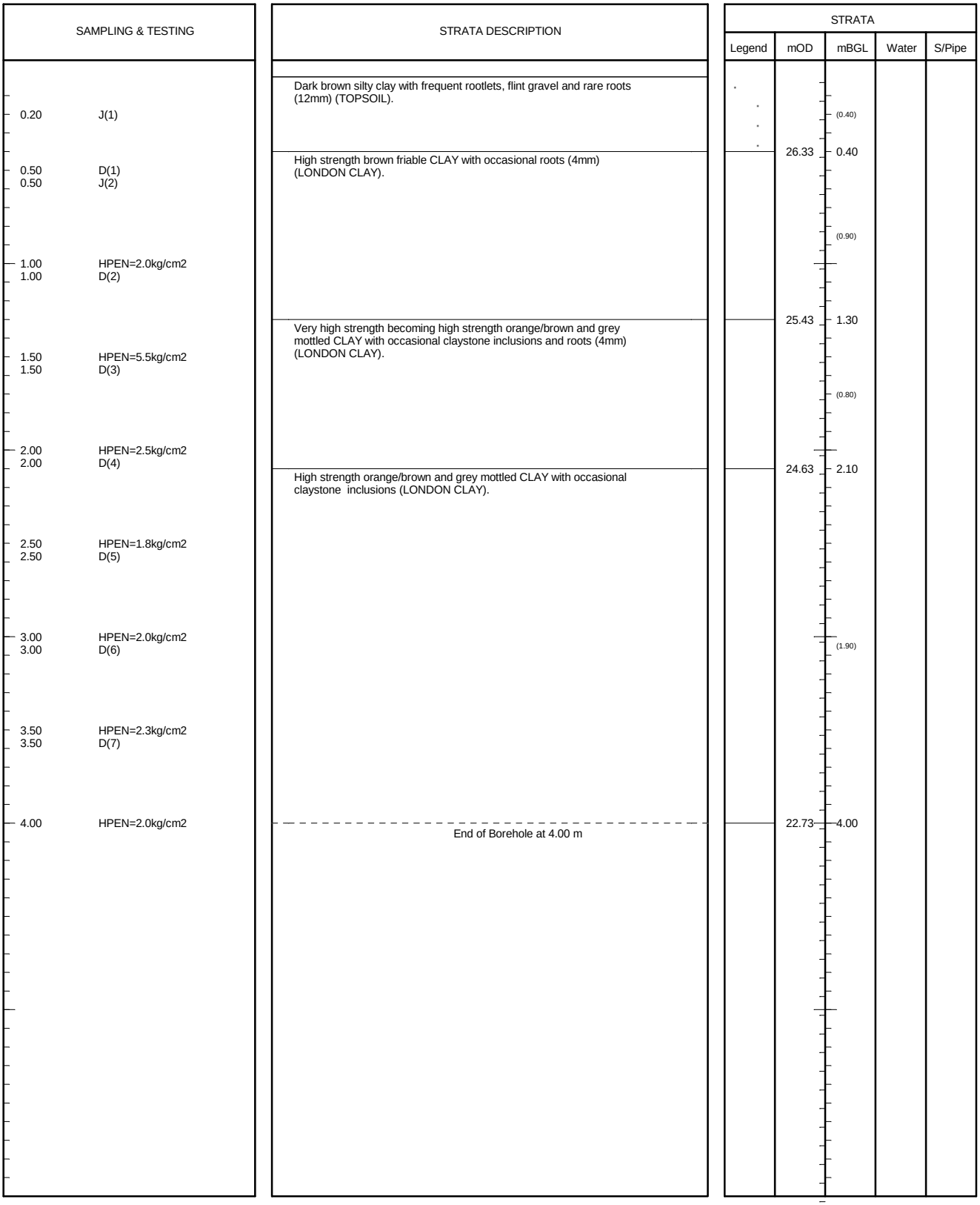
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS273
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 27.600mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS274
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 28.650mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



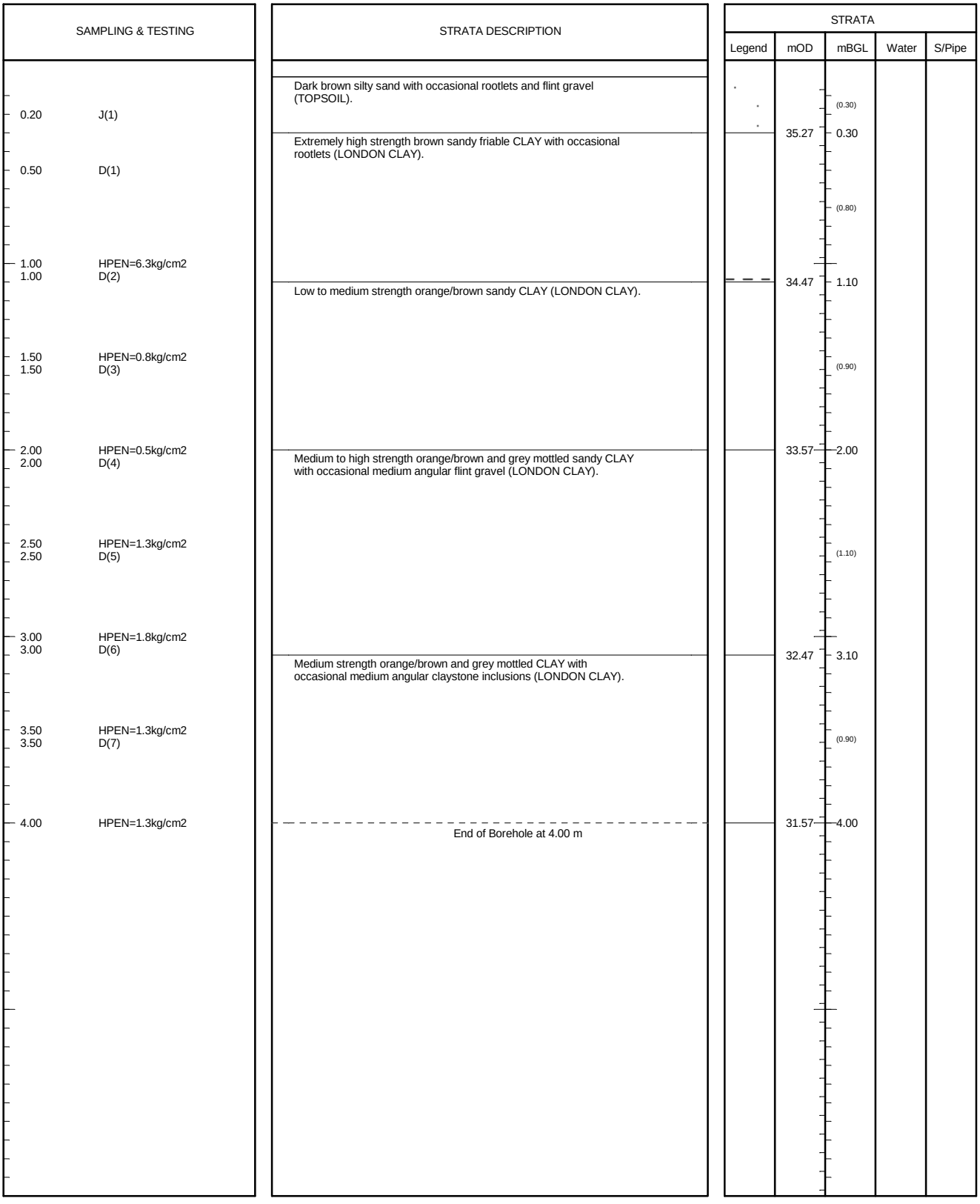
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS275
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.730mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional roots (3mm) (TOPSOIL).					
0.20	J(1)				(0.40)		
		Very high strength orange/brown and grey mottled sandy CLAY with occasional roots (12mm) (LONDON CLAY).		32.02	0.40		
0.50	D(1)						
1.00	HPEN=4.3kg/cm2						
1.00	D(2)						
					(1.80)		
1.50	HPEN=4.3kg/cm2						
1.50	D(3)						
2.00	HPEN=3.8kg/cm2						
2.00	D(4)						
		Low to medium strength orange/brown and occasionally black mottled very sandy CLAY (LONDON CLAY).		30.22	2.20		
2.50	HPEN=1.0kg/cm2						
2.50	D(5)						
					(1.40)		
3.00	HPEN=0.5kg/cm2						
3.00	D(6)						
3.50	HPEN=1.0kg/cm2						
3.50	D(7)						
		Low to medium strength light grey SILT/CLAY (LONDON CLAY).		28.82	3.60		
					(0.40)		
4.00	HPEN=0.8kg/cm2			28.42	4.00		
		End of Borehole at 4.00 m					

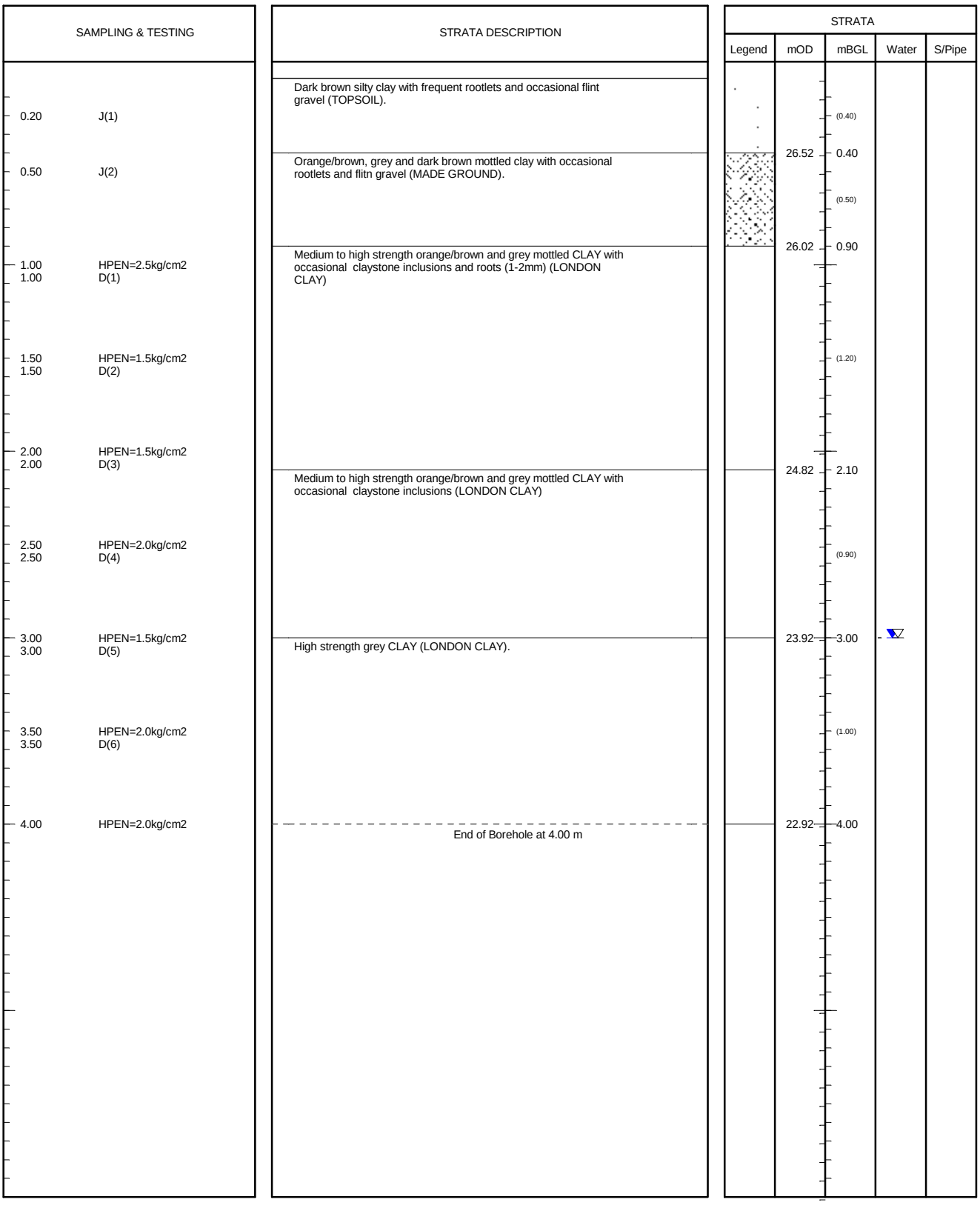
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS276
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 32.415mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS277
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 35.568mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS278
Groundwater: Water seepage at 3.00m	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.915mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent flint gravel and occasional rootlets (TOPSOIL).			(0.30)		
0.20	J(1)			24.58	0.30		
		High to very high strength orange/brown and grey mottled silty CLAY (LONDON CLAY).					
0.50	D(1)						
1.00	HPEN=2.3kg/cm2						
1.00	D(2)						
1.50	HPEN=3.0kg/cm2						
1.50	D(3)						
2.00	HPEN=3.0kg/cm2				(3.30)		
2.00	D(4)						
2.50	HPEN=2.3kg/cm2						
2.50	D(5)						
3.00	HPEN=2.0kg/cm2						
3.00	D(6)						
3.50	HPEN=2.8kg/cm2						
3.50	D(7)						
		High to very high strength grey CLAY (LONDON CLAY).		21.28	3.60		
					(0.40)		
4.00	HPEN=3.0kg/cm2			20.88	4.00		
		End of Borehole at 4.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS279
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.875mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with abundant rootlets and occasional flint gravel (TOPSOIL).					
0.20	J(1)				(0.40)		
		Very high strength orange/brown sandy CLAY (WITTERING FORMATION).		24.51	0.40		
0.50	HPEN=3.5kg/cm2				(0.40)		
0.50	D(1)						
		Orange/brown fine SAND with occasional sandy clay bands (WITTERING FORMATION).		24.11	0.80		
1.00	D(2)						
					(0.80)		
1.50	D(3)						
		Light grey/brown fine SAND (WITTERING FORMATION).		23.31	1.60		
2.00	D(4)						
2.50	D(5)						
					(2.40)		
3.00	D(6)						
3.50	D(7)						
		End of Borehole at 4.00 m		20.91	4.00		

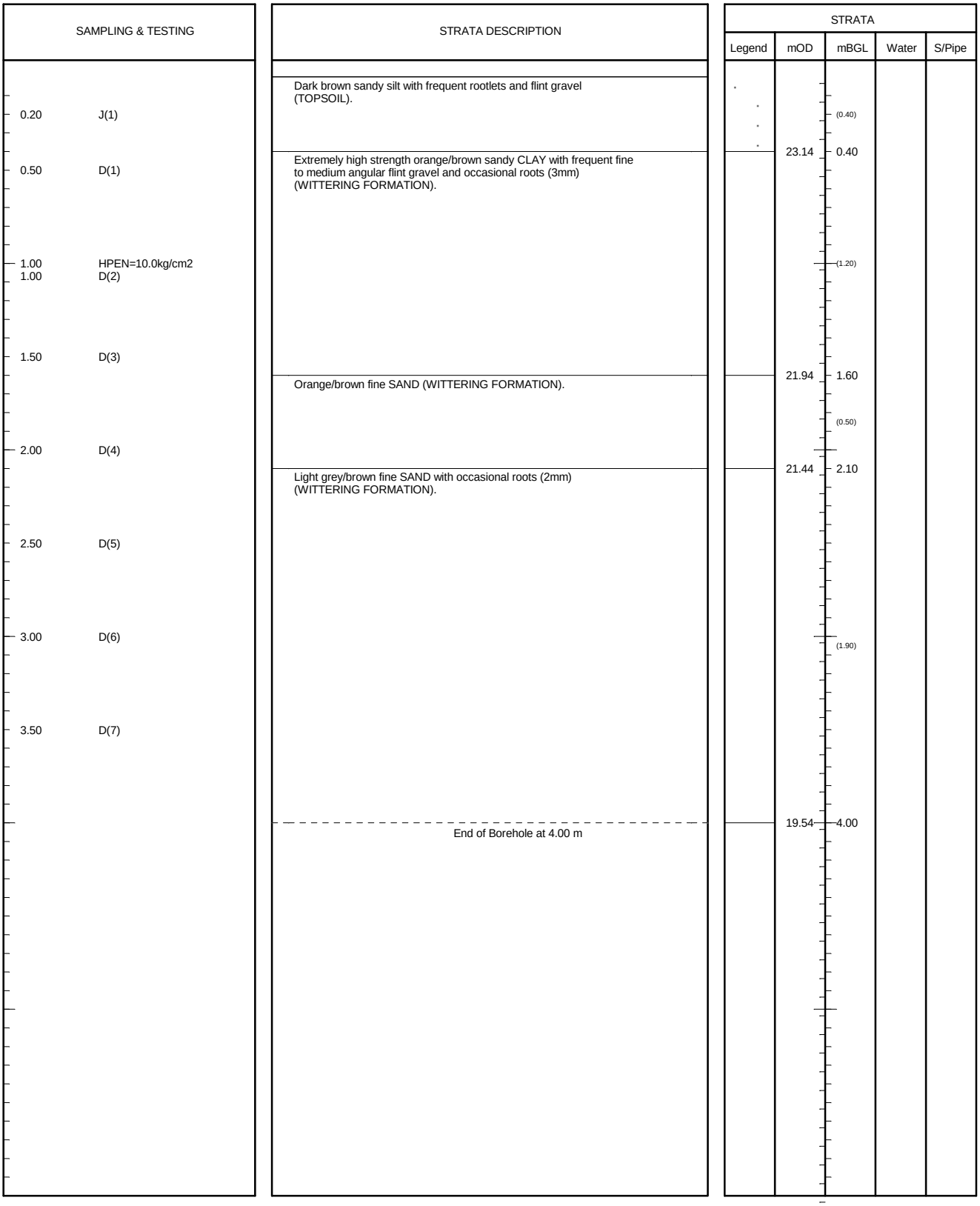
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS280
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.910mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent flint gravel and occasional rootlets (TOPSOIL).			(0.30)		
0.20	J(1)			23.77	0.30		
		Very high strength orange/brown sandy CLAY with occasional roots (1-2mm) (WITTERING FORMATION).					
0.50	D(1)				(0.70)		
1.00	HPEN=6.3kg/cm2						
1.00	D(2)	Extremely high strength orange/brown sandy CLAY (WITTERING FORMATION).		23.07	1.00		
					(0.40)		
		Orange/brown fine SAND with frequent sandy clay bands (WITTERING FORMATION).		22.67	1.40		
1.50	D(3)				(0.30)		
		Light grey/brown fine SAND with rare sandy clay bands (WITTERING FORMATION).		22.37	1.70		
2.00	D(4)						
2.50	D(5)				(2.30)		
3.00	D(6)						
3.50	D(7)						
		End of Borehole at 4.00 m		20.07	4.00		

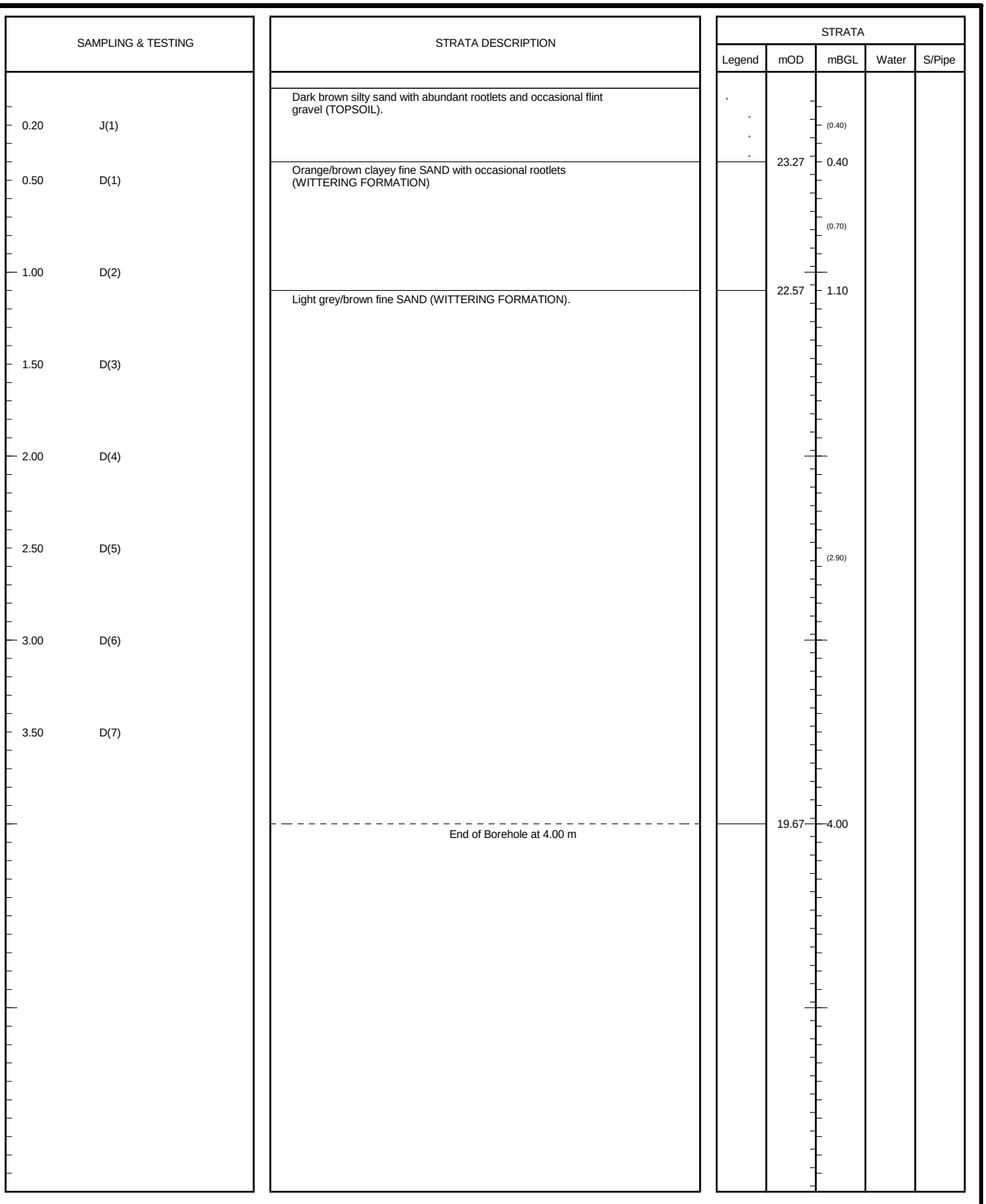
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS281
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.070mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



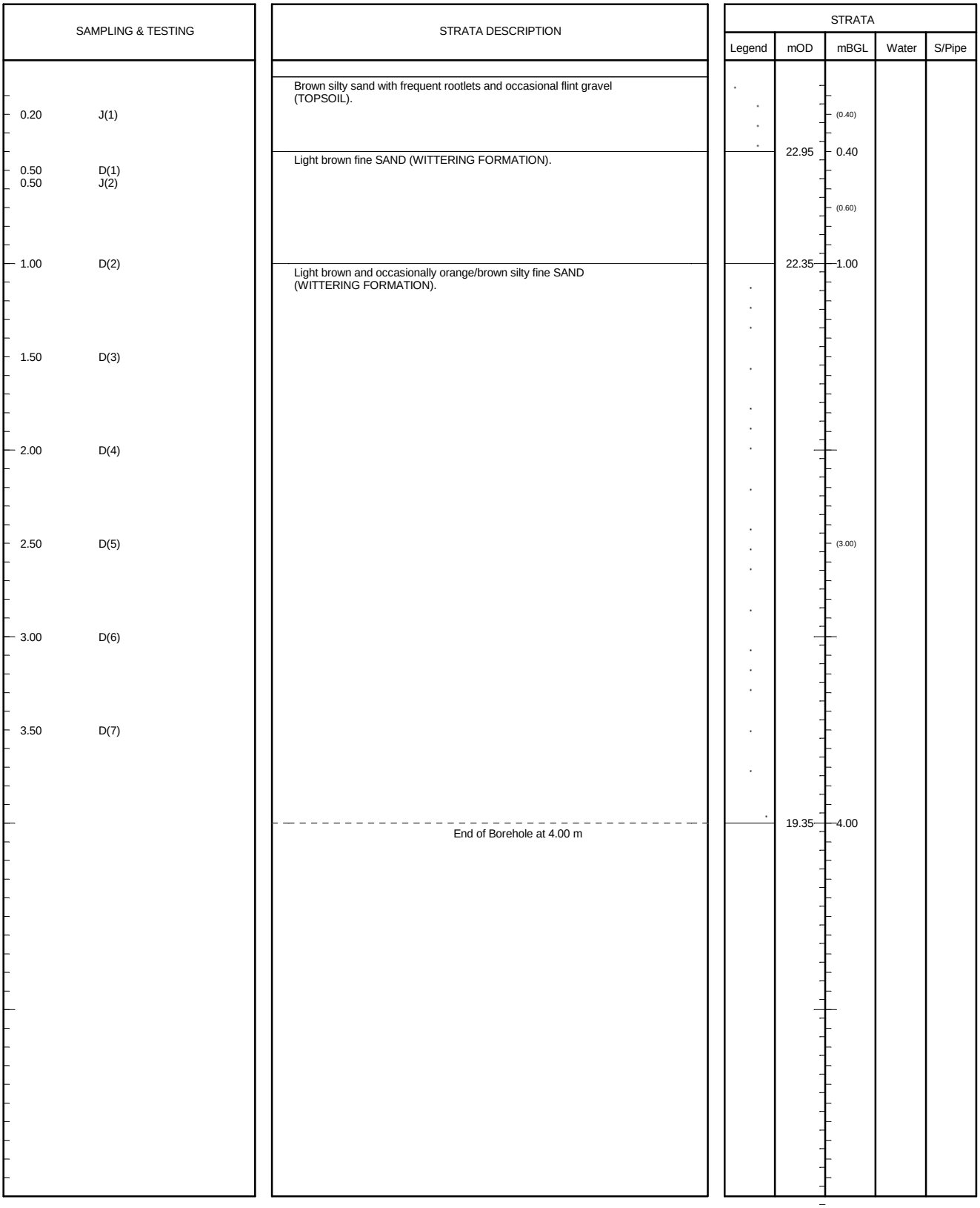
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.30m on completion	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS282
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.535mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



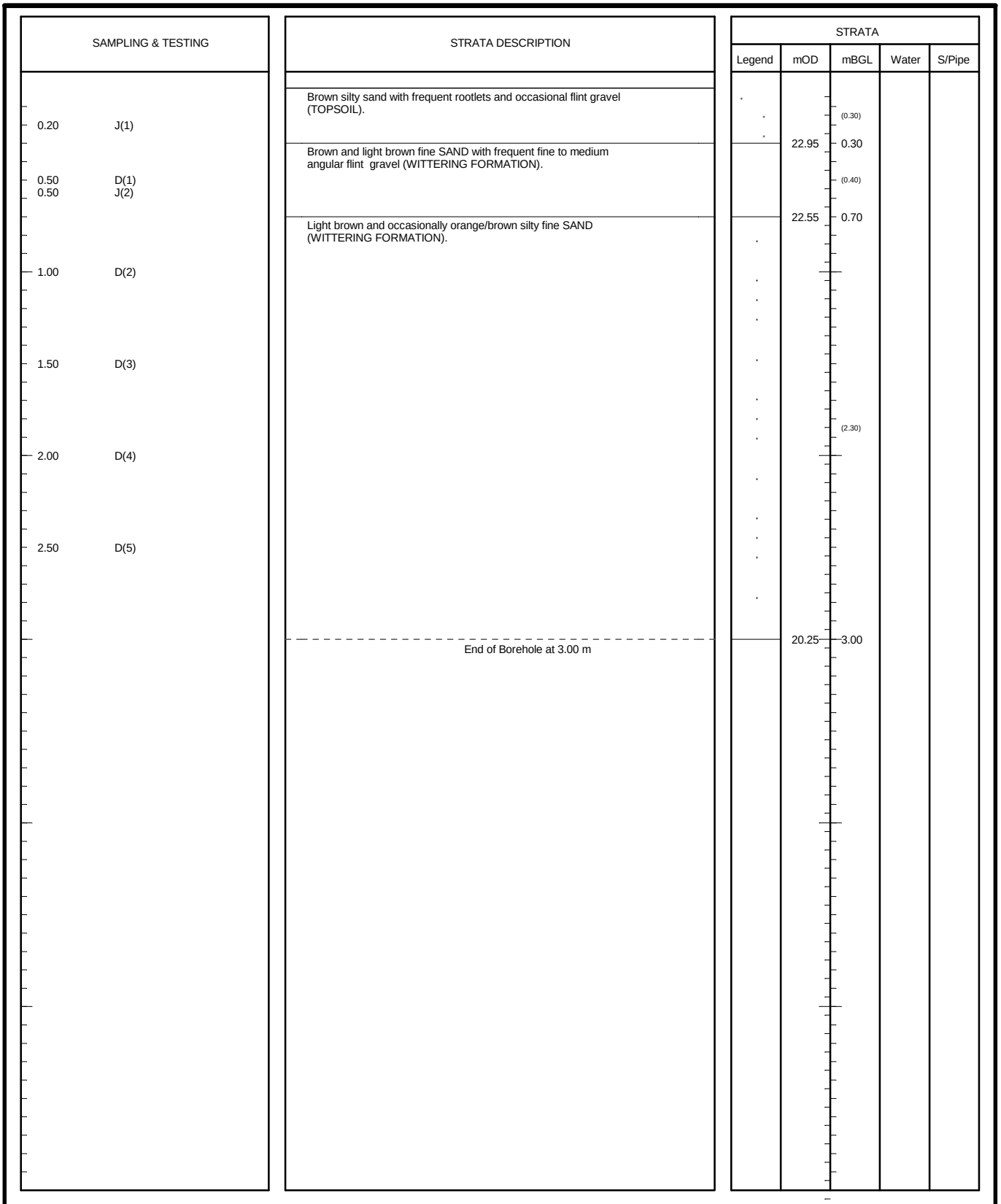
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS283
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.669mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS284
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.345mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



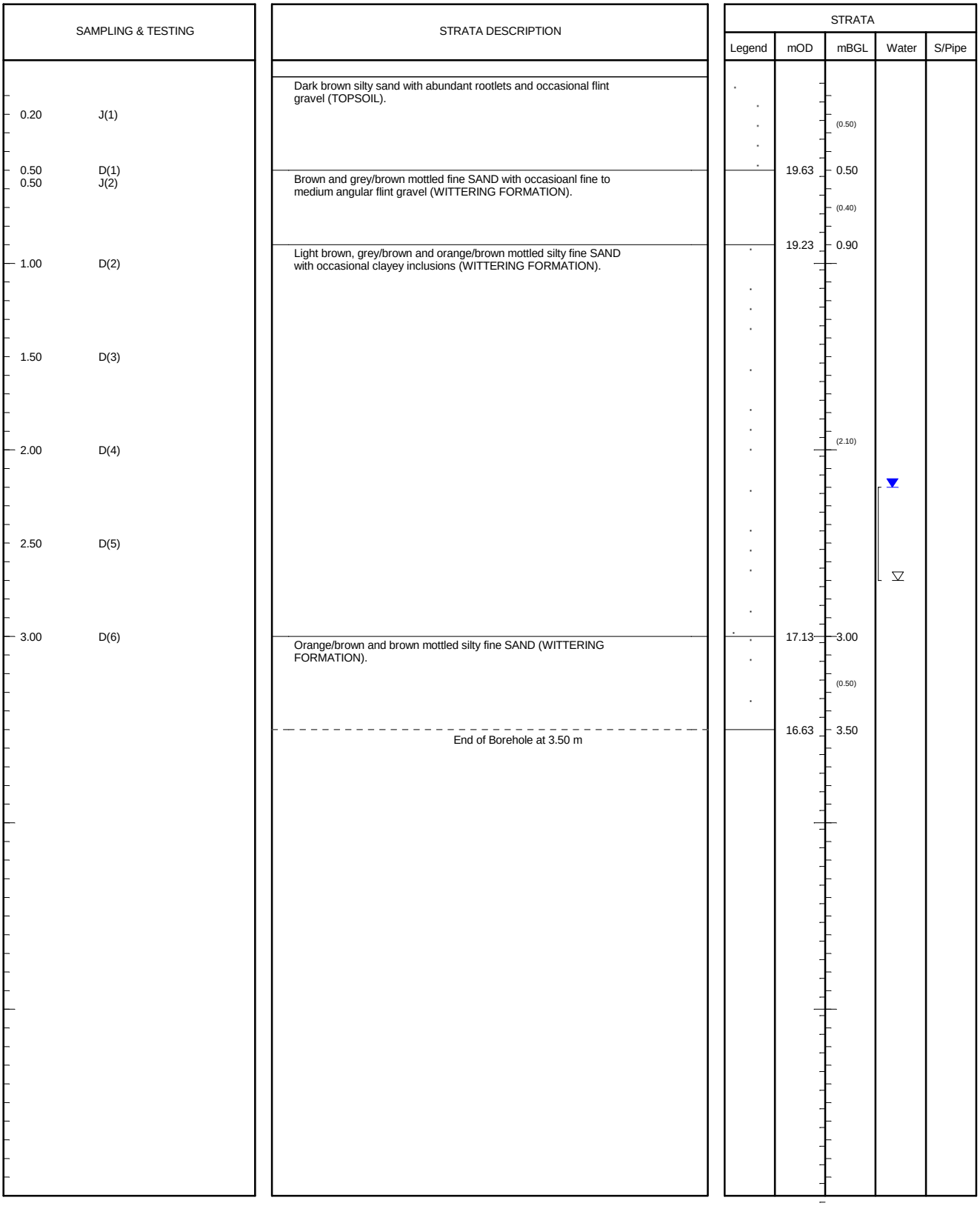
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS285
Groundwater: No Groundwater Encountered	Method: Archway	Start: 09/09/2013	Scale: 1:30
		Finish: 09/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 09/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 23.247mOD
Remarks: Refused on dense sand at 3.00m	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown silty sand with abundant rootlets and occasional flint gravel (TOPSOIL).					
0.20	J(1)				(0.50)		
0.50	D(1)			20.60	0.50		
0.50	J(2)	Brown and light grey/brown mottled silty fine SAND (WITTERING FORMATION).					
					(0.50)		
1.00	D(2)			20.10	1.00		
		Grey, brown and orange/brown mottled silty fine SAND (WITTERING FORMATION).					
1.50	D(3)				(1.00)		
2.00	D(4)			19.10	2.00		
		Light brown, grey/brown and orange/brown mottled silty fine SAND (WITTERING FORMATION).					
2.50	D(5)						
3.00	D(6)				(2.00)		
3.50	D(7)						
		End of Borehole at 4.00 m		17.10	4.00		

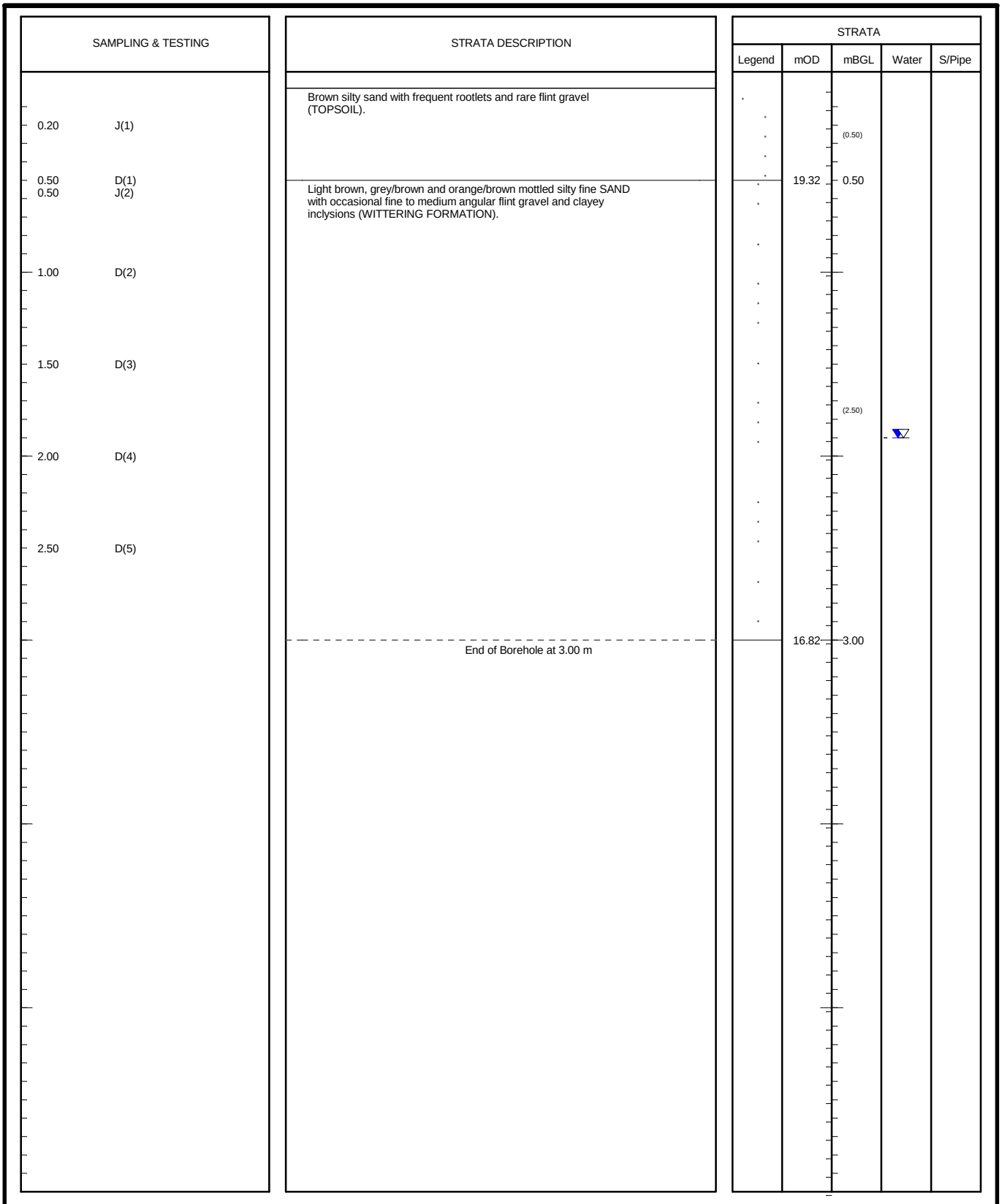
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS286
Groundwater: Strike at 3.50m; after 20mins no change.	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.100mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



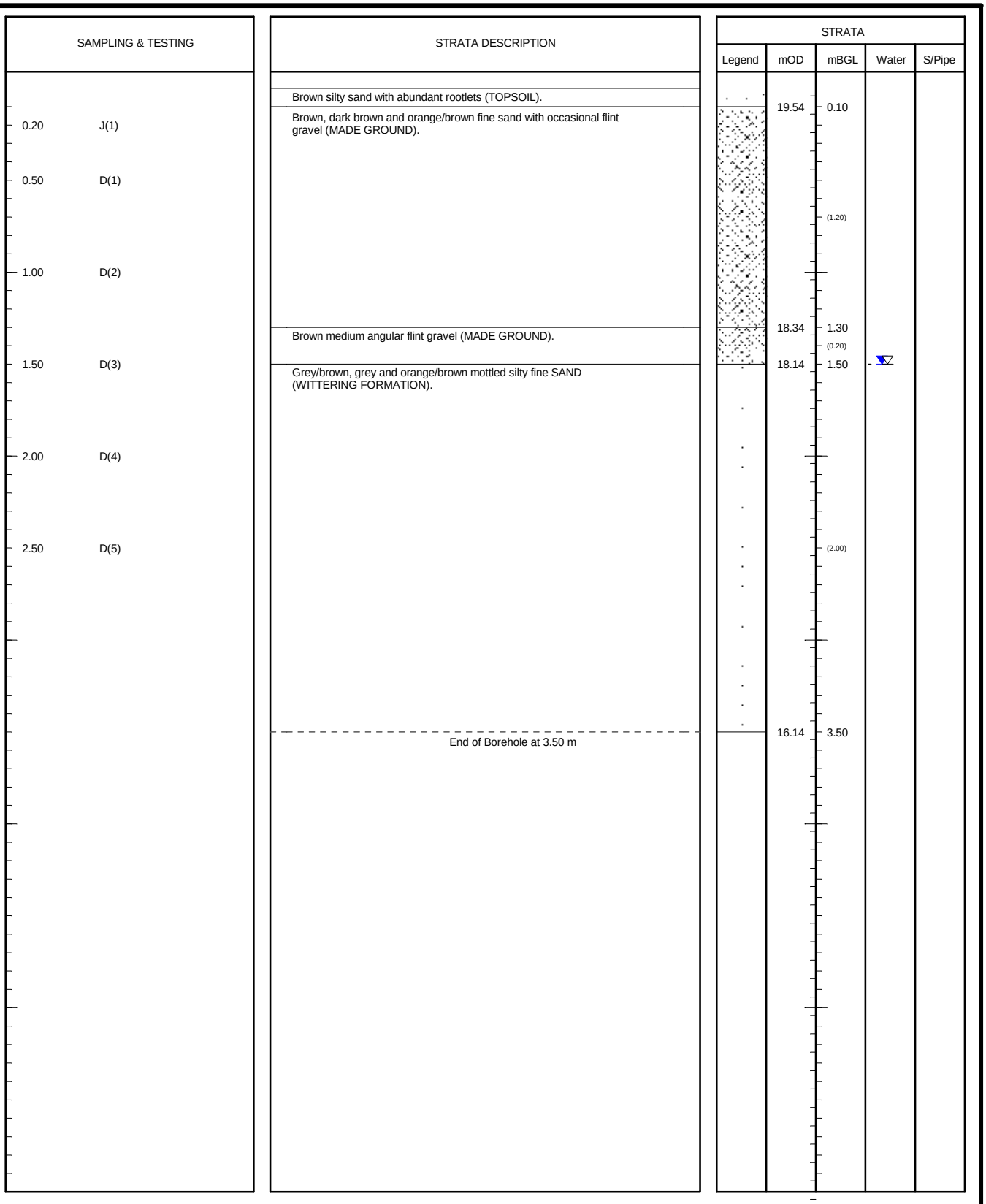
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.50m at 3.50m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS287
Groundwater: Strike at 2.70m; 2.20 after 20mins	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.50mBGL
		Eng: JK	Level: 20.134mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



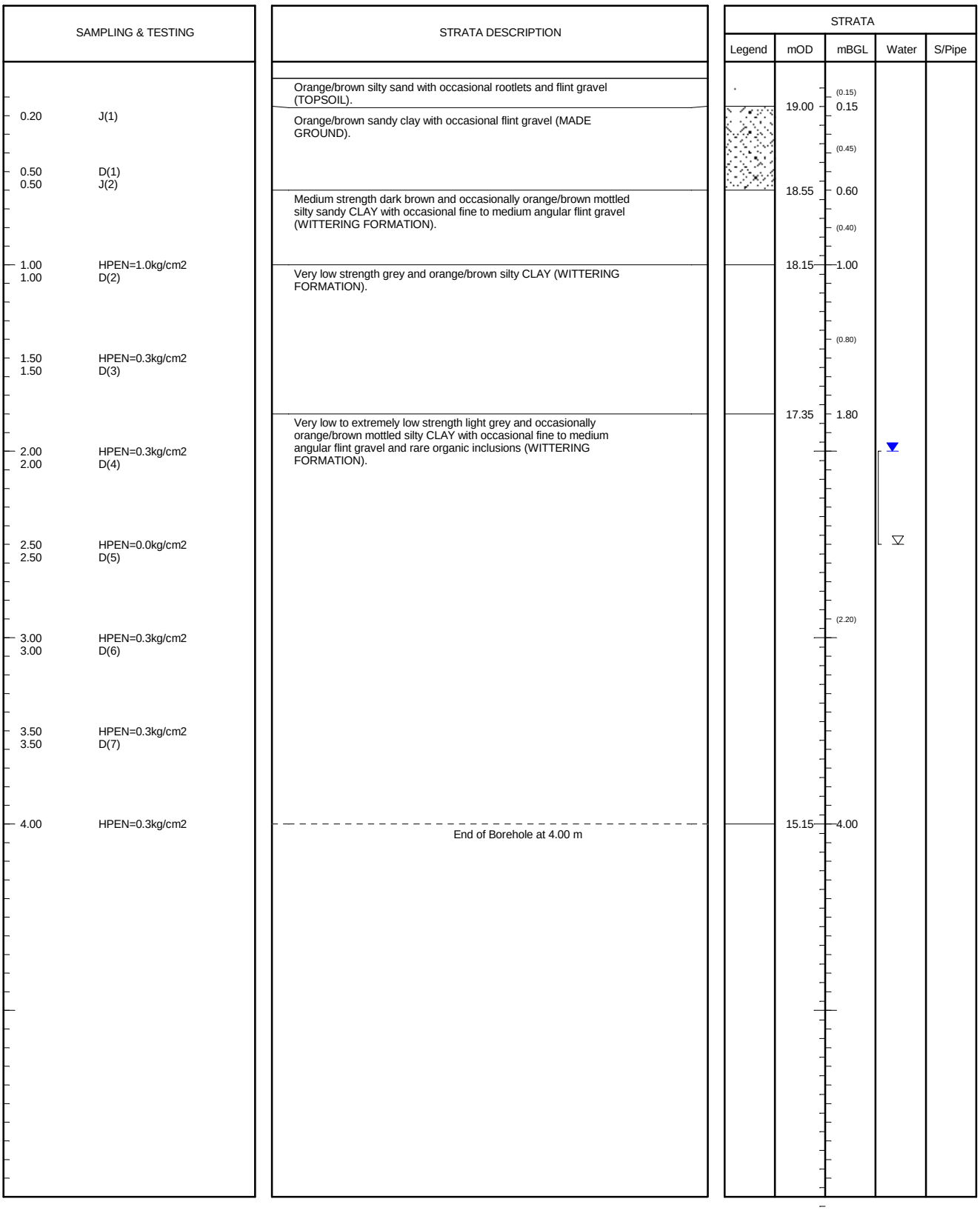
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.00m at 3.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS288
Groundwater: Strike at 1.90m; after 20mins no change.	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 19.821mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



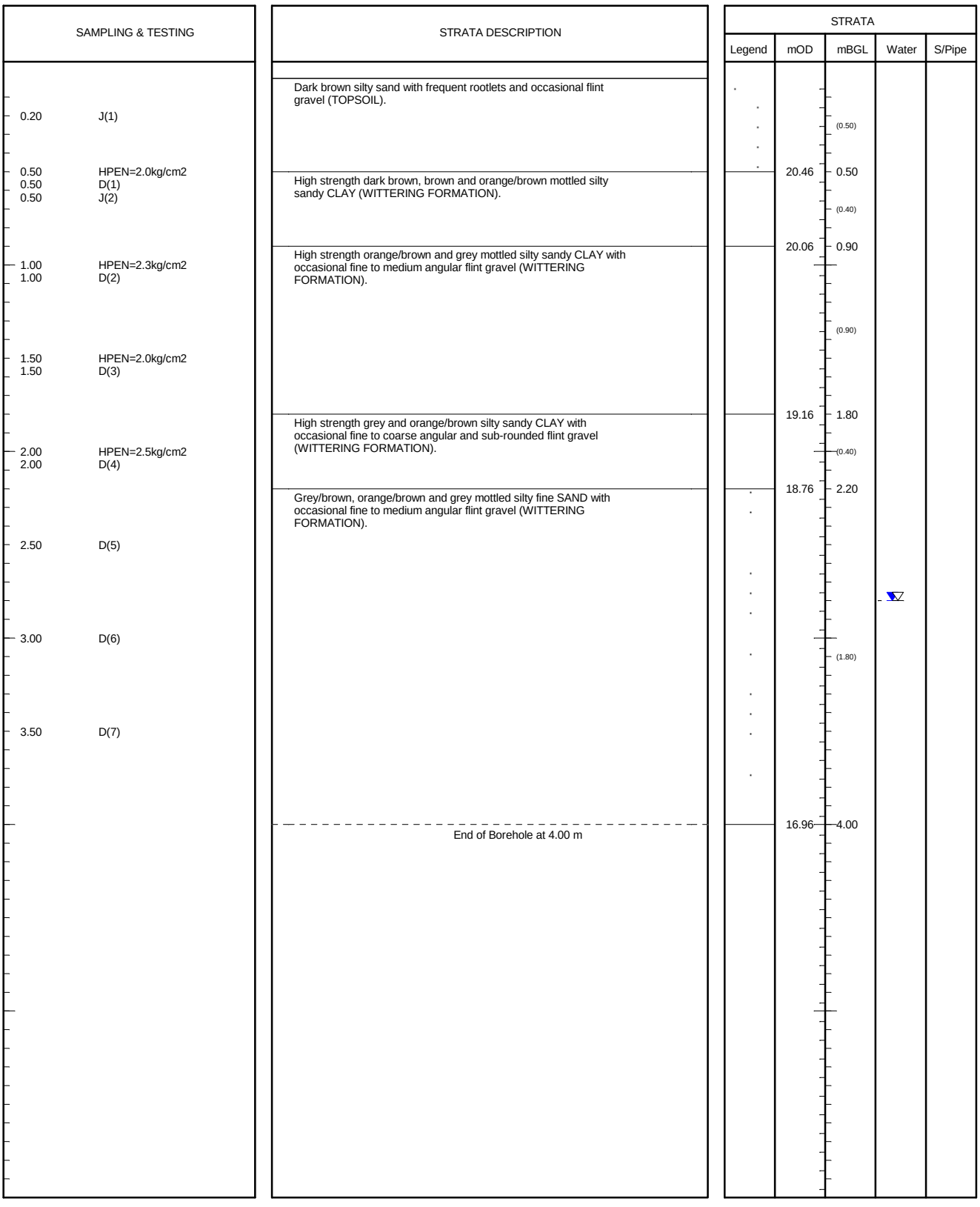
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.00m at 3.50m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS289
Groundwater: Strike at 1.50m; after 20mins no change.	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.50mBGL
		Eng: JK	Level: 19.641mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS290
Groundwater: Strike at 2.50m; 2.00 after 20mins	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.151mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



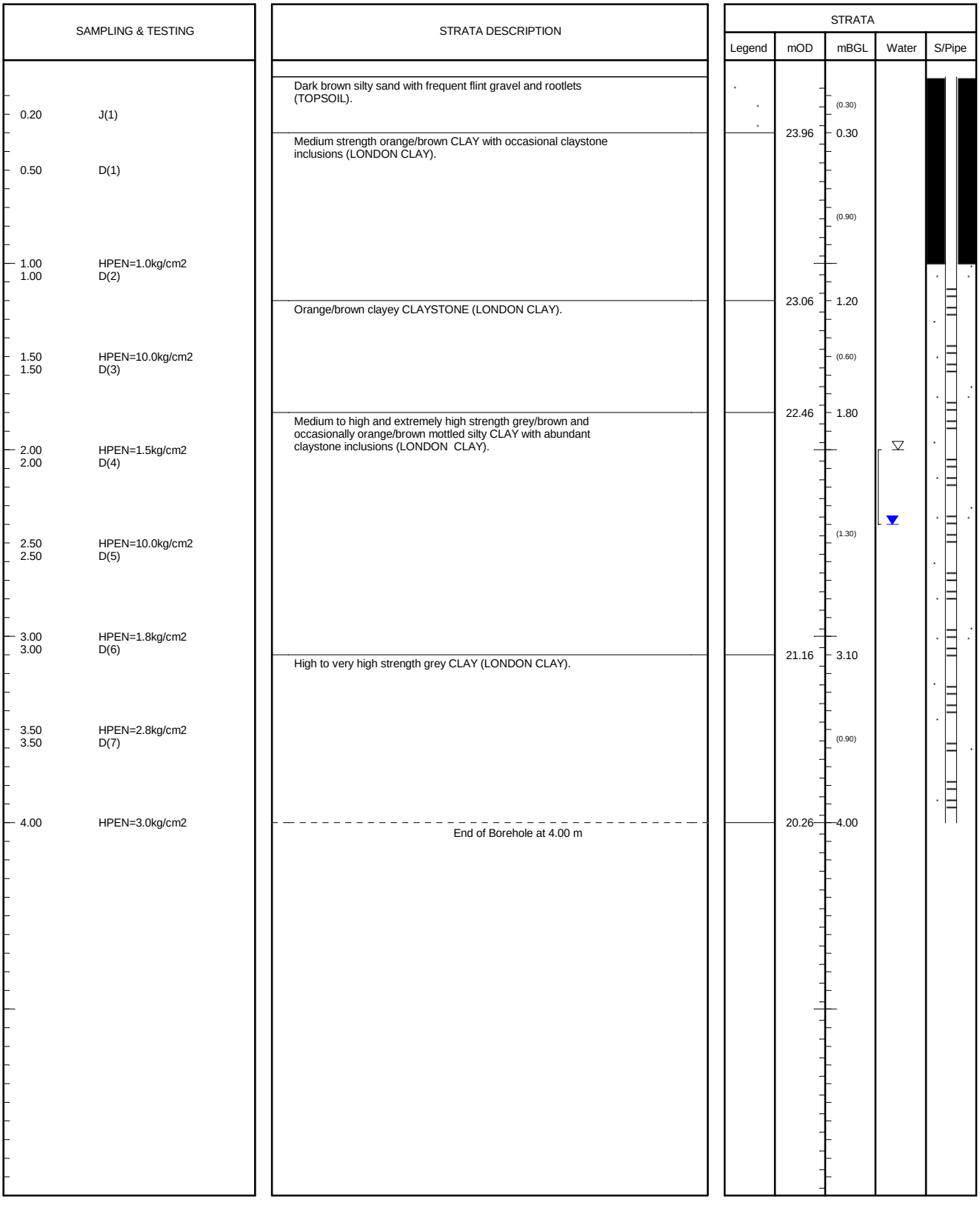
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS291
Groundwater: Strike at 2.80m; after 20mins no change.	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.957mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown sandy clay with occasional roots (2mm) and flint gravel (TOPSOIL).					
0.20	J(1)				(0.70)		
0.50	J(2)						
		High to very high strength light orange/brown and grey mottled silty CLAY with occasional claystone inclusions and rootlets (LONDON CLAY).		22.95	0.70		
1.00	HPEN=2.8kg/cm2						
1.00	D(1)						
1.50	HPEN=3.5kg/cm2						
1.50	D(2)						
2.00	HPEN=2.8kg/cm2				(2.55)		
2.00	D(3)						
2.50	HPEN=2.5kg/cm2						
2.50	D(4)						
3.00	HPEN=3.0kg/cm2						
3.00	D(5)						
		High to very high strength dark grey and occasioanlly brown mottled CLAY with occasional fine sandy partings (LONDON CLAY).		20.40	3.25		
3.50	HPEN=3.3kg/cm2						
3.50	D(6)				(0.75)		
4.00	HPEN=2.5kg/cm2	End of Borehole at 4.00 m		19.65	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS292
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.650mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



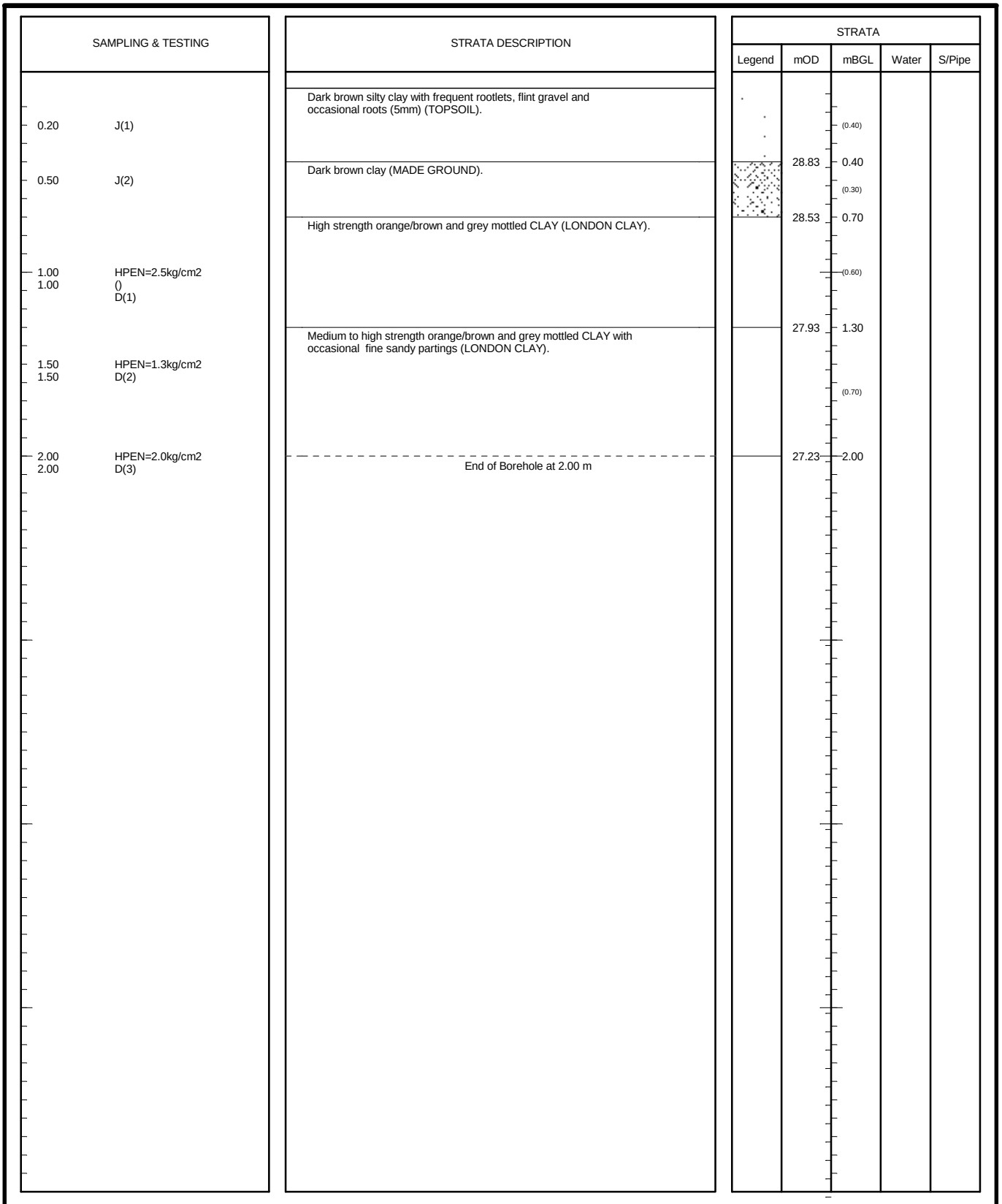
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS293
Groundwater: Strike at 2.00m; 2.40 after 20mins	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.261mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent flint gravel and occasional rootlets (TOPSOIL).			(0.30)		
0.20	J(1)			26.25	0.30		
		Medium to high strength orange/brown and grey mottled silty CLAY with occasional rootlets (LONDON CLAY).					
0.50	D(1)						
1.00	HPEN=1.3kg/cm2						
1.00	D(2)				(1.70)		
1.50	HPEN=1.5kg/cm2						
1.50	D(3)						
2.00	HPEN=1.5kg/cm2	End of Borehole at 2.00 m		24.55	2.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS294
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 2.00mBGL
		Eng: JK	Level: 26.554mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



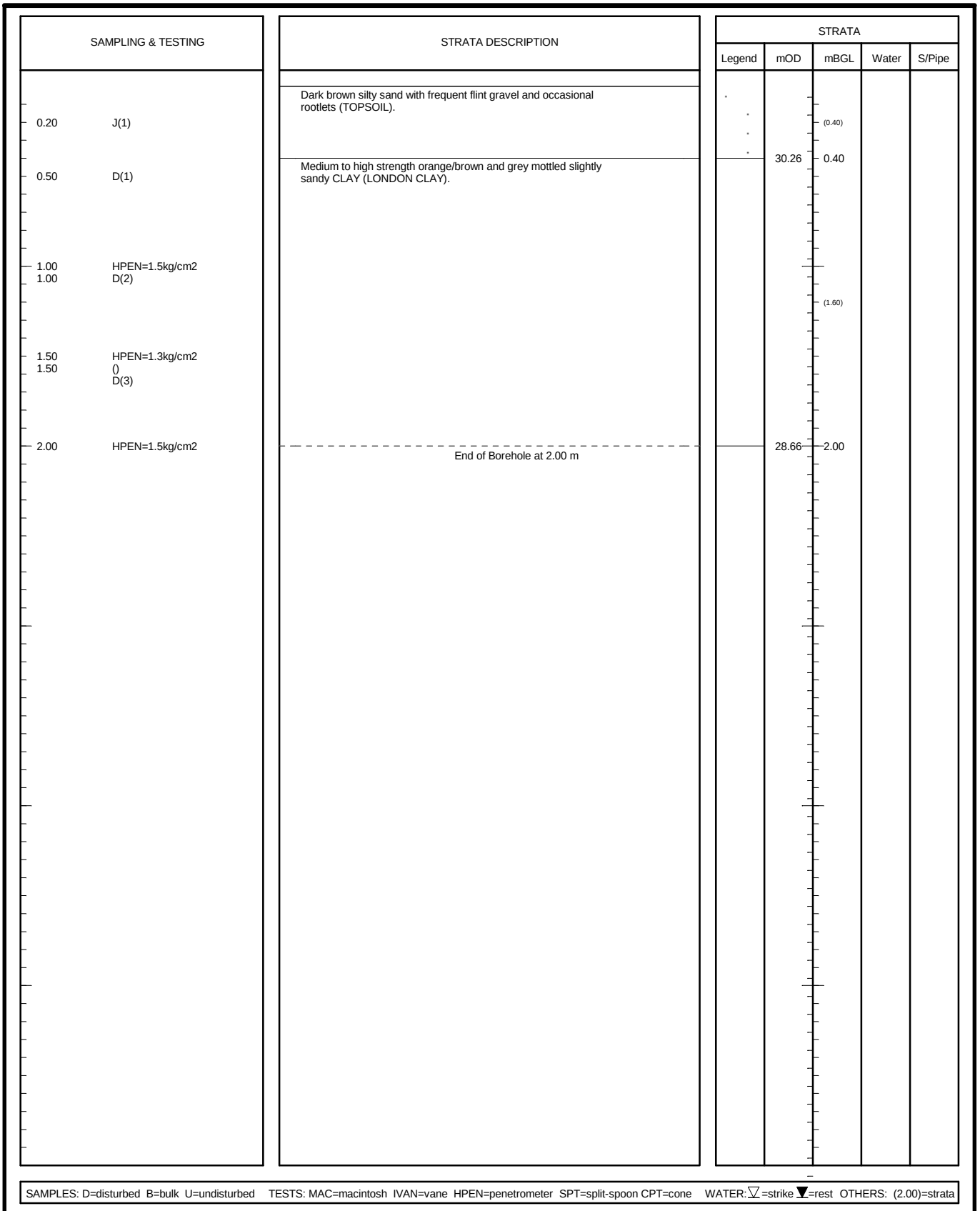
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS295
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 2.00mBGL
		Eng: JK	Level: 29.230mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty clay with frequent rootlets and occasioanl flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			32.37	0.30		
		Medium to high strength orange/brown and grey mottled CLAY with frequent fine sandy partings (LONDON CLAY).					
0.50	D(1)						
1.00	HPEN=1.3kg/cm2						
1.00	D(2)				(1.70)		
1.50	D(3)						
1.60	HPEN=2.5kg/cm2						
2.00	HPEN=1.8kg/cm2			30.67	2.00		
2.00	D(4)	End of Borehole at 2.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS296
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 2.00mBGL
		Eng: JK	Level: 32.669mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

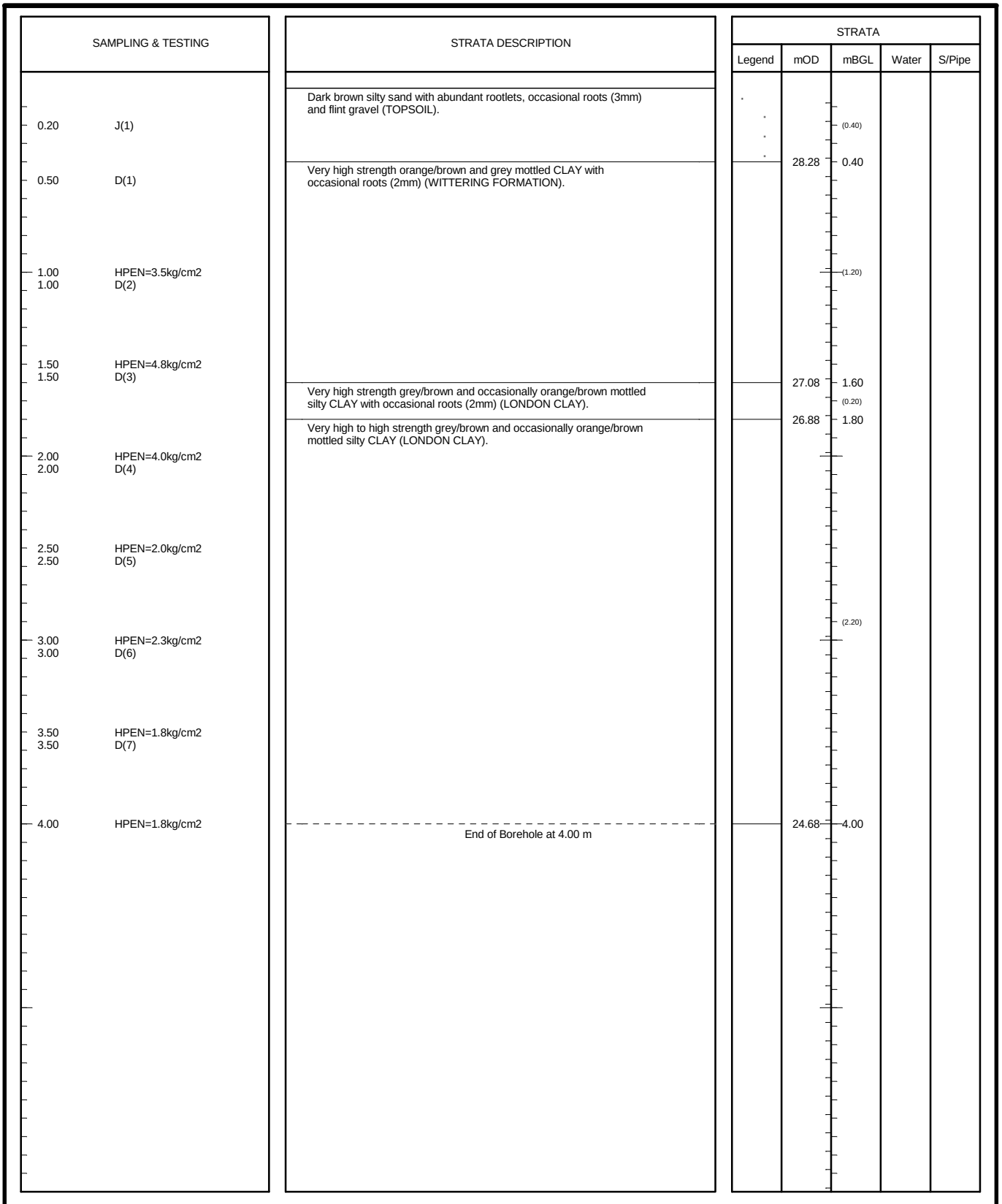


Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS297
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 2.00mBGL
		Eng: JK	Level: 30.660mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets, occasional roots (12mm) and flint gravel (TOPSOIL).					
0.20	J(1)				(0.60)		
0.50	J(2)						
				29.65	0.60		
		Very high strength orange/brown and grey slightly sandy CLAY with occasional roots (2mm) (LONDON CLAY).					
0.75	HPEN=3.5kg/cm2				(0.40)		
1.00	HPEN=4.0kg/cm2			29.25	1.00		
1.00	D(1)	Very high strength orange/brown and grey slightly sandy CLAY (LONDON CLAY).		29.15	1.10		
		High to very high strength light orange/brown and light grey silty CLAY (LONDON CLAY).					
1.50	HPEN=2.8kg/cm2						
1.50	D(2)						
2.00	HPEN=2.5kg/cm2						
2.00	() D(3)				(2.60)		
2.50	HPEN=3.3kg/cm2						
2.50	D(4)						
3.00	HPEN=3.8kg/cm2						
3.00	D(5)						
3.50	HPEN=3.8kg/cm2						
3.50	D(6)						
		Dark brown CLAYSTONE (LONDON CLAY).		26.55	3.70		
					(0.30)		
		End of Borehole at 4.00 m		26.25	4.00		

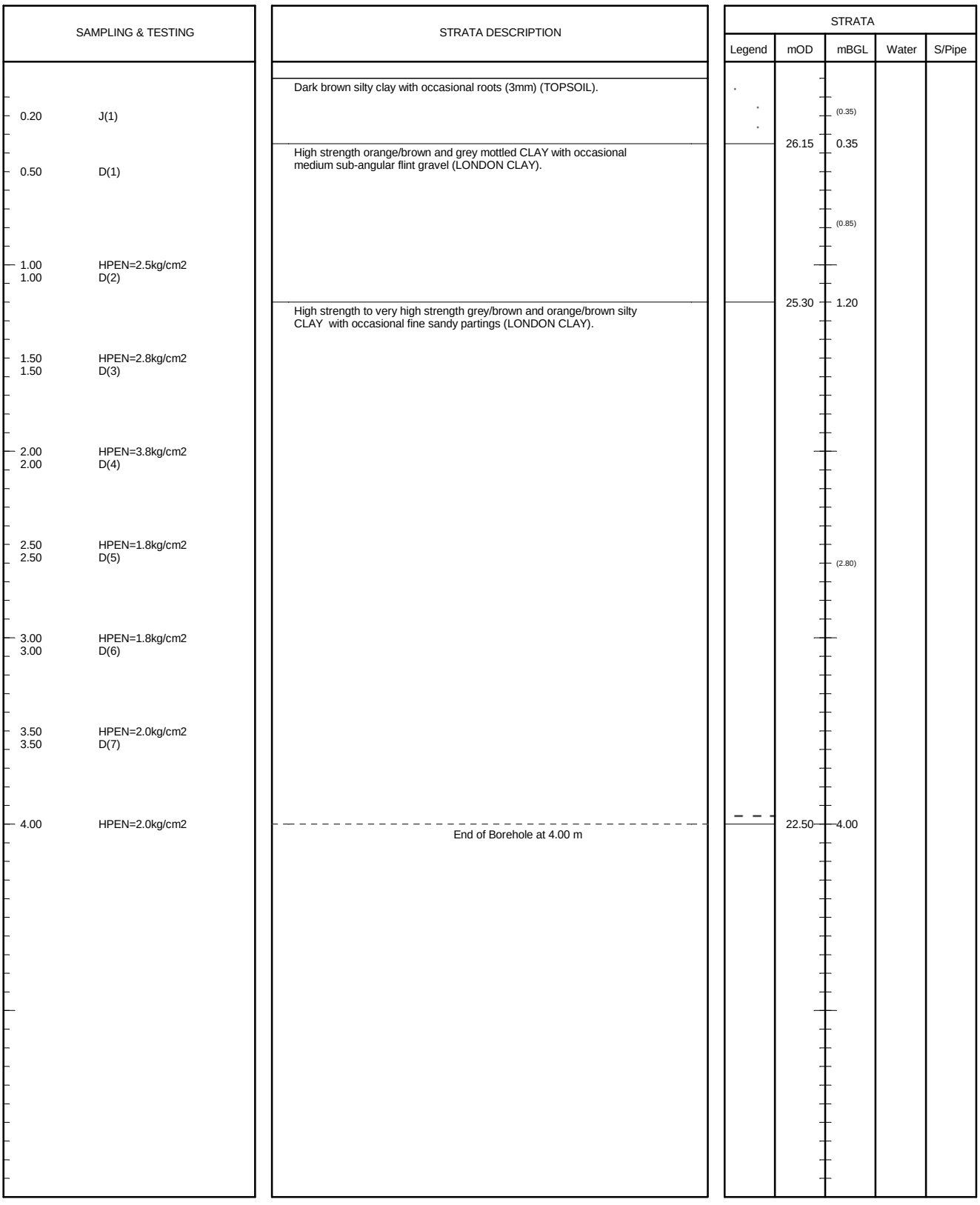
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS298
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 30.249mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS299
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 28.680mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS300
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.500mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
0.20	J(1)	Dark brown silty sand with abundant rootlets and occasional flint gravel (TOPSOIL).			(0.40)		
0.50	D(1)			23.19	0.40		
0.50	J(2)	High strength orange/brown, brown and grey mottled silty sandy CLAY with occasional fine to medium angular flint gravel (WITTERING FORMATION).			(0.60)		
1.00	HPEN=2.8kg/cm2			22.59	1.00		
1.00	D(2)	High to very high strength grey and dark orange/brown mottled silty sandy CLAY with occasional fine to coarse angular flint gravel (WITTERING FORMATION).			(0.90)		
1.50	HPEN=3.0kg/cm2						
1.50	D(3)			21.69	1.90		
2.00	D(4)	Orange/brown and light brown mottled silty fine SAND with occasioanl clayey inclusions (WITTERING FORMATION).			(1.10)		
2.50	D(5)						
		End of Borehole at 3.00 m		20.59	3.00		

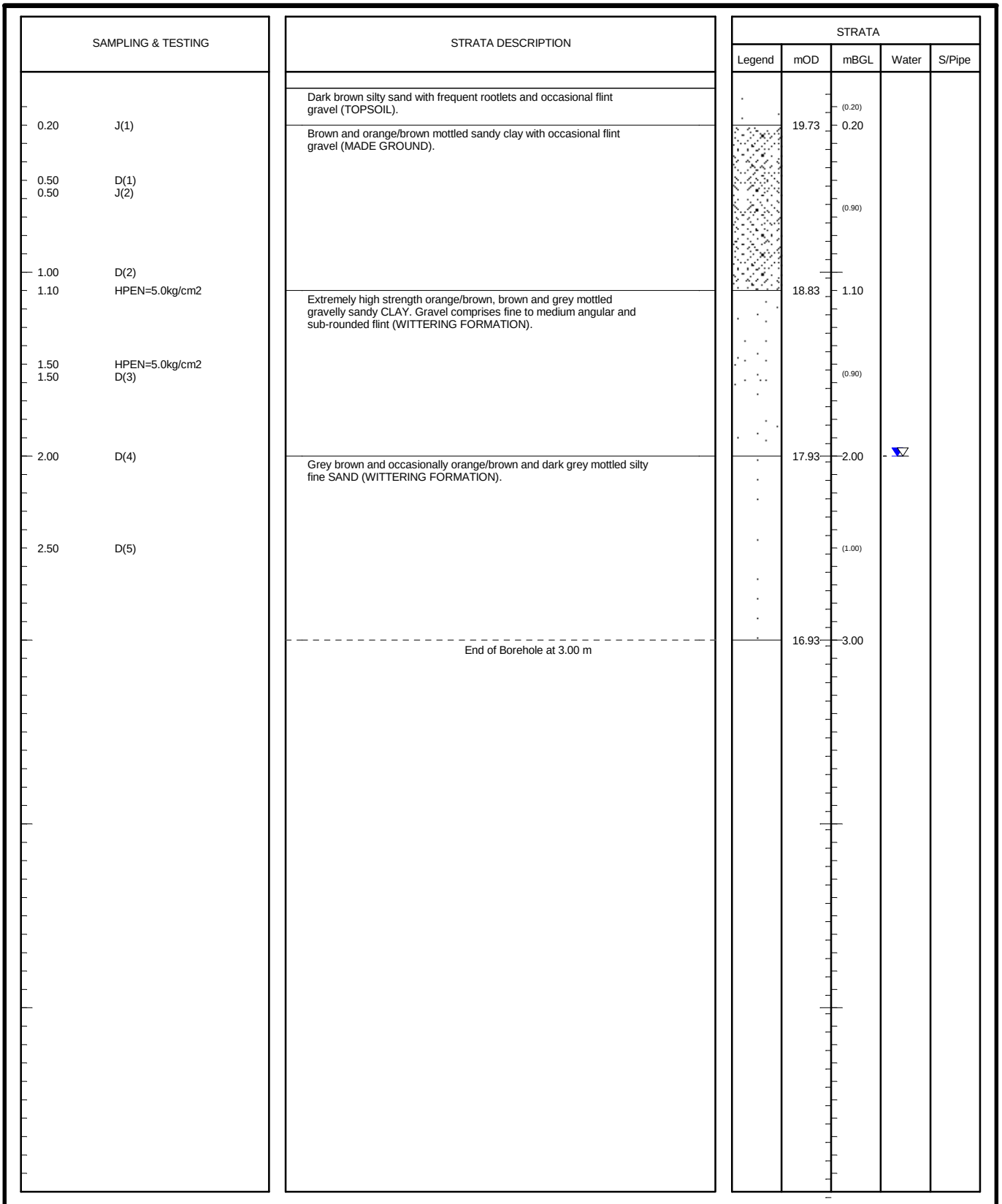
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS301
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 23.590mOD
Remarks: Refused on dense sand at 3.00m	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.20)		
0.20	J(1)			21.59	0.20		
		Dark brown and orange/brown mottled sandy clay with frequent flint gravel (MADE GROUND).			(0.30)		
0.50	D(1)			21.29	0.50		
0.50	J(2)	High to very high strength orange/brown, brown and grey mottled sandy CLAY with occasional fine to medium angular flint gravel (WITTERING FORMATION).			(0.50)		
1.00	HPEN=3.0kg/cm2			20.79	1.00		
1.00	D(2)	High to very high strength grey and dark orange/brown mottled silty sandy CLAY (WITTERING FORMATION).			(0.20)		
		Light brown and occasionally orange/brown mottled silty fine SAND (WITTERING FORMATION).		20.59	1.20		
1.50	D(3)						
2.00	D(4)				(2.10)		
2.50	D(5)						
3.00	D(6)						
		End of Borehole at 3.30 m		18.49	3.30		

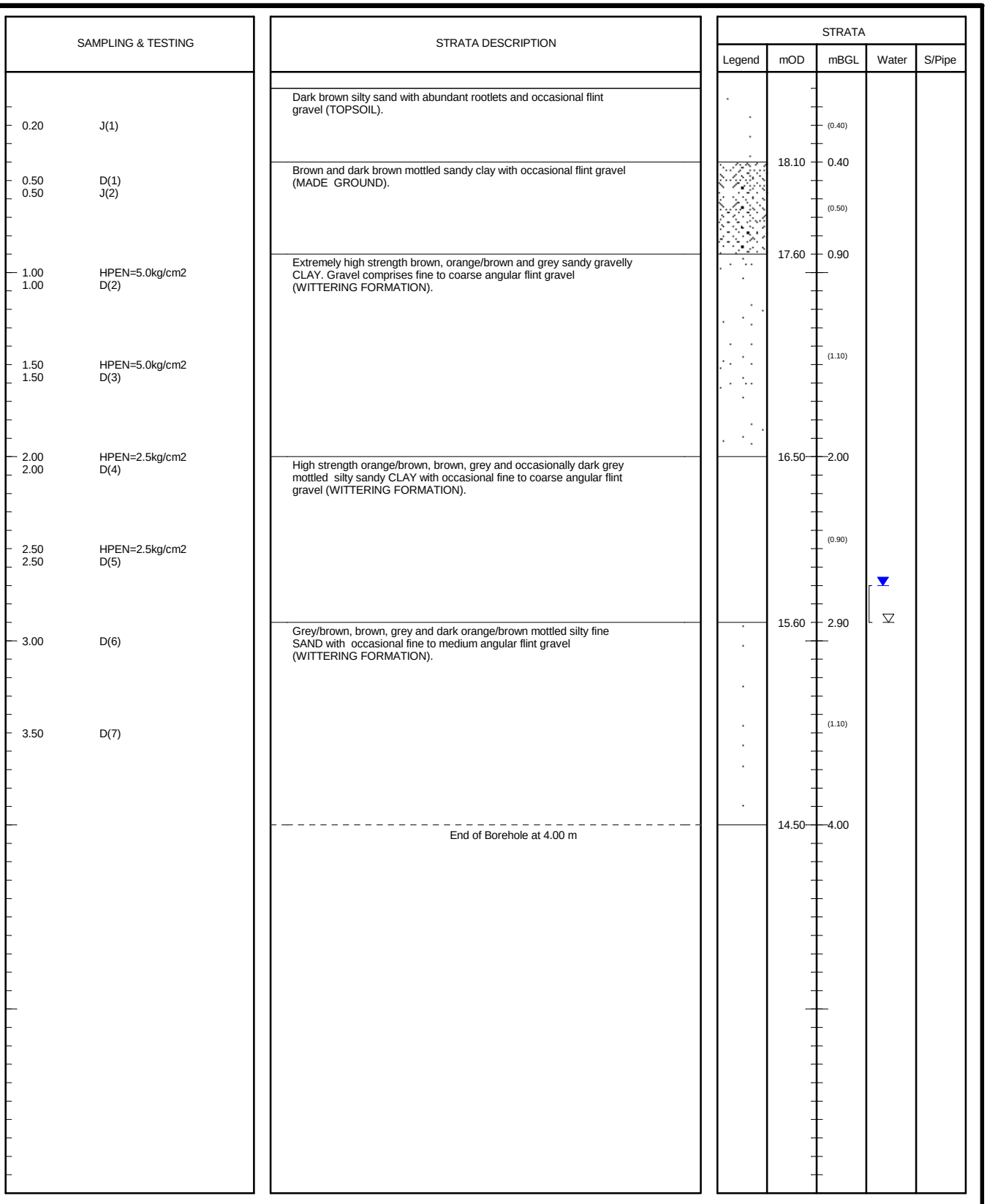
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS302
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.30mBGL
		Eng: JK	Level: 21.794mOD
Remarks: Refused on dense sand at 3.30m. Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.10m at 3.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS303
Groundwater: Strike at 2.00m; after 20mins no change.	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 19.932mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS304
Groundwater: Strike at 2.90m; 2.70 after 20mins	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.500mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
0.20	J(1)	Dark brown silty sand with frequent rootlets and flint gravel (TOPSOIL).			(0.30)		
0.50	HPEN=4.5kg/cm2			18.00	0.30		
0.50	D(1)	Very high strength brown and occasionally dark brown mottled sandy CLAY with occasional fine to medium angular flint gravel (WITTERING FORMATION).			(0.70)		
0.50	J(2)						
1.00	HPEN=5.0kg/cm2			17.30	1.00		
1.00	D(2)	Extremely high strength brown, orange/brown and grey mottled sandy CLAY with occasional fine ot medium angular flint gravel (WITTERING FORMATION).			(0.30)		
		Brown clayey medium SAND with occasional fine to coarse angular flint gravel (WITTERING FORMATION).		17.00	1.30		
1.50	D(3)				(0.60)		
2.00	HPEN=2.8kg/cm2			16.40	1.90		
2.00	D(4)	High strength light grey and orange/brown mottled silty sandy CLAY with occasional fine to medium angular flint gravel (WITTERING FORMATION).					
2.50	HPEN=1.8kg/cm2				(1.10)		
2.50	D(5)						
3.00	D(6)	Brown and orange/brown mottled clayey medium SAND with occasional fine to medium angular flint gravel (WITTERING FORMATION).		15.30	3.00		
					(0.60)		
3.60	D(7)	Brown silty fine SAND (WITTERING FORMATION).		14.70	3.60		
					(0.40)		
		End of Borehole at 4.00 m		14.30	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS305
Groundwater: Strike at 3.00m; 2.80 after 20mins	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.296mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with occasional rootlets, roots (1-2mm) and flint gravel (TOPSOIL).					
0.20	J(1)				(0.40)		
		Very high strength brown and occasionally dark brown mottled sandy CLAY (WITTERING FORMATION).		19.81	0.40		
0.50	HPEN=4.5kg/cm2						
0.50	D(1)				(0.40)		
0.50	J(2)						
		Very high strength orange/brown and grey mottled sandy CLAY with occasional fine angular flint gravel (WITTERING FORMATION).		19.41	0.80		
1.00	HPEN=5.0kg/cm2						
1.00	D(2)				(1.10)		
1.50	HPEN=5.0kg/cm2						
1.50	D(3)						
		Light brown and occasioanlly orange/brown and dark brown mottled silty fine SAND (WITTERING FORMATION).		18.31	1.90		
2.00	D(4)						
2.50	D(5)				(1.10)		
3.00	D(6)			17.21	3.00		
		Grey/brown and occasionally dark grey mottled silty fine SAND (WITTERING FORMATION).					
3.50	D(7)				(1.00)		
		End of Borehole at 4.00 m		16.21	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS306
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.208mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with abundant rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			23.41	0.30		
0.50	D(1)	Extremely high strength orange/brown and grey mottled sandy CLAY with occasional fine to coarse angular flint gravel (WITTERING FORMATION).					
0.50	J(2)						
1.00	HPEN=5.0kg/cm2				(1.50)		
1.00	D(2)						
1.50	HPEN=5.0kg/cm2						
1.50	D(3)						
		Very high strength light grey and orange/brown silty sandy CLAY with occasional bads of silty fine sand (WITTERING FORMATION).		21.91	1.80		
2.00	HPEN=4.0kg/cm2						
2.00	D(4)				(0.90)		
2.50	HPEN=3.5kg/cm2						
2.50	D(5)						
		Light brown and orange/brown silty fine SAND (WITTERING FORMATION).		21.01	2.70		
3.00	D(6)						
					(1.30)		
3.50	D(7)						
		End of Borehole at 4.00 m		19.71	4.00		

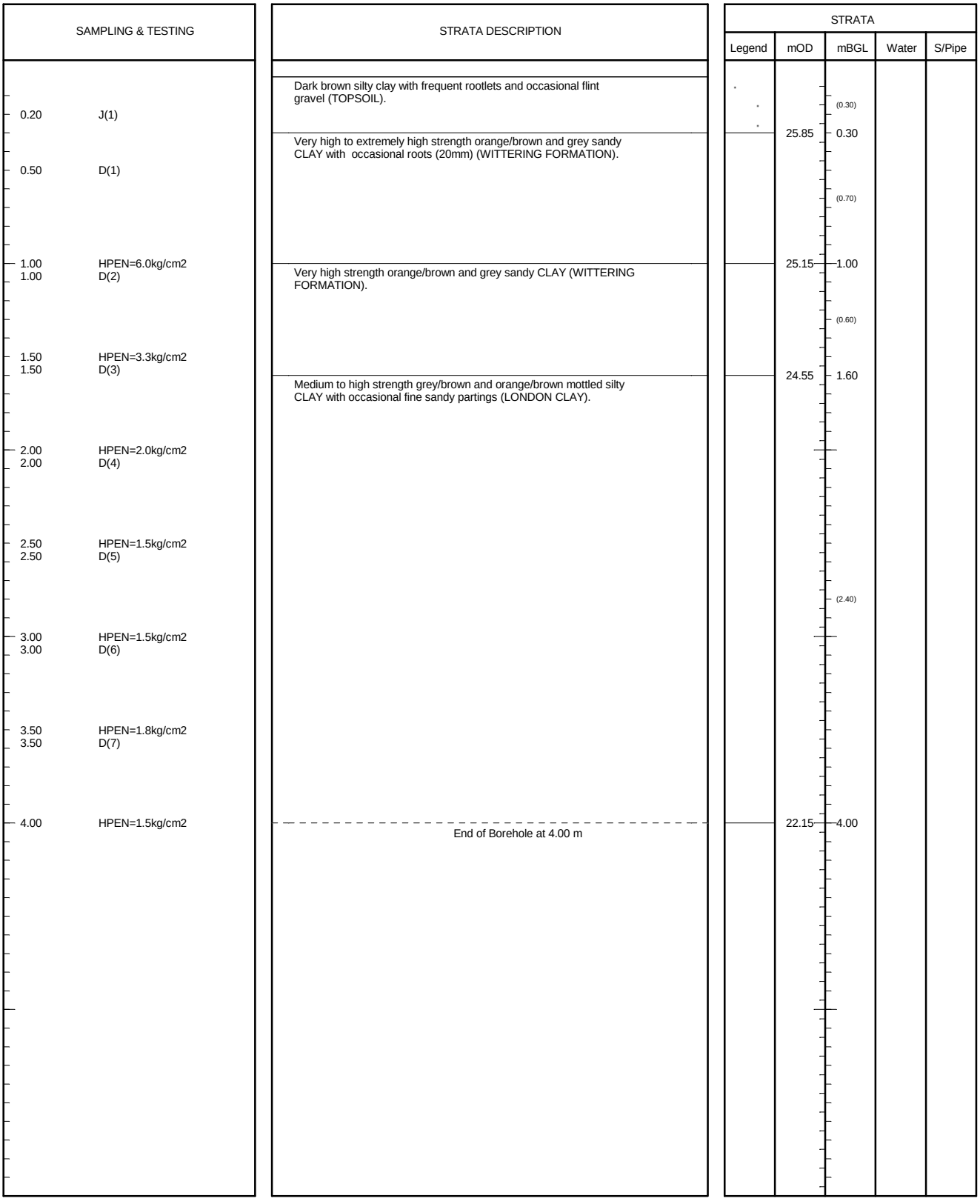
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS307
Groundwater: No Groundwater Encountered	Method: Archway	Start: 10/09/2013	Scale: 1:30
		Finish: 10/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 10/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.709mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown sandy clay with frequent rootlets and flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			25.79	0.30		
		Extremely high strength orange/brown and grey mottled sandy CLAY with occasional roots (2mm) (WITTERING FORMATION).			(0.80)		
0.50	D(1)						
1.00	HPEN=6.8kg/cm2						
1.00	D(2)			24.99	1.10		
		Extremely high strength orange/brown and grey mottled sandy CLAY (WITTERING FORMATION).			(1.20)		
1.50	HPEN=9.0kg/cm2						
1.50	D(3)						
2.00	HPEN=6.3kg/cm2						
2.00	D(4)						
		Orange/brown fine SAND with occasional sandy clay inclusions (WITTERING FORMATION).		23.79	2.30		
2.50	D(5)				(0.70)		
3.00	D(6)			23.09	3.00		
		Very high strength grey/brown and occasionally orange/brown silty CLAY (WITTERING FORMATION).			(0.60)		
3.50	HPEN=3.3kg/cm2						
3.50	D(7)			22.49	3.60		
		Light orange/brown and grey mottled fine SAND (WITTERING FORMATION).			(0.40)		
		End of Borehole at 4.00 m		22.09	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS308
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.086mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS309
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 26.150mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty clay with frequent rootlets and flint gravel (TOPSOIL).					
0.20	J(1)				(0.35)		
		High strength becoming medium to high strength orange and grey CLAY with occasional rootlets (LONDON CLAY).		27.36	0.35		
0.50	D(1)						
1.00	HPEN=1.8kg/cm2				(1.25)		
1.00	D(2)						
1.50	HPEN=1.5kg/cm2						
1.50	D(3)						
		High strength becoming very high strength grey/brown and orange/brown mottled silty CLAY (LONDON CLAY).		26.11	1.60		
2.00	HPEN=2.5kg/cm2						
2.00	D(4)						
2.50	HPEN=2.3kg/cm2						
2.50	D(5)						
					(2.40)		
3.00	HPEN=2.0kg/cm2						
3.00	D(6)						
3.50	HPEN=2.5kg/cm2						
3.50	D(7)						
4.00	HPEN=3.3kg/cm2	End of Borehole at 4.00 m		23.71	4.00		

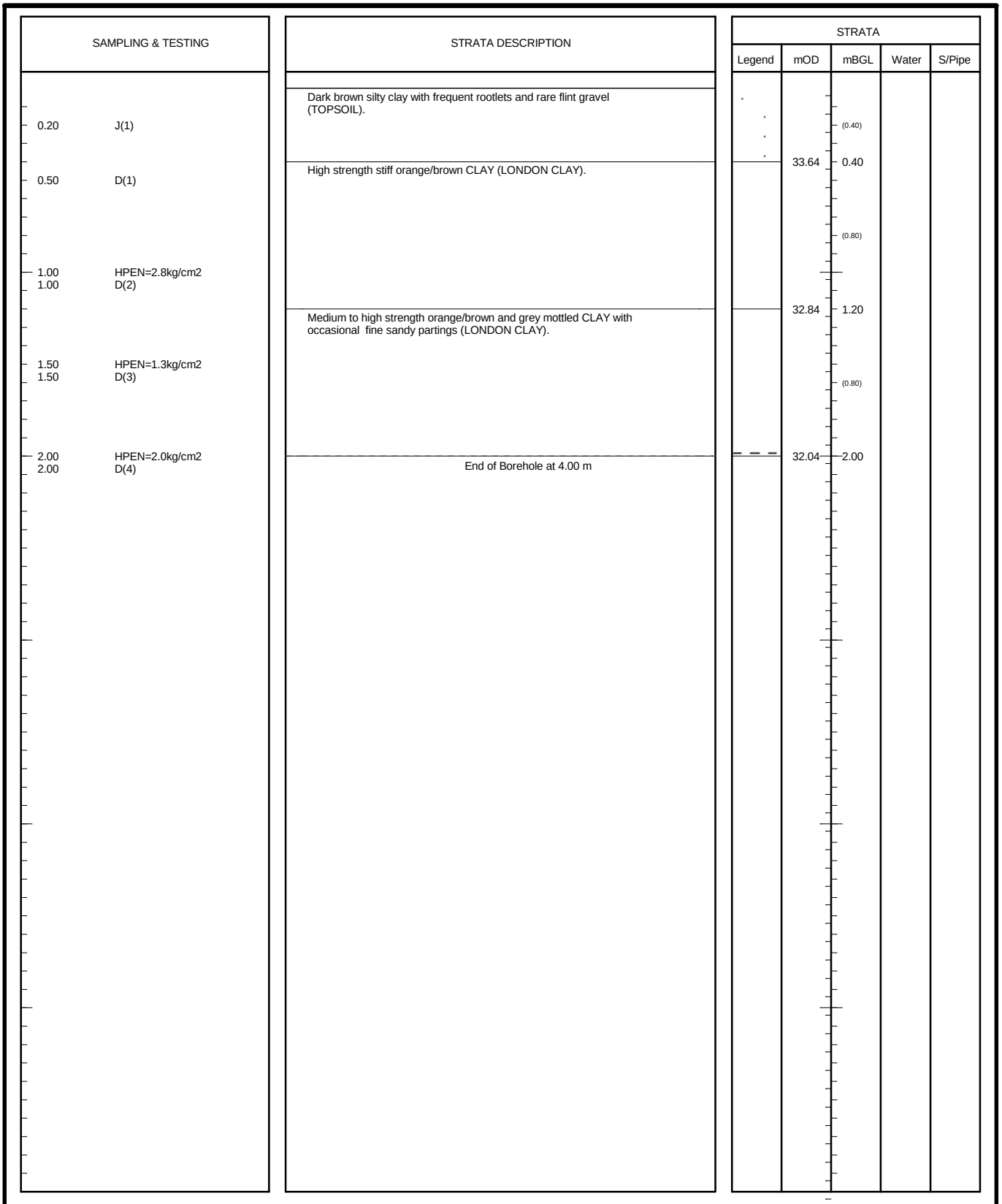
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS310
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 27.713mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with occasional rootlets and flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			33.10	0.30		
		Very high strength orange/brown and grey mottled CLAY with occasional roots (1-2mm) (LONDON CLAY).					
0.50	D(1)				(0.70)		
1.00	HPEN=4.5kg/cm2			32.40	1.00		
1.00	D(2)	Very high strength becoming medium strength orange/brown and grey mottled CLAY with occasional sandy partings (LONDON CLAY).					
1.50	HPEN=1.8kg/cm2				(1.00)		
1.50	D(3)						
2.00	HPEN=1.3kg/cm2			31.40	2.00		
		End of Borehole at 2.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS311
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 2.00mBGL
		Eng: JK	Level: 33.399mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



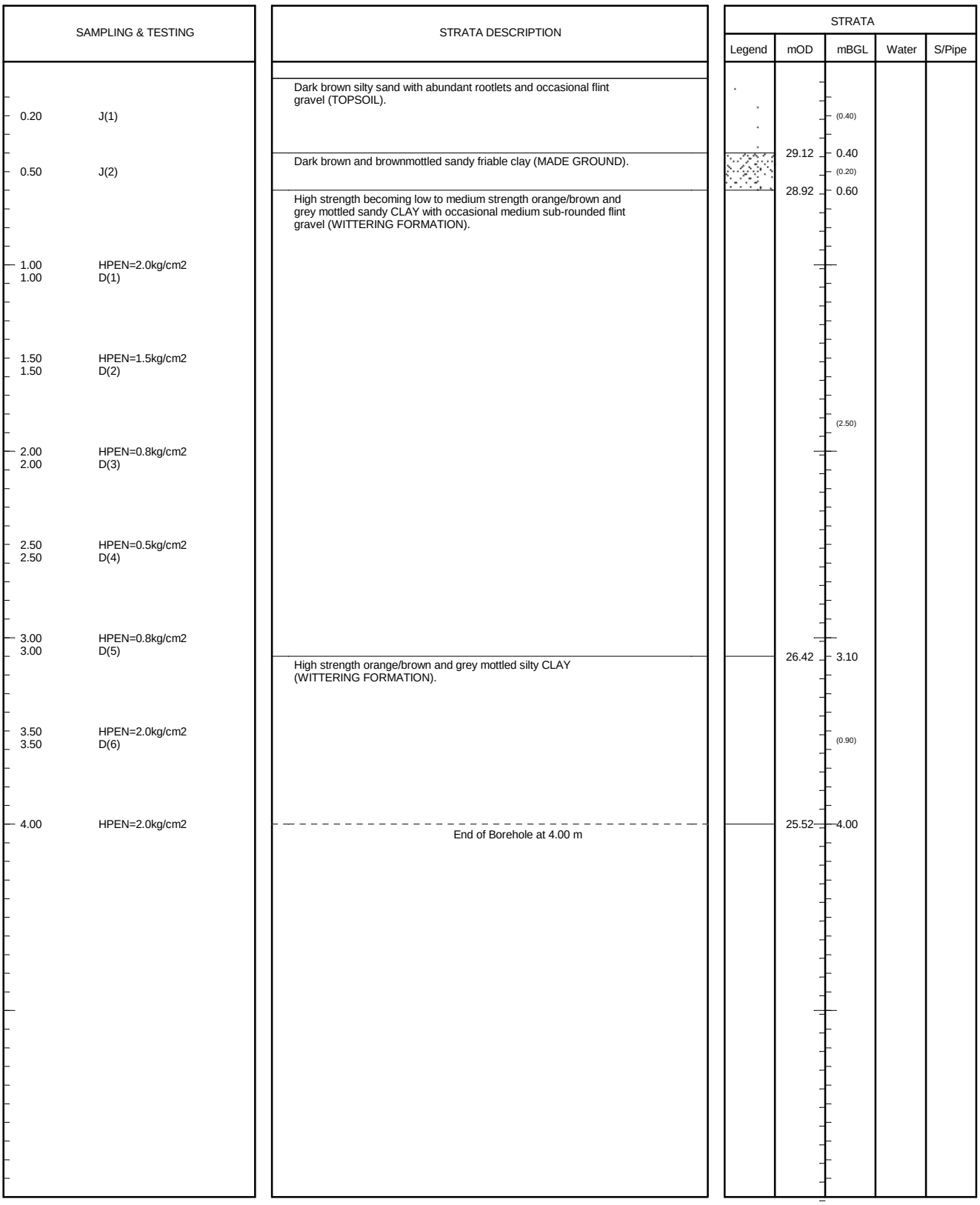
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS312
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 34.040mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty clay with frequent rootlets and occasioanl flint gravel (TOPSOIL).					
0.20	J(1)				(0.40)		
		Very high strength orange/brown and grey mottled CLAY with occasional medium angular flint gravel and roots (3mm) (WITTERING FORMATION).		30.52	0.40		
0.50	D(1)				(0.70)		
1.00	HPEN=3.3kg/cm2						
1.00	D(2)			29.82	1.10		
		Medium to high orange/brown and grey mottled CLAY with occasional fine sandy partings (WITTERING FORMATION).					
1.50	HPEN=1.5kg/cm2				(0.90)		
1.50	D(3)						
2.00	HPEN=1.5kg/cm2						
2.00	D(4)	End of Borehole at 2.00 m		28.92	2.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS313
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 2.00mBGL
		Eng: JK	Level: 30.918mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



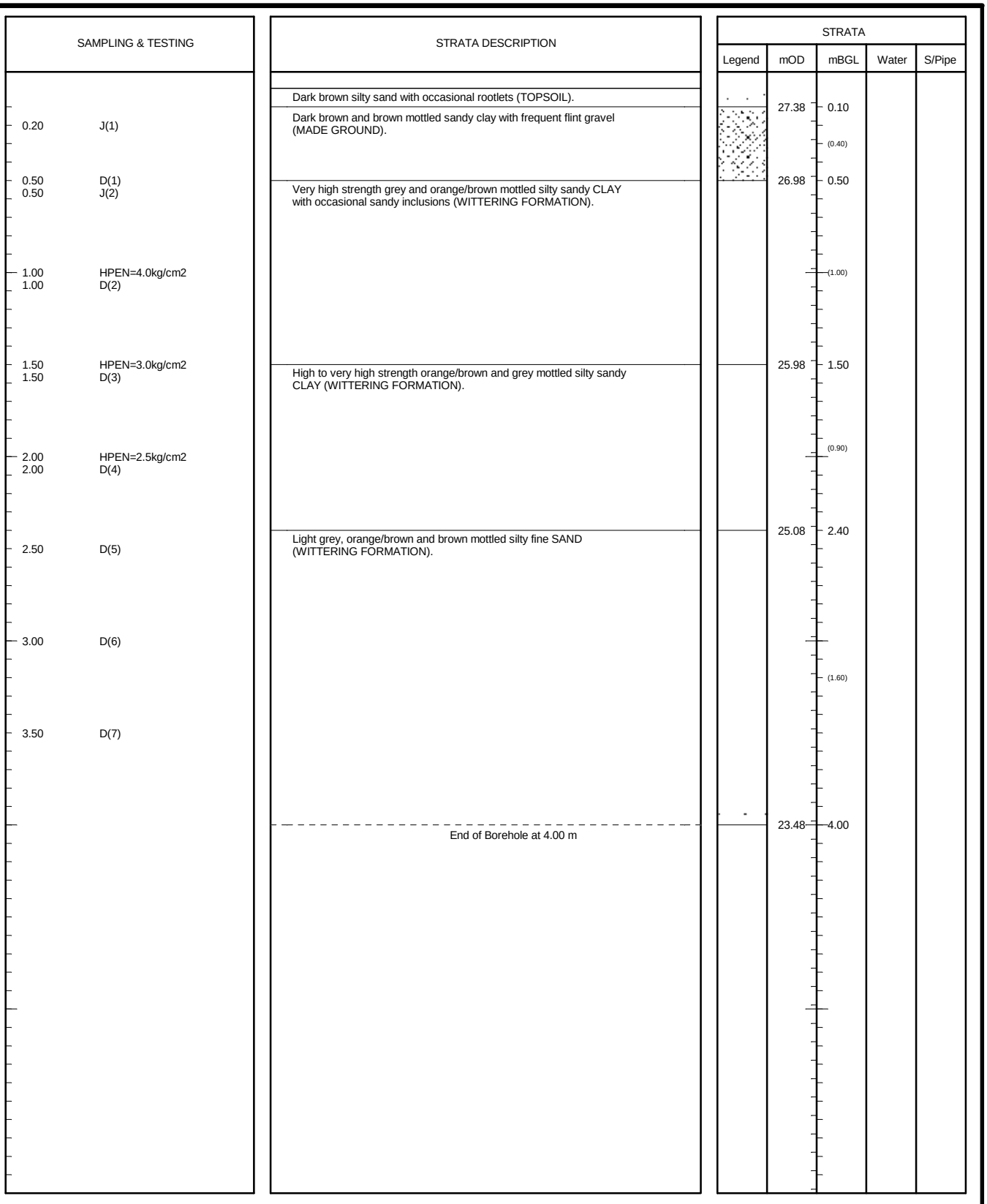
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS314
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 29.520mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
0.20	J(1)	Dark brown silty sand with occasional roots (2mm) and flint gravel (TOPSOIL).			(0.40)		
0.50	D(1)	Extremely high strength becoming very high strength orange/brown and grey mottled CLAY with occasional roots (4mm) (LONDON CLAY).		27.98	0.40		
1.00	HPEN=5.8kg/cm2						
1.00	D(2)						
1.50	HPEN=3.5kg/cm2				(2.20)		
1.50	D(3)						
2.00	HPEN=3.3kg/cm2						
2.00	D(4)						
2.50	HPEN=3.5kg/cm2						
2.50	D(5)						
		High strength brown and orange/brown mottled silty sandy CLAY with occasional claystone inclusion and rootlets (LONDON CLAY).		25.78	2.60		
3.00	HPEN=2.5kg/cm2						
3.00	D(6)						
					(1.40)		
3.50	HPEN=2.3kg/cm2						
3.50	D(7)						
4.00	HPEN=2.3kg/cm2	End of Borehole at 4.00 m		24.38	4.00		

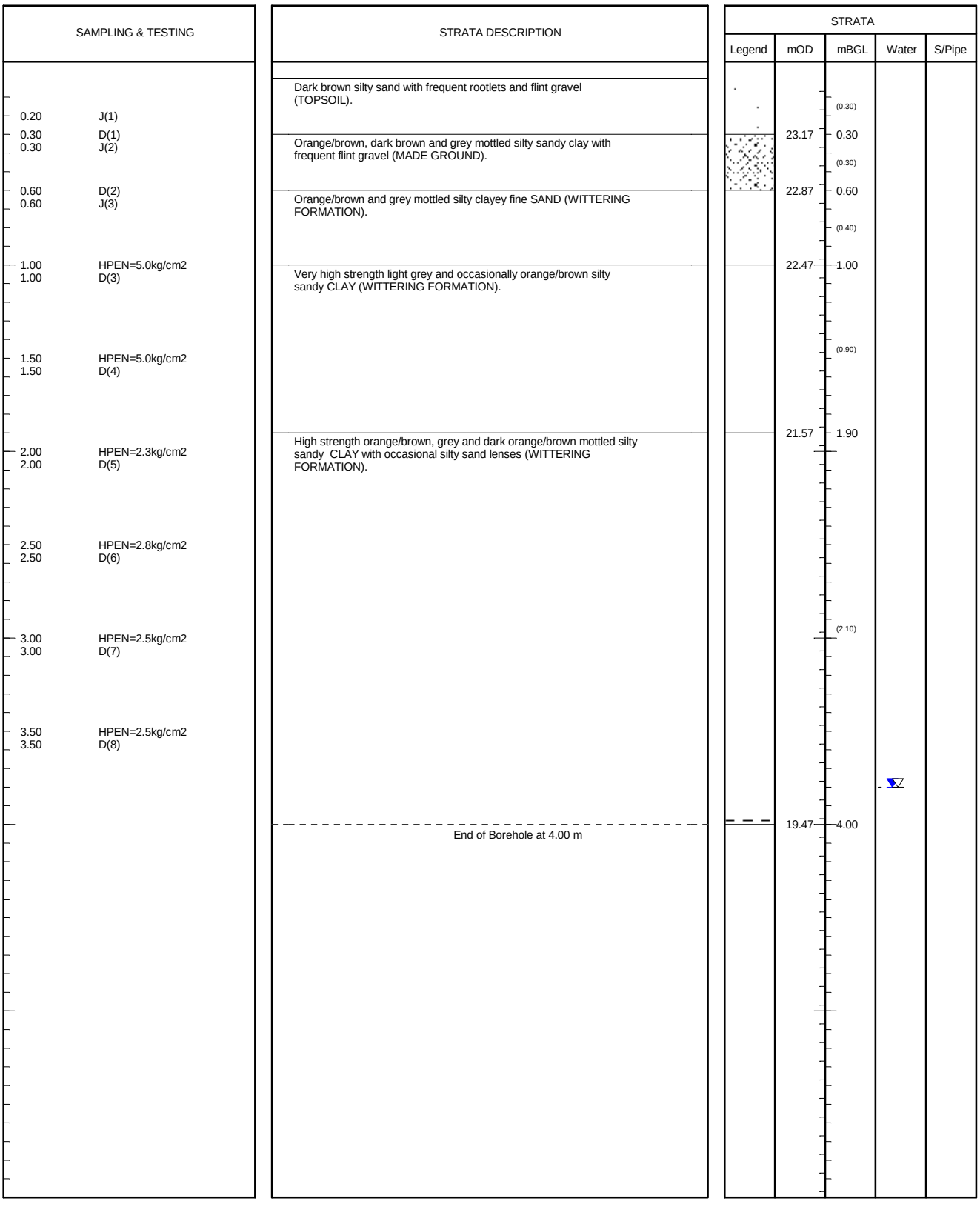
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS315
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 28.375mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS316
Groundwater: No Groundwater Encountered	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 27.478mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



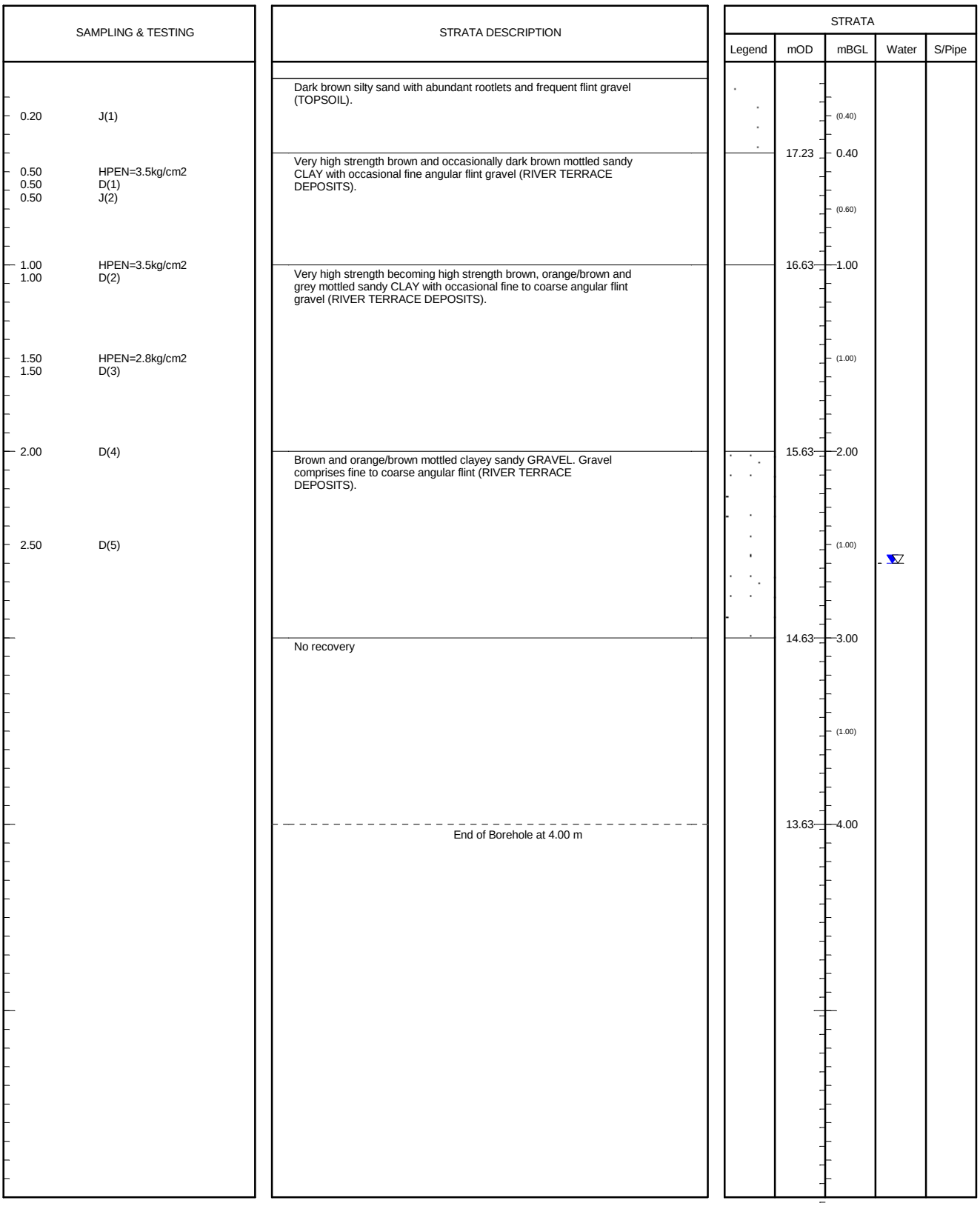
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS317
Groundwater: Strike at 3.80m; after 20mins no change.	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 23.469mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with abundant rootlets and occasional flint gravel (TOPSOIL).					
0.20	J(1)				(0.40)		
		Very high strength brown, dark brown and orange/brown very sandy CLAY with occasional fine to coarse angular flint gravel (WITTERING FORMATION).		19.38	0.40		
0.50	D(1)				(0.30)		
0.50	J(2)						
		Very high strength orange/brown and grey mottled fissured CLAY with occasional fine to coarse angular flint gravel (WITTERING FORMATION).		19.08	0.70		
0.70	D(2)				(0.30)		
0.70	J(3)						
		Very high strength becoming medium strength light grey and orange/brown sandy CLAY (WITTERING FORMATION).		18.78	1.00		
1.00	HPEN=5.0kg/cm2				(0.40)		
1.00	D(3)						
		Very stiff light grey and orange/brown mottled silty sandy CLAY (WITTERING FORMATION).		18.38	1.40		
1.50	HPEN=5.0kg/cm2						
1.50	D(4)						
2.00	HPEN=5.0kg/cm2						
2.00	D(5)						
2.50	HPEN=3.0kg/cm2				(2.60)		
2.50	D(6)						
3.00	HPEN=2.5kg/cm2						
3.00	D(7)						
3.50	HPEN=1.5kg/cm2						
3.50	D(8)						
4.00	HPEN=1.0kg/cm2	End of Borehole at 4.00 m		15.78	4.00		

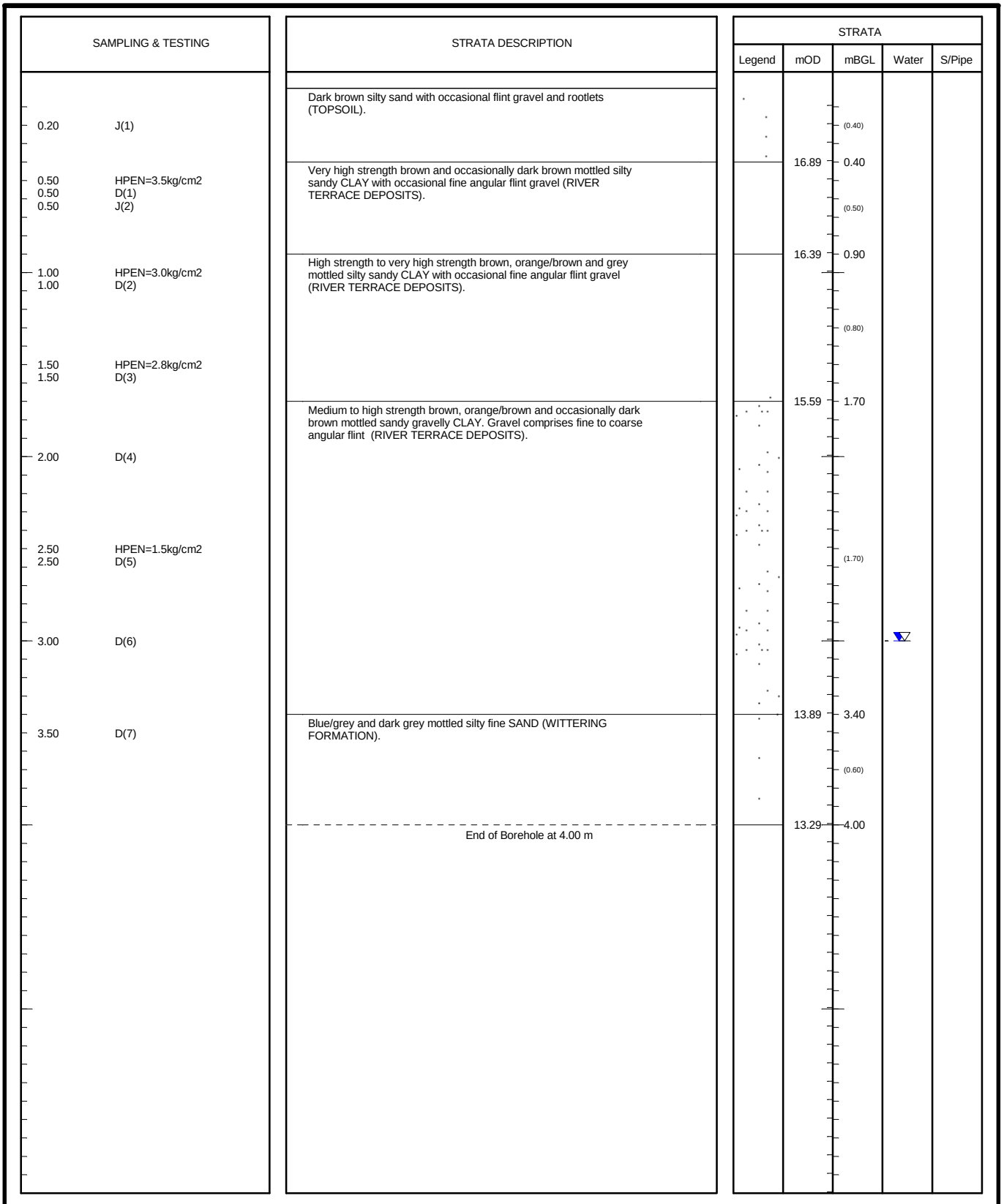
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS318
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.780mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



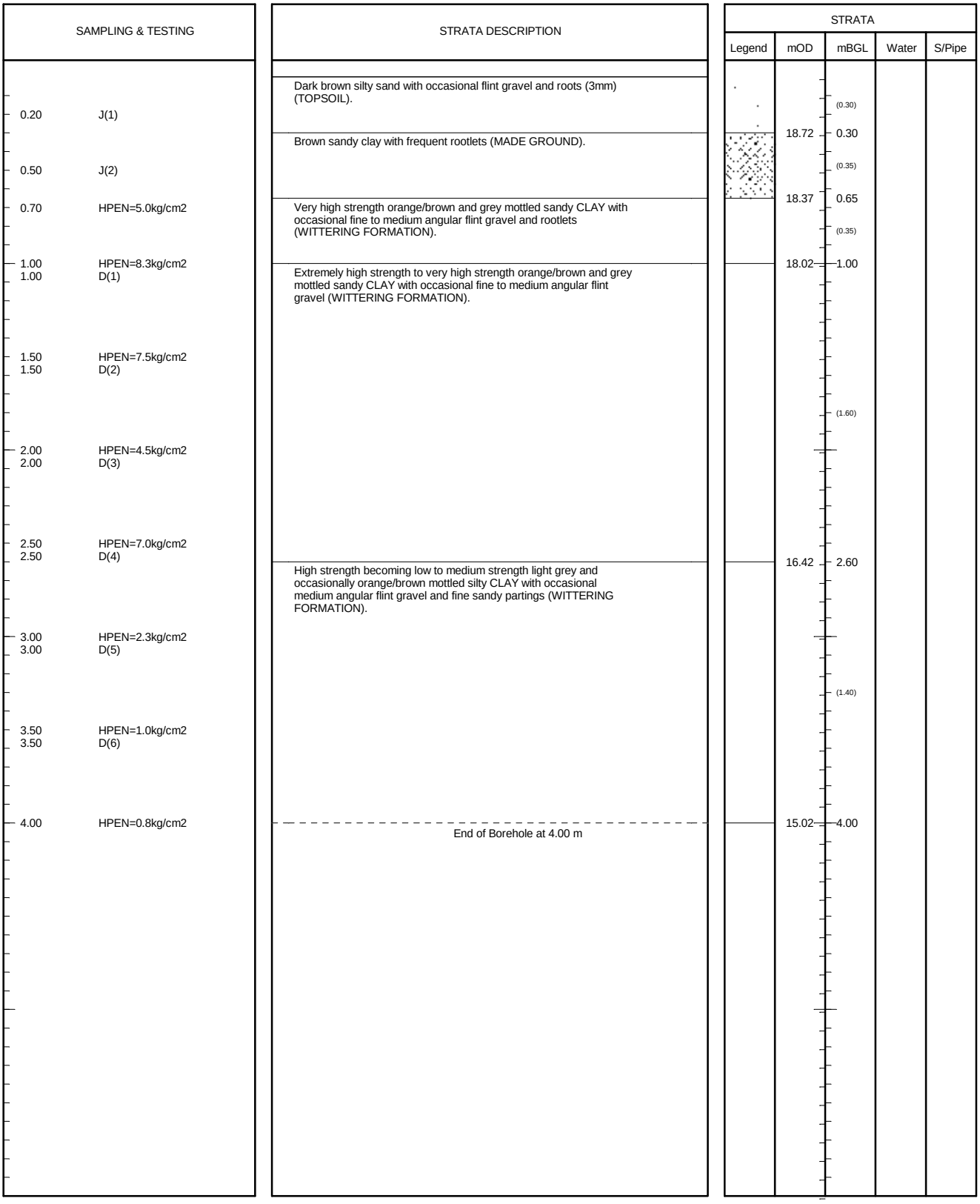
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS319
Groundwater: Strike at 2.60m; after 20mins no change.	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 17.627mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS320
Groundwater: Strike at 3.00m; after 20mins no change.	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 17.292mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



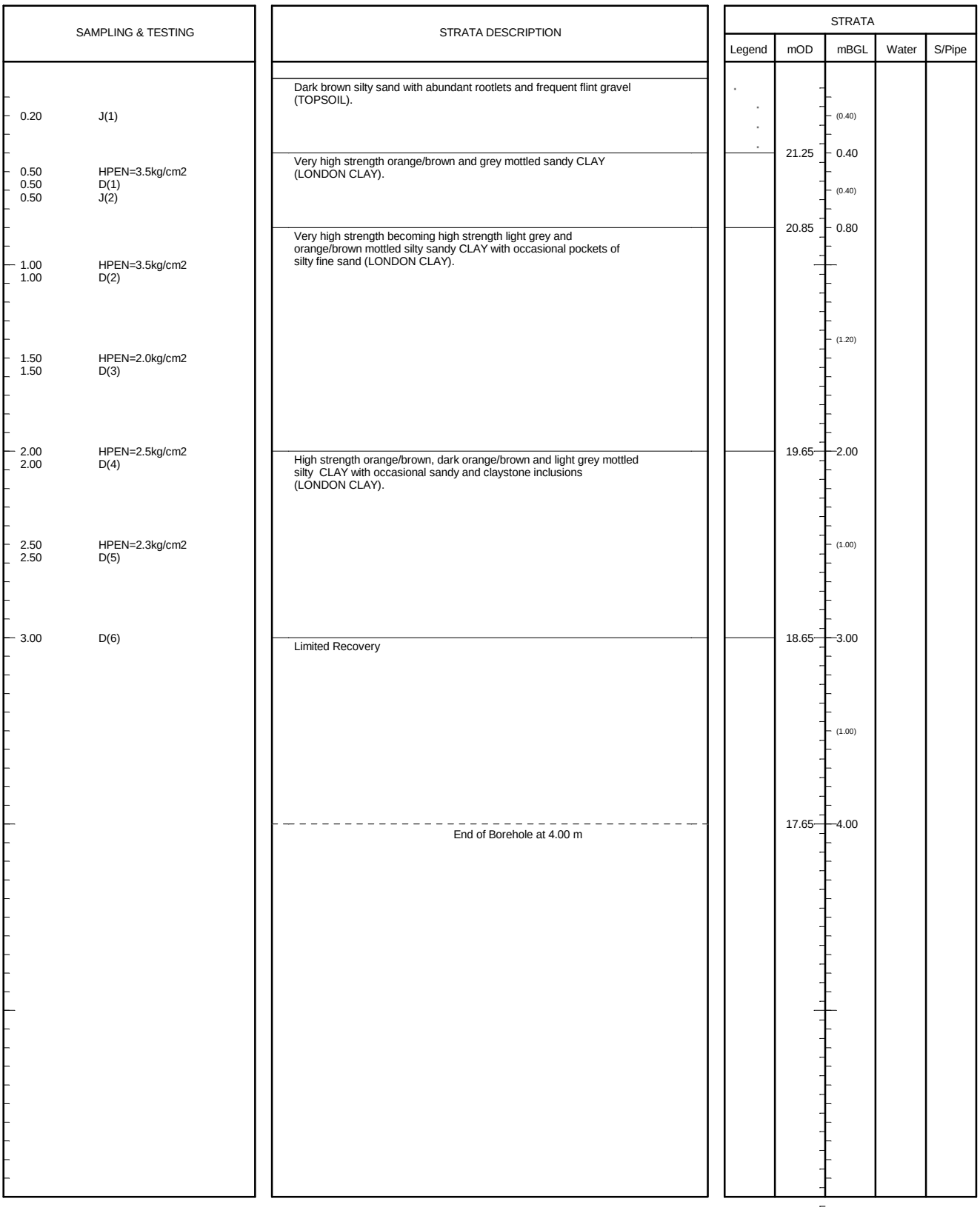
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS321
Groundwater: No Groundwater Encountered	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.015mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).					
0.20	J(1)				(0.50)		
0.50	D(1)			19.09	0.50		
0.50	J(2)	Very high strength light grey and orange/brown mottled silty sandy CLAY with occasional silty sand lenses (LONDON CLAY).					
1.00	HPEN=5.0kg/cm2						
1.00	D(2)				(1.80)		
1.50	HPEN=4.5kg/cm2						
1.50	D(3)						
2.00	HPEN=5.0kg/cm2						
2.00	D(4)			17.29	2.30		
		High strength orange/brown, light brown and dark orange/brown silty sandy CLAY with occasional claystone lenses and inclusions (LONDON CLAY).					
2.50	HPEN=2.0kg/cm2						
2.50	D(5)				(1.00)		
3.00	HPEN=2.0kg/cm2						
3.00	D(6)			16.29	3.30		
		High strength dark blue/grey silty sandy CLAY (LONDON CLAY).					
3.50	HPEN=2.3kg/cm2						
3.50	D(7)				(0.70)		
4.00	HPEN=2.3kg/cm2			15.59	4.00		
		End of Borehole at 4.00 m					

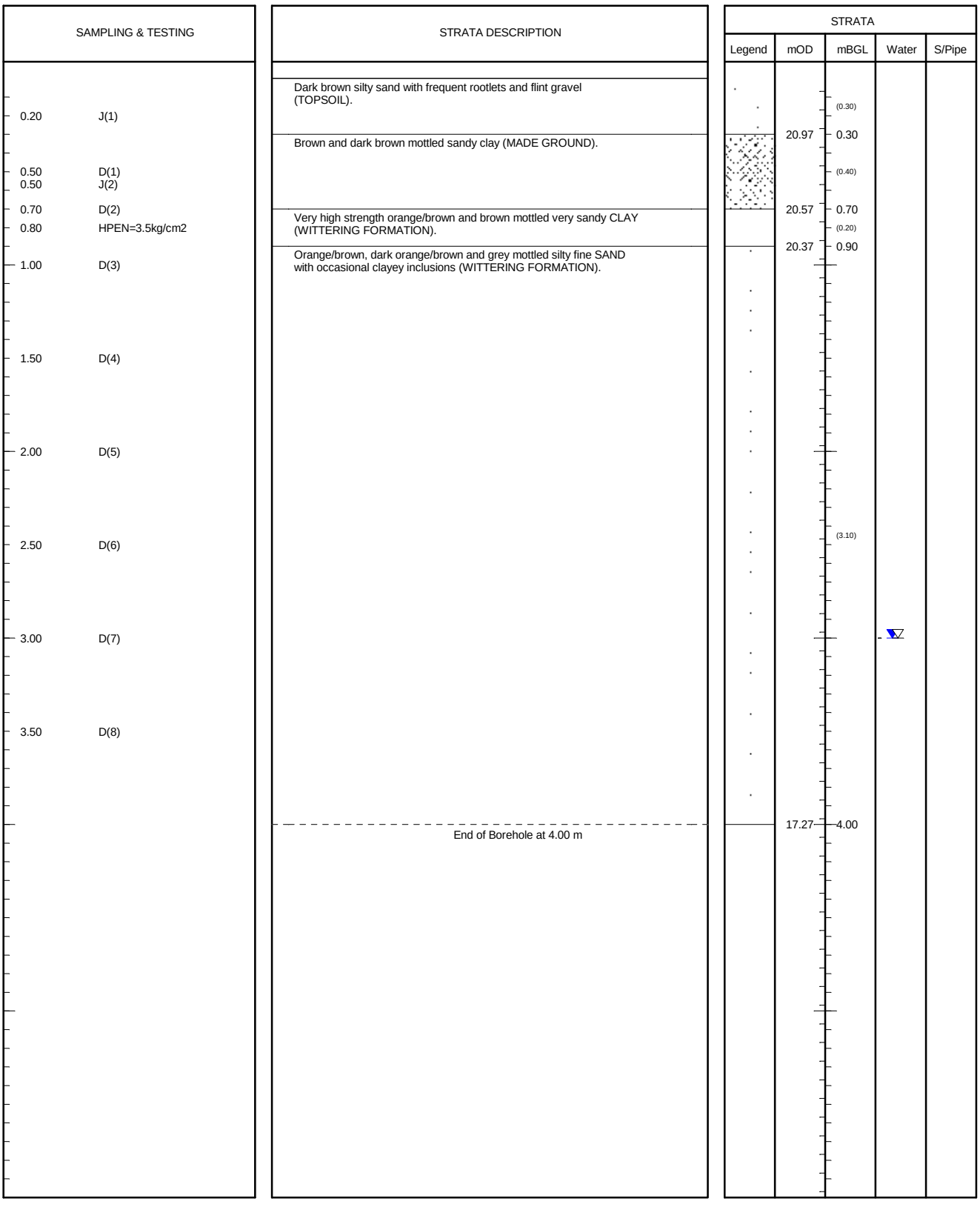
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS322
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.591mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



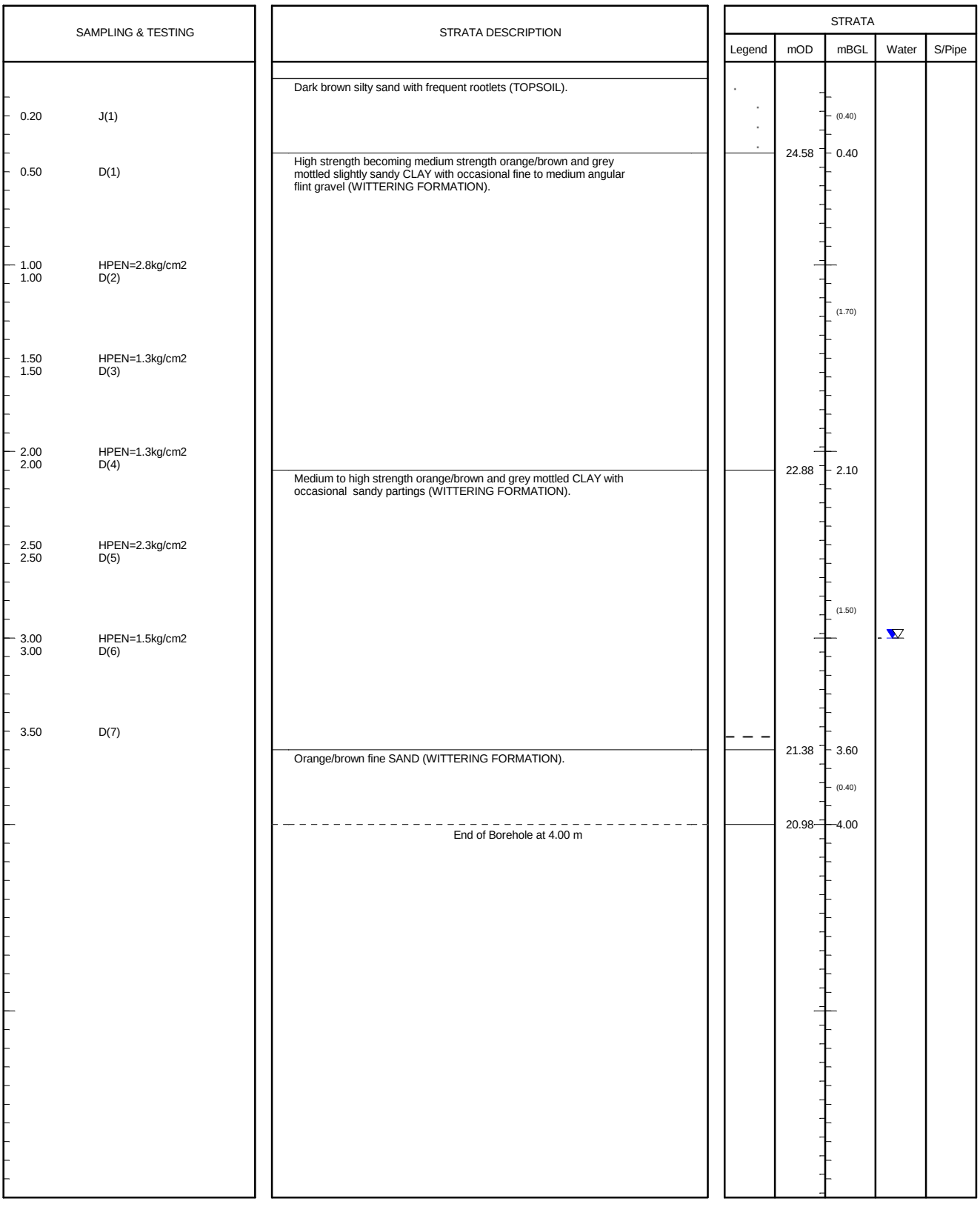
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS323
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.651mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



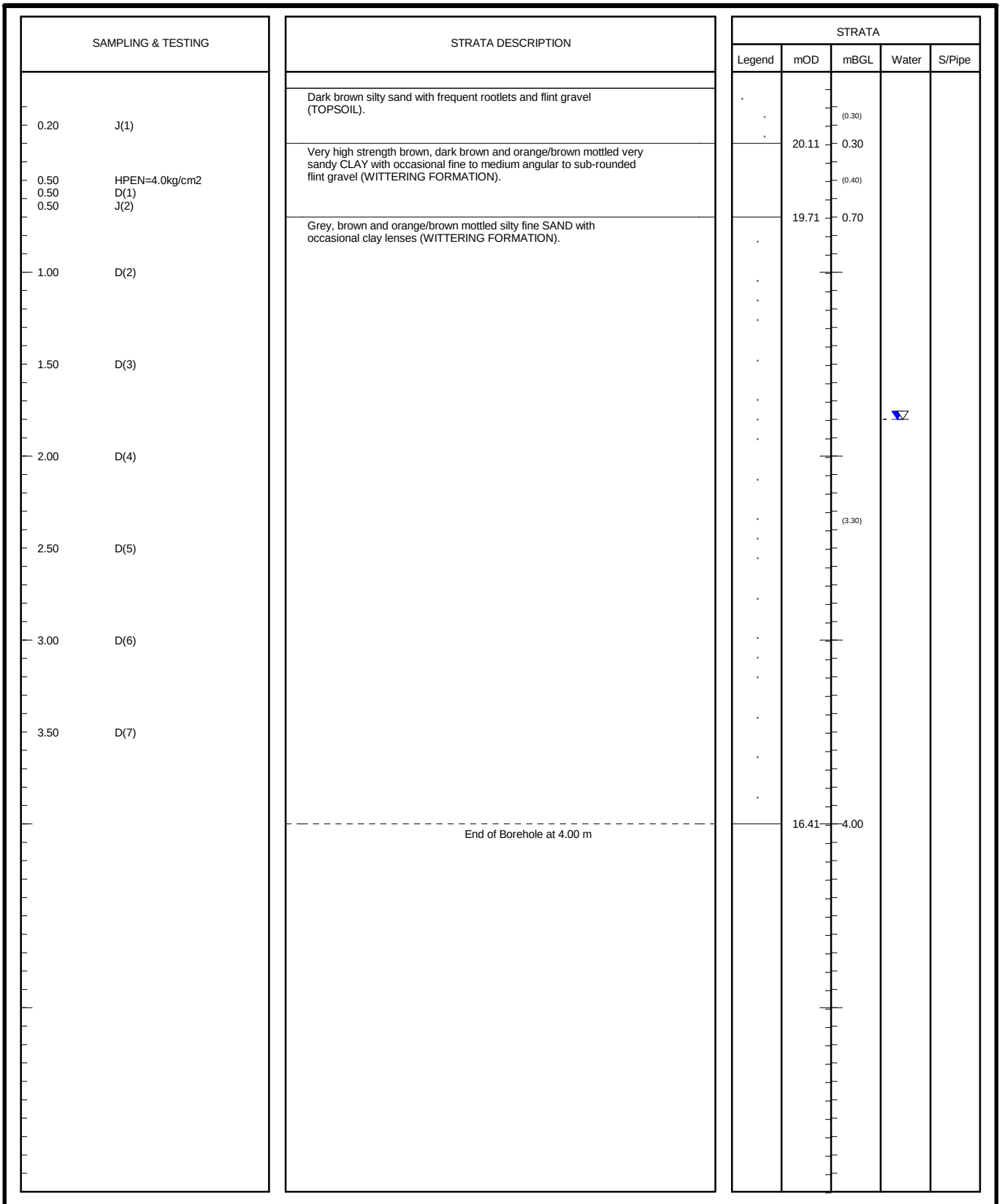
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS324
Groundwater: Strike at 3.00m; after 20mins no change.	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.269mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS325
Groundwater: Water seepage at 3.00m	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 24.976mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



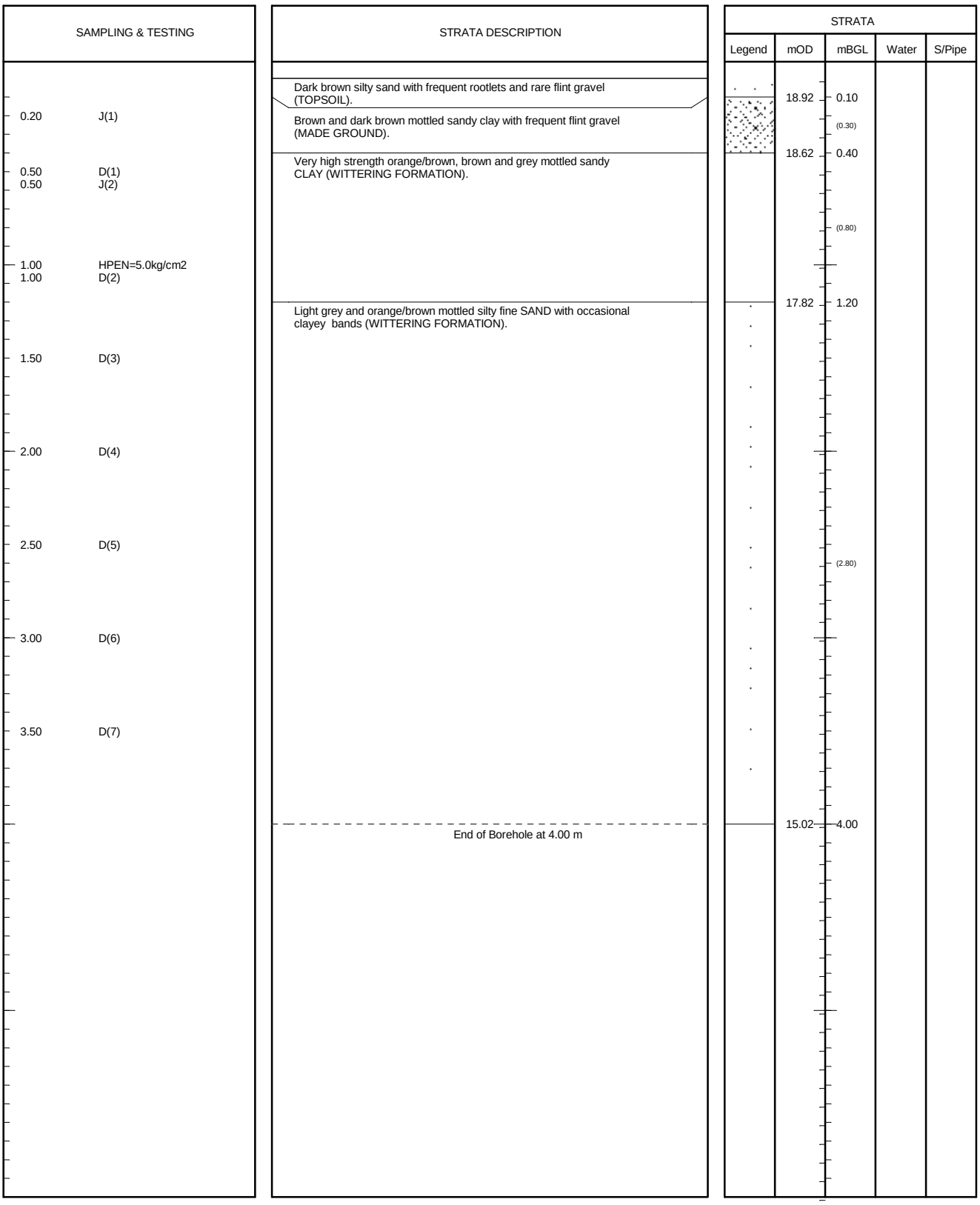
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS326
Groundwater: Strike at 1.80m; after 20mins no change.	Method: Archway	Start: 13/09/2013	Scale: 1:30
		Finish: 13/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.407mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown sandy clay with frequent rootlets and flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			18.40	0.30		
		High to very high strength dark brown, brown and orange/brown mottled sandy CLAY with occasional fine to medium angular flint gravel (WITTERING FORMATION).			(0.30)		
0.50	HPEN=3.0kg/cm2						
0.50	D(1)						
0.50	J(2)			18.10	0.60		
0.60	D(2)	High to very high strength orange/brown, brown and grey mottled sandy CLAY with abundant fine to coarse angular flint gravel (WITTERING FORMATION).					
					(0.60)		
1.00	HPEN=3.0kg/cm2						
1.00	D(3)						
		Orange/brown and grey mottled silty fine SAND with occasional clayey bands (WITTERING FORMATION).		17.50	1.20		
1.50	D(4)						
					(1.00)		
2.00	D(5)						
		Dark orange/brown, orange/brown and grey/brown mottled silty fine SAND with occasional clayey bands (WITTERING FORMATION).		16.50	2.20	▼	
2.50	D(6)						
3.00	D(7)						
					(1.80)		
3.50	D(8)						
		End of Borehole at 4.00 m		14.70	4.00		

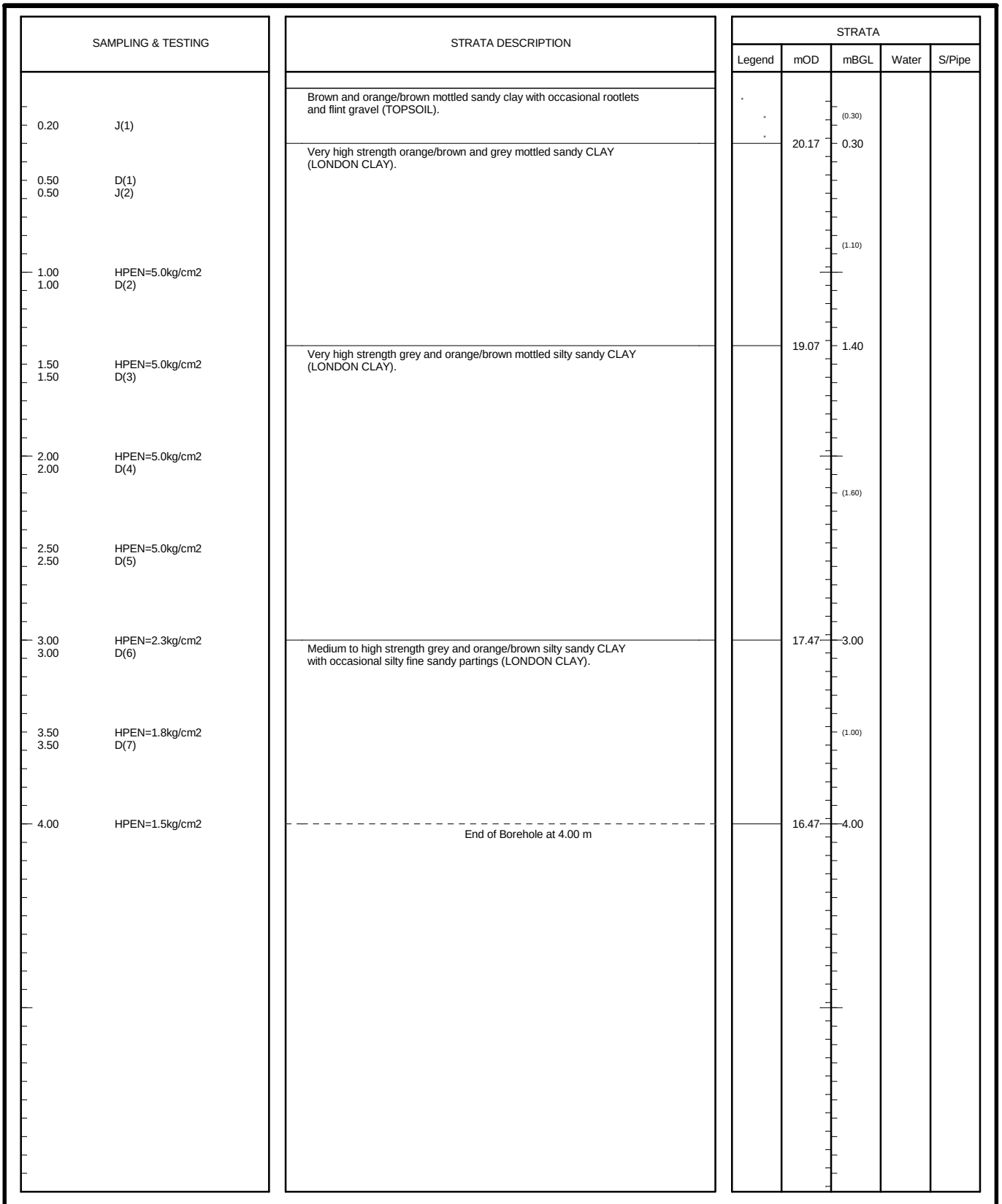
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS327
Groundwater: Strike at 2.20m; after 20mins no change.	Method: Archway	Start: 13/09/2001	Scale: 1:30
		Finish: 13/09/2001	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2001	Depth: 4.00mBGL
		Eng: JK	Level: 18.700mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



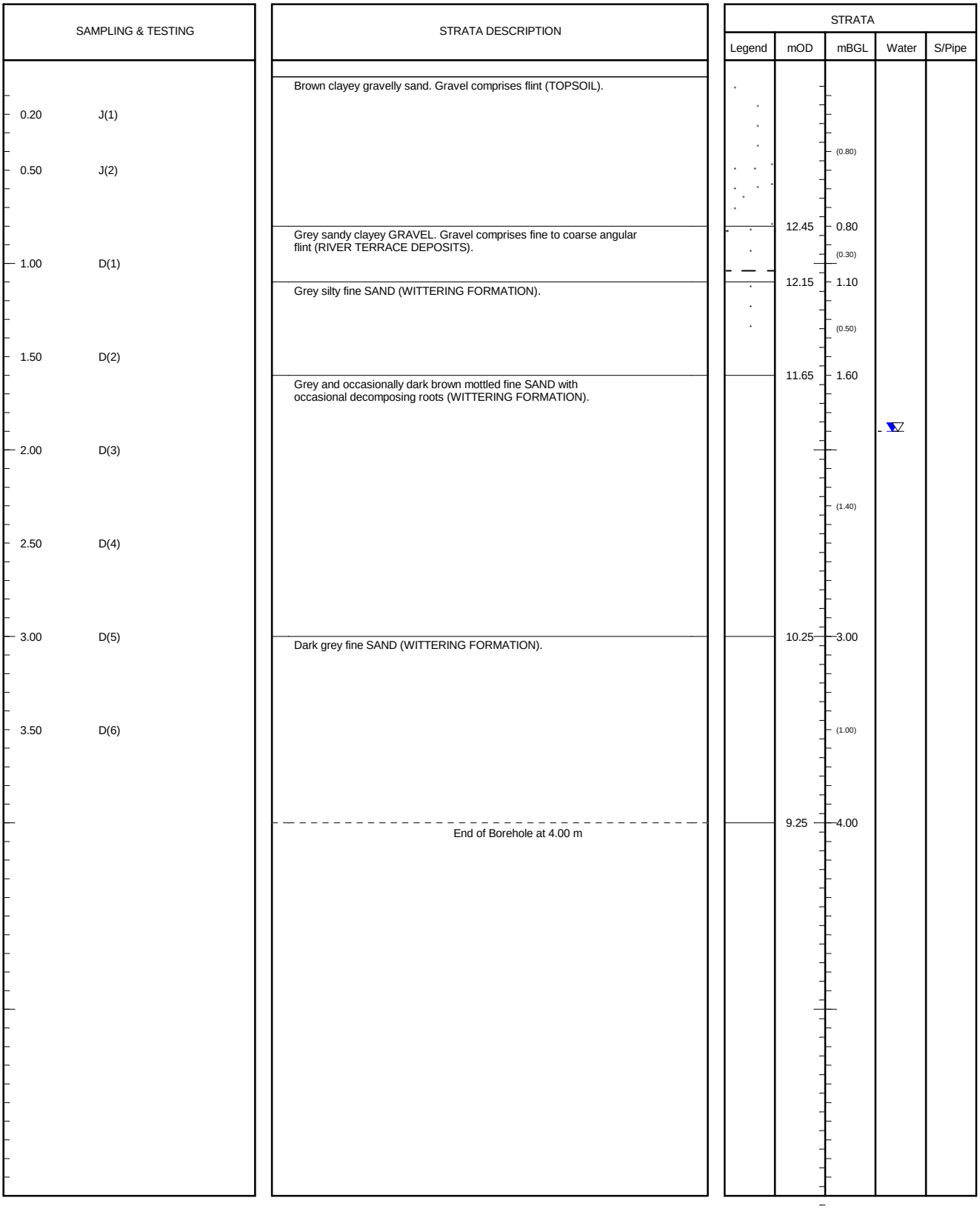
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS328
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.018mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS329
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.471mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



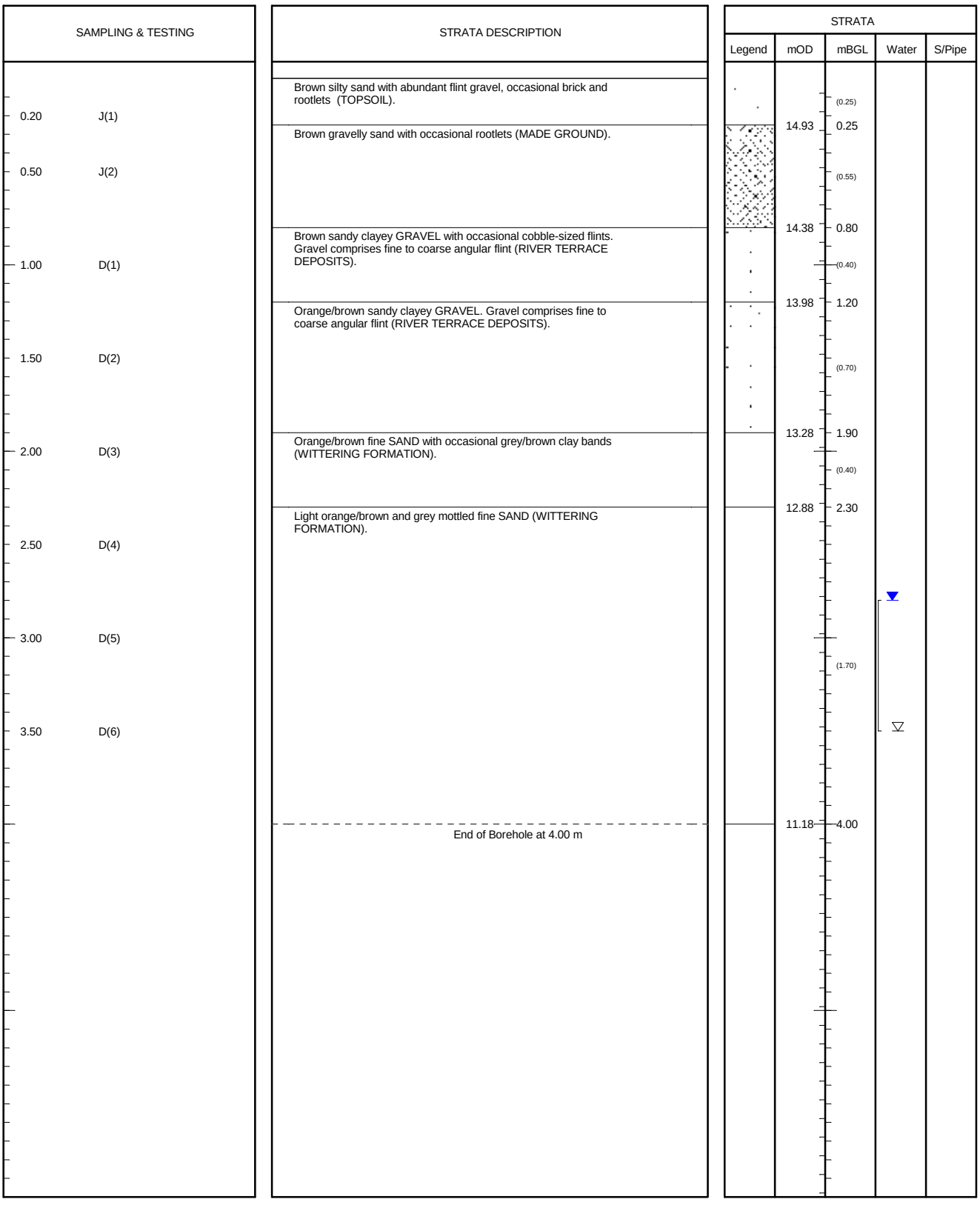
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.00m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS330
Groundwater: Strike at 1.90m; after 20mins no change.	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 13.250mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with abundant flint gravel and occasional rootlets (TOPSOIL).			(0.40)		
0.20	J(1)			15.43	0.40		
0.50	J(2)	Brown sandy flint gravel (MADE GROUND).			(0.45)		
		Brown sandy clayey GRAVEL. Gravel comprises fine to coarse angular flint (RIVER TERRACE DEPOSITS).		14.98	0.85		
1.00	D(1)						
1.50	D(2)				(1.00)		
		High strength orange/brown and grey mottled sandy CLAY with occasional fine to medium angular flint gravel (RIVER TERRACE DEPOSITS).		13.98	1.85		
2.00	D(3)				(0.25)		
		Brown fine SAND (WITTERING FORMATION).		13.73	2.10		
2.50	D(4)						
3.00	D(5)				(1.90)		
3.50	D(6)						
		End of Borehole at 4.00 m		11.83	4.00		

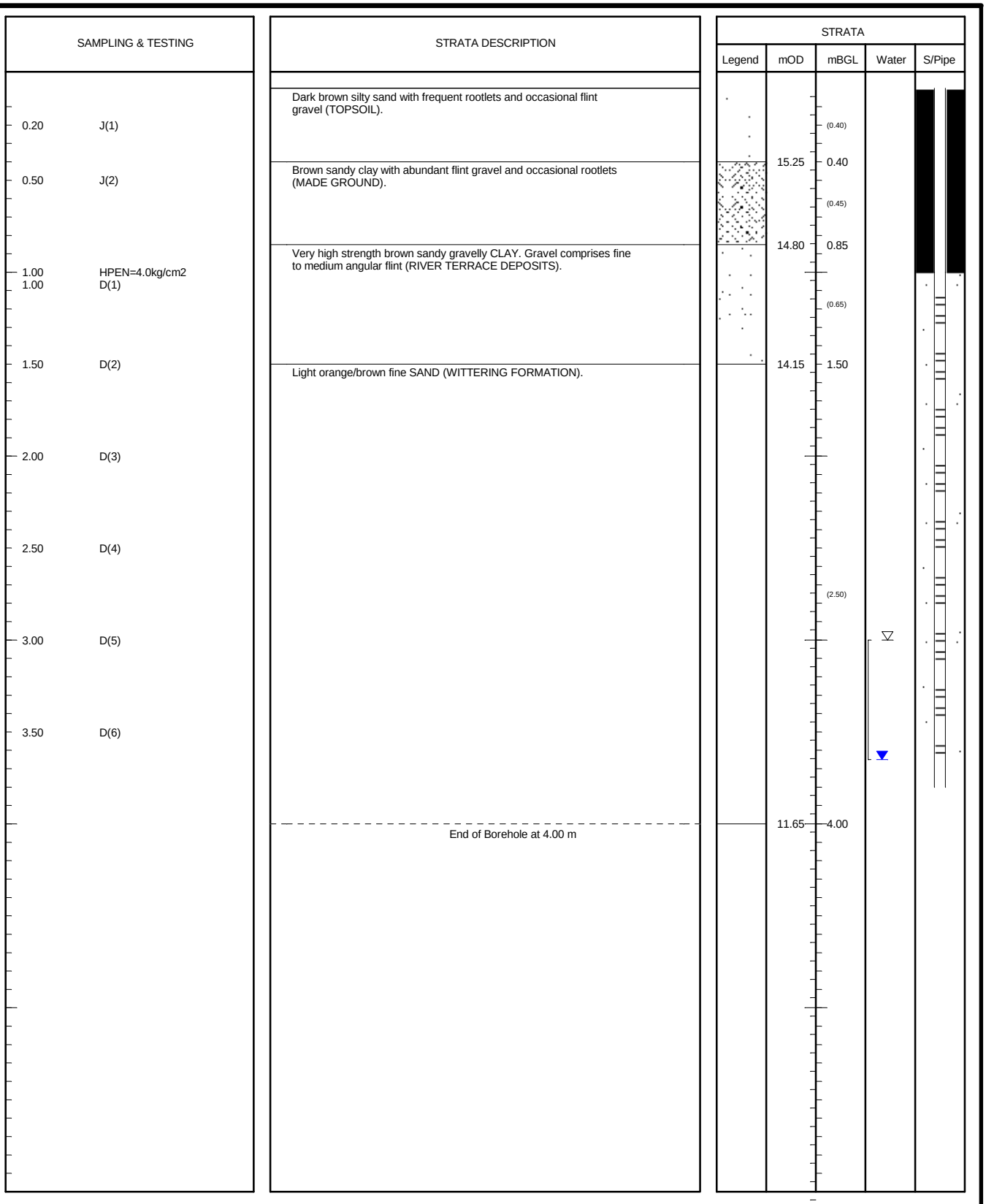
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.90m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS331
Groundwater: No Groundwater Encountered	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 15.834mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



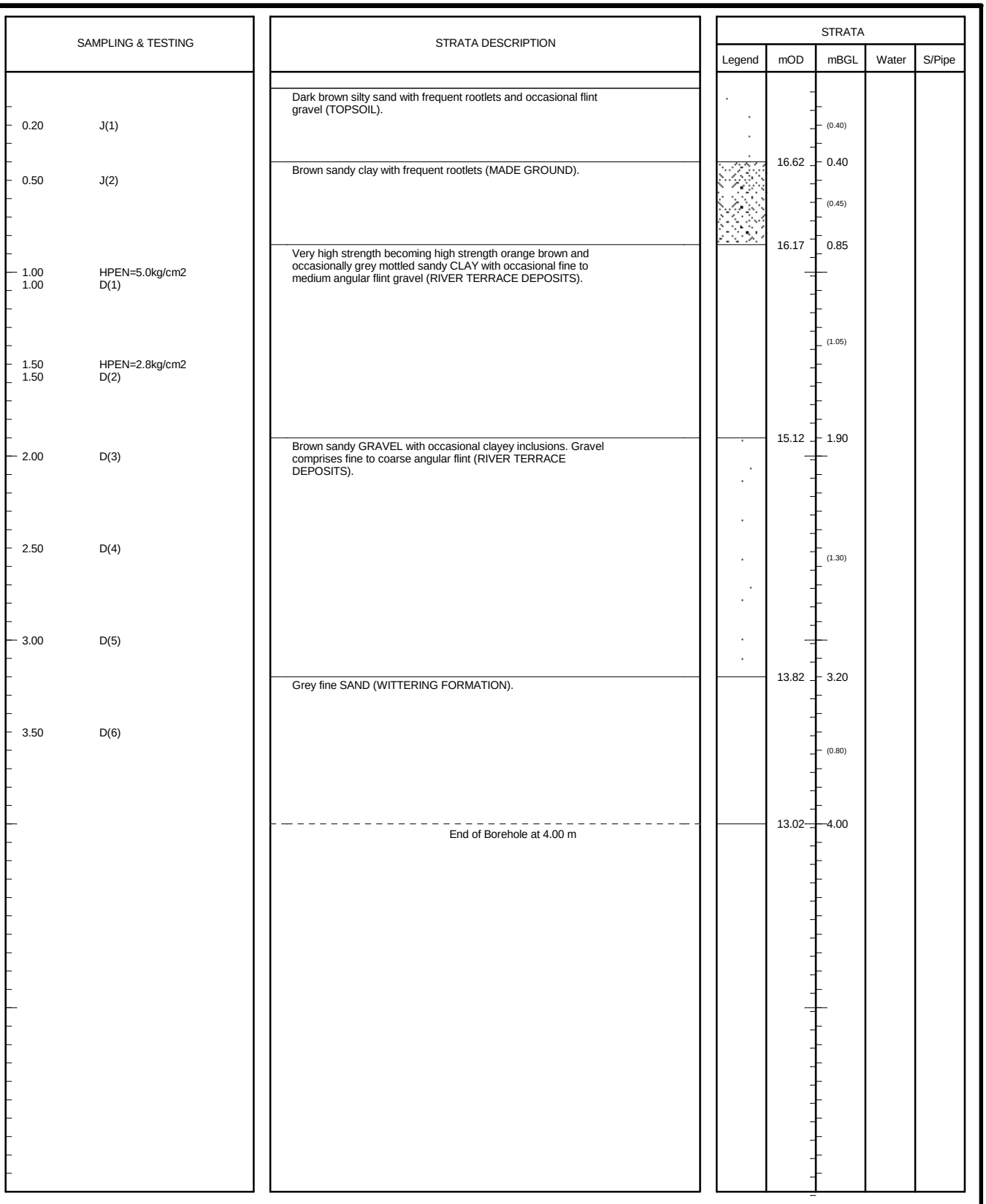
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.80m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS332
Groundwater: Strike at 3.50m; 2.80 after 20mins	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 15.179mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



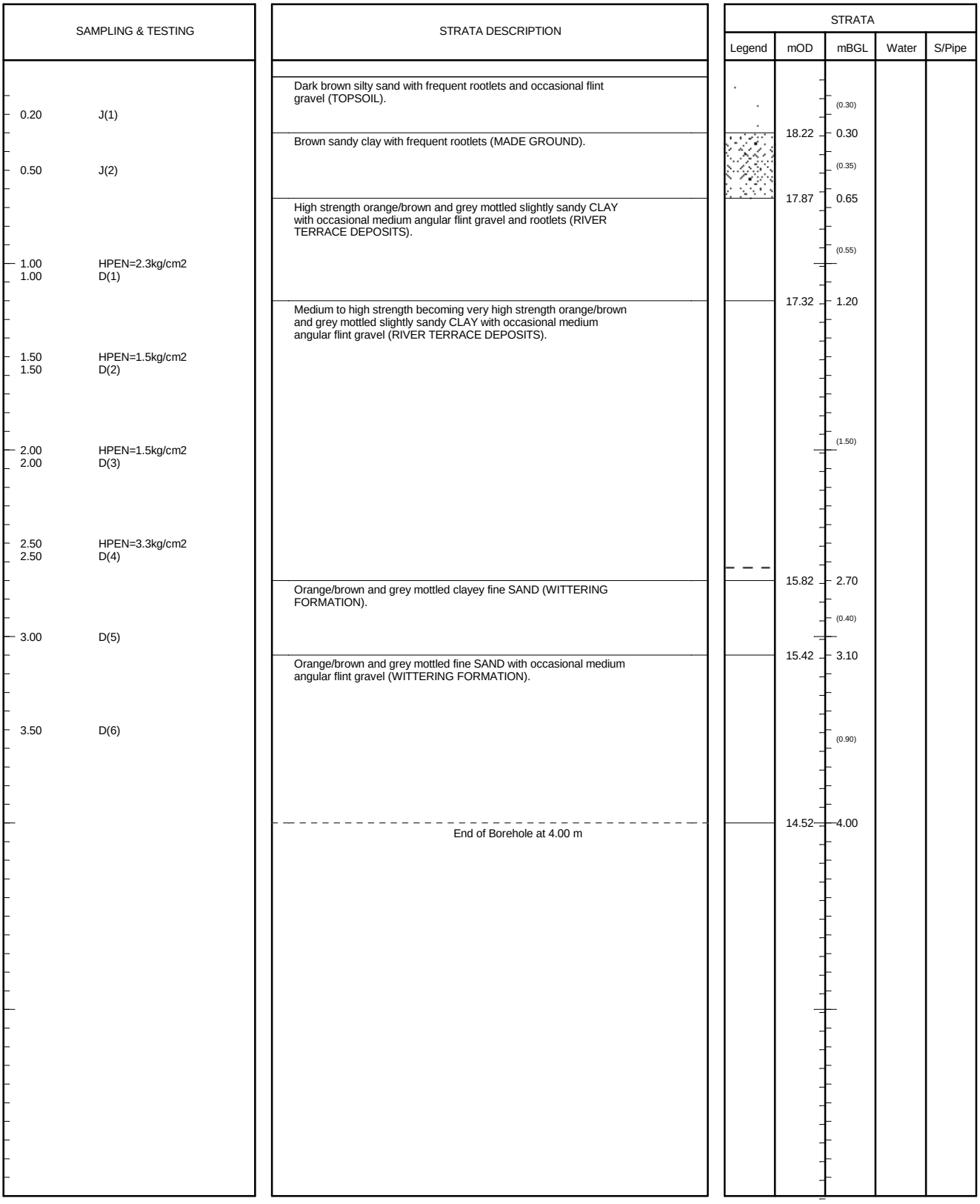
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS333
Groundwater: Strike at 3.00m; 3.65 after 20mins	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 15.645mOD
Remarks: Standpipe installed to 3.80m bgl	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS334
Groundwater: No Groundwater Encountered	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 17.020mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



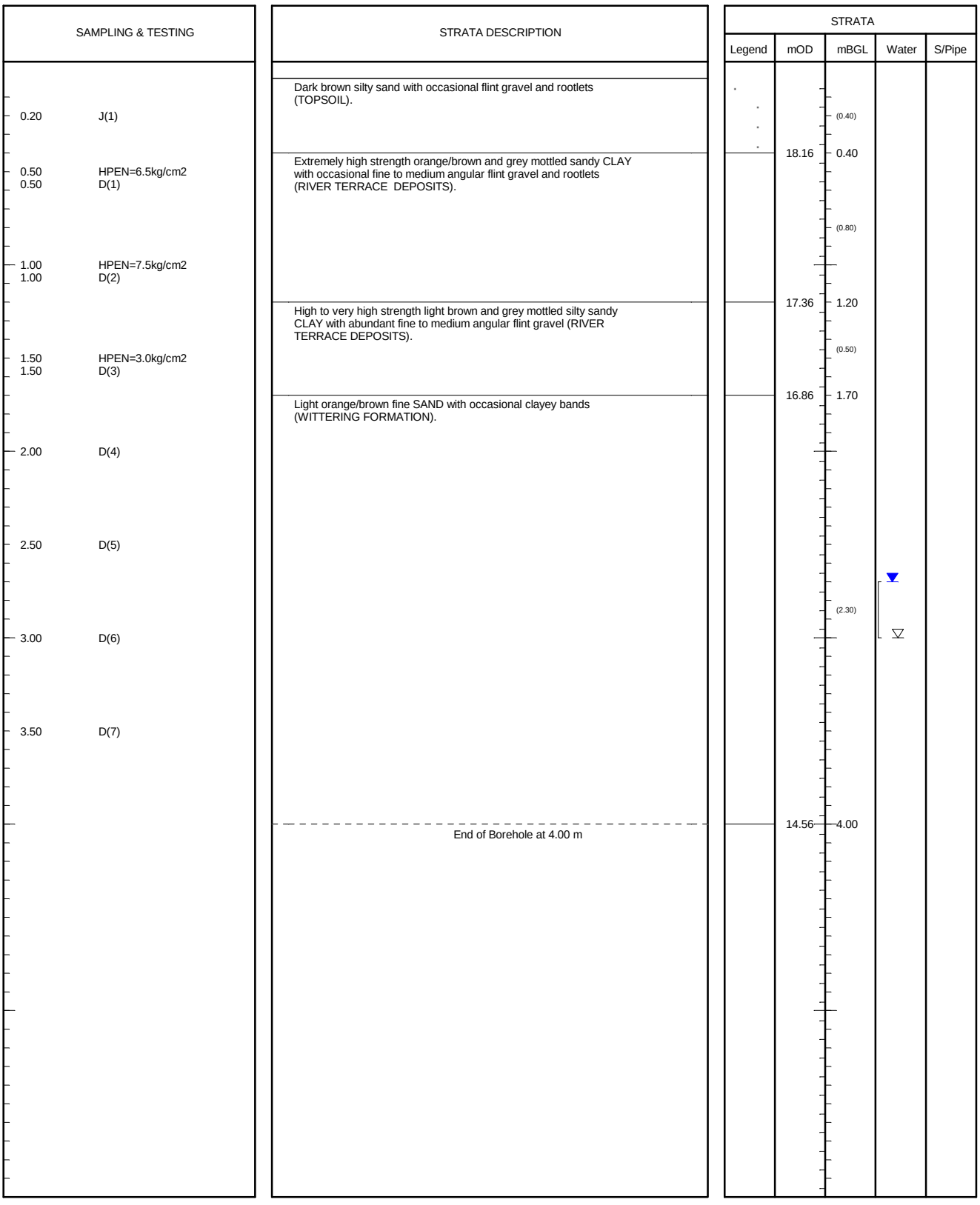
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS335
Groundwater: No Groundwater Encountered	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.516mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

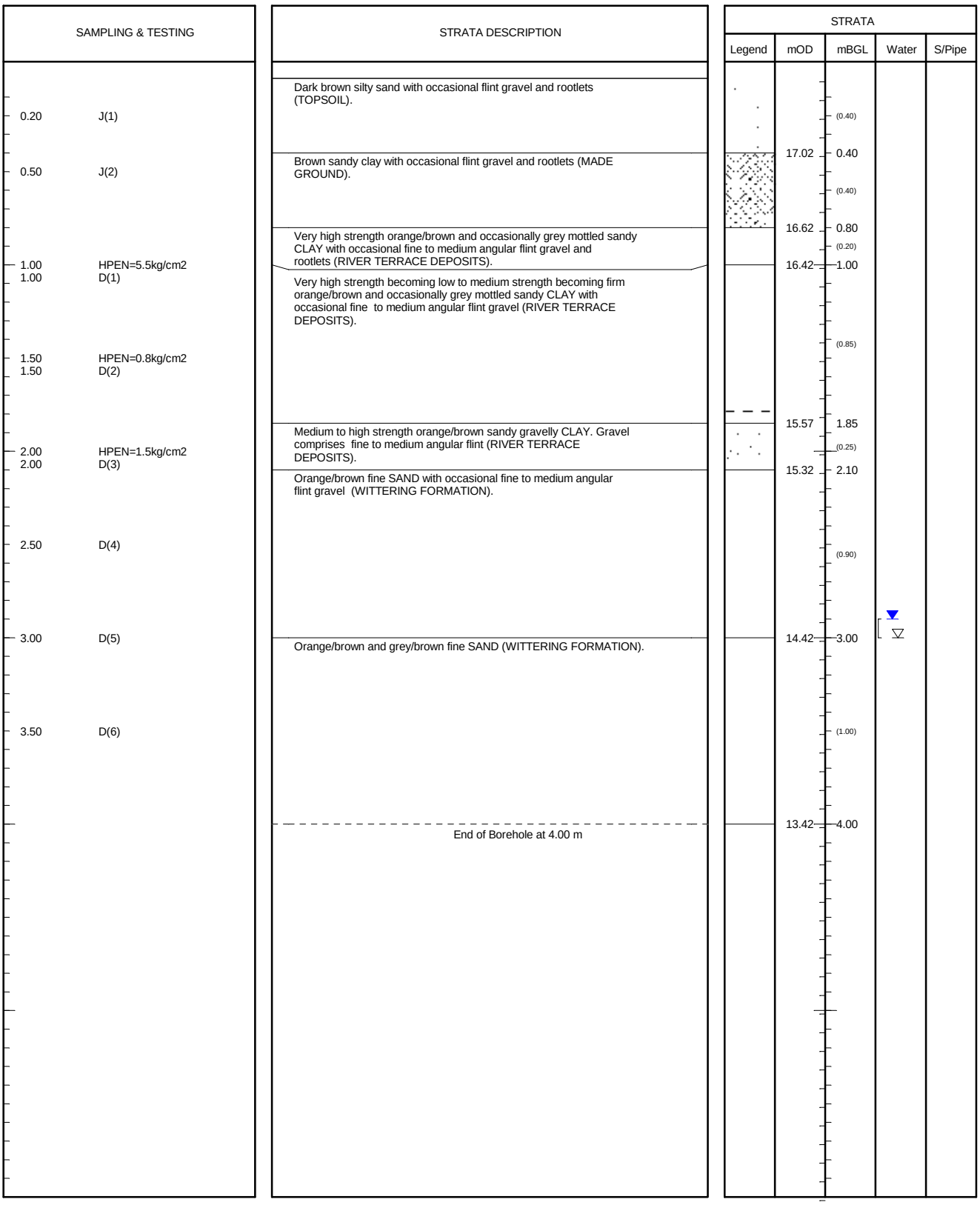
SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)						
0.30	J(2)			20.29	0.30		
0.30	J(3)	High to very high strength brown and dark brown mottled sandy friable CLAY (RIVER TERRACE DEPOSITS).			(0.20)		
0.50	D(1)			20.09	0.50		
		Very high strength orange/brown and grey mottled sandy CLAY with occasional fine ot coarse angular flint gravel (RIVER TERRACE DEPOSITS).			(0.70)		
1.00	HPEN=5.0kg/cm2						
1.00	D(2)						
		Light brown and occasioanlly orange/brown mottled silty fine SAND with occasional fine to medium angular flint gravel (WITTERING FORMATION).		19.39	1.20		
1.50	D(3)						
2.00	D(4)				(1.80)		
2.50	D(5)						
3.00	D(6)	Orange/brown, light grey and brown mottled silty fine to medium SAND with occasional fine to coarse angular flint gravel (WITTERING FORMATION).		17.59	3.00		
3.50	D(7)				(1.00)		
		End of Borehole at 4.00 m		16.59	4.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS336
Groundwater: No Groundwater Encountered	Method: Archway	Start: 11/09/2013	Scale: 1:30
		Finish: 11/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 11/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.589mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

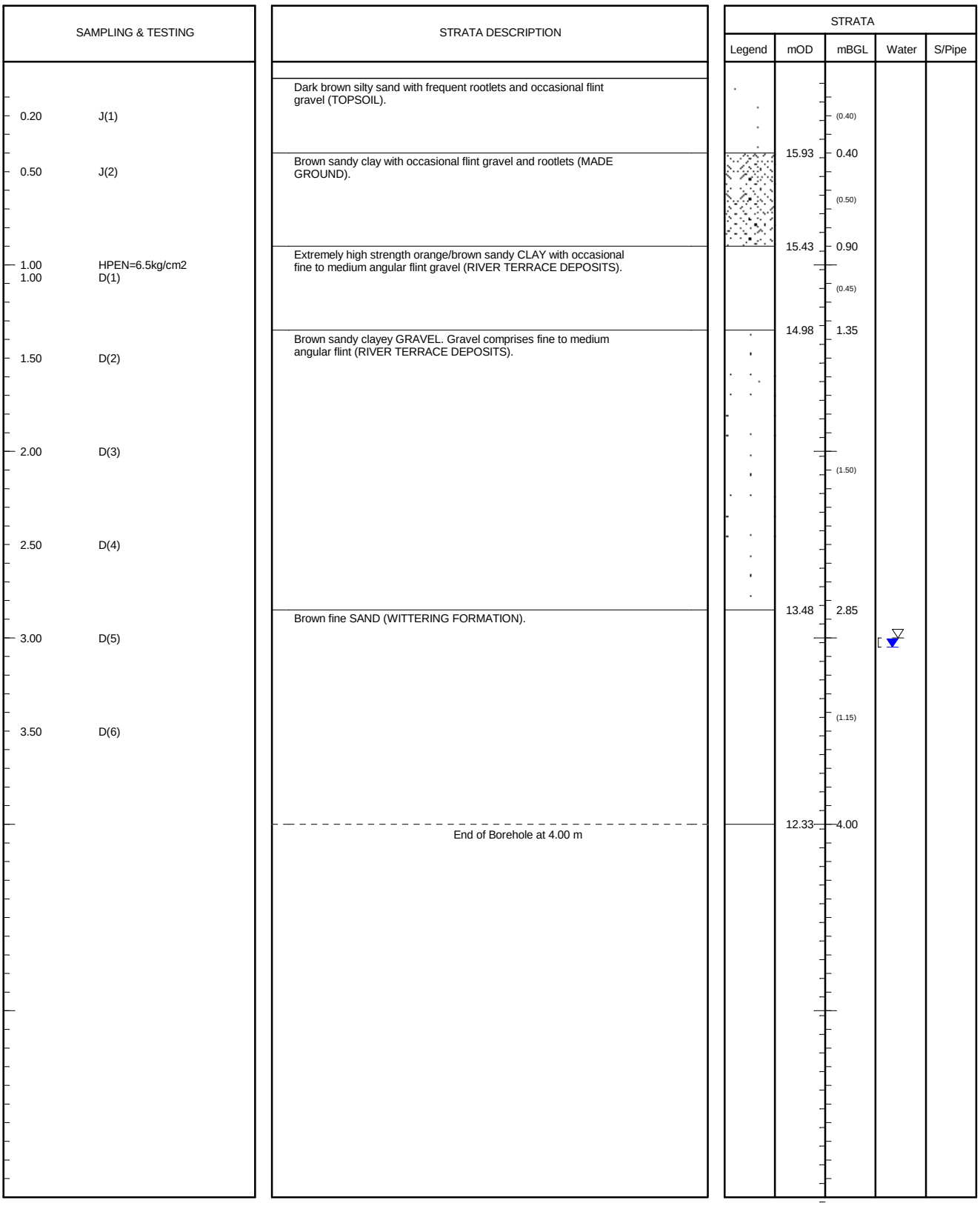


Stability: Borehole collapsed to 2.90m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS337
Groundwater: Strike at 3.00m; 2.70 after 20mins	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.555mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



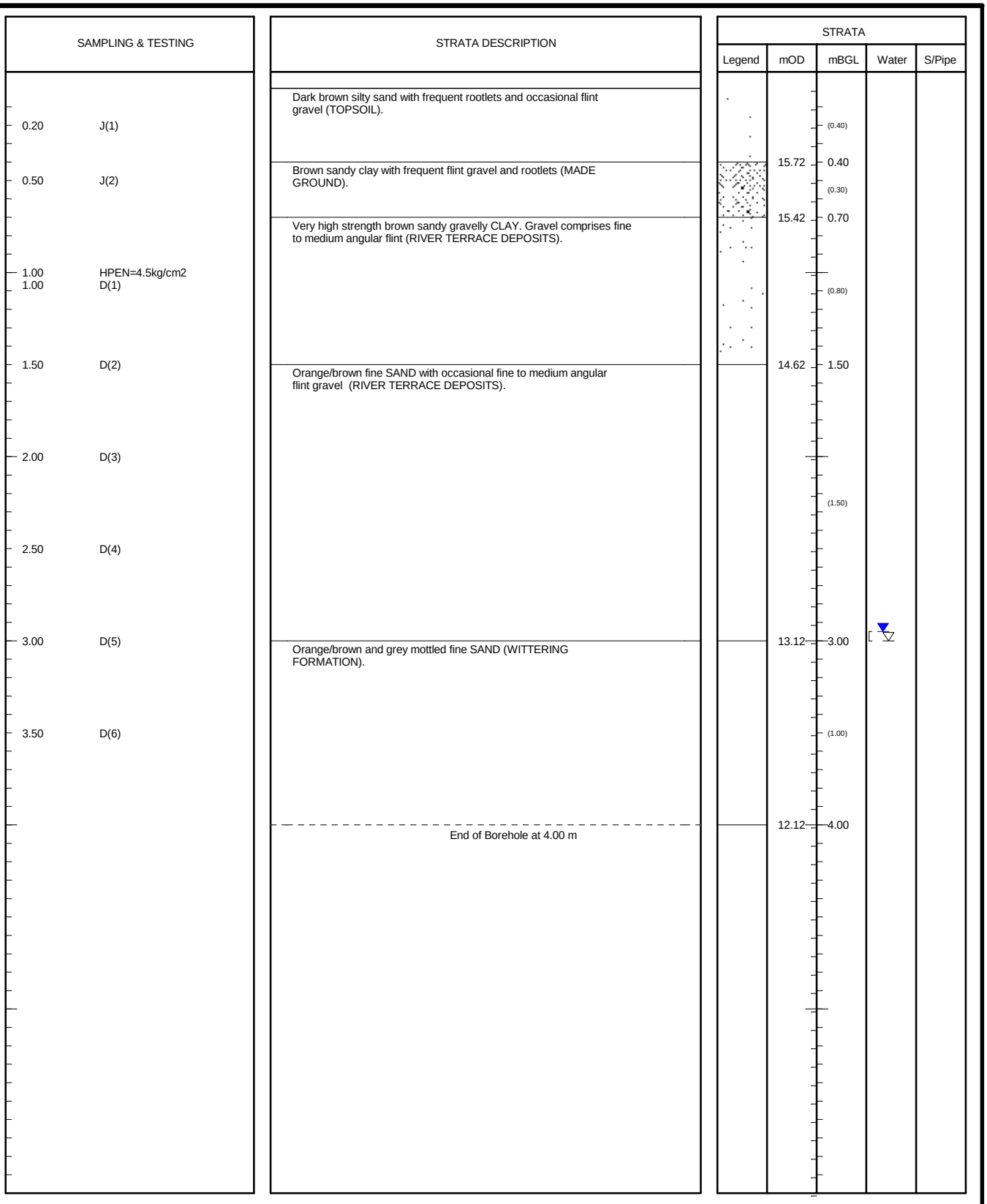
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.90m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS338
Groundwater: Strike at 3.00m; 2.90 after 20mins	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 17.419mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.30m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS339
Groundwater: Strike at 3.00m; 3.05 after 20mins	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 16.326mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



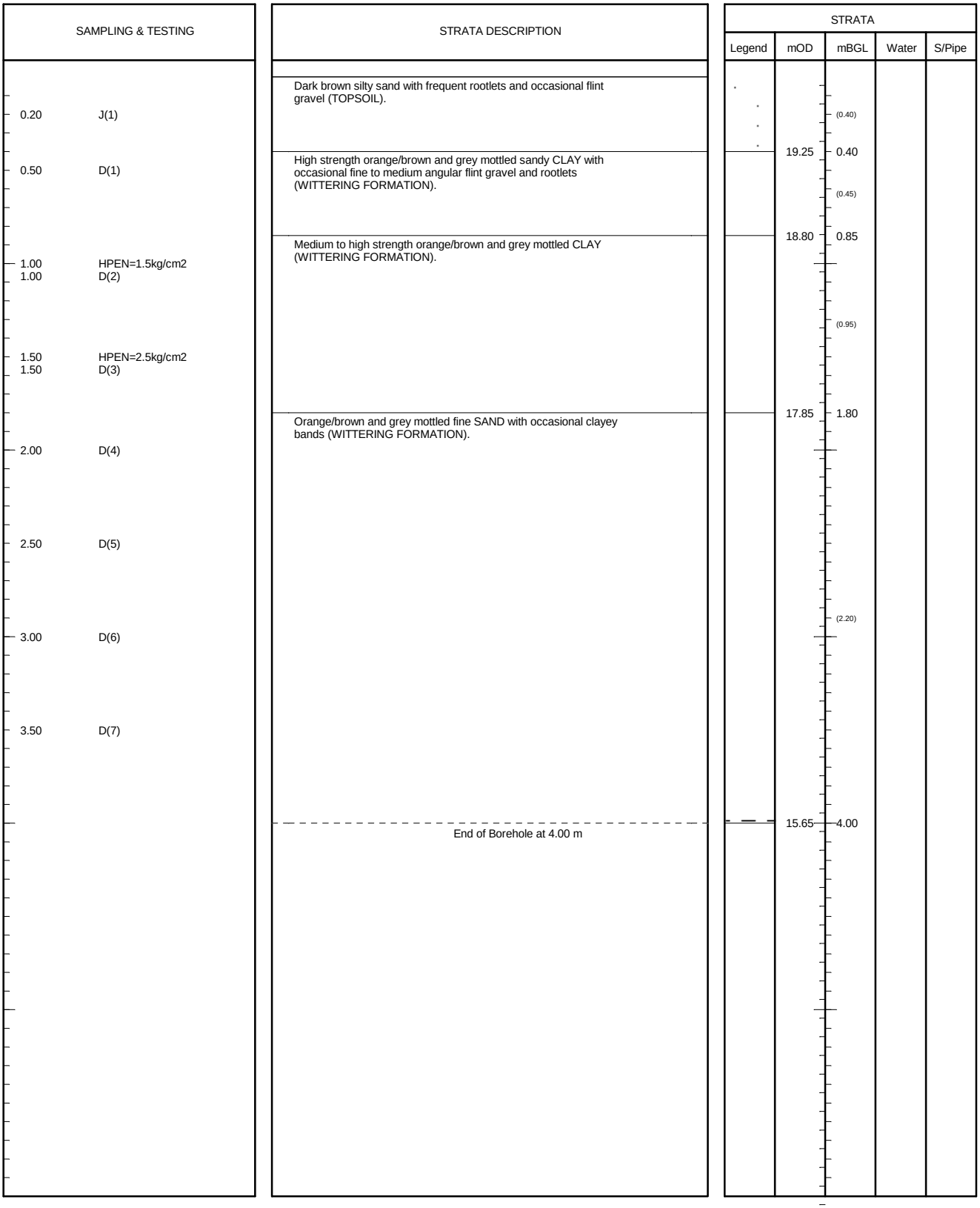
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.95m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS340
Groundwater: Strike at 3.00m; 2.95 after 20mins	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 16.116mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			18.41	0.30		
		Dark brown fine sand with abundant flint gravel (MADE GROUND).			(0.30)		
0.50	J(2)			18.11	0.60		
		Extremely high strength orange/brown and grey mottled sandy CLAY with occasional fine to medium angular flint gravel and roots (5mm) (RIVER TERRACE DEPOSITS).			(1.00)		
1.00	HPEN=7.8kg/cm2						
1.00	() D(1)						
1.50	HPEN=7.0kg/cm2						
1.50	D(2)			17.11	1.60		
		Light orange/brown fine SAND (WITTERING FORMATION).					
2.00	D(3)				(1.50)		
2.50	D(4)						
3.00	D(5)			15.61	3.10		
		End of Borehole at 3.10 m					
3.50	D(6)						

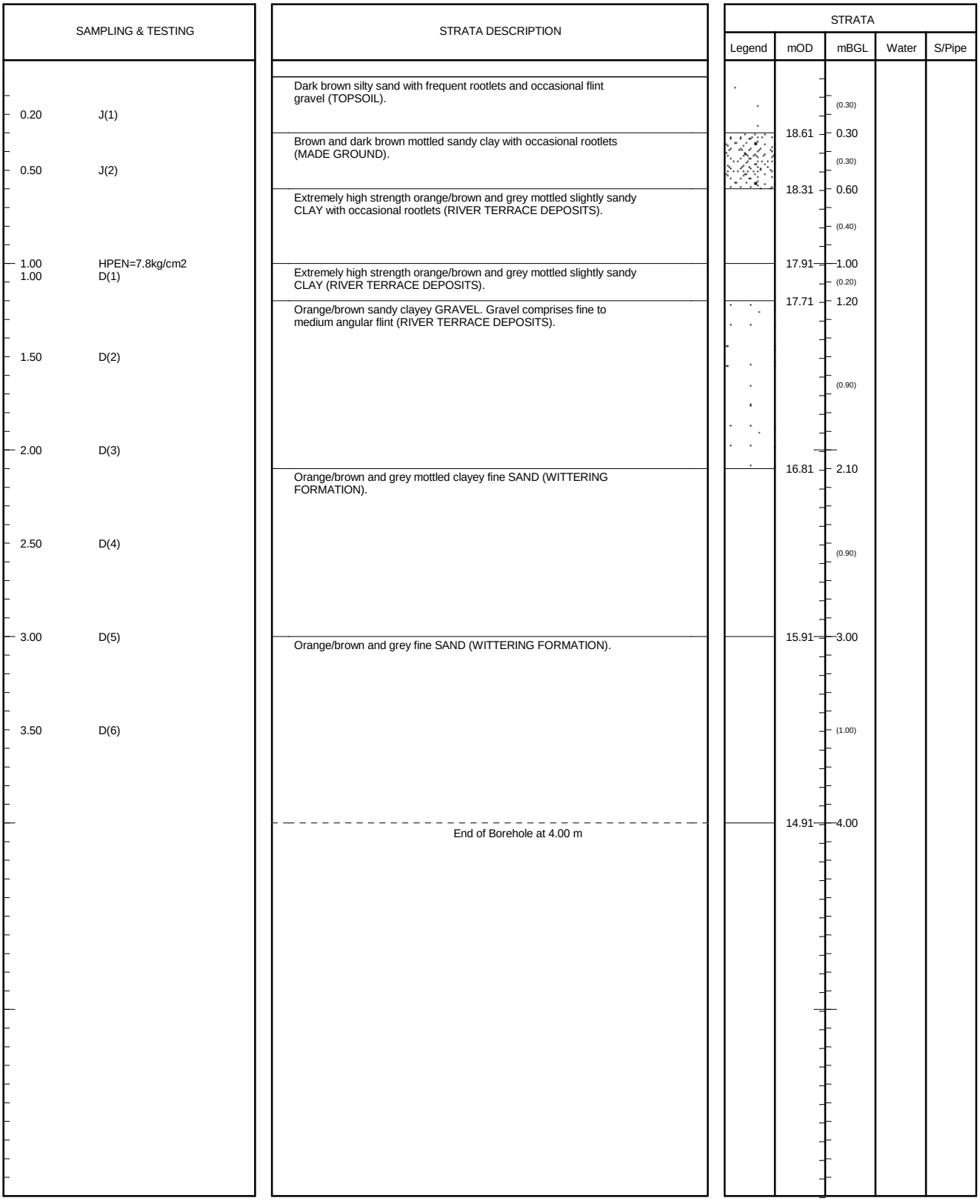
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS341
Groundwater: No Groundwater Encountered	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 3.10mBGL
		Eng: JK	Level: 18.705mOD
Remarks: Refused on dense sand at 3.10m	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



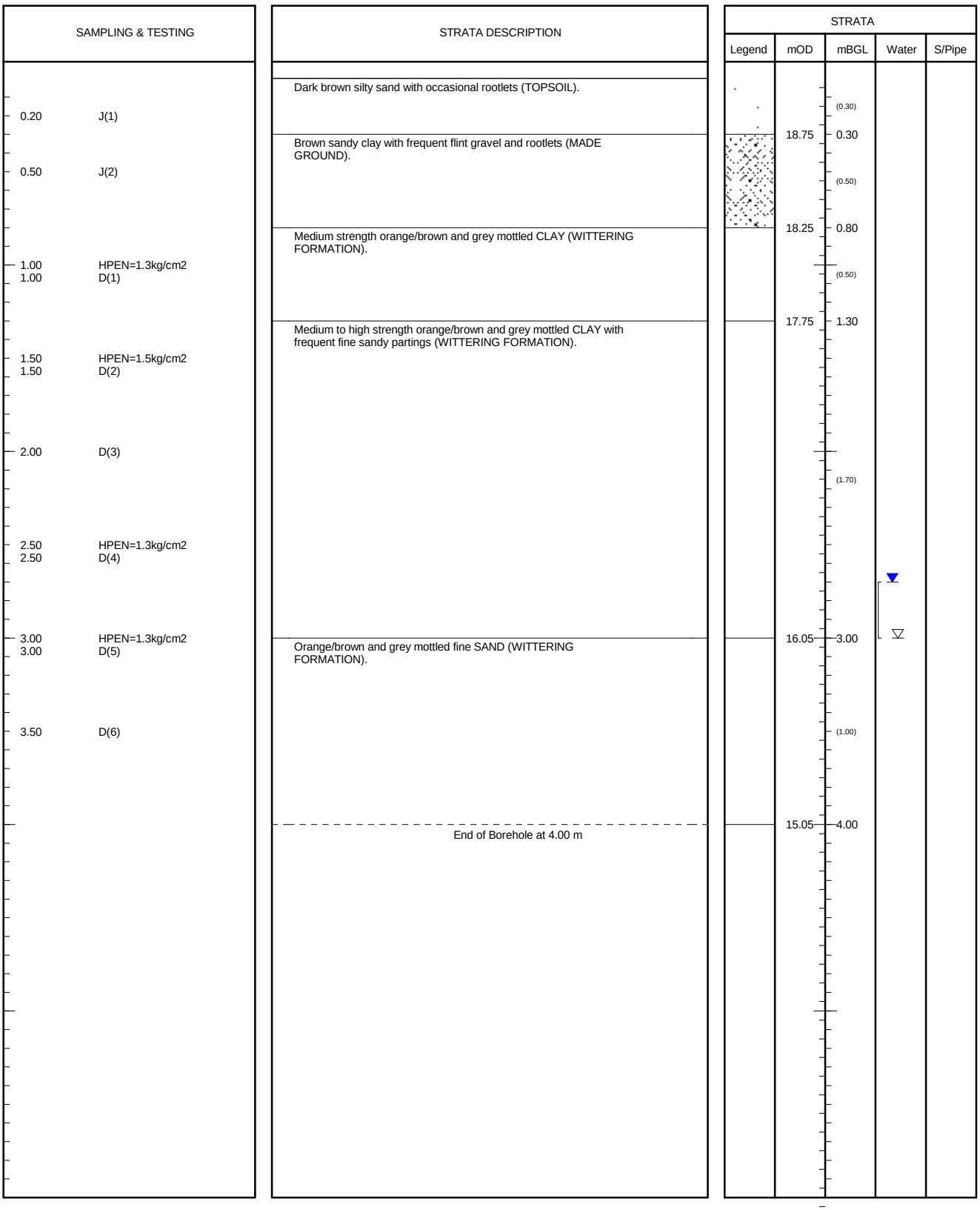
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS342
Groundwater: No Groundwater Encountered	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.645mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



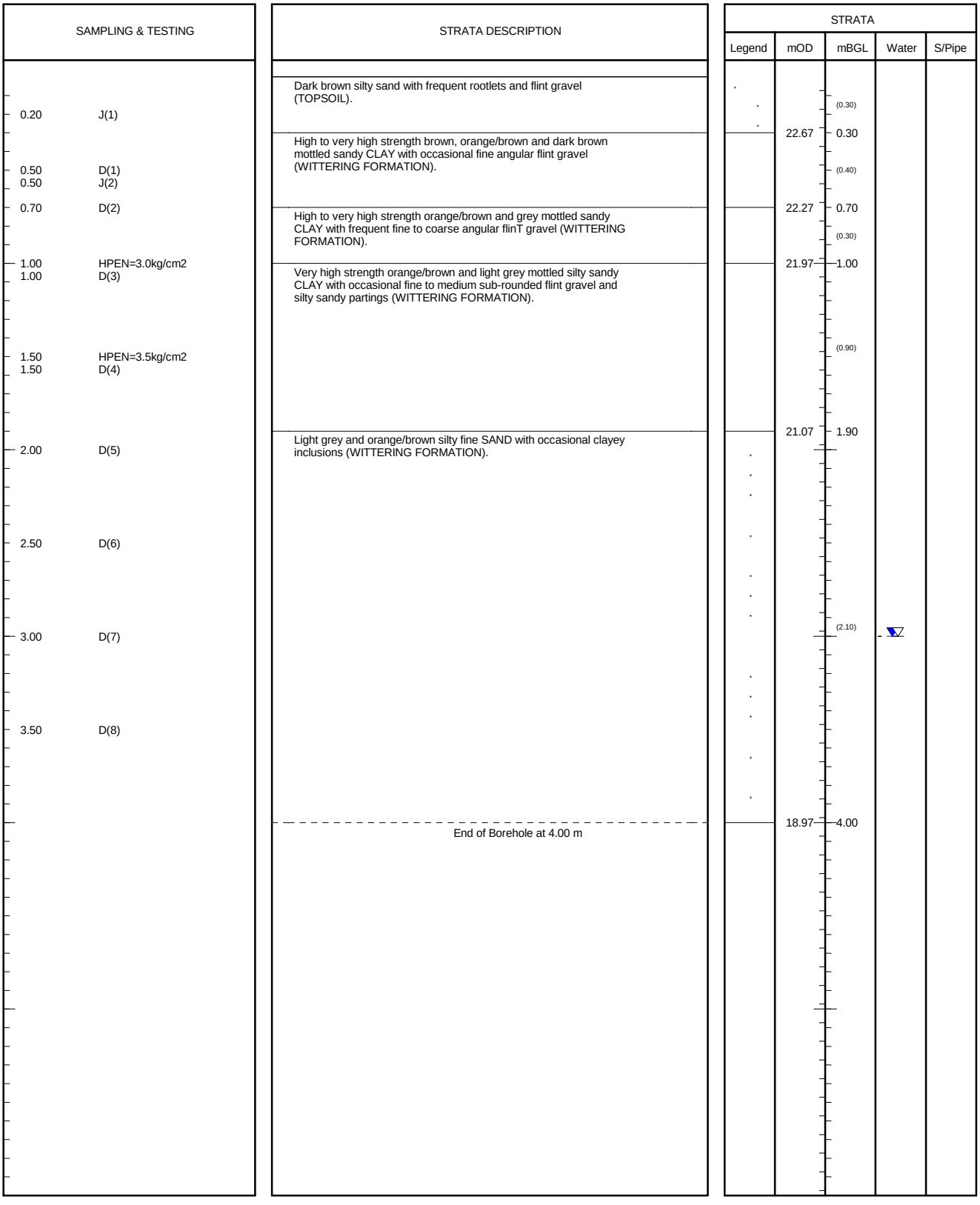
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.20m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS343
Groundwater: No Groundwater Encountered	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.909mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.70m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS344
Groundwater: Strike at 3.00m; 2.70 after 20mins	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.049mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS345
Groundwater: Strike at 3.00m; after 20mins no change.	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 22.973mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with frequent rootlets and flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			21.17	0.30		
		Very high strength brown and dark brown mottled sandy CLAY with occasional fine to medium angular flint gravel (WITTERING FORMATION).			(0.60)		
0.50	HPEN=4.0kg/cm2						
0.50	D(1)						
0.50	J(2)			20.57	0.90		
		Very high strength brown, orange/brown and grey mottled sandy gravelly CLAY. Gravel comprises fine to coarse angular flint (WITTERING FORMATION).			(0.30)		
1.00	HPEN=3.5kg/cm2						
1.00	D(2)			20.27	1.20		
		Orange/brown, brown and grey mottled silty fine SAND with occasional clayey bands (WITTERING FORMATION).					
1.50	D(3)						
2.00	D(4)						
2.50	D(5)				(2.80)		
3.00	D(6)						
3.50	D(7)						
		End of Borehole at 4.00 m		17.47	4.00		

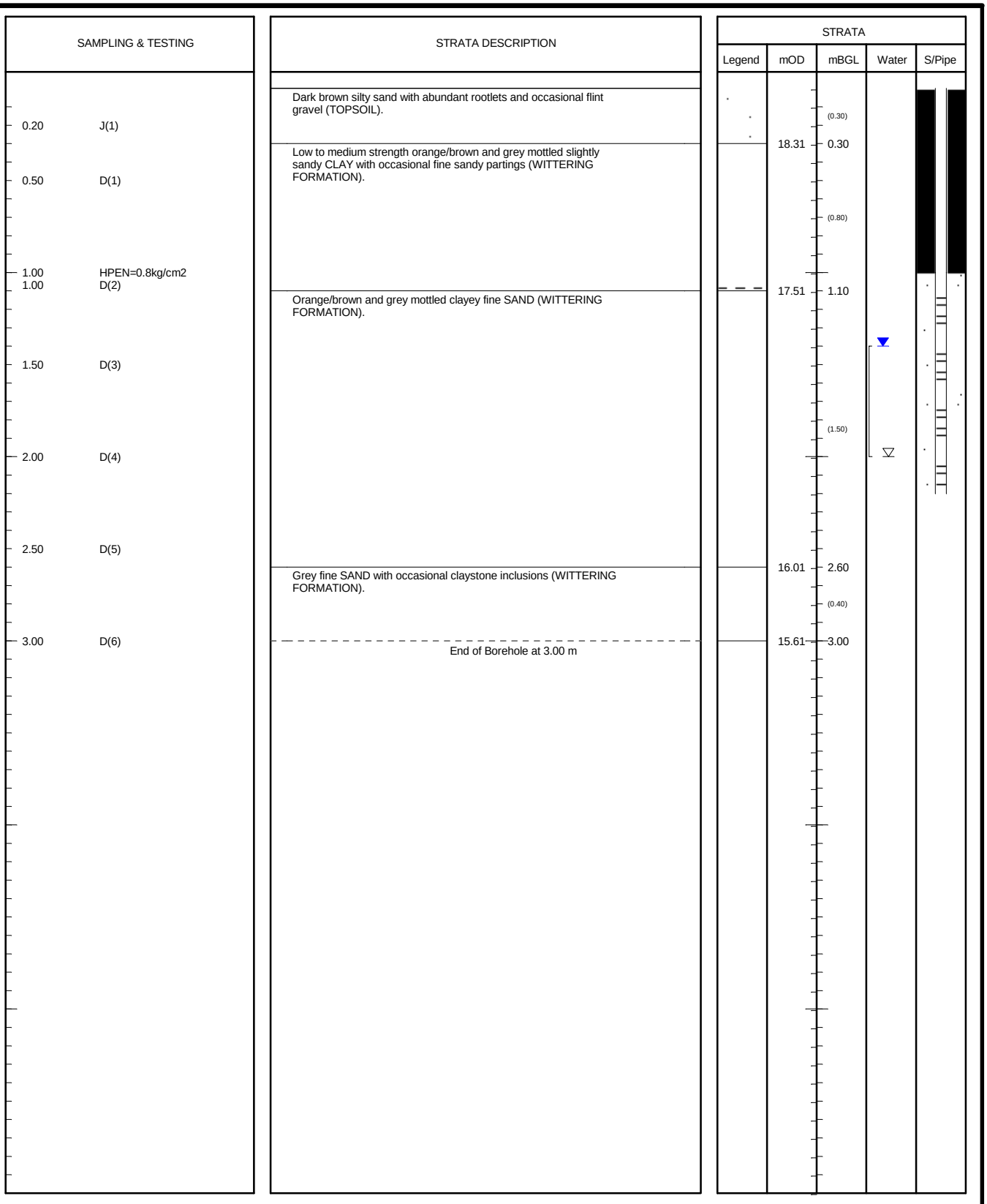
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS346
Groundwater: Strike at 2.00m; after 20mins no change.	Method: Archway	Start: 13/09/2013	Scale: 1:30
		Finish: 13/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.467mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with abundant rootlets and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	J(1)			20.61	0.30		
		Very high strength brown and dark brown mottled sandy CLAY with occasional fine to medium angular flint gravel (WITTERING FORMATION).			(0.50)		
0.50	HPEN=4.0kg/cm2						
0.50	D(1)						
0.50	J(2)			20.11	0.80		
		Light grey, brown and orange/brown mottled silty fine SAND with occasional clayey bands (WITTERING FORMATION).					
1.00	D(2)				(1.00)		
1.50	D(3)					▽	
		Grey and brown mottled silty fine SAND with occasional clayey inclusions (WITTERING FORMATION).		19.11	1.80		
2.00	D(4)						
					(1.20)		
2.50	D(5)						
		End of Borehole at 3.00 m		17.91	3.00		

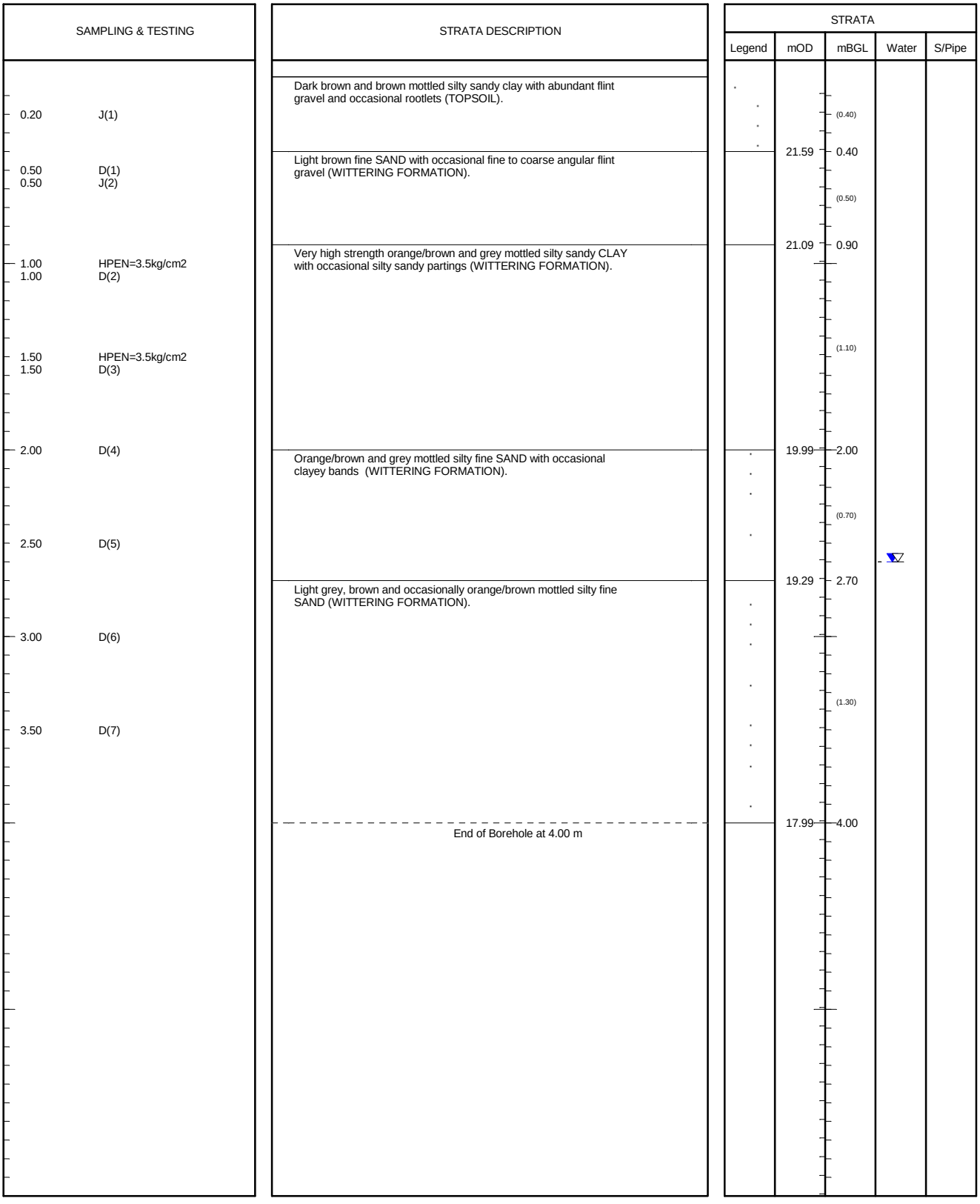
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 1.70m at 3.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS347
Groundwater: Strike at 1.50m; after 20mins no change.	Method: Archway	Start: 13/09/2013	Scale: 1:30
		Finish: 13/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 20.905mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



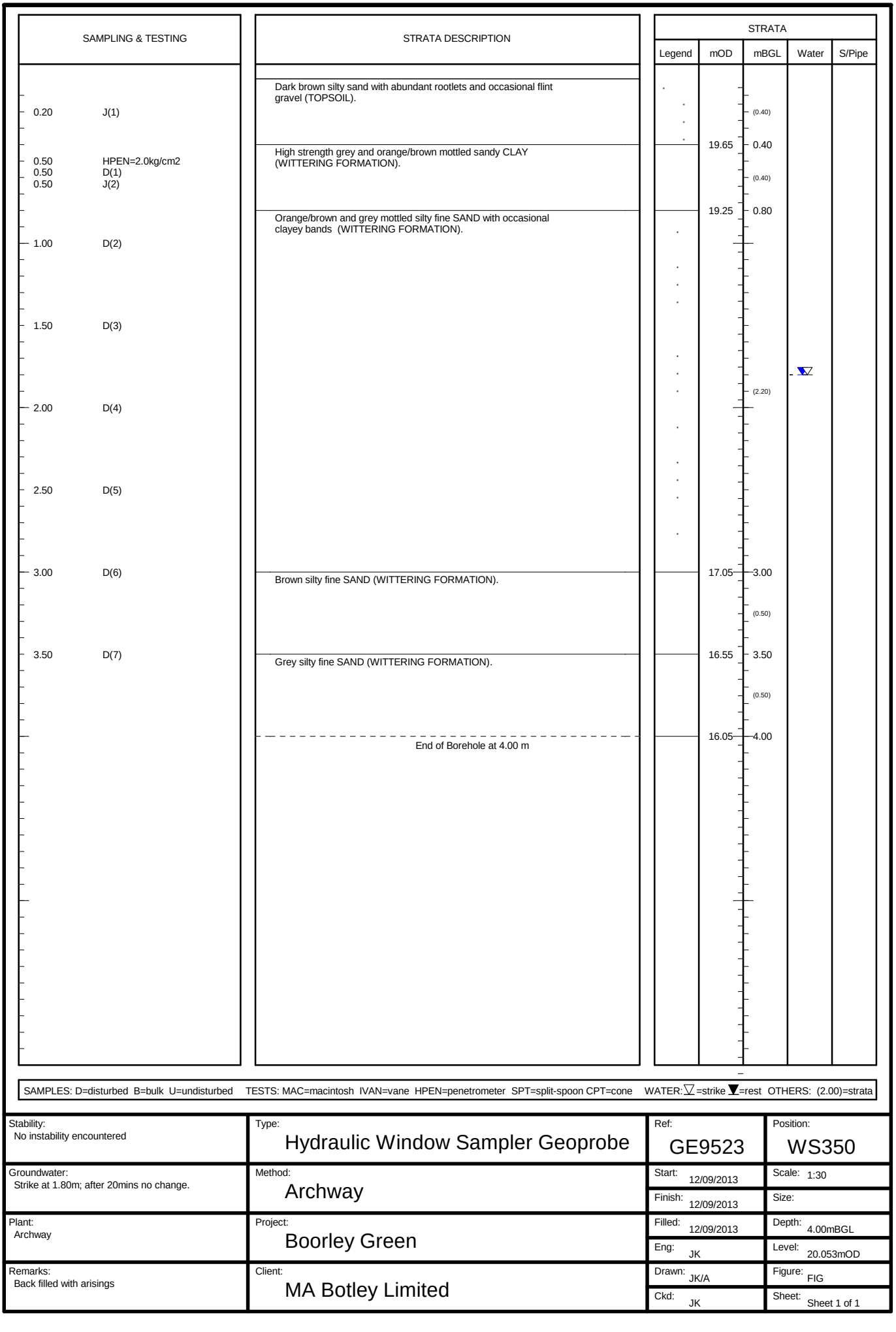
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.20m at 3.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS348
Groundwater: Strike at 2.00m; 1.40 after 20mins	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 18.608mOD
Remarks: Standpipe installed to 2.20m bgl	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

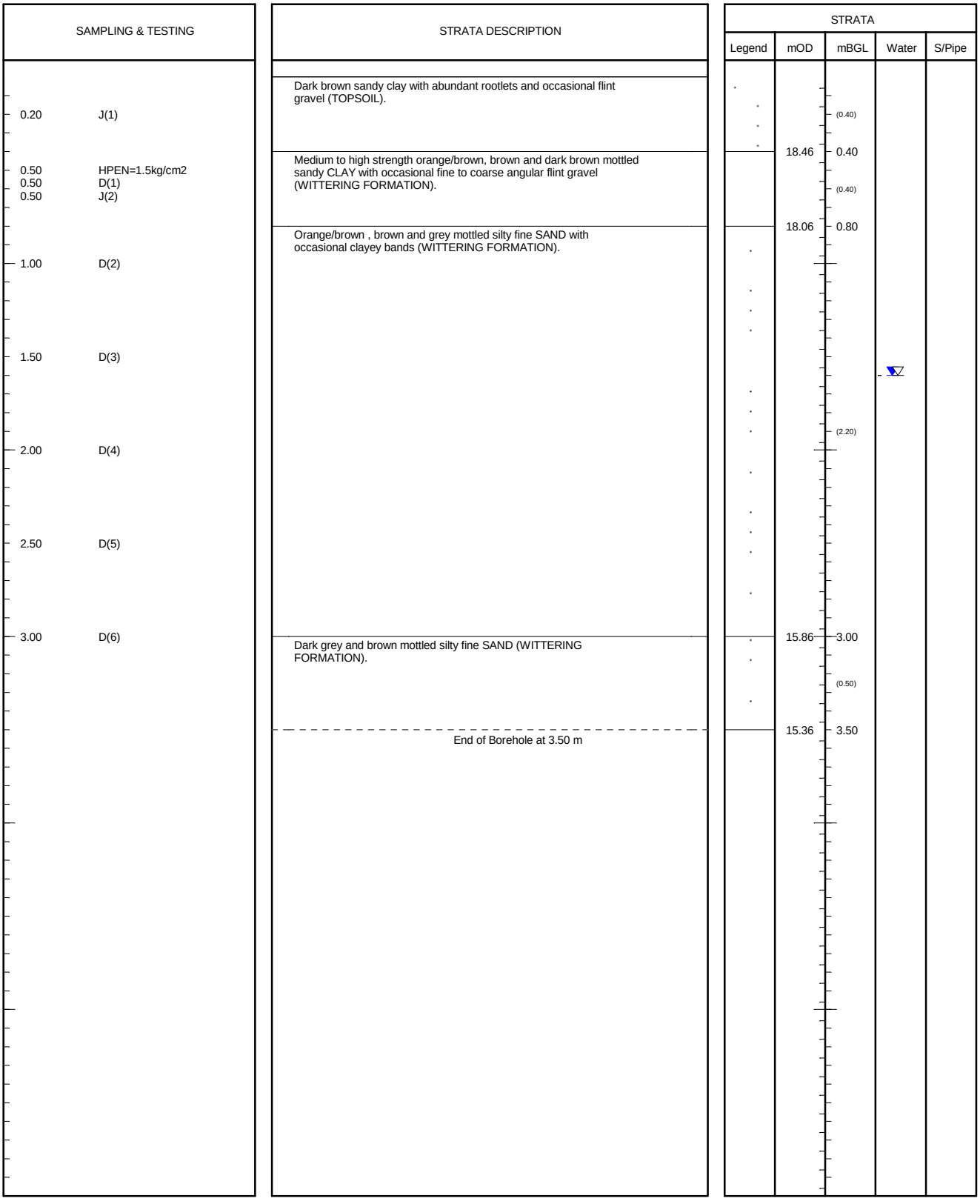


SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

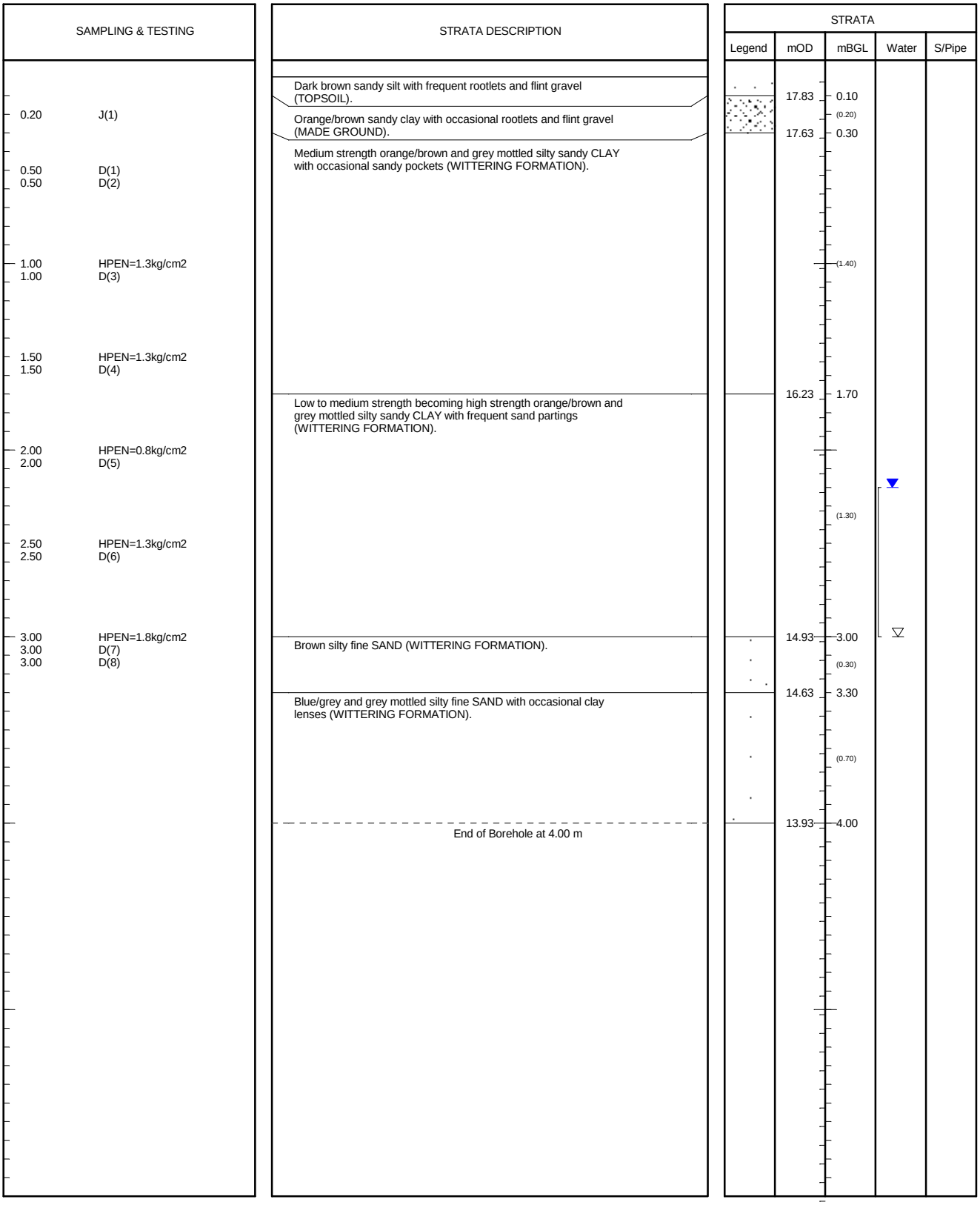
Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS349
Groundwater: Strike at 2.60m; after 20mins no change.	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 21.989mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS350
Groundwater: Strike at 1.80m; after 20mins no change.	Method: Archway	Start: 12/09/2013	Scale: 1:30
		Finish: 12/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 12/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 20.053mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

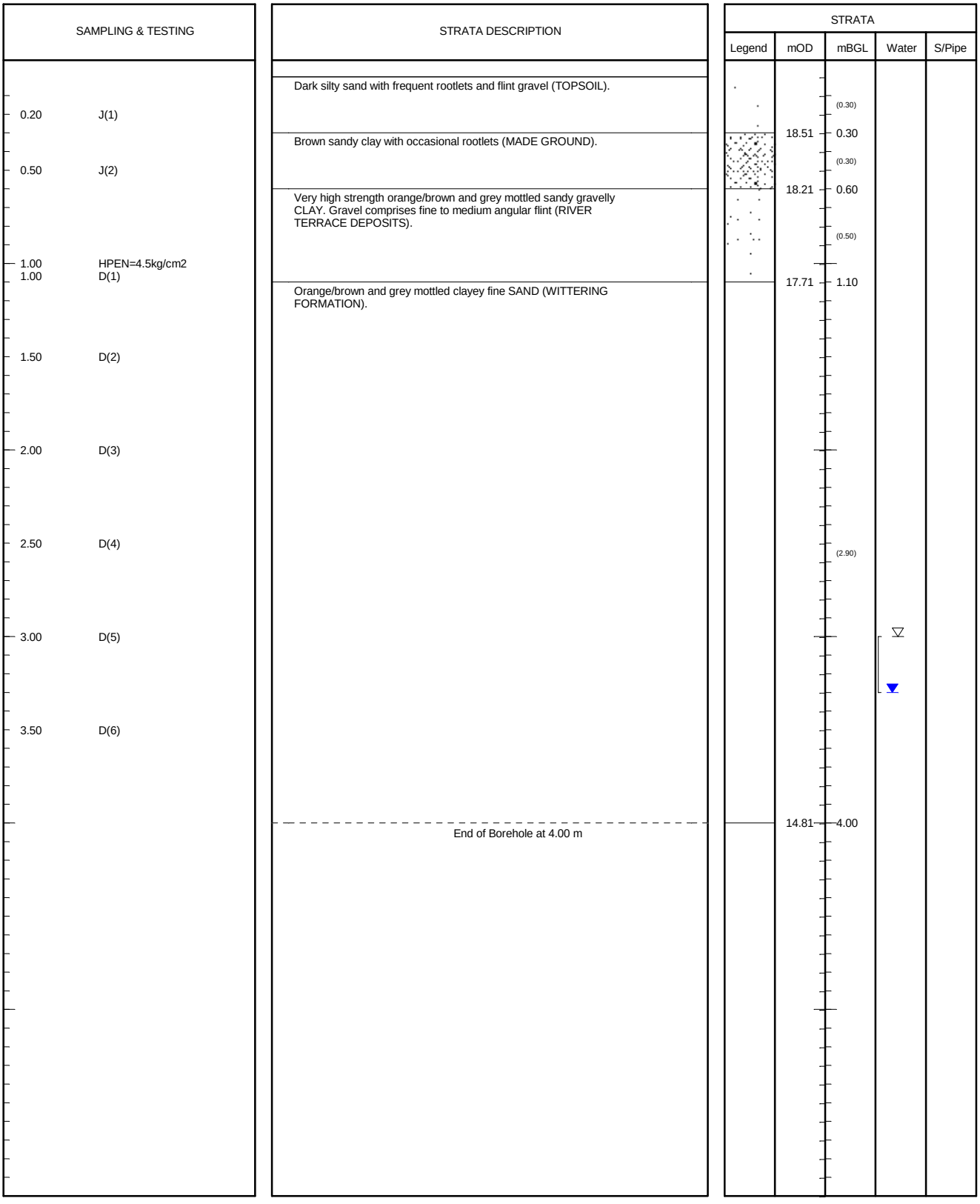


Stability: Borehole collapsed to 2.00m at 3.50m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS351
Groundwater: Strike at 1.60m; after 20mins no change.	Method: Archway	Start: 13/09/2013	Scale: 1:30
		Finish: 13/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2013	Depth: 3.50mBGL
		Eng: JK	Level: 18.860mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



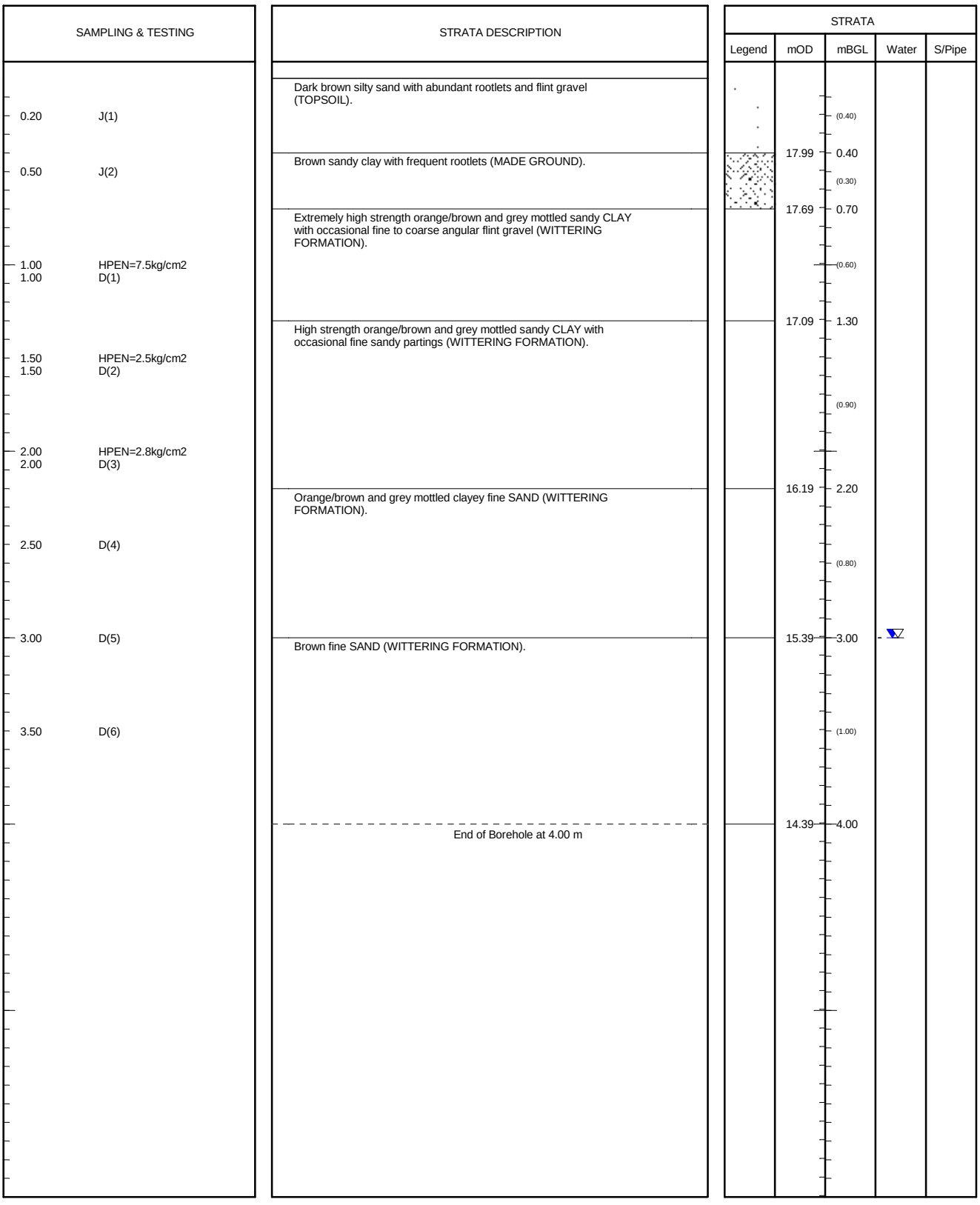
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS352
Groundwater: Strike at 3.00m; 2.20 after 20mins	Method: Archway	Start: 13/09/2013	Scale: 1:30
		Finish: 13/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 17.927mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/A	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



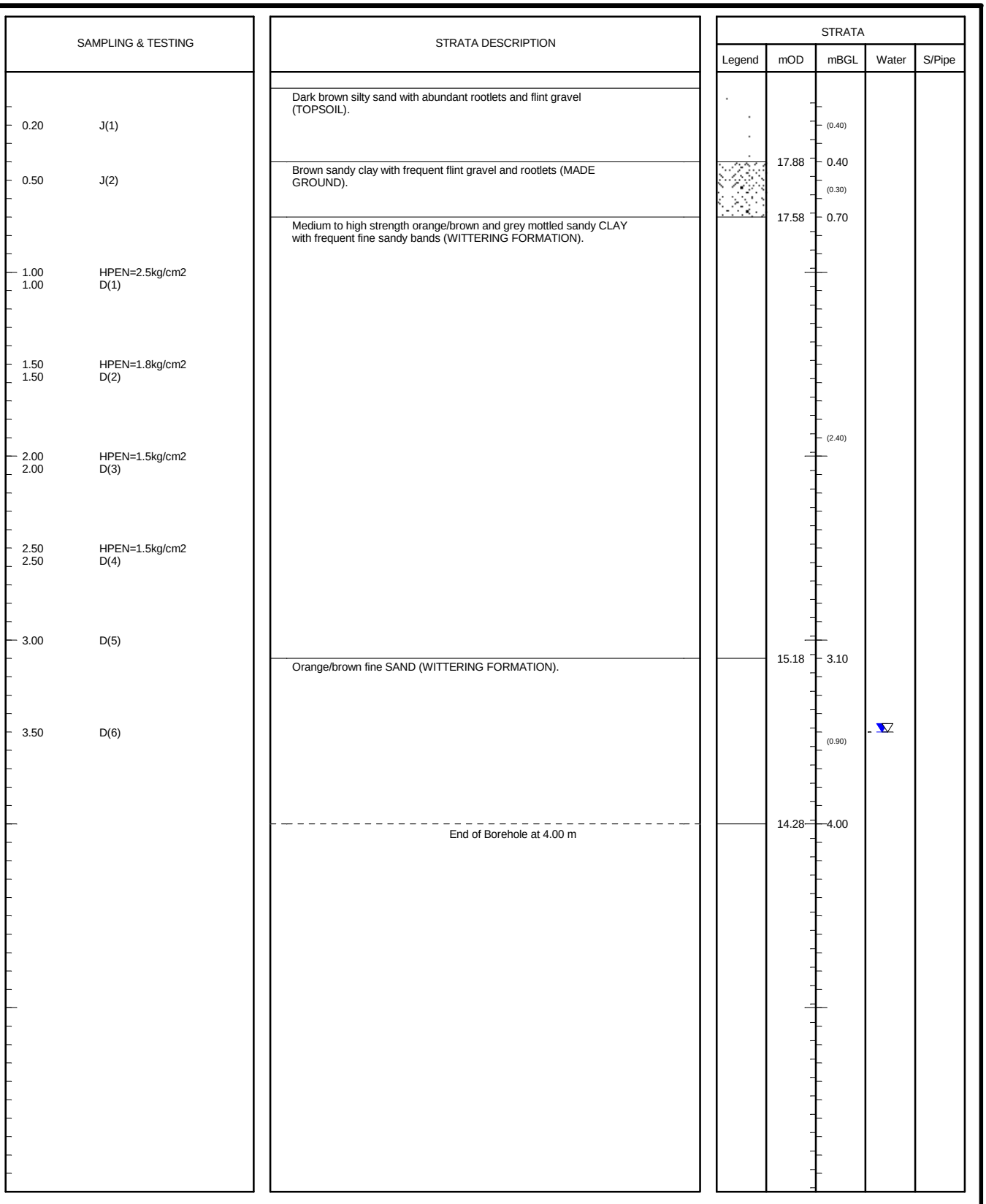
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.30m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS353
Groundwater: Strike at 3.00m; 3.30 after 20mins	Method: Archway	Start: 17/09/2013	Scale: 1:30
		Finish: 17/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.805mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



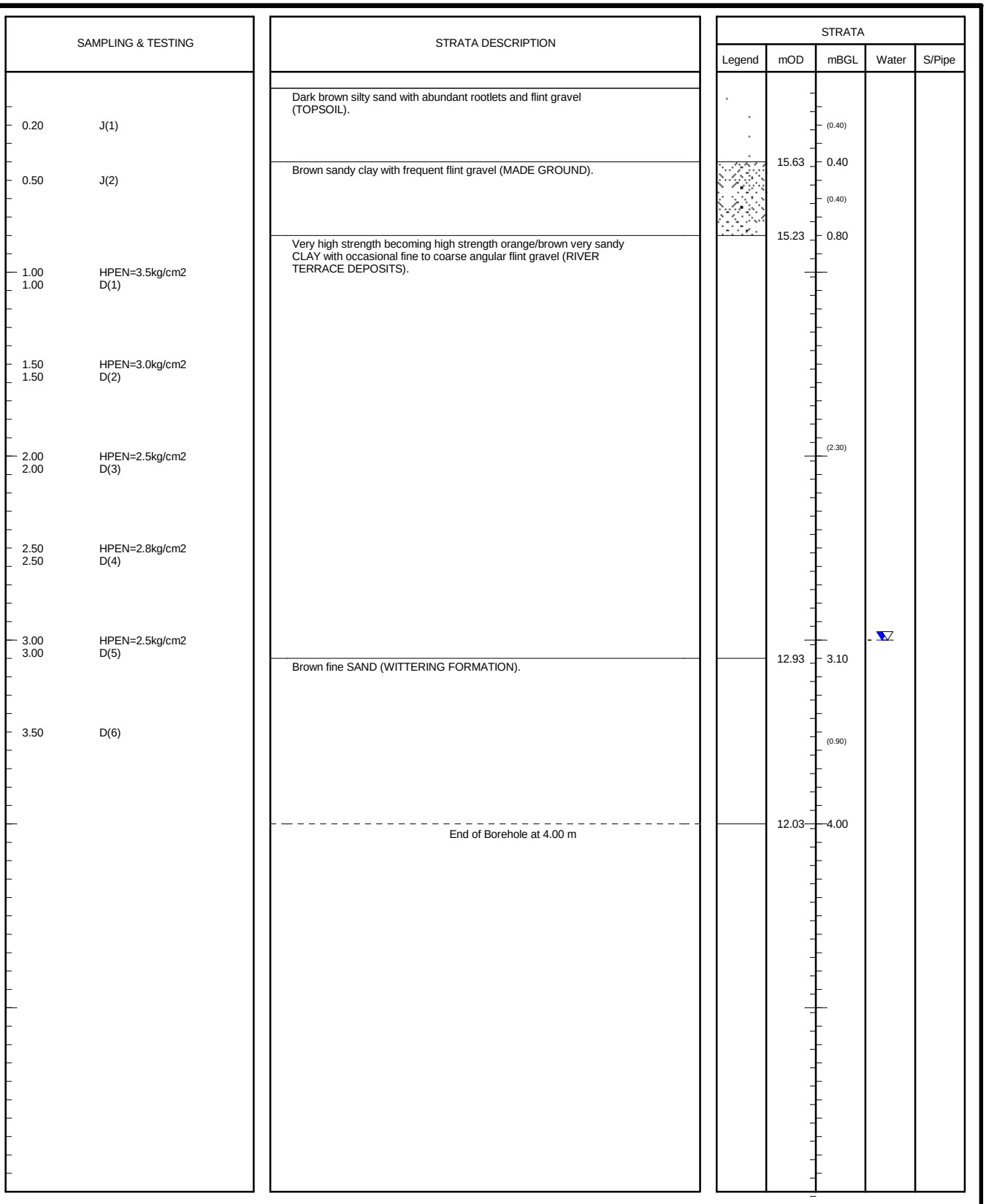
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Stability: Borehole collapsed to 2.90m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS354
Groundwater: Slight seepage at 3.00m bgl	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.393mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



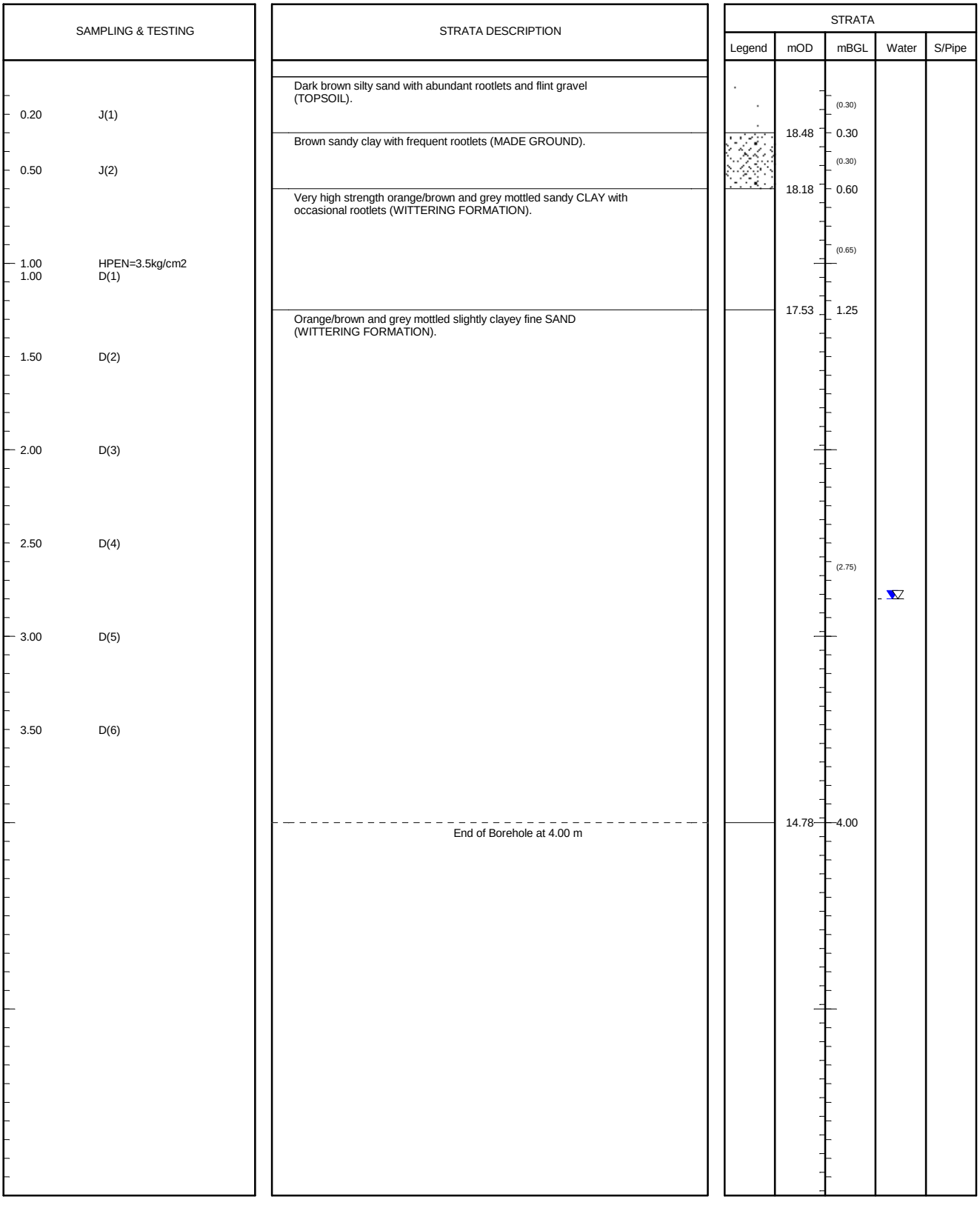
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Stability: Borehole collapsed to 3.10m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS355
Groundwater: Slight seepage at 3.50m bgl	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.279mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



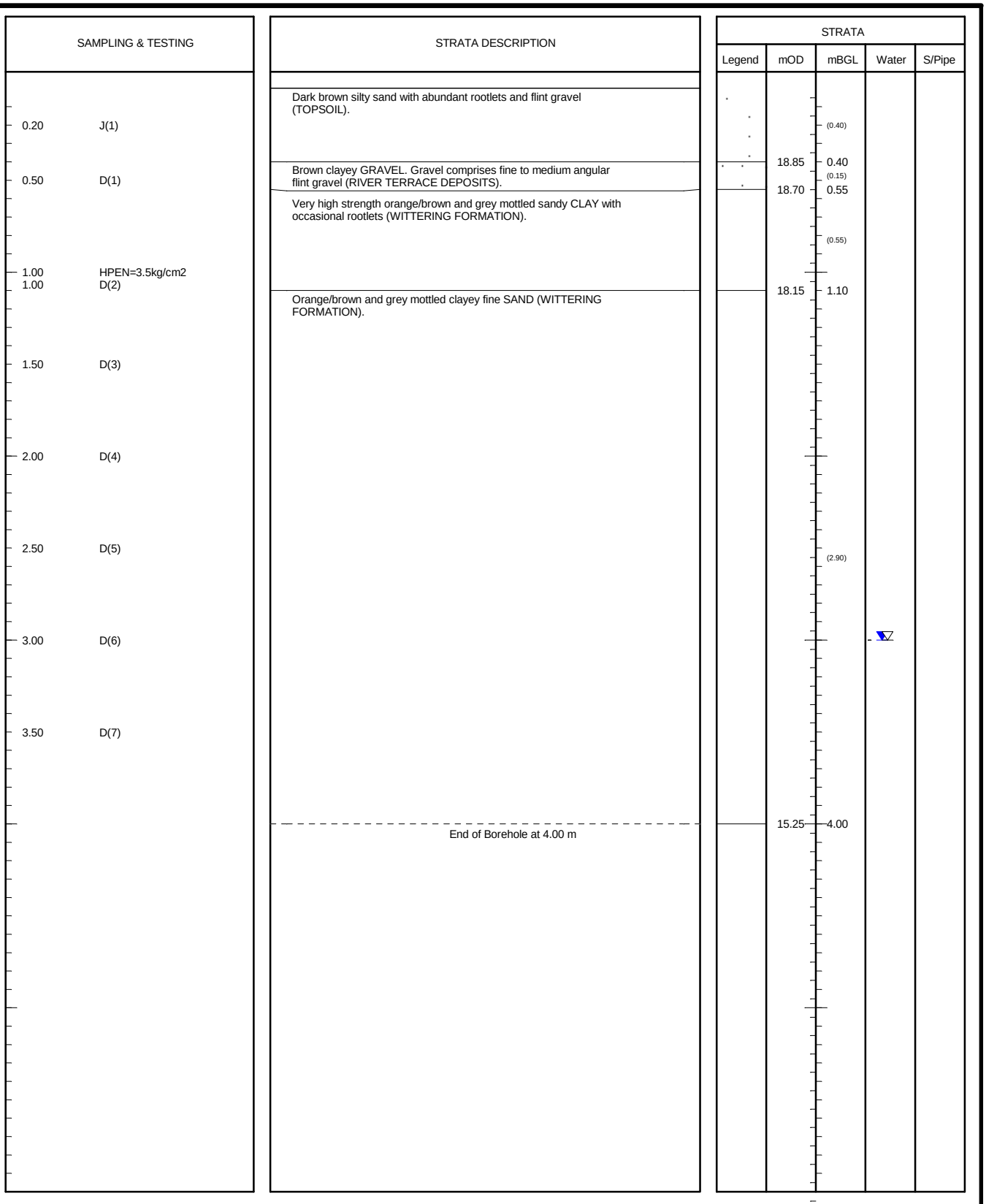
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.60m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS356
Groundwater: Slight seepage at 3.00m bgl	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 16.026mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

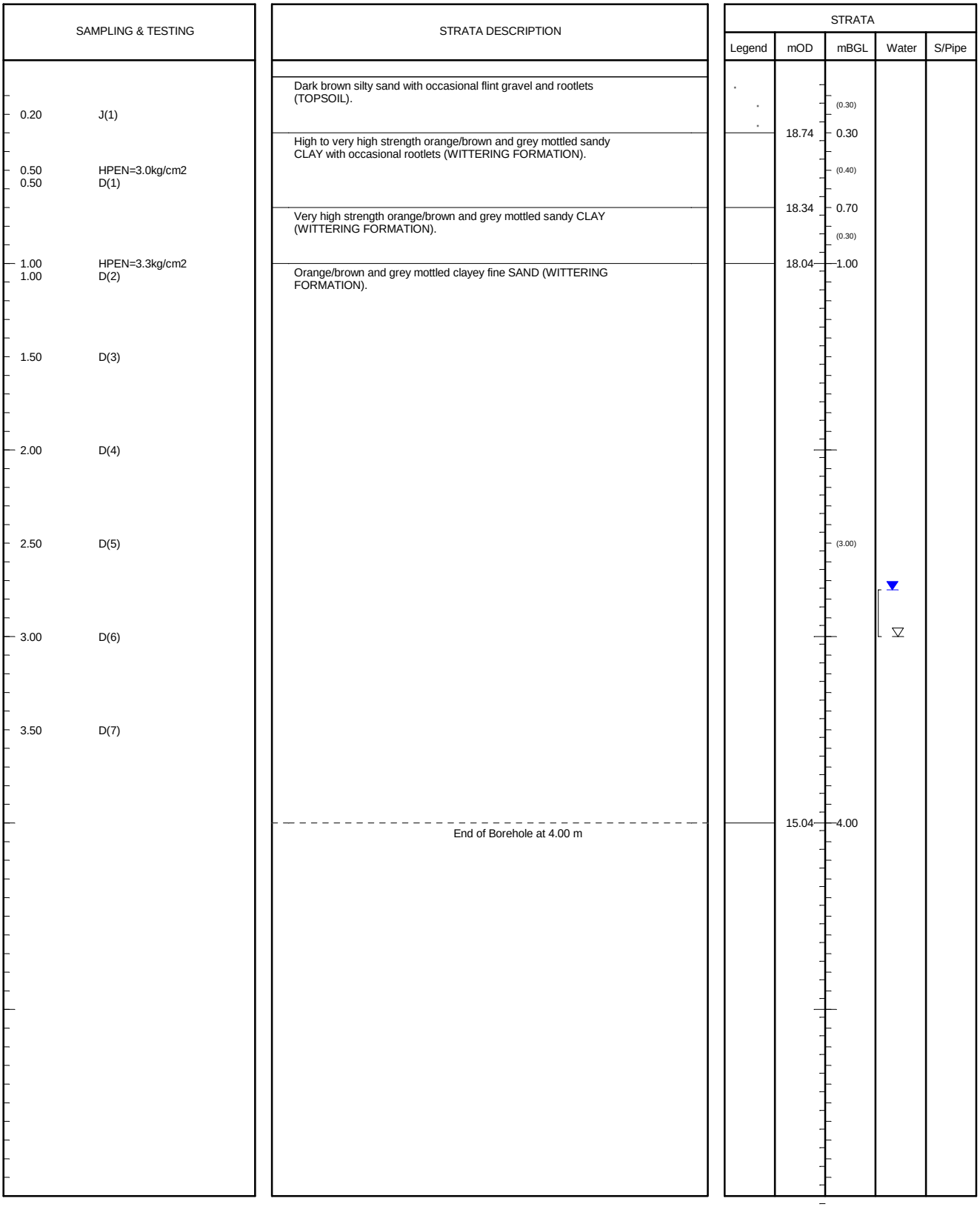


SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS357
Groundwater: Strike at 2.80m; after 20mins no change.	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.775mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

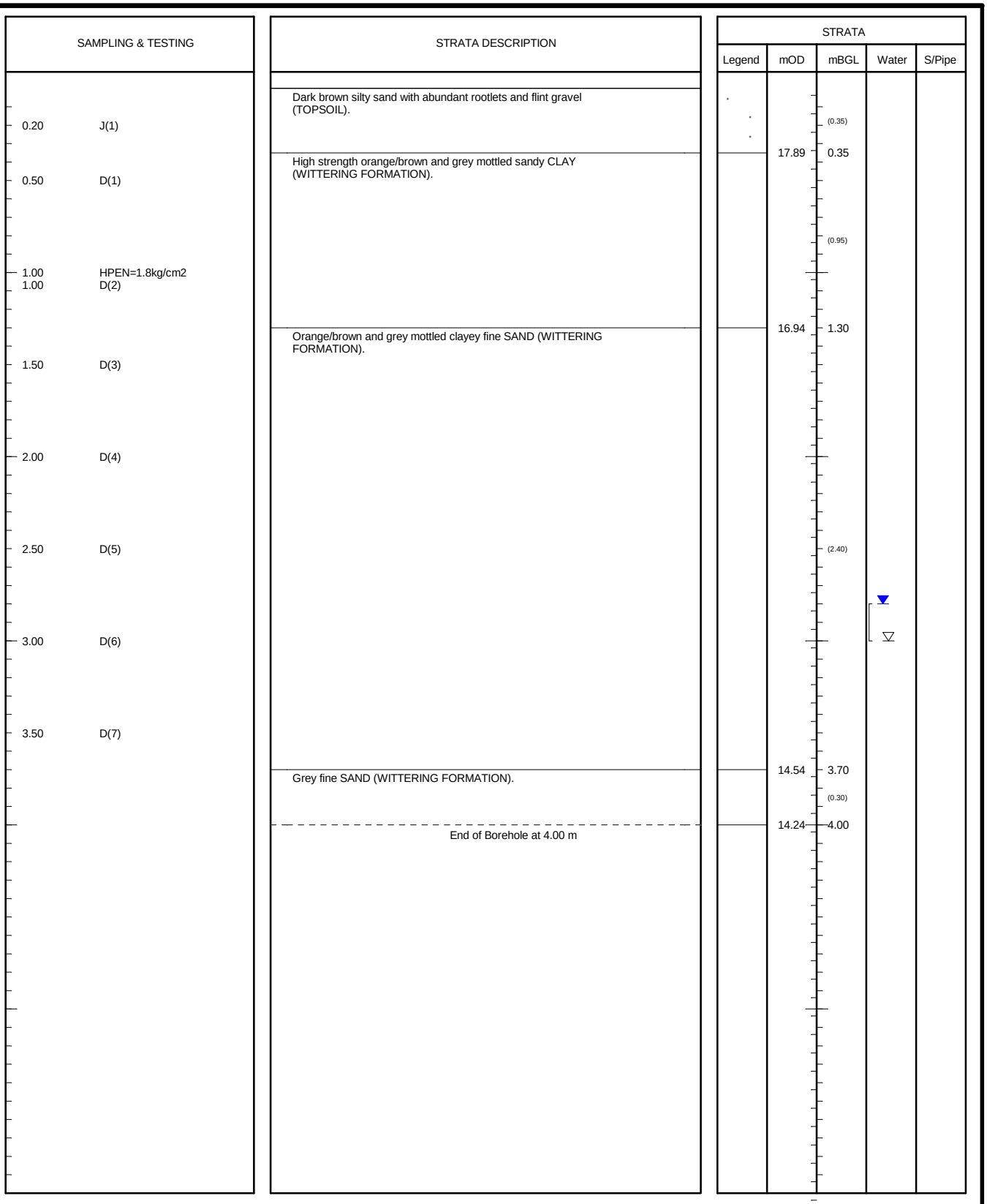


Stability: Borehole collapsed to 2.60m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS358
Groundwater: Strike at 3.00m; after 20mins no change.	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.251mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



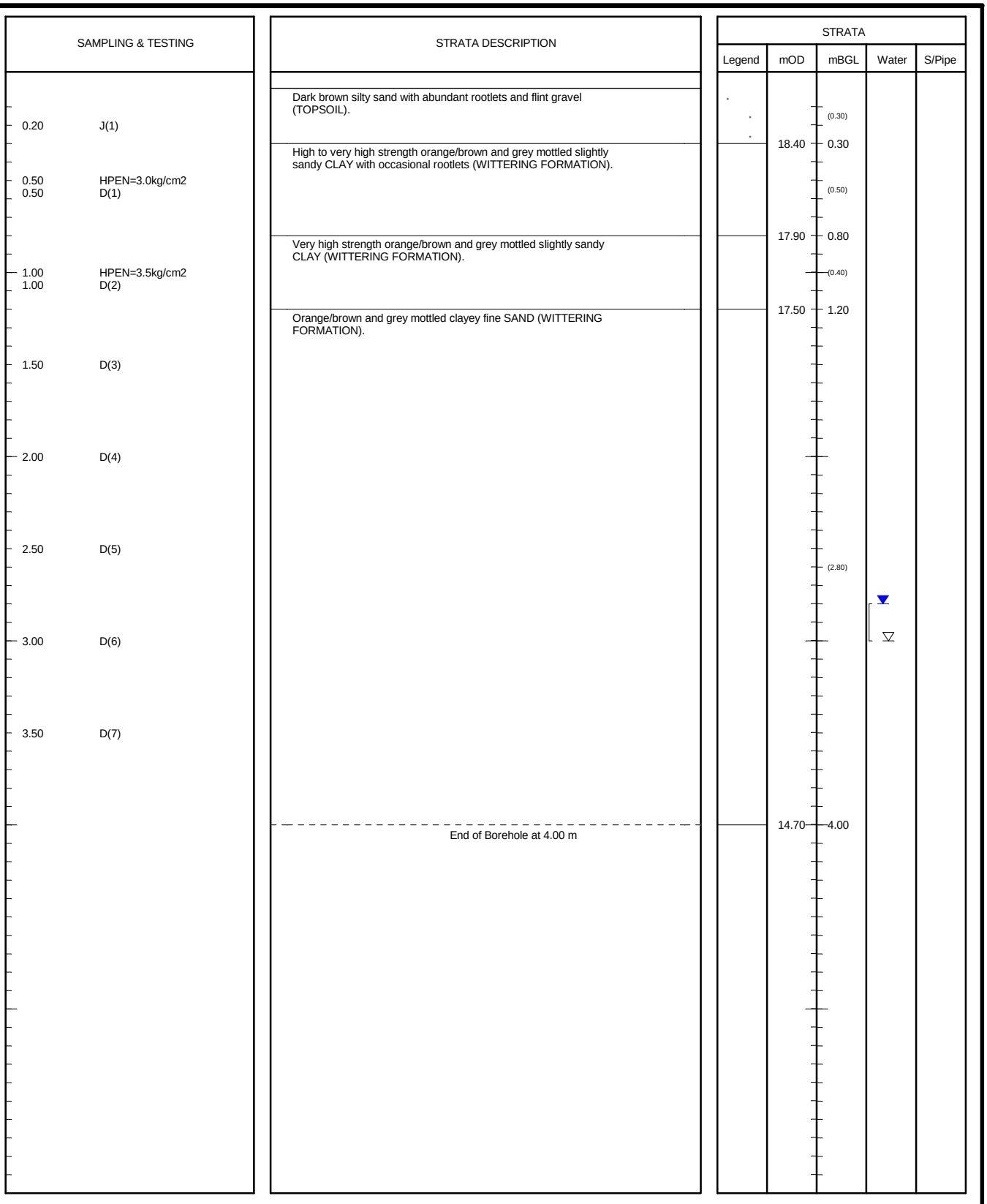
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.80m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS359
Groundwater: Strike at 3.00m; 2.75 after 20mins	Method: Archway	Start: 17/08/2013	Scale: 1:30
		Finish: 17/08/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 17/08/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.041mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



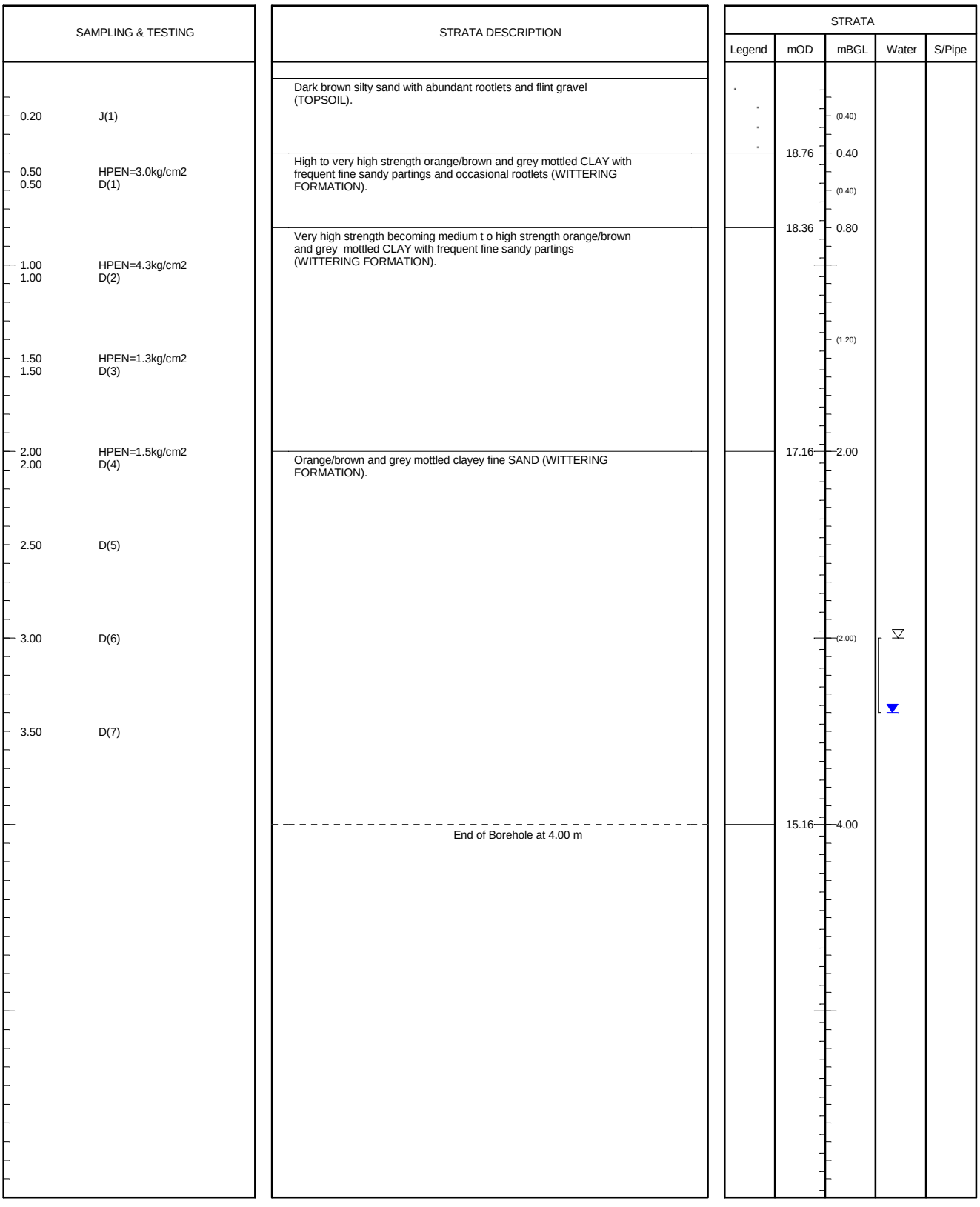
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.60m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS360
Groundwater: Strike at 3.00m; 2.80 after 20mins	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.238mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



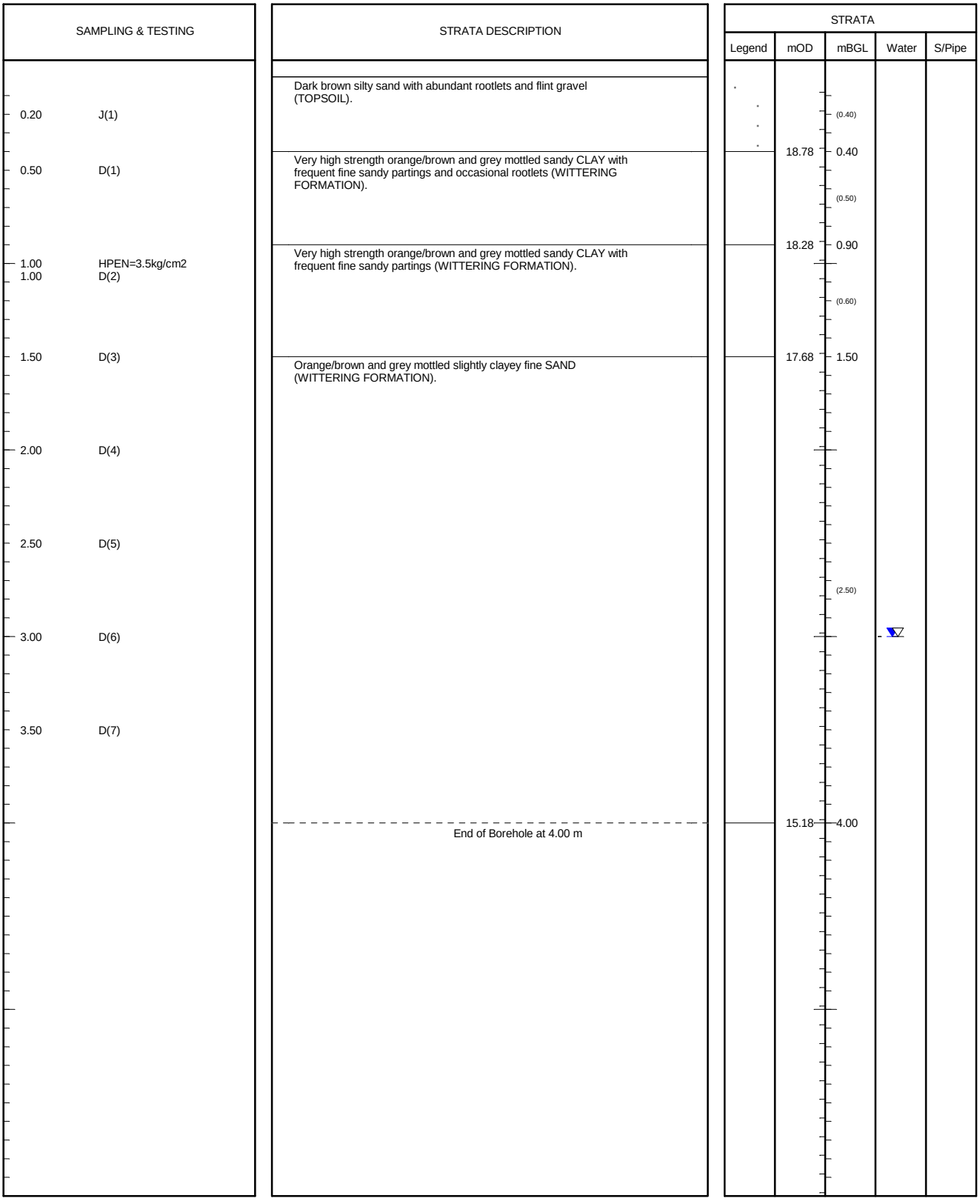
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.50m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS361
Groundwater: Strike at 3.00m; 2.80 after 20mins	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.698mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



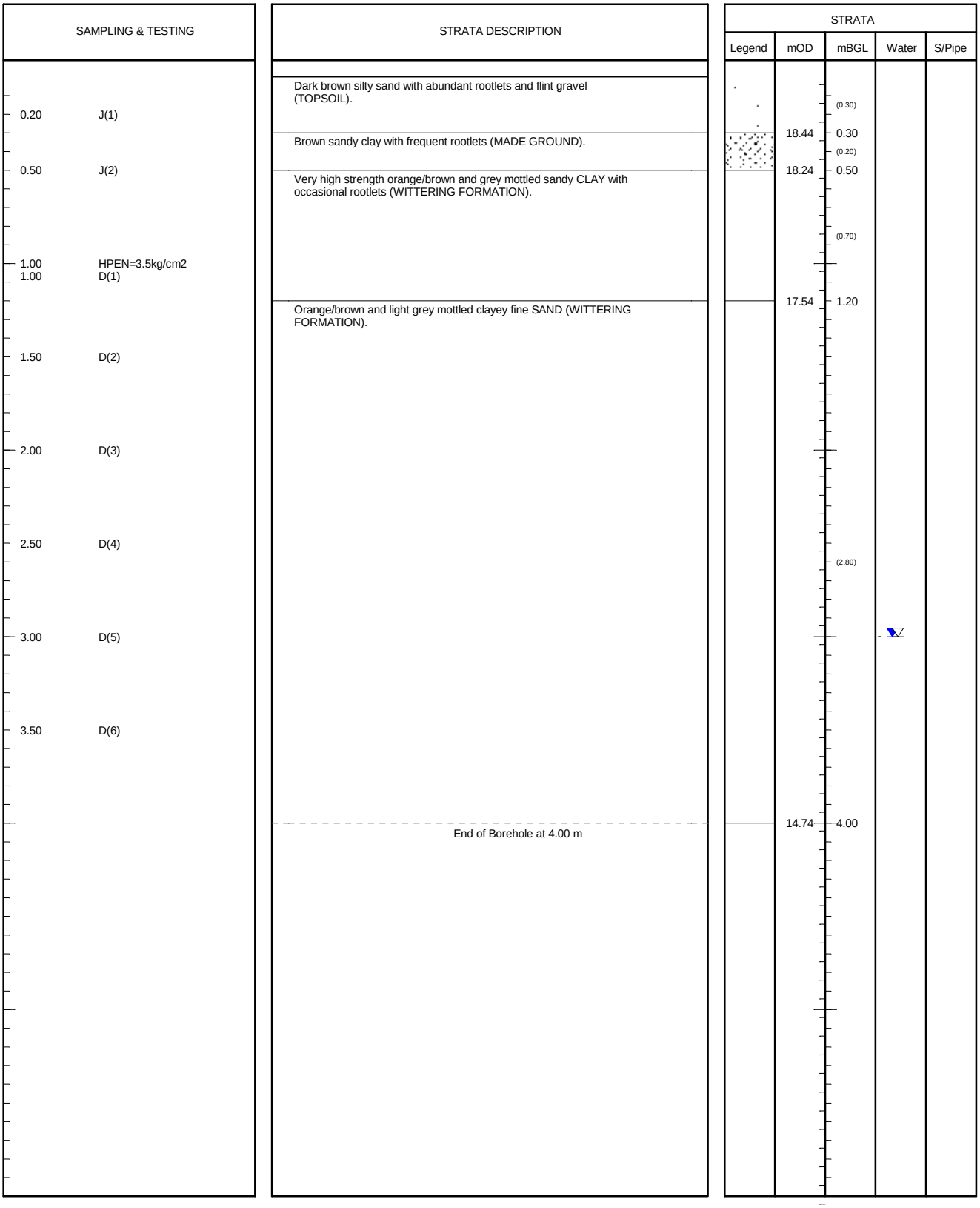
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS362
Groundwater: Strike at 3.00m; 3.40 after 20mins	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.162mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



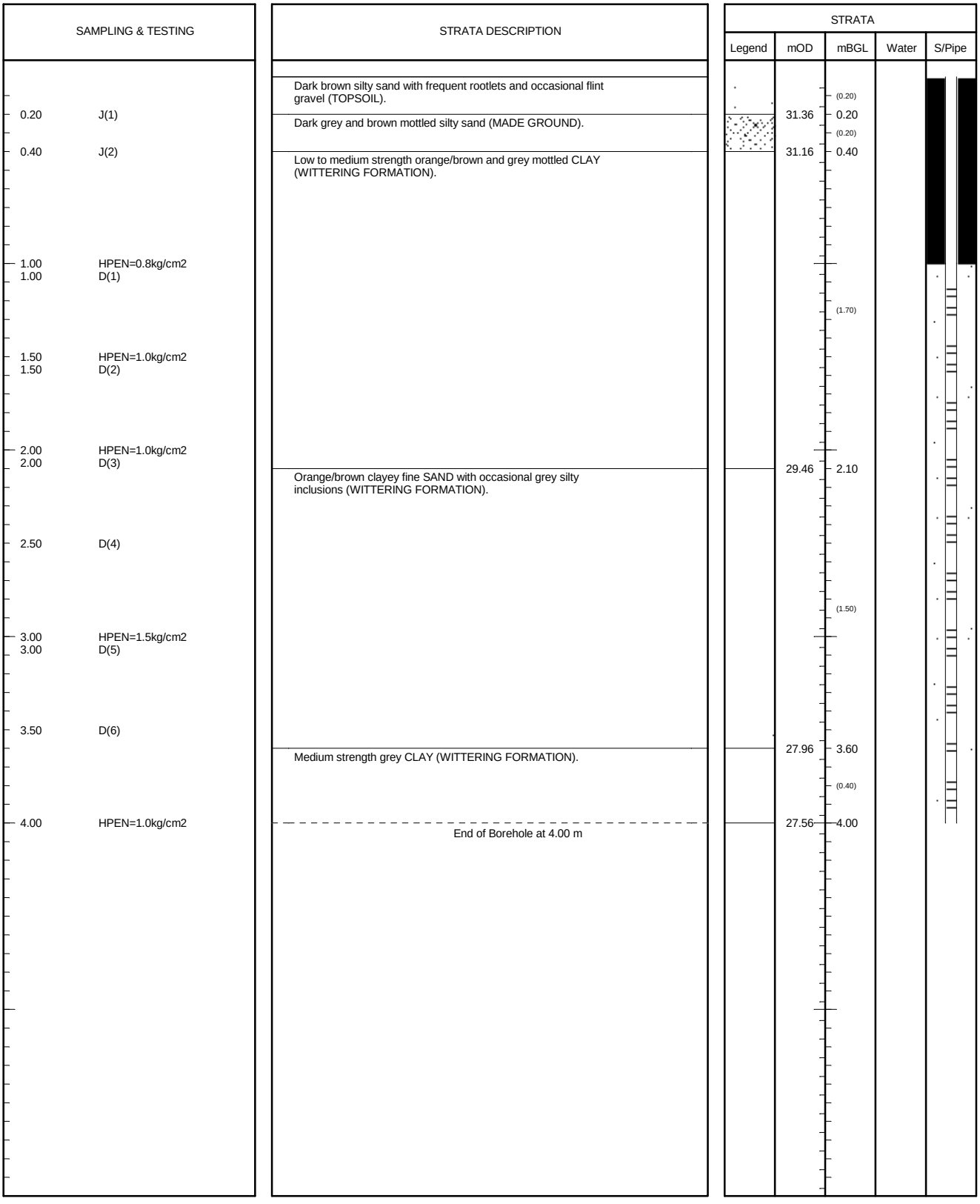
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 3.10m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS363
Groundwater: Strike at 3.00m; after 20mins no change.	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 19.182mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.70m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS364
Groundwater: Strike at 3.00m; after 20mins no change.	Method: Archway	Start: 16/09/2013	Scale: 1:30
		Finish: 16/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 16/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 18.742mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



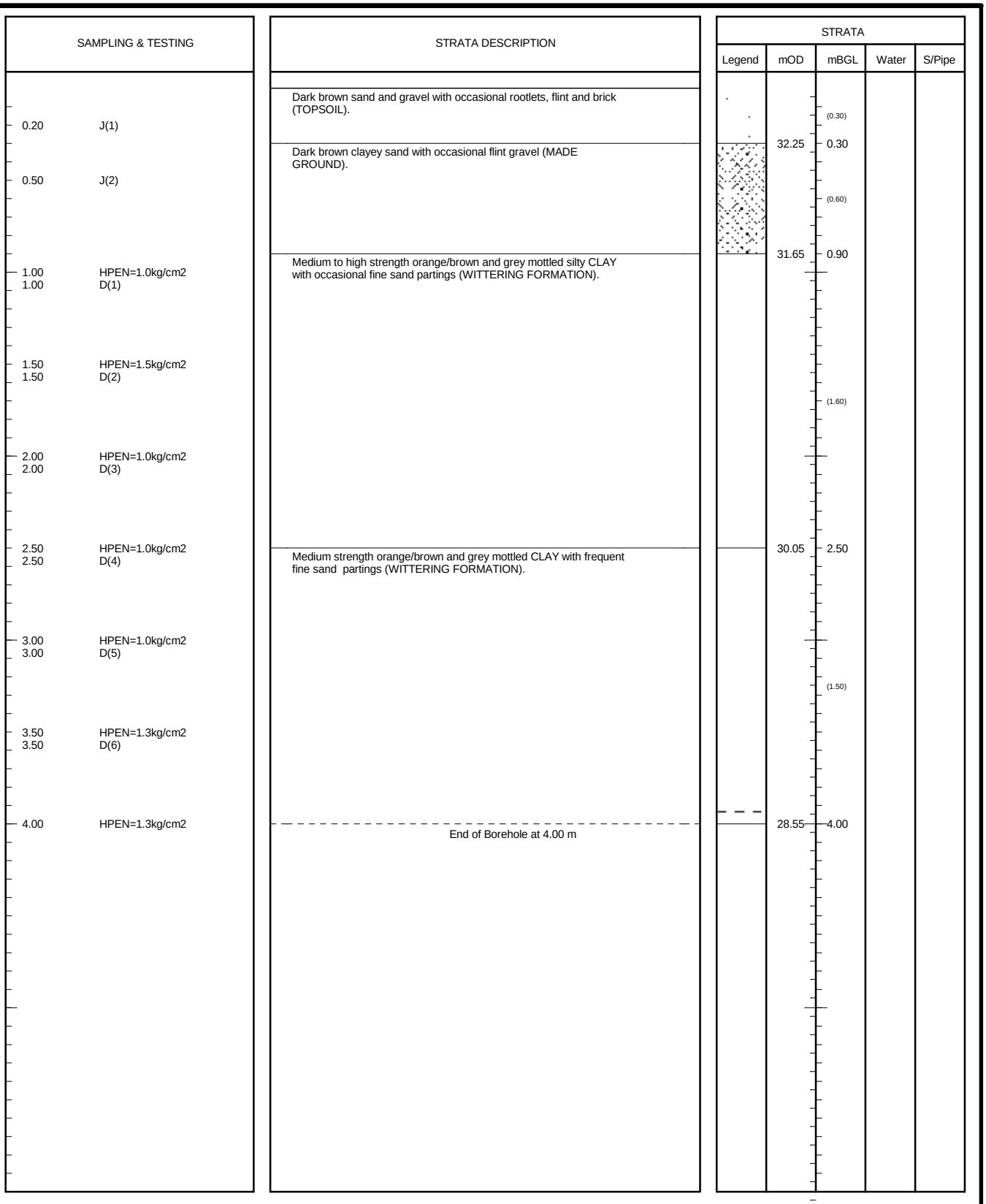
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS365
Groundwater: No Groundwater Encountered	Method: Archway	Start: 13/09/2013	Scale: 1:30
		Finish: 13/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 31.559mOD
Remarks: Standpipe installed to 4.00m bgl	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Concrete			(0.15)		
0.20	J(1)	Brown sand with frequent concrete, brick and occasional ash (MADE GROUND).		30.84	0.15		
					(0.25)		
0.50	J(2)	Brown and dark brown mottled sandy clay (MADE GROUND).		30.59	0.40		
					(0.40)		
		High to very high strength becoming medium strength brown and grey mottled silty sandy CLAY (WITTERING FORMATION).		30.19	0.80		
1.00	HPEN=3.0kg/cm2						
1.00	D(1)						
1.50	HPEN=1.0kg/cm2				(1.40)		
1.50	D(2)						
2.00	HPEN=1.0kg/cm2						
2.00	D(3)						
		Medium to high strength light grey/brown CLAY (WITTERING FORMATION).		28.79	2.20		
2.50	HPEN=1.5kg/cm2						
2.50	D(4)						
3.00	HPEN=1.3kg/cm2						
3.00	D(5)				(1.80)		
3.50	HPEN=2.0kg/cm2						
3.50	D(6)						
4.00	HPEN=2.3kg/cm2	End of Borehole at 4.00 m		26.99	4.00		

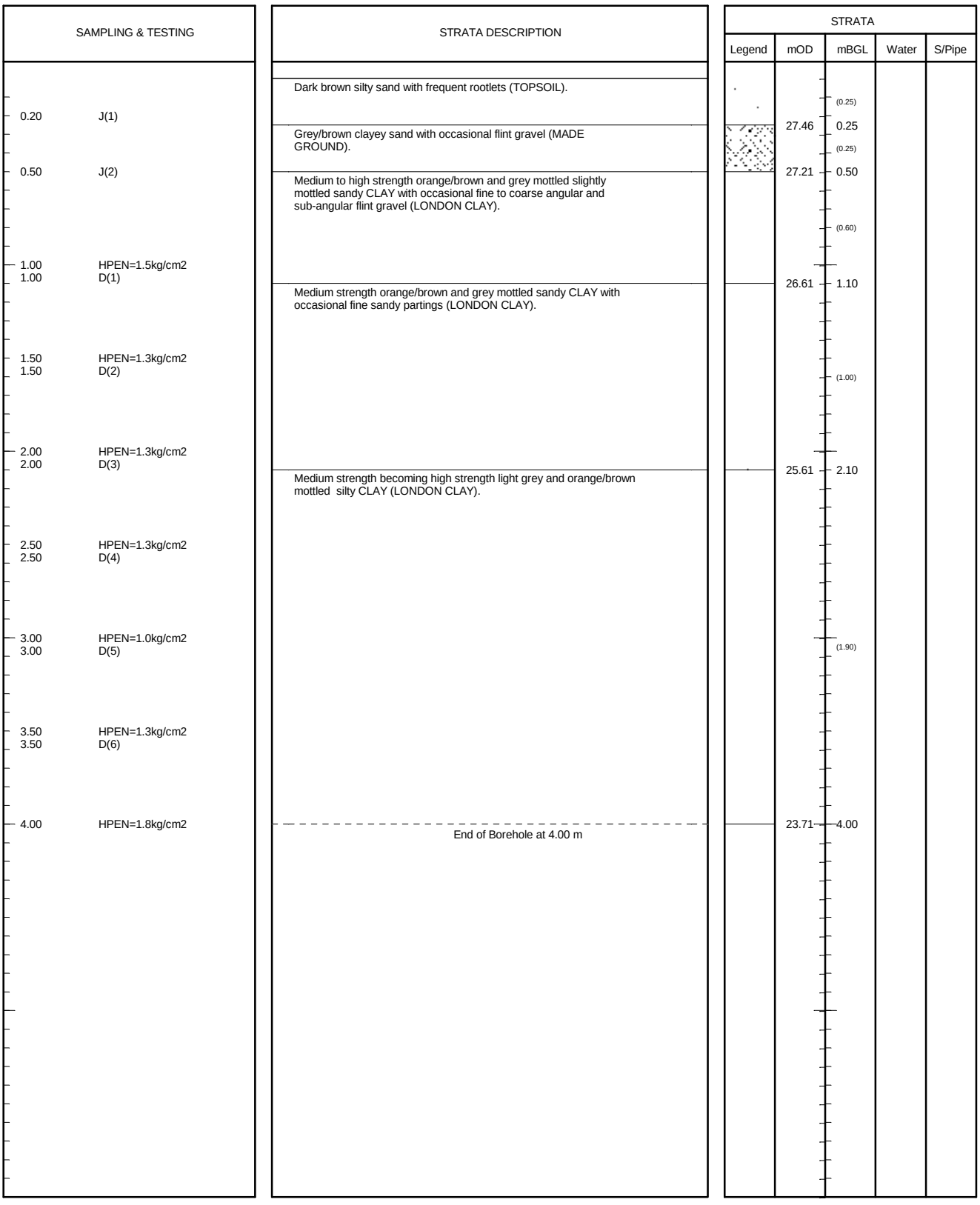
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS366
Groundwater: No Groundwater Encountered	Method: Archway	Start: 13/09/2013	Scale: 1:30
		Finish: 13/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 13/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 30.990mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS367
Groundwater: No Groundwater Encountered	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 32.546mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



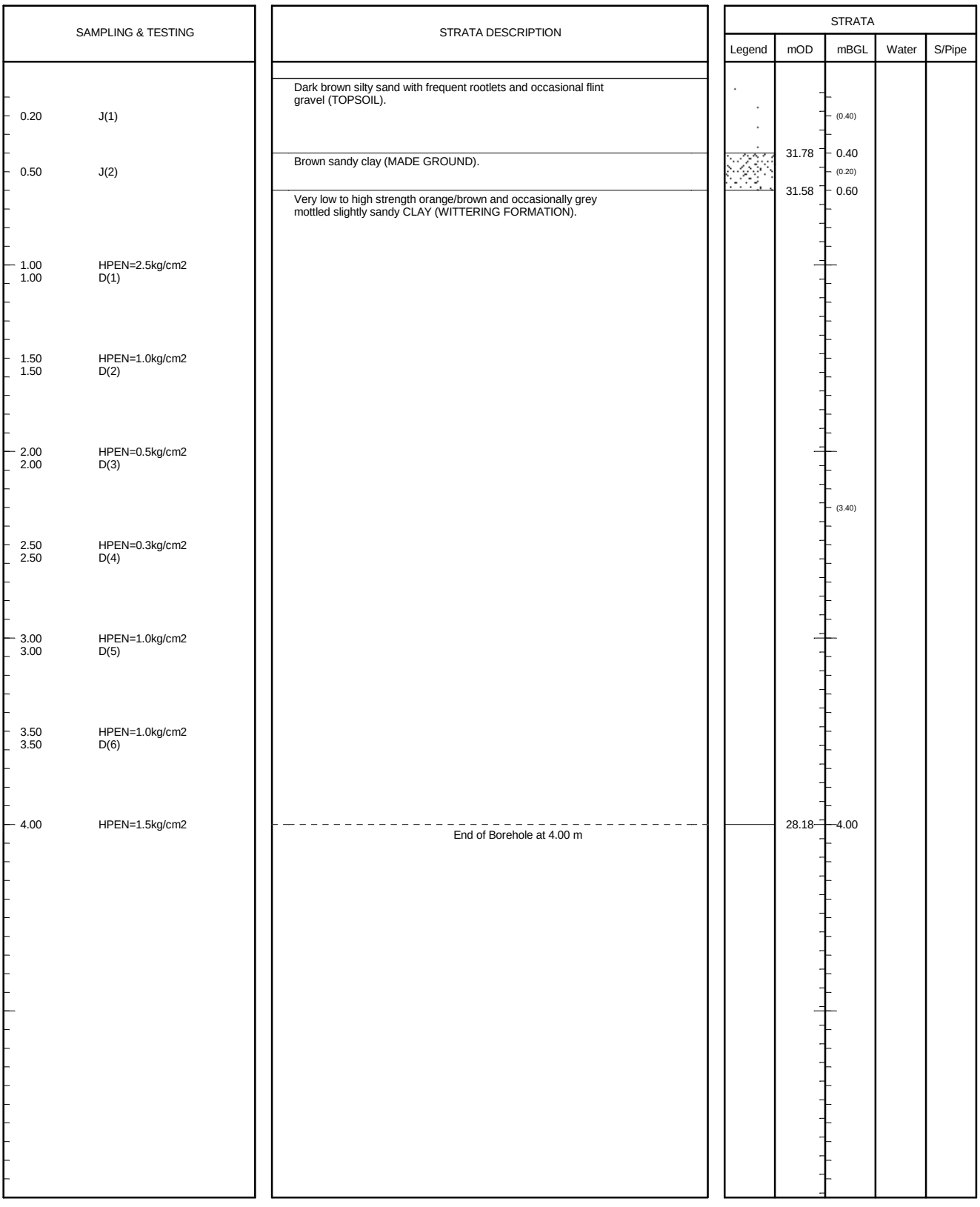
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS368
Groundwater: No Groundwater Encountered	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 27.705mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Dark brown silty sand with occasional rootlets (TOPSOIL).					
0.20	J(1)				(0.30)		
		Brown sandy clay with frequent rootlets (MADE GROUND).		35.74	0.30		
0.50	J(2)				(0.30)		
		High strength becoming low strength orange/brown sandy CLAY (WITTERING FORMATION).		35.44	0.60		
1.00	HPEN=2.5kg/cm2						
1.00	D(1)						
					(1.70)		
1.50	HPEN=0.5kg/cm2						
1.50	D(2)						
2.00	HPEN=0.5kg/cm2						
2.00	D(3)						
		Grey/green fine SAND (WITTERING FORMATION).		33.74	2.30		
2.50	D(4)				(0.40)		
		High strength brown and grey mottled sandy CLAY (WITTERING FORMATION).		33.34	2.70		
3.00	HPEN=2.0kg/cm2						
3.00	D(5)						
					(1.30)		
3.50	D(6)						
		End of Borehole at 4.00 m		32.04	4.00		

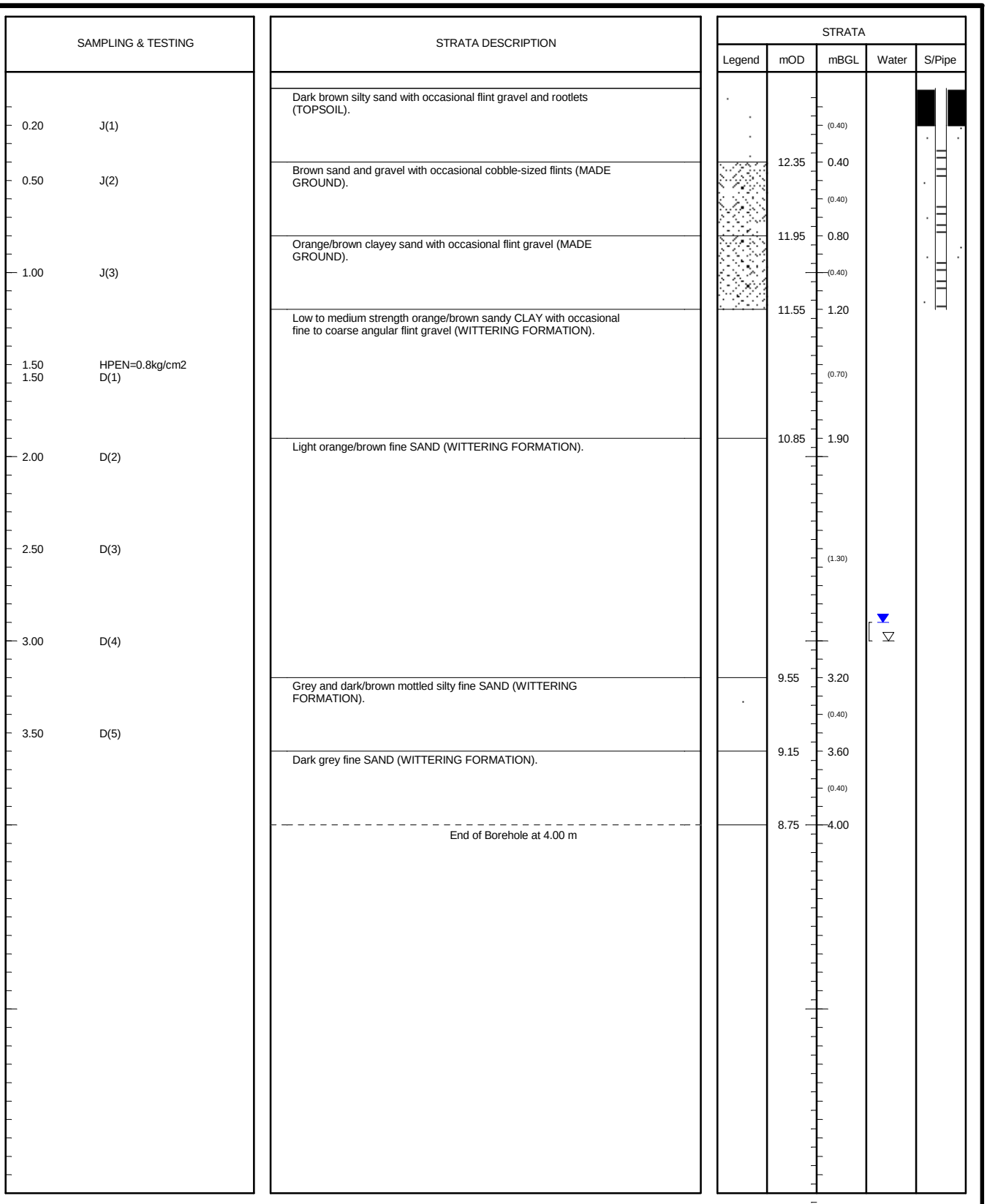
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS369
Groundwater: No Groundwater Encountered	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 36.038mOD
Remarks: Back filled with arisings on completion of falling head soakage test	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



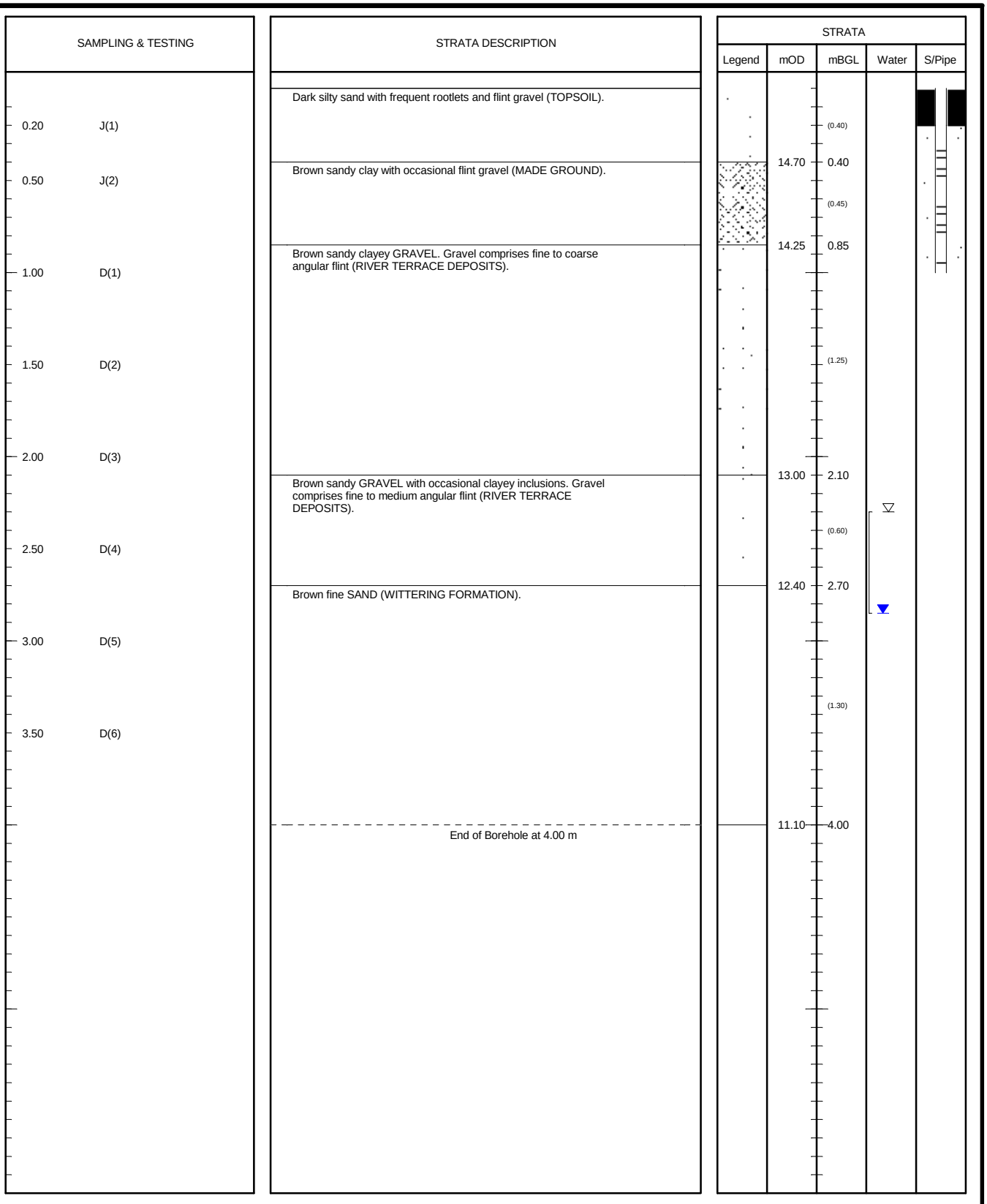
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS370
Groundwater: No Groundwater Encountered	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 32.176mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



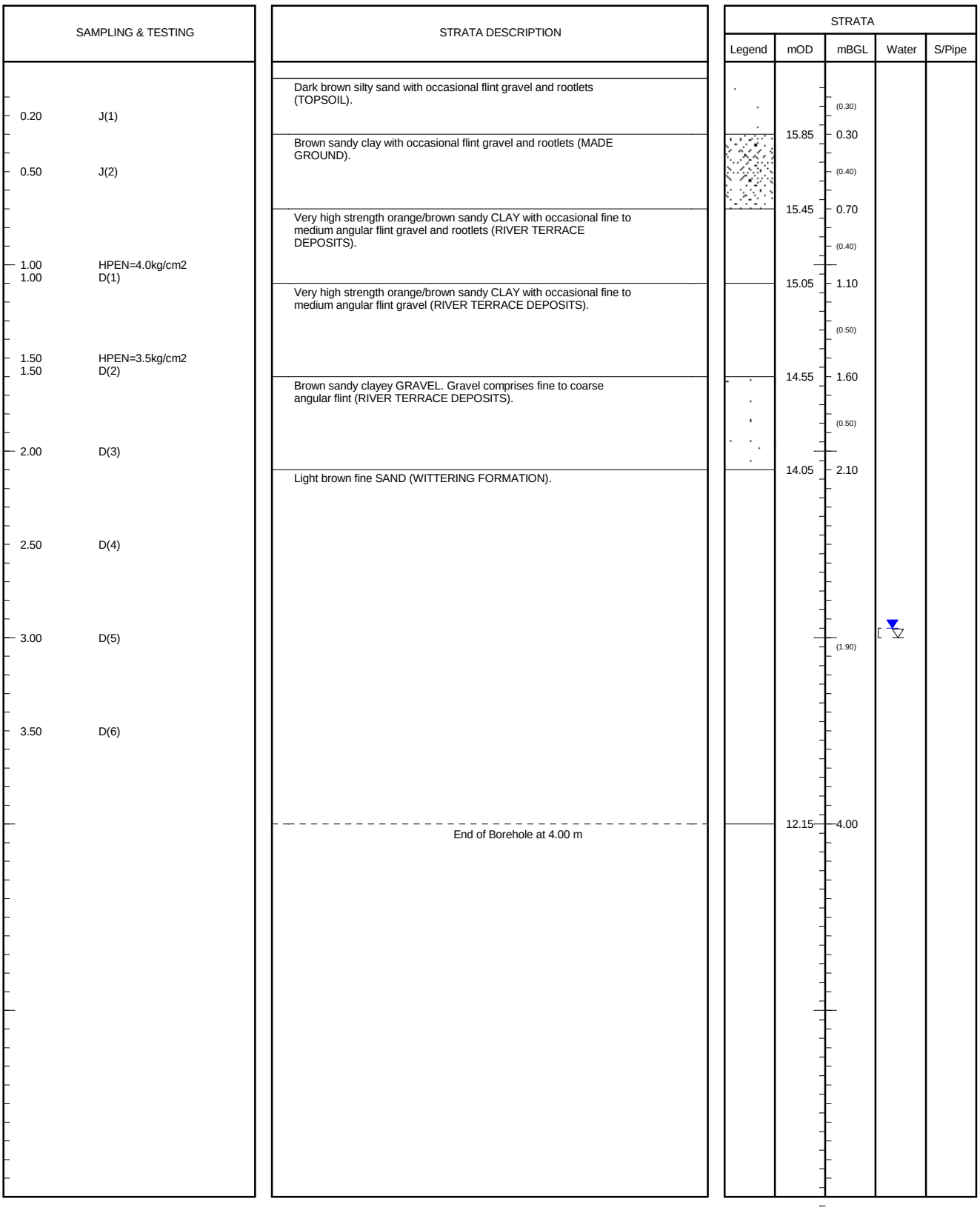
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 1.20m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS371
Groundwater: Strike at 3.00m; 2.90 after 20mins	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 12.750mOD
Remarks: Standpipe installed to 1.20m bgl	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



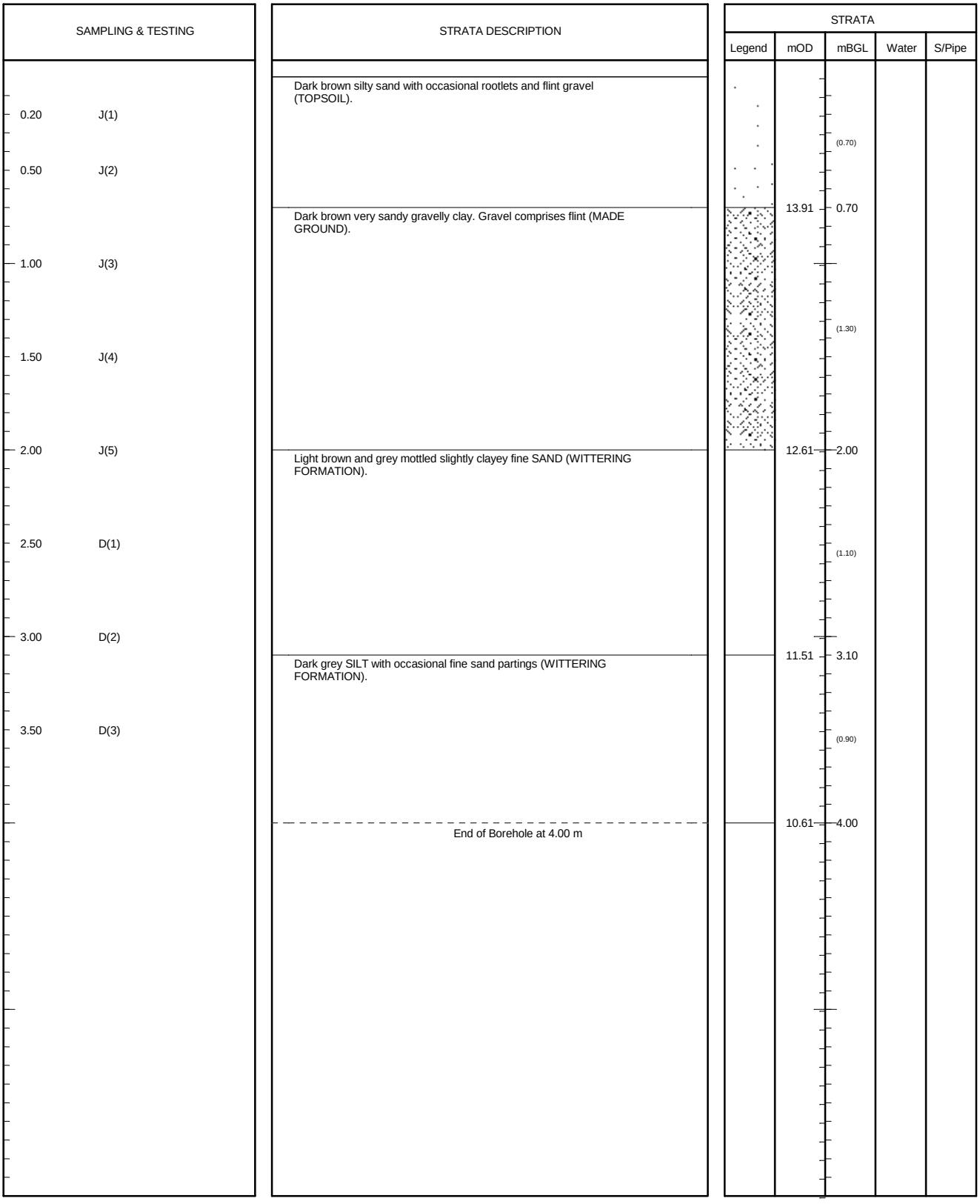
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.95m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS372
Groundwater: Strike at 2.30m; 2.85 after 20mins	Method: Archway	Start: 18/09/2013	Scale: 1:30
		Finish: 18/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 18/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 15.100mOD
Remarks: Standpipe installed to 1.00m bgl	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



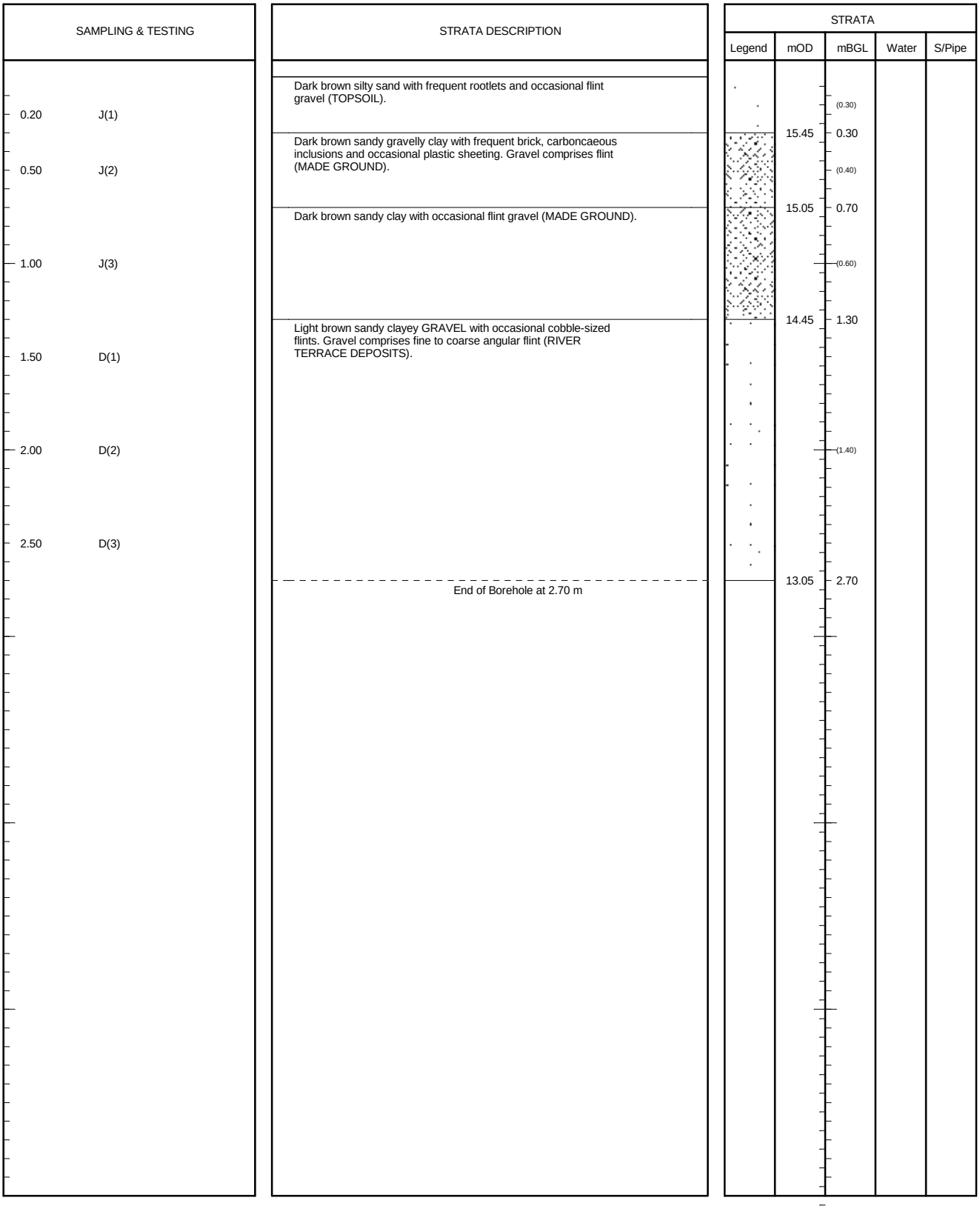
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole collapsed to 2.95m at 4.00m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS373
Groundwater: Strike at 3.00m; 2.95 after 20mins	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 16.150mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS374
Groundwater: No Groundwater Encountered	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 4.00mBGL
		Eng: JK	Level: 14.610mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: Borehole refused on dense gravel at 2.70m	Type: Hydraulic Window Sampler Geoprobe	Ref: GE9523	Position: WS375
Groundwater: No Groundwater Encountered	Method: Archway	Start: 19/09/2013	Scale: 1:30
		Finish: 19/09/2013	Size:
Plant: Archway	Project: Boorley Green	Filled: 19/09/2013	Depth: 2.70mBGL
		Eng: JK	Level: 15.750mOD
Remarks: Back filled with arisings	Client: MA Botley Limited	Drawn: JK/T	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Light grey/brown slightly clayey fine sandy silt with frequent roots (<5mm) (TOPSOIL).					
0.20	D(1)				(0.60)		
0.50	D(2)						
		Very high strength becoming medium to high strength grey/brown sandy silty CLAY (WITTERING FORMATION).		36.25	0.60		
1.00	HPEN=3.5kg/cm2						
1.00	B(1)						
1.00	D(3)				(1.60)		
1.50	HPEN=3.0kg/cm2						
1.50	D(4)						
2.00	HPEN=1.5kg/cm2						
2.00	B(2)						
2.00	D(5)						
		Medium to high strength orange/brown and grey/brown mottled silty sandy CLAY (WITTERING FORMATION).		34.65	2.20		
2.50	HPEN=1.3kg/cm2						
2.50	D(6)				(0.80)		
3.00	HPEN=1.5kg/cm2						
3.00	B(3)			33.85	3.00		
3.00	D(7)	End of Trial Pit at 3.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP101
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 09/09/2013	Scale: 1:25
		Finish: 09/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 09/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 36.854mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Light grey/brown slightly clayey fine sandy silt with frequent roots (<5mm) (TOPSOIL).					
0.20	D(1)				(0.40)		
		Extremely high strength becoming medium strength grey/brown sandy silty CLAY (WITTERING FORMATION).		22.40	0.40		
0.50	HPEN=8.0kg/cm2						
0.50	D(2)						
1.00	HPEN=1.3kg/cm2						
1.00	B(1)						
1.00	D(3)				(1.40)		
1.50	HPEN=1.0kg/cm2						
1.50	D(4)						
		Medium to high strength becoming medium strength light orange/brown silty fine sandy CLAY with occasional coarse sub-angular flint gravel (WITTERING FORMATION).		21.00	1.80		
2.00	HPEN=1.5kg/cm2						
2.00	B(2)						
2.00	D(5)						
					(1.20)		
2.50	HPEN=1.3kg/cm2						
2.50	D(6)						
3.00	HPEN=1.3kg/cm2						
3.00	B(3)						
3.00	D(7)	End of Trial Pit at 3.00 m		19.80	3.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP102
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 09/09/2013	Scale: 1:25
		Finish: 09/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 09/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 22.804mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Grey/brown silty fine sandy silty clay with occasional rootlets (TOPSOIL).			(0.30)		
0.20	D(1)			18.72	0.30		
		Very high strength grey/brown and orange/brown mottled slightly fine sandy silty CLAY (WITTERING FORMATION).			(1.00)		
0.50	HPEN=3.8kg/cm2						
0.50	D(2)						
1.00	HPEN=3.3kg/cm2						
1.00	B(1)						
1.00	D(3)			17.72	1.30		
		Medium strength orange/brown and grey mottled sandy silty CLAY with occasional medium sub-angular flint gravel (WITTERING FORMATION).			(0.60)		
1.50	HPEN=1.3kg/cm2						
1.50	D(4)			17.12	1.90		
		Medium to high strength orange/brown and grey mottled sandy silty CLAY with frequent medium sub-angular flint gravel (WITTERING FORMATION).			(0.80)		
2.00	HPEN=1.5kg/cm2						
2.00	B(2)						
2.00	D(5)						
2.50	HPEN=1.3kg/cm2						
2.50	D(6)			16.32	2.70		
		Dark grey clayey medium SAND (WITTERING FORMATION).			(0.30)		
3.00	B(3)			16.02	3.00		
3.00	D(7)	End of Trial Pit at 3.00 m					

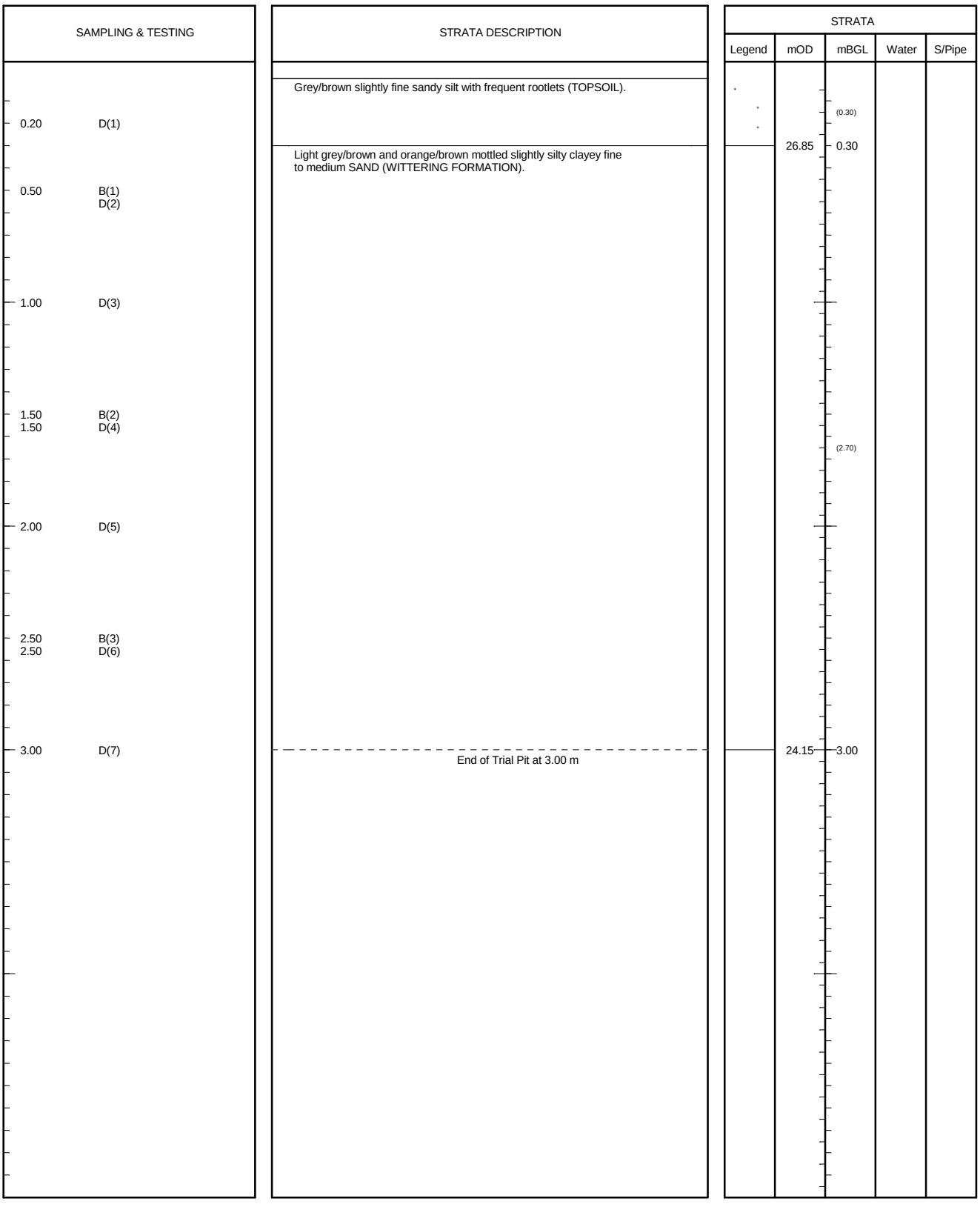
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP103
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 10/09/2013	Scale: 1:25
		Finish: 10/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 19.018mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Light grey/brown slightly sandy silty clay with frequent rootlets (TOPSOIL).					
0.20	D(1)				(0.40)		
		High to very high strength orange/brown and grey mottled silty CLAY with occasional medium to coarse sub-angular flint gravel (WITTERING FORMATION).		26.62	0.40		
0.50	HPEN=3.3kg/cm2						
0.50	D(2)						
1.00	HPEN=3.5kg/cm2						
1.00	B(1)						
1.00	D(3)				(1.50)		
1.50	HPEN=3.0kg/cm2						
1.50	D(4)						
		High strength brown/red, orange/brown and grey mottled silty sandy CLAY (WITTERING FORMATION).		25.12	1.90		
2.00	HPEN=2.8kg/cm2						
2.00	B(2)						
2.00	D(5)				(0.50)		
		Orange/brown and light grey mottled slightly clayey fine to medium SAND (WITTERING FORMATION).		24.62	2.40		
2.50	D(6)						
					(0.60)		
3.00	B(3)			24.02	3.00		
3.00	D(7)	End of Trial Pit at 3.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP104
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 09/09/2013	Scale: 1:25
		Finish: 09/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 09/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 27.023mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

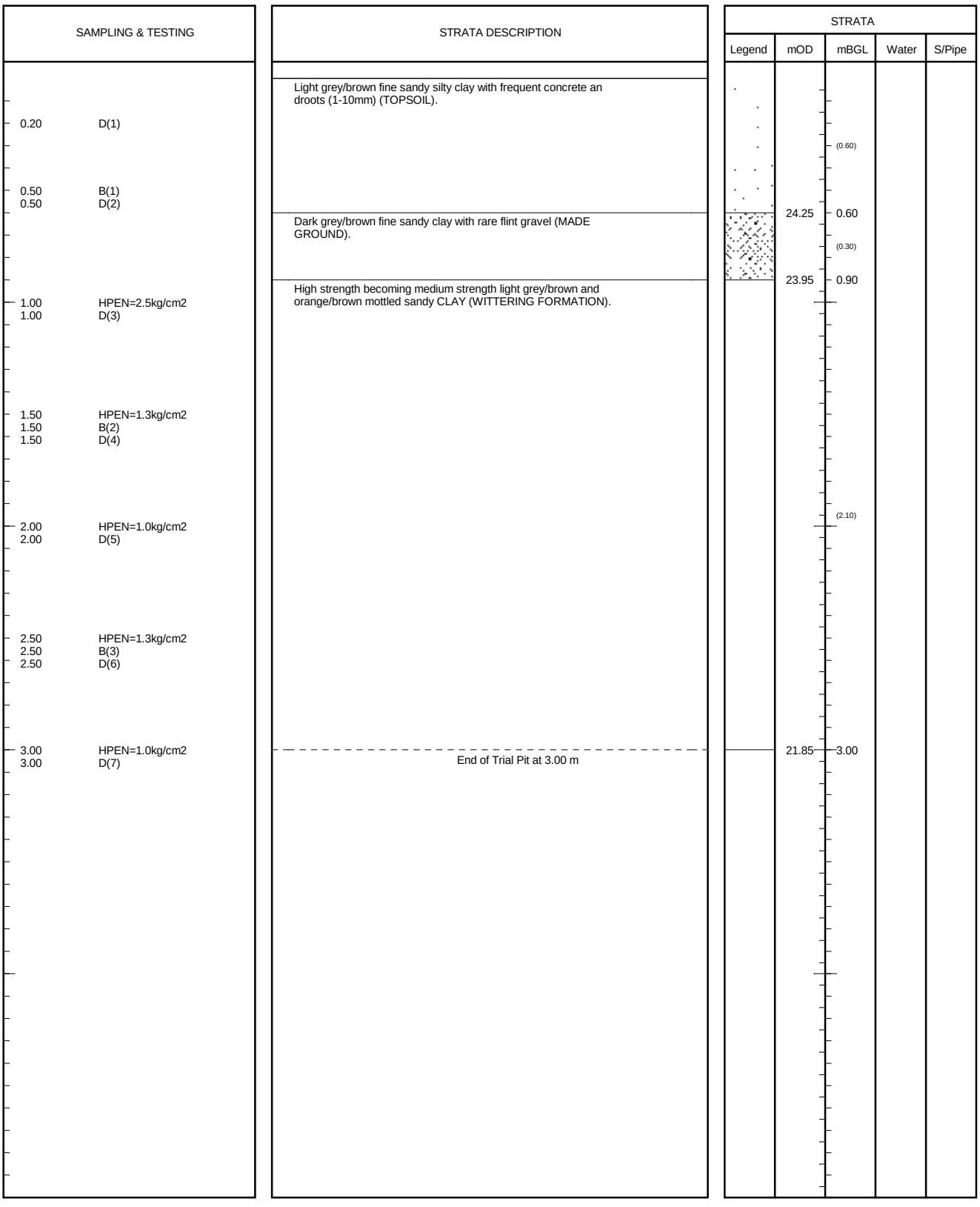


Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP105
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 10/09/2013	Scale: 1:25
		Finish: 10/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 27.151mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Light brown slightly sandy silt with abundant roots (1mm) and occasional flint gravel (TOPSOIL).			(0.26)		
0.20	D(1)			39.42	0.26		
		Orange/brown and grey mottled slightly clayey fine to medium SAND (WITTERING FORMATION).					
0.50	D(2)						
1.00	B(1)						
1.00	D(3)						
					(2.14)		
1.50	D(4)						
2.00	B(2)						
2.00	D(5)						
				37.28	2.40		
		Light grey/green and orange motled slightly silty fine to medium SAND (WITTERING FORMATION).					
2.50	D(6)						
					(0.60)		
3.00	B(3)			36.68	3.00		
3.00	D(7)	End of Trial Pit at 3.00 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP106
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 11/09/2013	Scale: 1:25
		Finish: 11/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 11/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 39.683mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: AB	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



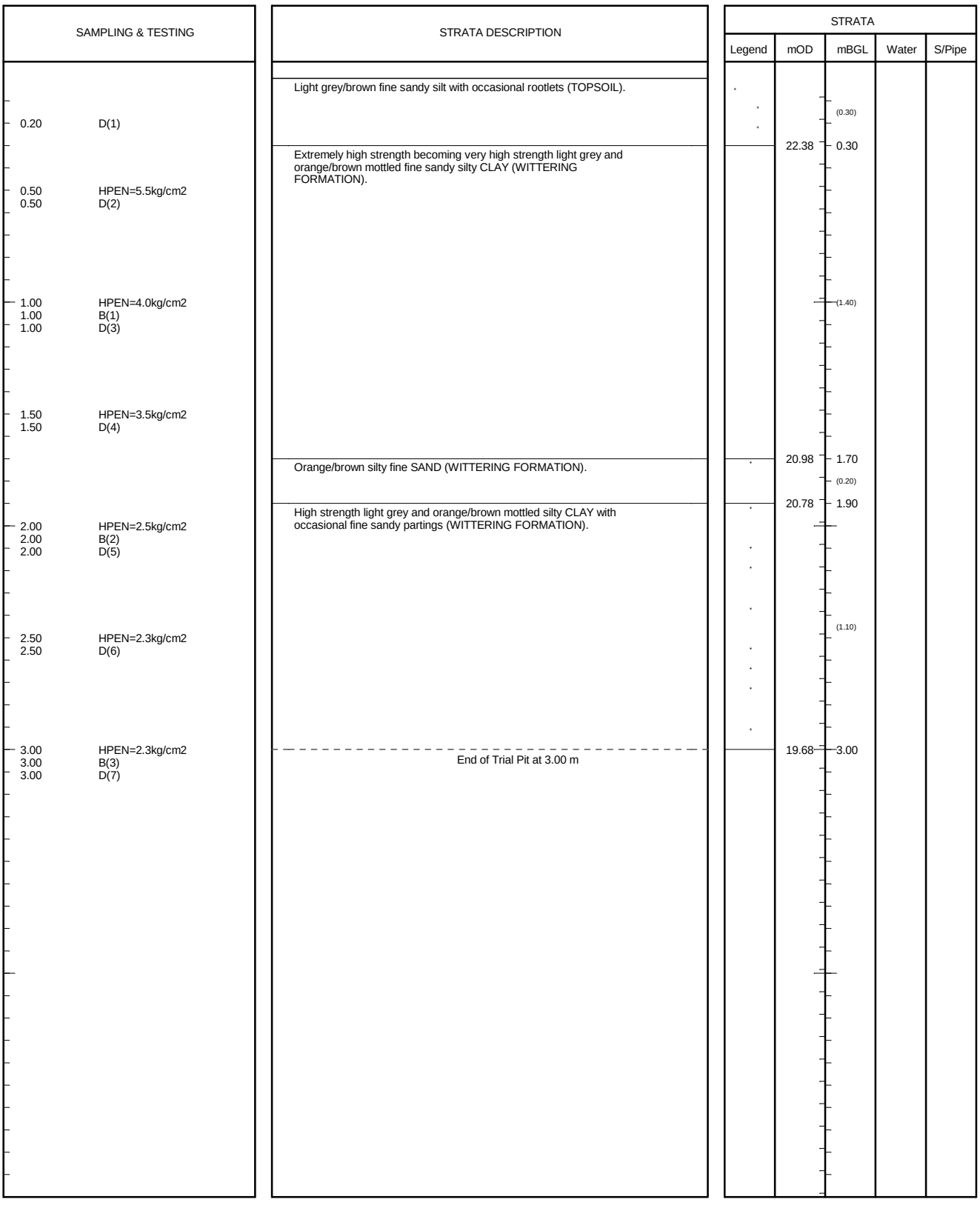
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP107
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 11/09/2013	Scale: 1:25
		Finish: 11/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 11/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 24.851mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: AB	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Brown slightly clayey silt with abundant roots (1mm) and occasional flint gravel (TOPSOIL).			(0.36)		
0.20	D(1)			24.56	0.36		
0.50	HPEN=3.3kg/cm2	Very high strength becoming medium to high strength brown/orange and grey mottled slightly silty CLAY with rare rootlets (WITTERING FORMATION).					
0.50	D(2)						
1.00	HPEN=2.8kg/cm2				(1.54)		
1.00	B(1)						
1.00	D(3)						
1.50	HPEN=1.5kg/cm2						
1.50	D(4)						
		Light brown slightly clayey fine SAND (WITTERING FORMATION).		23.02	1.90		
2.00	B(2)						
2.00	D(5)				(1.10)		
2.50	D(6)						
3.00	B(3)			21.92	3.00		
3.00	D(7)	End of Trial Pit at 3.00 m					

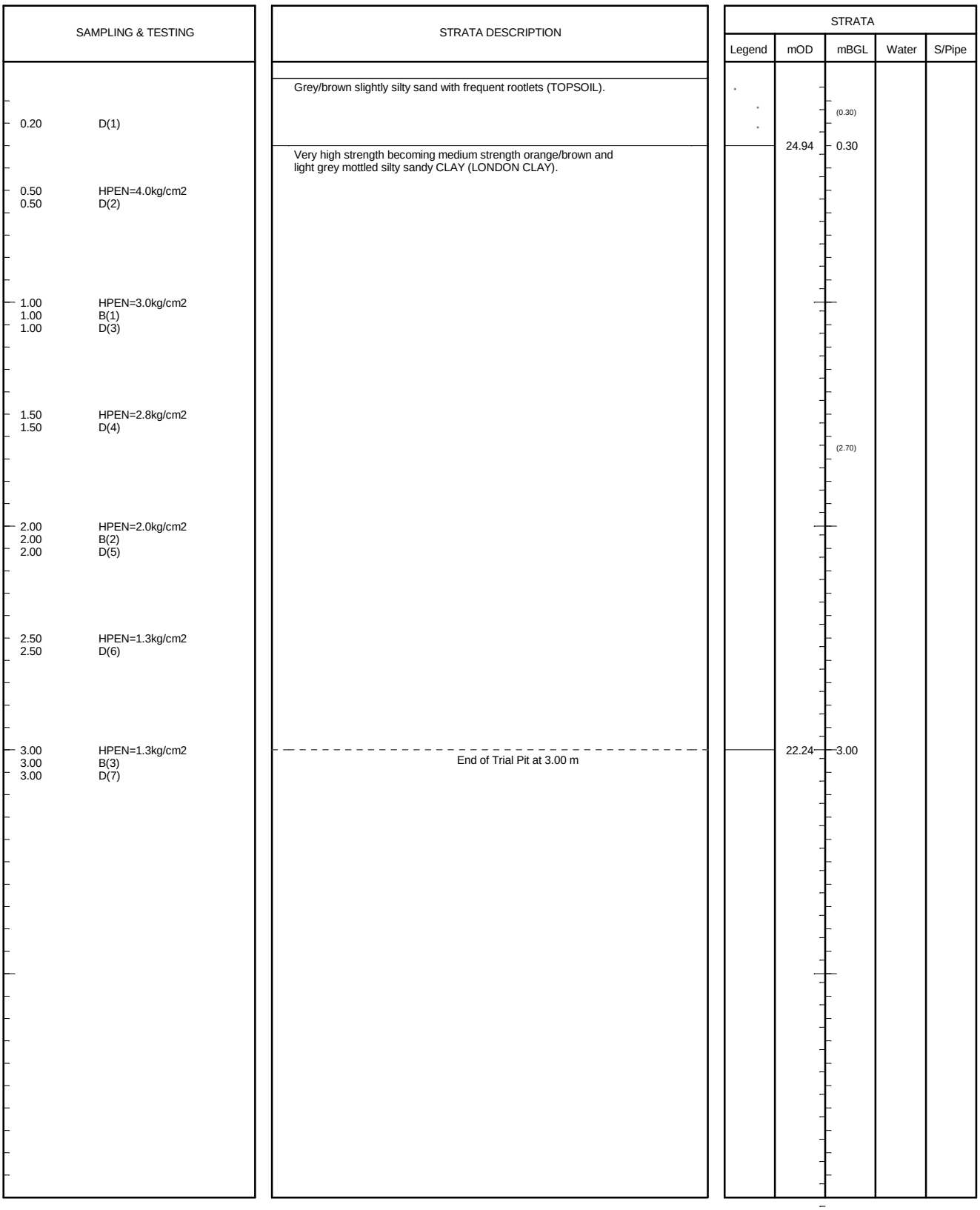
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP108
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 11/09/2013	Scale: 1:25
		Finish: 11/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 11/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 24.915mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: AB	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



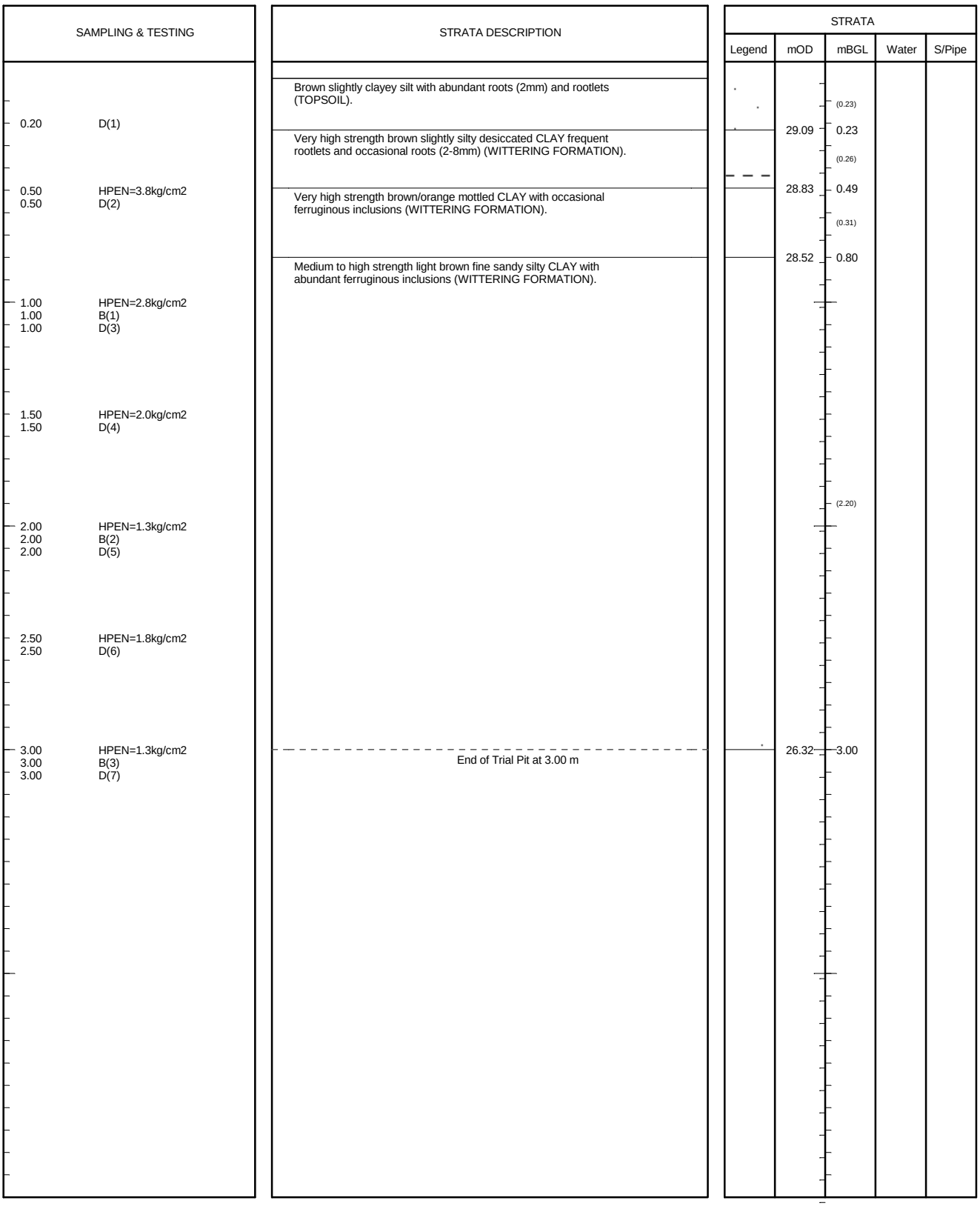
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP109
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 12/09/2013	Scale: 1:25
		Finish: 12/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 12/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 22.683mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP110
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 13/09/2013	Scale: 1:25
		Finish: 13/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 13/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 25.239mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



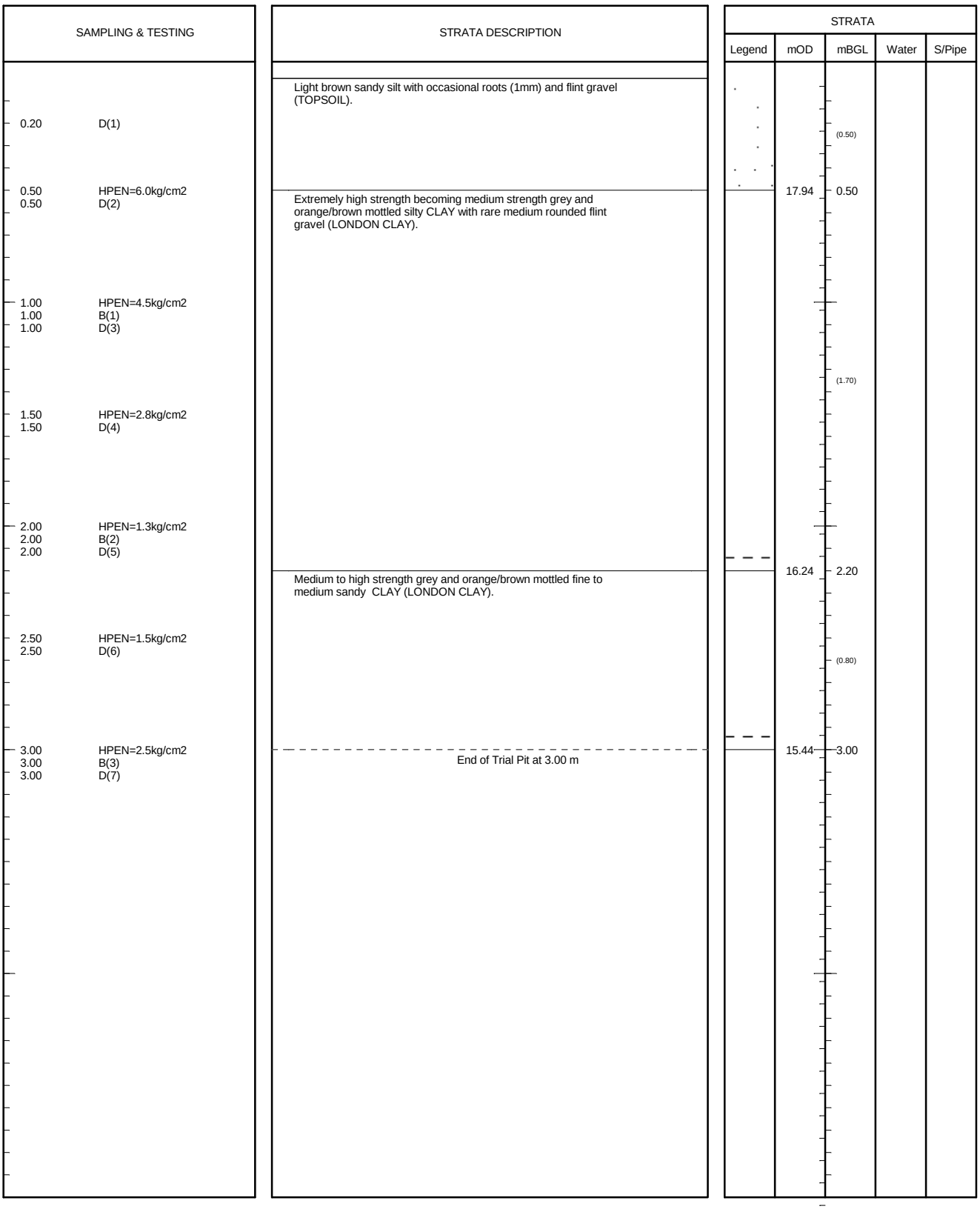
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP111
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 10/09/2013	Scale: 1:25
		Finish: 10/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 10/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 29.323mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: AB	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Grey/brown slightly silty sand with frequent rootlets (TOPSOIL).					
0.20	D(1)				(0.40)		
		Very high strength light grey and orange/brown mottled fine sandy CLAY (WITTERING FORMATION).		23.21	0.40		
0.50	HPEN=5.0kg/cm2						
0.50	B(1)						
	D(2)						
					(1.10)		
1.00	HPEN=4.0kg/cm2						
1.00	D(3)						
1.50	B(2)			22.11	1.50		
1.50	D(4)	Orange/brown and light grey mottled silty fine to medium SAND (WITTERING FORMATION).					
2.00	D(5)						
					(1.50)		
2.50	B(3)						
2.50	D(6)						
3.00	D(7)	End of Trial Pit at 3.00 m		20.61	3.00		

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP112
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 13/09/2013	Scale: 1:25
		Finish: 13/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 13/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 23.609mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1



SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP113
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 16/09/2013	Scale: 1:25
		Finish: 16/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 16/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 18.436mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: AB	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Light grey/brown slightly clayey fine sandy silt with frequent roots (<5mm) (TOPSOIL).			(0.30)		
0.20	D(1)			16.39	0.30		
		High to very high strength grey/brown and orange/brown mottled slightly silty CLAY (WITTERING FORMATION).			(1.50)		
0.50	HPEN=3.0kg/cm2						
0.50	D(2)						
1.00	HPEN=1.8kg/cm2						
1.00	B(1)						
1.00	D(3)						
1.50	HPEN=2.8kg/cm2						
1.50	D(4)						
		Orange/brown clayey silty fine SAND with frequent medium to coarse sub-angular flint gravel and occasional cobble-sized flints (WITTERING FORMATION).		14.89	1.80		
2.00	B(2)						
2.00	D(5)				(1.20)		
2.50	D(6)						
3.00	B(3)			13.69	3.00		
3.00	D(7)	End of Trial Pit at 3.30 m					

SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP114
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 16/09/2013	Scale: 1:25
		Finish: 16/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 16/09/2013	Depth: 3.30mBGL
		Eng: JK	Level: 16.687mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: EN	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

SAMPLING & TESTING		STRATA DESCRIPTION	STRATA				
			Legend	mOD	mBGL	Water	S/Pipe
		Light brown sandy silt with with abundant roots (1mm) and occasional flint gravel (TOPSOIL).			(0.30)		
0.20	D(1)			18.41	0.30		
0.50	HPEN=3.0kg/cm2	High to very high strength brown/orange slightly silty fine sandy CLAY (WITTERING FORMATION).					
0.50	B(1)						
0.50	D(2)						
1.00	HPEN=2.5kg/cm2				(1.40)		
1.00	D(3)						
1.50	HPEN=3.0kg/cm2						
1.50	B(2)						
1.50	D(4)						
		Grey/brown and orange mottled clayey fine SAND (WITTERING FORMATION).		17.01	1.70		
2.00	D(5)						
					(1.30)		
2.50	B(3)						
2.50	D(6)						
3.00	D(7)	End of Trial Pit at 3.00 m		15.71	3.00		

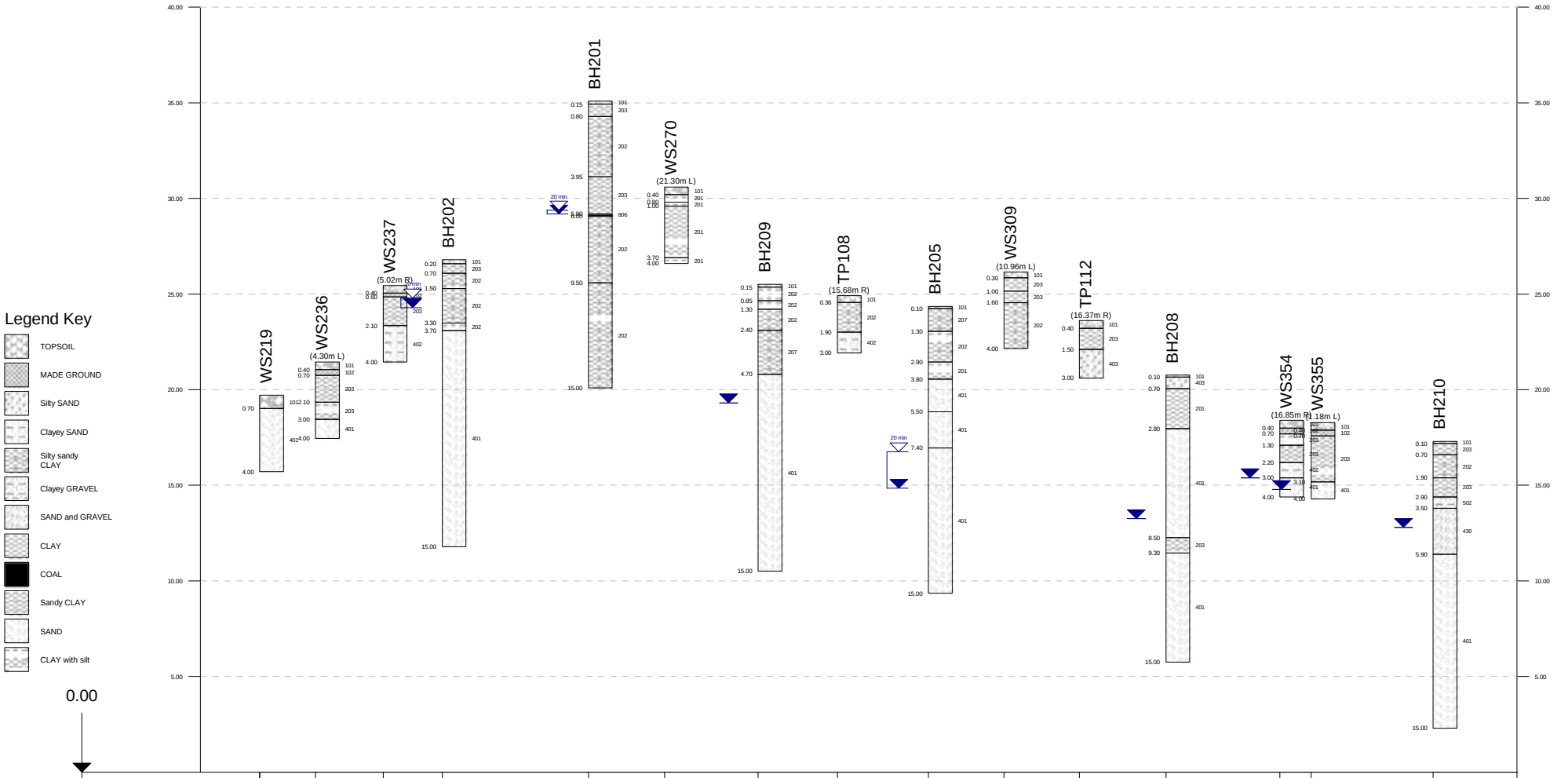
SAMPLES: D=disturbed B=bulk U=undisturbed TESTS: MAC=macintosh IVAN=vane HPEN=penetrometer SPT=split-spoon CPT=cone WATER: ▽=strike ▼=rest OTHERS: (2.00)=strata

Stability: No instability encountered	Type: Machine Excavated Trial Pit	Ref: GE9523	Position: TP115
Groundwater: No Groundwater Encountered	Method: 5 Tonne Mini	Start: 16/09/2013	Scale: 1:25
		Finish: 16/09/2013	Size: -
Plant: 5 Tonne Mini	Project: Boorley Green	Filled: 16/09/2013	Depth: 3.00mBGL
		Eng: JK	Level: 18.711mOD
Remarks: Back filled on completion of soakage test	Client: MA Botley Limited	Drawn: AB	Figure: FIG
		Ckd: JK	Sheet: Sheet 1 of 1

PROJECT REF: GE9523
LOCATION: Boorley Green (Southampton) (Section: Section 1 (NW-SE))
CLIENT: MA Botley Limited

TITLE: Boorley Green

ENGINEER: JK



Chainage (m)	0.00	64.87	143.58	212.36	382.50	470.98	579.95	672.09	778.08	866.06	953.72	1054.37	1186.76	1223.30	1365.23	
Elev. (mAOD)	19.71	21.45	25.45	26.79	35.09	30.60	25.51	24.92	24.35	26.15	23.61	20.76	18.39	18.28	17.29	

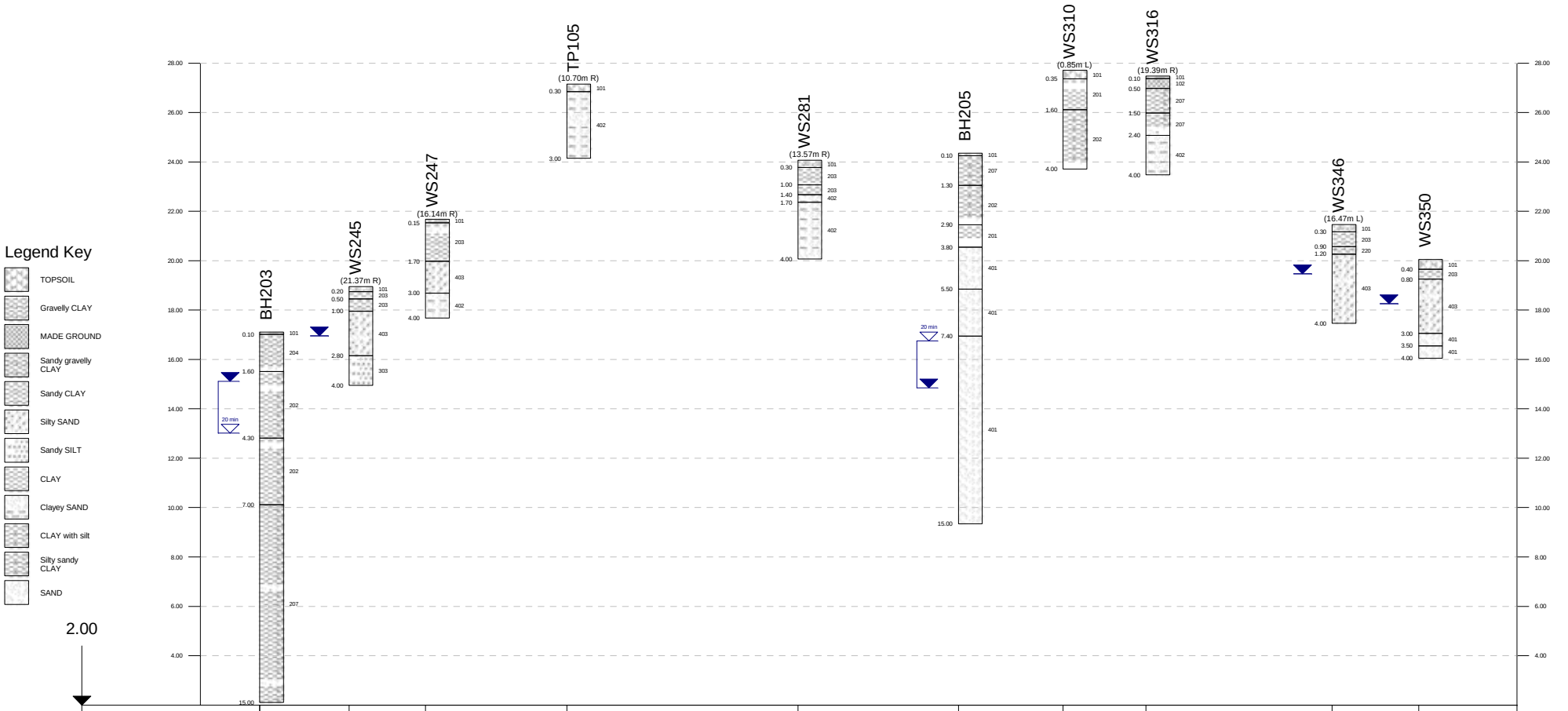
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Created 29 October 2013 at 17:07 from HoleBASE 3.1

PROJECT REF: GE9523
LOCATION: Boorley Green (Southampton) (Section: Section 2 (NE-SW))
CLIENT: MA Botley Limited

TITLE: Boorley Green

ENGINEER: JK



Chainage (m)	0.00	66.24	123.03	227.88	399.32	518.41	596.04	657.61	795.67	859.89	
Elev. (mAOD)	17.11	18.95	21.68	27.15	24.07	24.35	27.71	27.48	21.47	20.05	

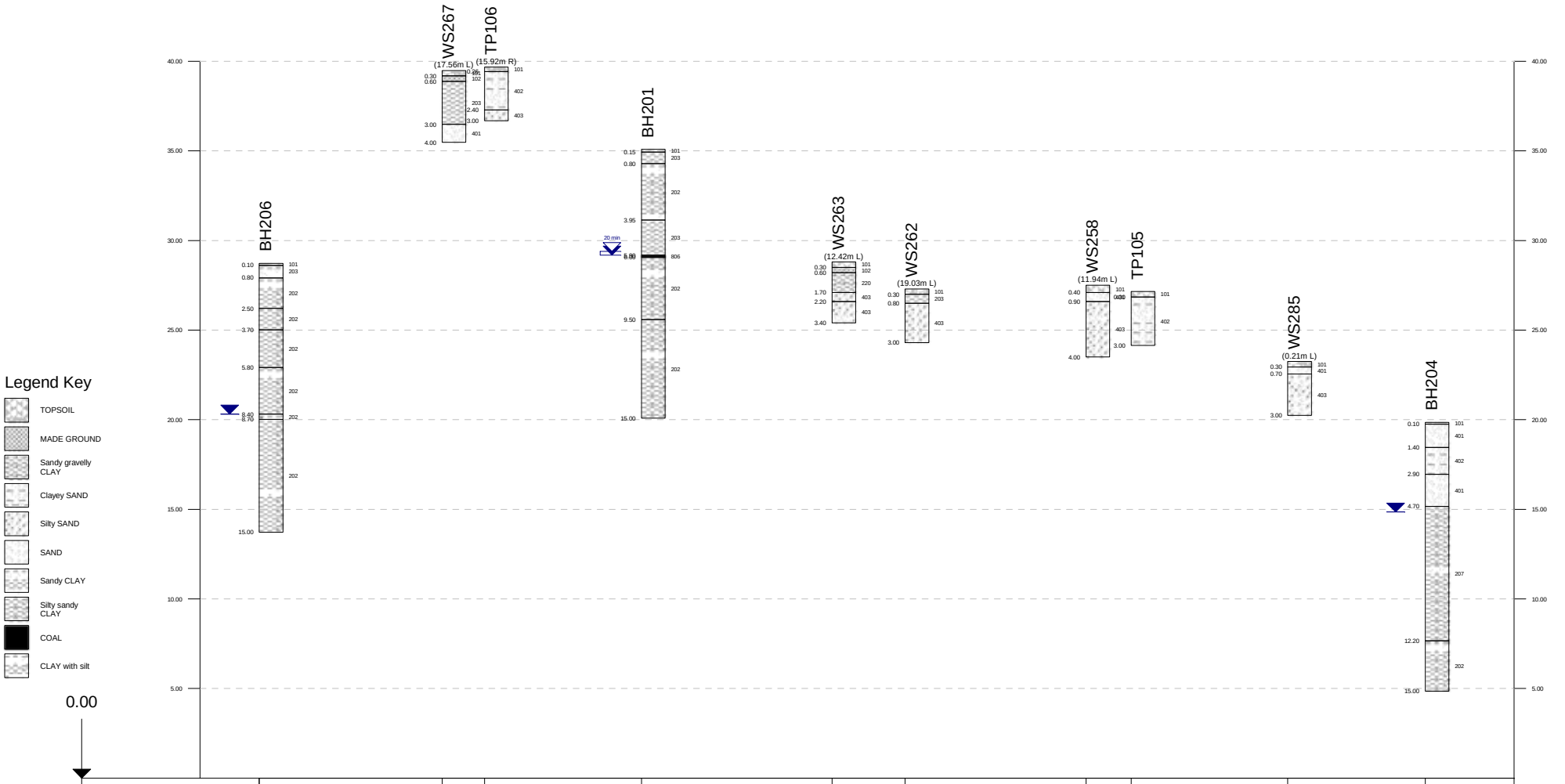
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Created 29 October 2013 at 17:10 from HoleBASE 3.1

PROJECT REF: GE9523
LOCATION: Boorley Green (Southampton) (Section: Section 3 (W-E))
CLIENT: MA Botley Limited

TITLE: Boorley Green

ENGINEER: JK

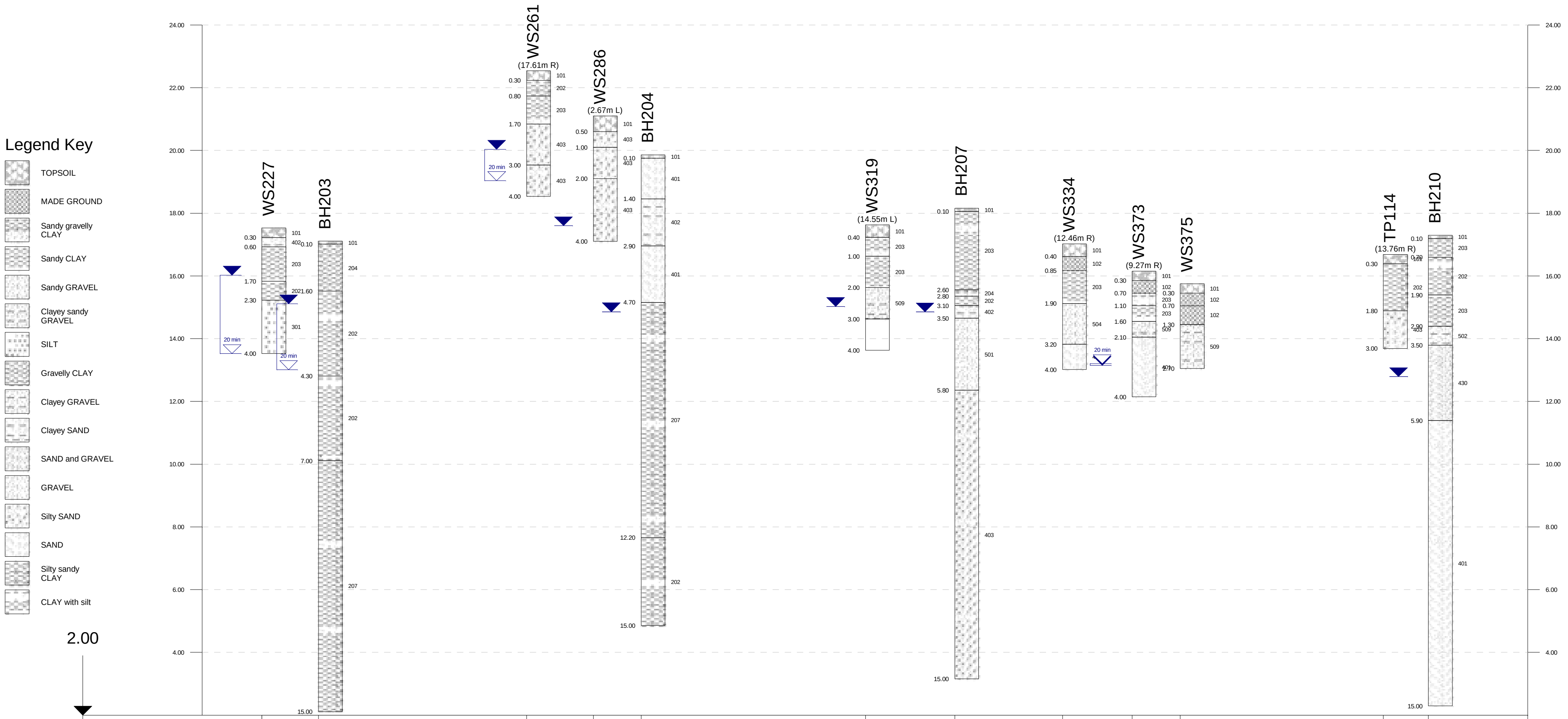


Chainage (m)	0.00	123.60	152.25	258.34	387.06	436.49	558.72	589.22	695.09	788.02	
Elev. (mAOD)	28.72	39.48	39.68	35.09	28.80	27.30	27.50	27.15	23.25	19.86	

SCALE: Horizontal 1:4000 Vertical 1:330
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Created 29 October 2013 at 17:12 from HoleBASE 3.1

PROJECT REF: GE9523 | TITLE: Boorley Green
LOCATION: Boorley Green (Southampton) (Section: Section 4 (Eastern Side NW-SE))
CLIENT: MA Botley Limited | ENGINEER: JK



Chainage (m)	0.00	52.11	243.74	305.30	349.36	555.95	638.31	737.49	801.57	845.99	1033.06	1074.55
Elev. (mAOD)	17.53	17.11	22.54	21.10	19.86	17.63	18.16	17.02	16.15	15.75	16.69	17.29

SCALE: Horizontal 1:5500 Vertical 1:190
(Plotted to Scale for paper size A4)

Created 29 October 2013 at 17:15 from HoleBASE 3.1

APPENDIX C

Dynamic Cone Penetrometer Results

Penetration Data Report

Project Name: BH204

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	125	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted

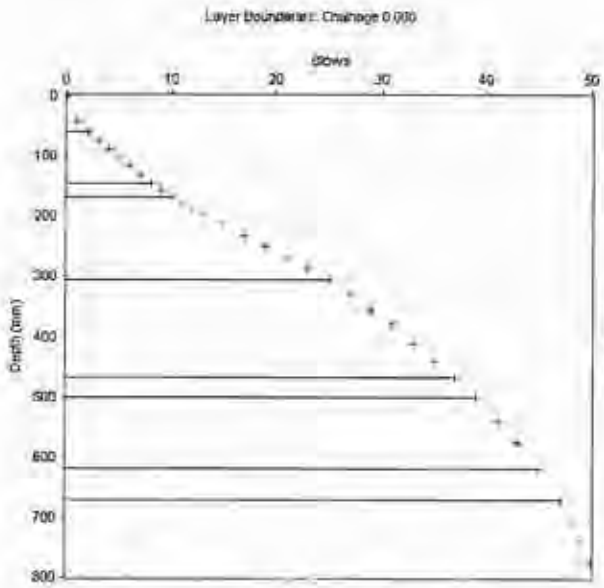
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	125	0.00	26	2	37	593	14.00
2	1	1	168	43.00	27	2	39	626	16.50
3	1	2	186	18.00	28	2	41	666	20.00
4	1	3	200	14.00	29	2	43	701	17.50
5	1	4	214	14.00	30	2	45	745	22.00
6	1	5	227	13.00	31	2	47	796	25.50
7	1	6	242	15.00	32	1	48	834	38.00
8	1	7	256	14.00	33	1	49	865	31.00
9	1	8	270	14.00	34	1	50	900	35.00
10	1	9	282	12.00					
11	1	10	294	12.00					
12	1	11	304	10.00					
13	1	12	314	10.00					
14	1	13	322	8.00					
15	2	15	335	6.50					
16	2	17	358	11.50					
17	2	19	375	8.50					
18	2	21	393	9.00					
19	2	23	411	9.00					
20	2	25	430	9.50					
21	2	27	453	11.50					
22	2	29	480	13.50					
23	2	31	504	12.00					
24	2	33	536	16.00					
25	2	35	565	14.50					

UK DCP V3.1

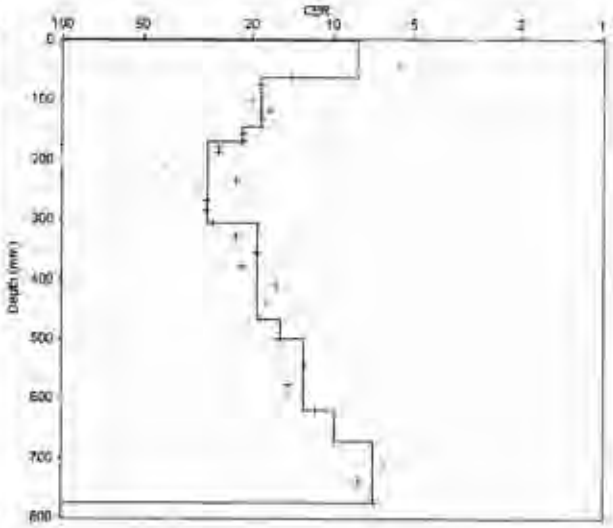
DCP Layer Strength Analysis Report

Project Name: BH204

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	125	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	30.50	8	61	61
2	14.00	19	84	145
3	12.00	22	24	169
4	9.07	29	136	305
5	13.58	19	163	468
6	16.50	16	33	501
7	19.83	13	119	620
8	25.50	10	51	671
9	34.67	7	104	775

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: BH205

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 120
Test Date: 02/10/2013

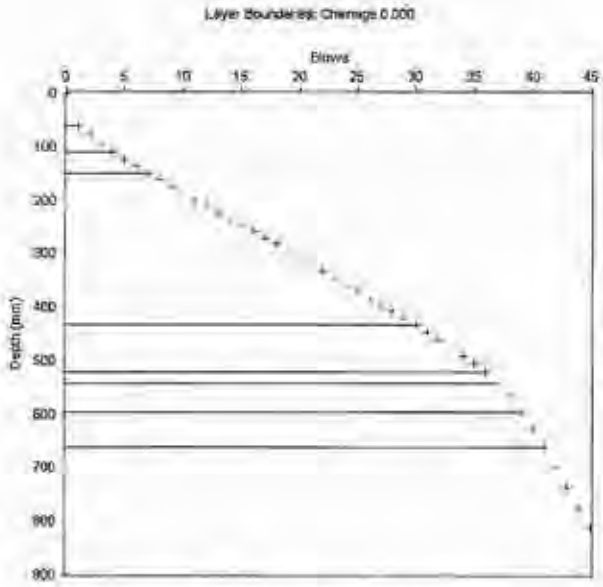
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	120	0.00	26	1	25	490	10.00
2	1	1	180	60.00	27	1	26	505	15.00
3	1	2	196	16.00	28	1	27	514	9.00
4	1	3	215	19.00	29	1	28	527	13.00
5	1	4	230	15.00	30	1	29	540	13.00
6	1	5	244	14.00	31	1	30	552	12.00
7	1	6	255	11.00	32	1	31	566	14.00
8	1	7	270	15.00	33	1	32	580	14.00
9	1	8	282	12.00	34	1	33	594	14.00
10	1	9	295	13.00	35	1	34	610	16.00
11	1	10	308	13.00	36	1	35	626	16.00
12	1	11	320	12.00	37	1	36	642	16.00
13	1	12	330	10.00	38	1	37	663	21.00
14	1	13	342	12.00	39	1	38	686	23.00
15	1	14	357	15.00	40	1	39	715	29.00
16	1	15	365	8.00	41	1	40	747	32.00
17	1	16	377	12.00	42	1	41	782	35.00
18	1	17	390	13.00	43	1	42	820	38.00
19	1	18	401	11.00	44	1	43	857	37.00
20	1	19	415	14.00	45	1	44	895	38.00
21	1	20	425	10.00	46	1	45	932	37.00
22	1	21	440	15.00					
23	1	22	451	11.00					
24	1	23	465	14.00					
25	1	24	480	15.00					

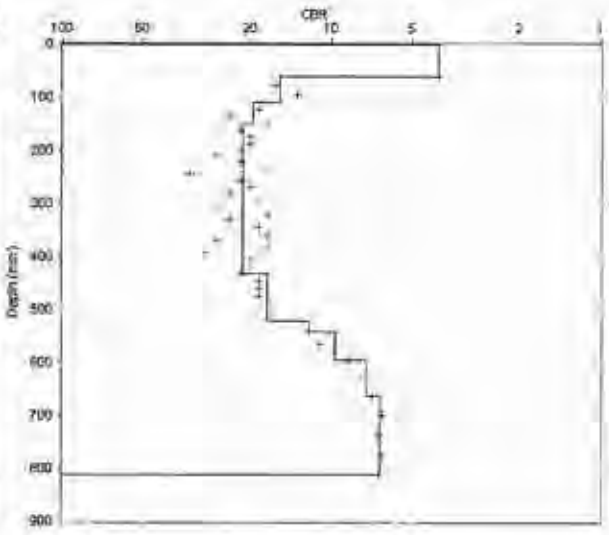
DCP Layer Strength Analysis Report

Project Name: BH205

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	120	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	60.00	4	60	60
2	16.67	15	50	110
3	13.33	20	40	150
4	12.26	21	282	432
5	15.00	17	90	522
6	21.00	12	21	543
7	26.00	10	52	595
8	33.50	7	67	662
9	37.50	7	150	812

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: BH207

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 146
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

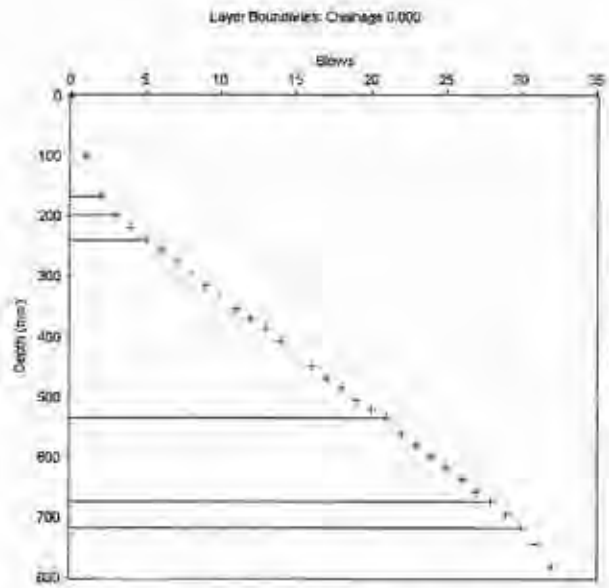
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	146	0.00	26	1	25	763	19.00
2	1	1	245	99.00	27	1	26	781	18.00
3	1	2	313	68.00	28	1	27	802	21.00
4	1	3	344	31.00	29	1	28	820	18.00
5	1	4	364	20.00	30	1	29	841	21.00
6	1	5	385	21.00	31	1	30	863	22.00
7	1	6	402	17.00	32	1	31	890	27.00
8	1	7	421	19.00	33	1	32	927	37.00
9	1	8	441	20.00					
10	1	9	460	19.00					
11	1	10	478	18.00					
12	1	11	500	22.00					
13	1	12	516	16.00					
14	1	13	532	16.00					
15	1	14	554	22.00					
16	1	15	572	18.00					
17	1	16	595	23.00					
18	1	17	614	19.00					
19	1	18	630	16.00					
20	1	19	650	20.00					
21	1	20	666	16.00					
22	1	21	680	14.00					
23	1	22	706	26.00					
24	1	23	726	20.00					
25	1	24	744	18.00					

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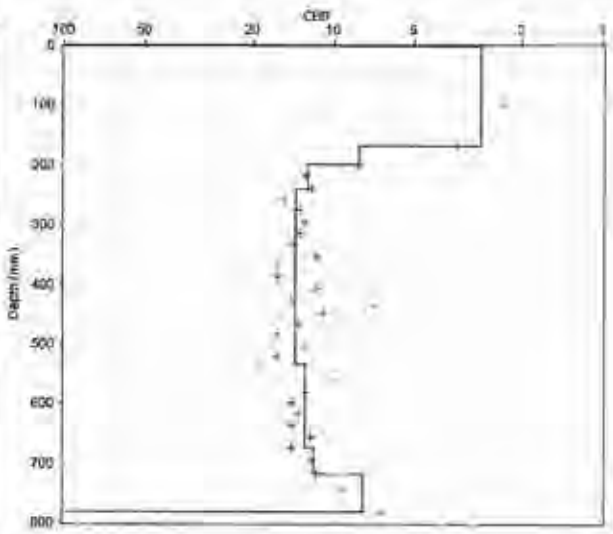
DCP Layer Strength Analysis Report

Project Name: BH207

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	146	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	83.50	3	167	167
2	31.00	8	31	198
3	20.50	12	41	239
4	18.44	14	295	534
5	20.00	13	140	674
6	21.50	12	43	717
7	32.00	8	64	781

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: BH209

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 125
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

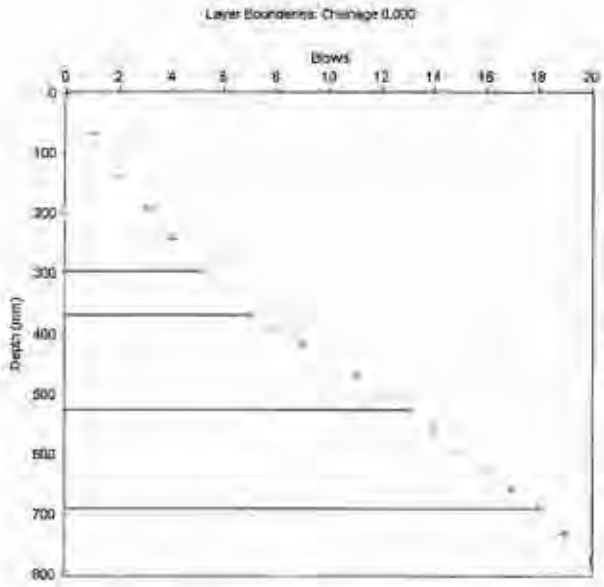
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	125	0.00					
2	1	1	191	66.00					
3	1	2	265	74.00					
4	1	3	316	51.00					
5	1	4	365	49.00					
6	1	5	420	55.00					
7	1	6	456	36.00					
8	1	7	493	37.00					
9	1	8	517	24.00					
10	1	9	540	23.00					
11	1	10	567	27.00					
12	1	11	595	28.00					
13	1	12	626	31.00					
14	1	13	650	24.00					
15	1	14	686	36.00					
16	1	15	720	34.00					
17	1	16	750	30.00					
18	1	17	783	33.00					
19	1	18	815	32.00					
20	1	19	856	41.00					
21	1	20	900	44.00					

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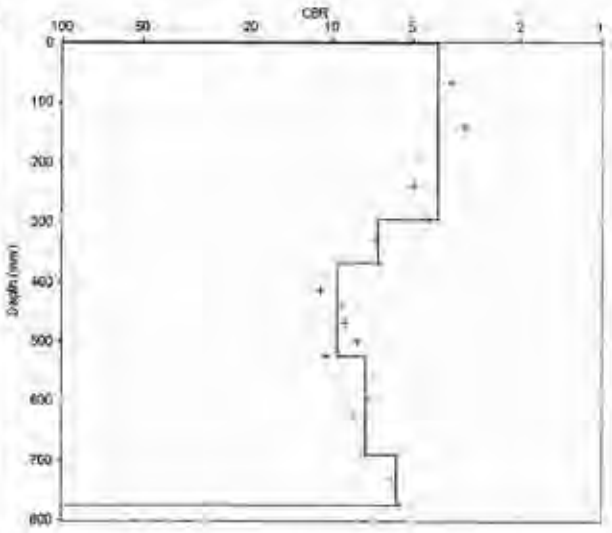
DCP Layer Strength Analysis Report

Project Name: BH209

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	125	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	59.00	4	295	295
2	36.50	7	73	368
3	26.17	10	157	525
4	33.00	7	165	690
5	42.50	6	85	775

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP104

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	134	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

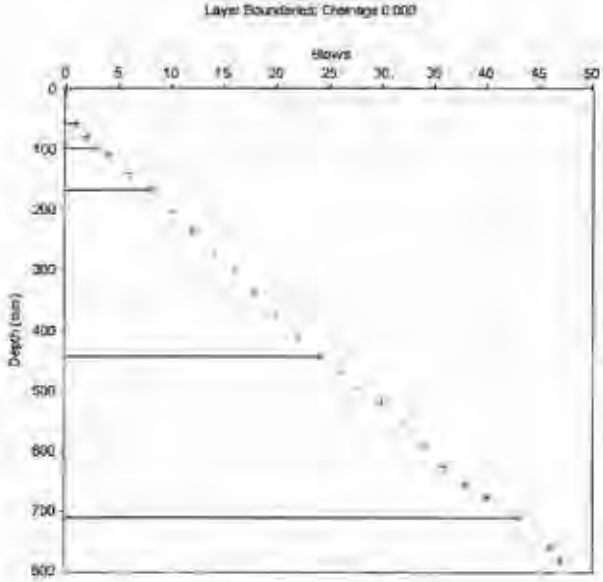
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	134	0.00	26	1	47	916	23.00
2	1	1	190	56.00					
3	1	2	213	23.00					
4	1	3	231	18.00					
5	1	4	243	12.00					
6	2	6	274	15.50					
7	2	8	301	13.50					
8	2	10	335	17.00					
9	2	12	368	16.50					
10	2	14	400	16.00					
11	2	16	436	18.00					
12	2	18	470	17.00					
13	2	20	505	17.50					
14	2	22	543	19.00					
15	2	24	576	16.50					
16	2	26	606	15.00					
17	2	28	630	12.00					
18	2	30	653	11.50					
19	2	32	687	17.00					
20	2	34	727	20.00					
21	2	36	760	16.50					
22	2	38	790	15.00					
23	2	40	812	11.00					
24	3	43	844	10.67					
25	3	46	895	17.00					

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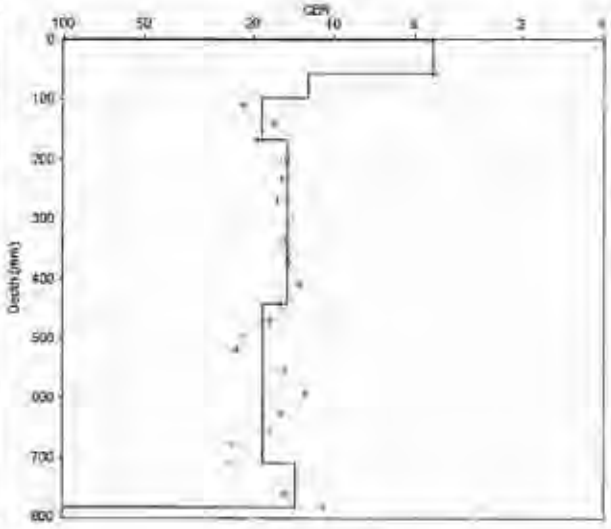
DCP Layer Strength Analysis Report

Project Name: TP104

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	134	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	56.00	4	56	56
2	20.50	12	41	97
3	14.00	19	70	167
4	17.19	15	275	442
5	14.11	18	268	710
6	18.50	14	74	784

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP106

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	145	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted

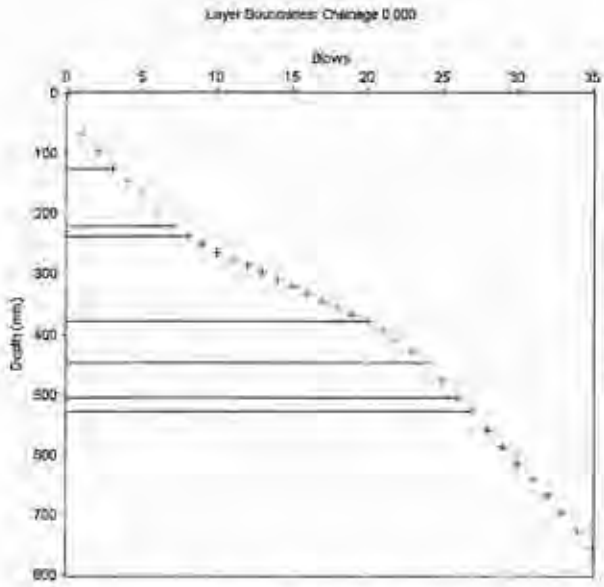
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	145	0.00	26	1	25	621	29.00
2	1	1	212	67.00	27	1	26	650	29.00
3	1	2	240	28.00	28	1	27	672	22.00
4	1	3	270	30.00	29	1	28	703	31.00
5	1	4	290	20.00	30	1	29	731	28.00
6	1	5	311	21.00	31	1	30	760	29.00
7	1	6	342	31.00	32	1	31	785	25.00
8	1	7	365	23.00	33	1	32	812	27.00
9	1	8	382	17.00	34	1	33	841	29.00
10	1	9	395	13.00	35	1	34	872	31.00
11	1	10	408	13.00	36	1	35	900	28.00
12	1	11	420	12.00					
13	1	12	430	10.00					
14	1	13	443	13.00					
15	1	14	454	11.00					
16	1	15	466	12.00					
17	1	16	477	11.00					
18	1	17	489	12.00					
19	1	18	501	12.00					
20	1	19	512	11.00					
21	1	20	523	11.00					
22	1	21	538	15.00					
23	1	22	552	14.00					
24	1	23	573	21.00					
25	1	24	592	19.00					

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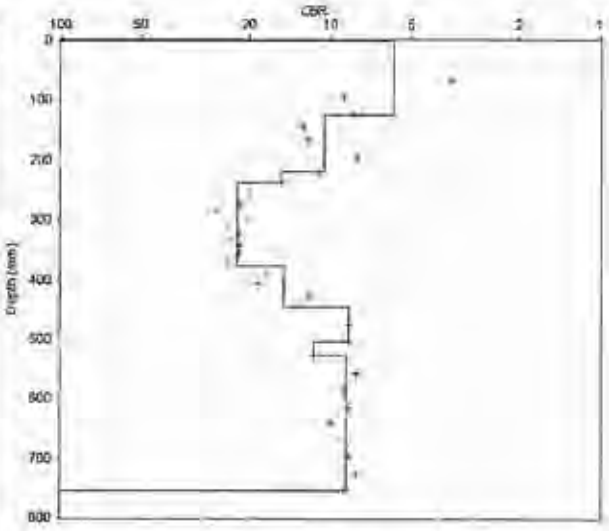
DCP Layer Strength Analysis Report

Project Name: TP106

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	145	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	41.67	6	125	125
2	23.75	11	95	220
3	17.00	15	17	237
4	11.75	22	141	378
5	17.25	15	69	447
6	29.00	9	58	505
7	22.00	12	22	527
8	28.50	9	228	755

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP107

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 141
Test Date: 02/10/2013

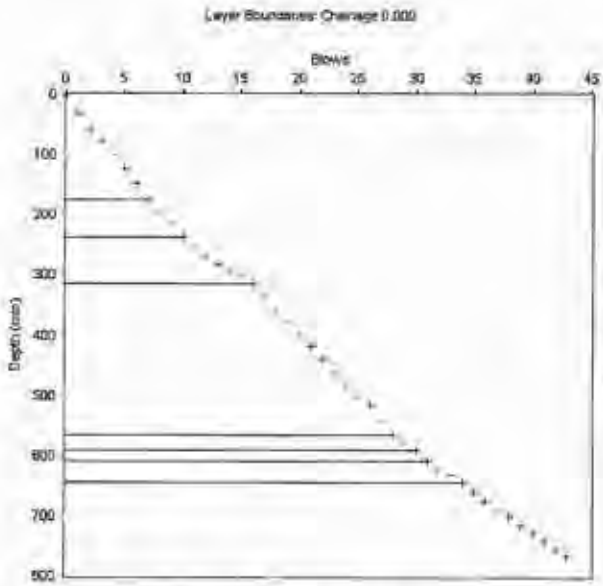
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	141	0.00	26	1	25	646	21.00
2	1	1	172	31.00	27	1	26	657	11.00
3	1	2	199	27.00	28	1	27	683	26.00
4	1	3	217	18.00	29	1	28	706	23.00
5	1	4	240	23.00	30	1	29	721	15.00
6	1	5	263	23.00	31	1	30	732	11.00
7	1	6	288	25.00	32	1	31	750	18.00
8	1	7	315	27.00	33	1	32	762	12.00
9	1	8	336	21.00	34	1	33	773	11.00
10	1	9	356	20.00	35	1	34	786	13.00
11	1	10	377	21.00	36	1	35	801	15.00
12	1	11	395	18.00	37	1	36	816	15.00
13	1	12	412	17.00	38	1	37	830	14.00
14	1	13	423	11.00	39	1	38	842	12.00
15	1	14	433	10.00	40	1	39	856	14.00
16	1	15	443	10.00	41	1	40	870	14.00
17	1	16	455	12.00	42	1	41	882	12.00
18	1	17	476	21.00	43	1	42	897	15.00
19	1	18	500	24.00	44	1	43	908	11.00
20	1	19	520	20.00					
21	1	20	540	20.00					
22	1	21	558	18.00					
23	1	22	579	21.00					
24	1	23	601	22.00					
25	1	24	625	24.00					

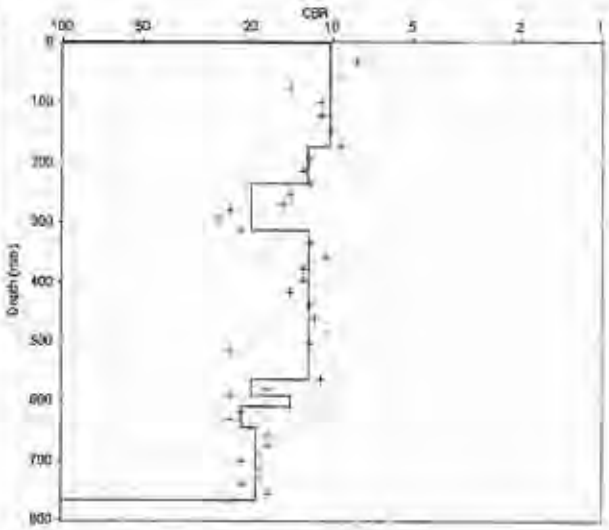
DCP Layer Strength Analysis Report

Project Name: TP107

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	141	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	24.86	10	174	174
2	20.67	12	62	236
3	13.00	20	78	314
4	20.92	12	251	565
5	13.00	20	26	591
6	18.00	14	18	609
7	12.00	22	36	645
8	13.56	19	122	767

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP108

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 132
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

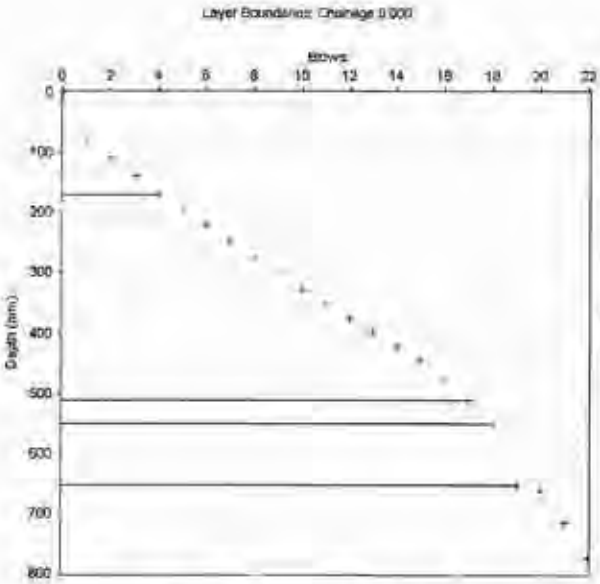
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	132	0.00					
2	1	1	210	78.00					
3	1	2	243	33.00					
4	1	3	271	28.00					
5	1	4	302	31.00					
6	1	5	326	24.00					
7	1	6	353	27.00					
8	1	7	381	28.00					
9	1	8	408	27.00					
10	1	9	434	26.00					
11	1	10	461	27.00					
12	1	11	484	23.00					
13	1	12	508	24.00					
14	1	13	529	21.00					
15	1	14	554	25.00					
16	1	15	576	22.00					
17	1	16	610	34.00					
18	1	17	643	33.00					
19	1	18	682	39.00					
20	1	19	784	102.00					
21	1	20	793	9.00					
22	1	21	846	53.00					
23	1	22	906	60.00					

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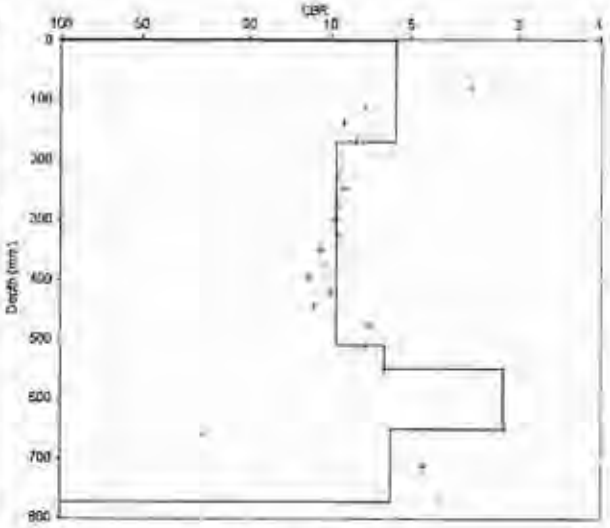
DCP Layer Strength Analysis Report

Project Name: TP108

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	132	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	42.50	6	170	170
2	26.23	10	341	511
3	39.00	6	39	550
4	102.00	2	102	652
5	40.67	6	122	774

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP109

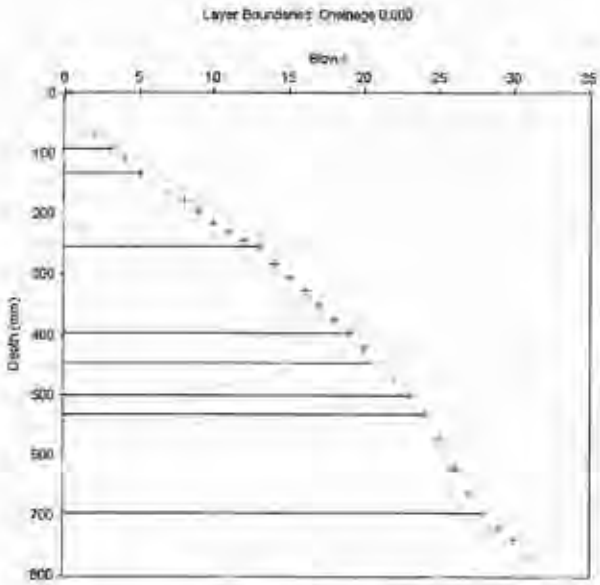
Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	154	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	154	0.00	26	1	25	727	41.00
2	1	1	205	51.00	27	1	26	775	48.00
3	1	2	223	18.00	28	1	27	816	41.00
4	1	3	246	23.00	29	1	28	850	34.00
5	1	4	265	19.00	30	1	29	875	25.00
6	1	5	284	19.00	31	1	30	894	19.00
7	1	6	300	16.00	32	1	31	924	30.00
8	1	7	316	16.00					
9	1	8	331	15.00					
10	1	9	350	19.00					
11	1	10	367	17.00					
12	1	11	383	16.00					
13	1	12	398	15.00					
14	1	13	407	9.00					
15	1	14	436	29.00					
16	1	15	460	24.00					
17	1	16	480	20.00					
18	1	17	505	25.00					
19	1	18	527	22.00					
20	1	19	551	24.00					
21	1	20	576	25.00					
22	1	21	600	24.00					
23	1	22	626	26.00					
24	1	23	654	28.00					
25	1	24	686	32.00					

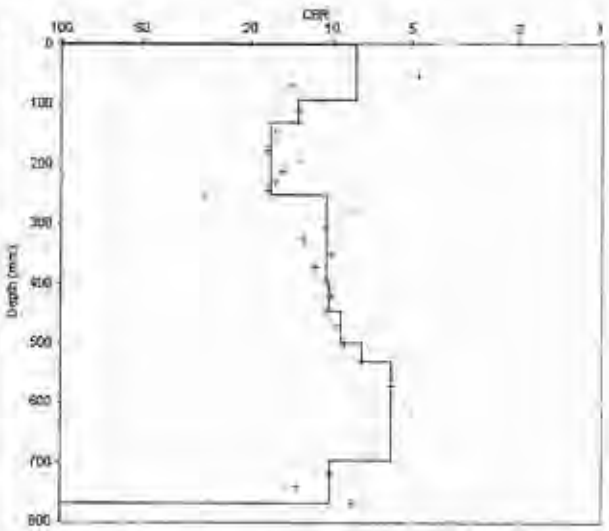
DCP Layer Strength Analysis Report

Project Name: TP109

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	154	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	30.67	8	92	92
2	19.00	13	38	130
3	15.38	17	123	253
4	24.00	10	144	397
5	24.50	10	49	446
6	27.00	9	54	500
7	32.00	8	32	532
8	41.00	6	164	696
9	24.67	10	74	770

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP110

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 132
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

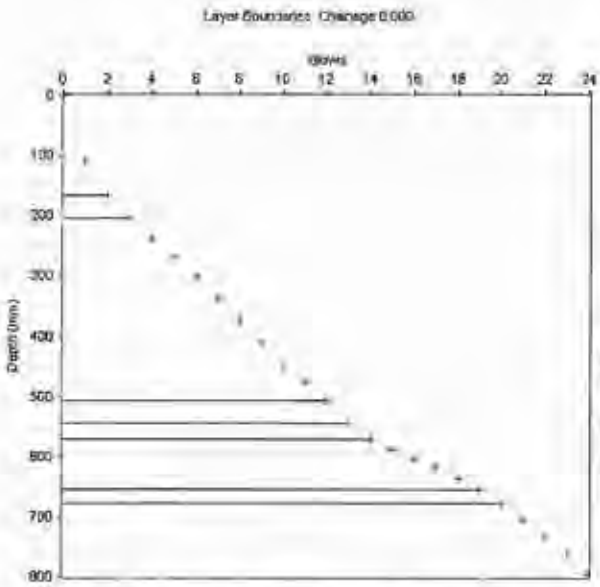
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	132	0.00					
2	1	1	242	110.00					
3	1	2	299	57.00					
4	1	3	336	37.00					
5	1	4	371	35.00					
6	1	5	401	30.00					
7	1	6	433	32.00					
8	1	7	468	35.00					
9	1	8	506	38.00					
10	1	9	542	36.00					
11	1	10	579	37.00					
12	1	11	607	28.00					
13	1	12	639	32.00					
14	1	13	677	38.00					
15	1	14	704	27.00					
16	1	15	720	16.00					
17	1	16	737	17.00					
18	1	17	750	13.00					
19	1	18	768	18.00					
20	1	19	786	18.00					
21	1	20	810	24.00					
22	1	21	837	27.00					
23	1	22	865	28.00					
24	1	23	895	30.00					
25	1	24	927	32.00					

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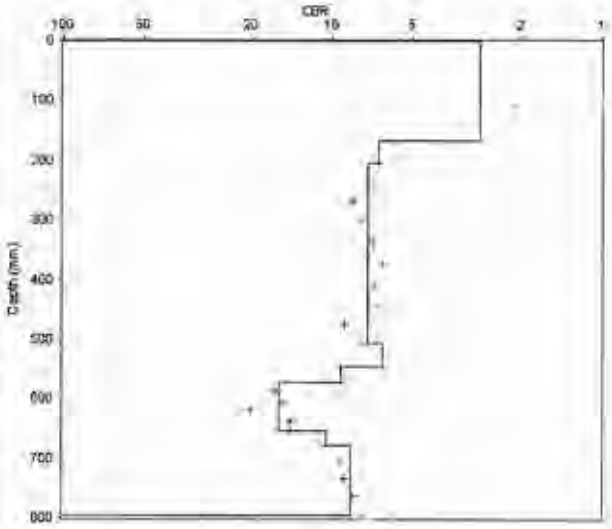
DCP Layer Strength Analysis Report

Project Name: TP110

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	132	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	83.50	3	167	167
2	37.00	7	37	204
3	33.67	7	303	507
4	38.00	6	38	545
5	27.00	9	27	572
6	16.40	16	82	654
7	24.00	10	24	678
8	29.25	9	117	795

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP112

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 146
Test Date: 25/09/2013

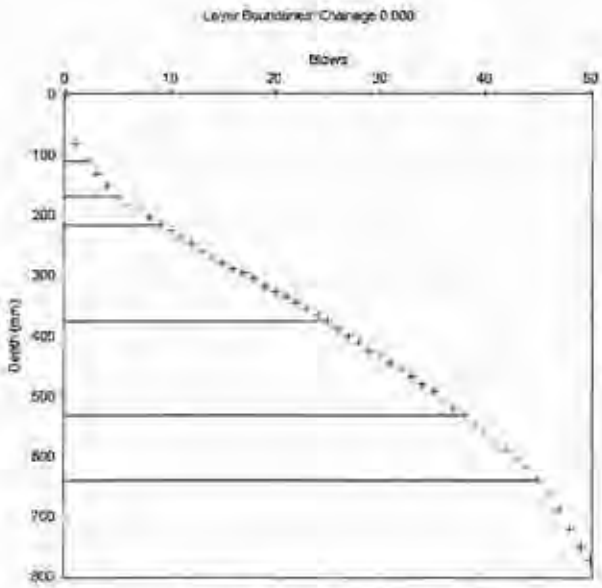
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	146	0.00	26	1	25	522	10.00
2	1	1	227	81.00	27	1	26	535	13.00
3	1	2	257	30.00	28	1	27	546	11.00
4	1	3	276	19.00	29	1	28	557	11.00
5	1	4	298	22.00	30	1	29	569	12.00
6	1	5	314	16.00	31	1	30	578	9.00
7	1	6	327	13.00	32	1	31	590	12.00
8	1	7	338	11.00	33	1	32	601	11.00
9	1	8	350	12.00	34	1	33	613	12.00
10	1	9	362	12.00	35	1	34	626	13.00
11	1	10	371	9.00	36	1	35	638	12.00
12	1	11	382	11.00	37	1	36	657	19.00
13	1	12	393	11.00	38	1	37	665	8.00
14	1	13	405	12.00	39	1	38	677	12.00
15	1	14	417	12.00	40	1	39	692	15.00
16	1	15	426	9.00	41	1	40	706	14.00
17	1	16	435	9.00	42	1	41	721	15.00
18	1	17	442	7.00	43	1	42	736	15.00
19	1	18	452	10.00	44	1	43	751	15.00
20	1	19	463	11.00	45	1	44	766	15.00
21	1	20	472	9.00	46	1	45	785	19.00
22	1	21	481	9.00	47	1	46	806	21.00
23	1	22	490	9.00	48	1	47	835	29.00
24	1	23	502	12.00	49	1	48	867	32.00
25	1	24	512	10.00	50	1	49	897	30.00
51	1	50	920	23.00					

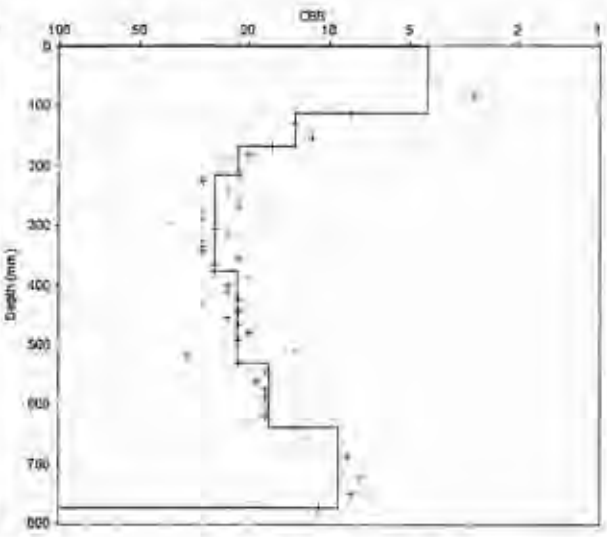
DCP Layer Strength Analysis Report

Project Name: TP112

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	146	Surface Morsture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	55.50	4	111	111
2	19.00	13	57	168
3	12.00	22	48	216
4	10.00	26	160	376
5	11.92	22	155	531
6	15.43	17	108	639
7	27.00	9	135	774

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP113

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 133
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

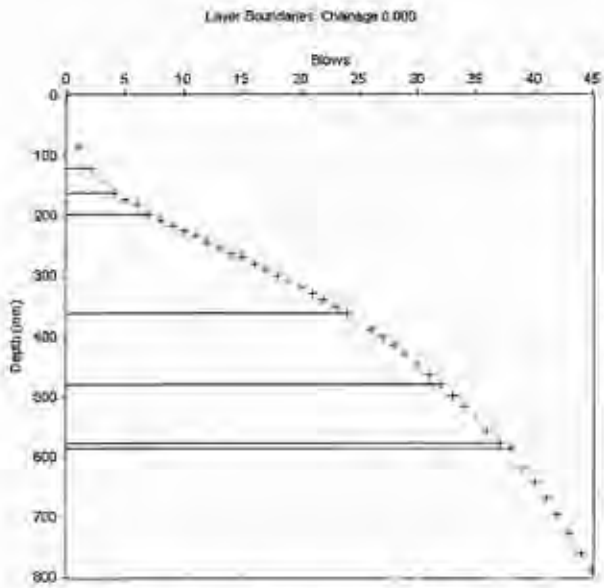
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	133	0.00	26	1	25	508	13.00
2	1	1	219	86.00	27	1	26	521	13.00
3	1	2	253	34.00	28	1	27	534	13.00
4	1	3	277	24.00	29	1	28	548	14.00
5	1	4	295	18.00	30	1	29	564	16.00
6	1	5	305	10.00	31	1	30	580	16.00
7	1	6	314	9.00	32	1	31	597	17.00
8	1	7	331	17.00	33	1	32	613	16.00
9	1	8	340	9.00	34	1	33	632	19.00
10	1	9	349	9.00	35	1	34	650	18.00
11	1	10	358	9.00	36	1	35	667	17.00
12	1	11	366	8.00	37	1	36	690	23.00
13	1	12	376	10.00	38	1	37	710	20.00
14	1	13	386	10.00	39	1	38	720	10.00
15	1	14	395	9.00	40	1	39	753	33.00
16	1	15	402	7.00	41	1	40	776	23.00
17	1	16	413	11.00	42	1	41	802	26.00
18	1	17	422	9.00	43	1	42	830	28.00
19	1	18	432	10.00	44	1	43	860	30.00
20	1	19	441	9.00	45	1	44	894	34.00
21	1	20	450	9.00	46	1	45	923	29.00
22	1	21	461	11.00					
23	1	22	472	11.00					
24	1	23	484	12.00					
25	1	24	495	11.00					

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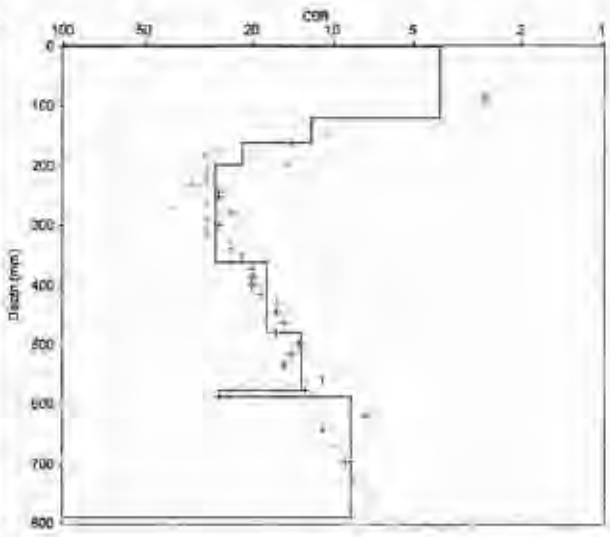
DCP Layer Strength Analysis Report

Project Name: TP113

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	133	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	60.00	4	120	120
2	21.00	12	42	162
3	12.00	22	36	198
4	9.65	28	164	362
5	14.75	18	118	480
6	19.40	13	97	577
7	10.00	26	10	587
8	29.00	9	203	790

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP114

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 124
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

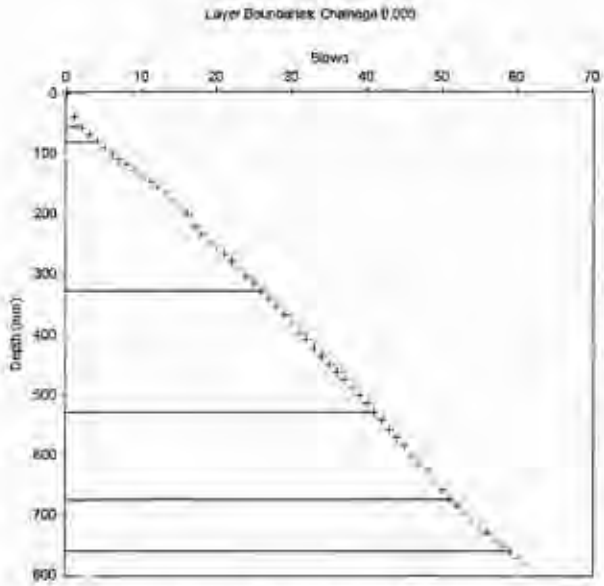
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00	26	1	25	440	10.00
2	1	1	163	39.00	27	1	26	452	12.00
3	1	2	180	17.00	28	1	27	465	13.00
4	1	3	193	13.00	29	1	28	478	13.00
5	1	4	206	13.00	30	1	29	491	13.00
6	1	5	215	9.00	31	1	30	506	15.00
7	1	6	225	10.00	32	1	31	520	14.00
8	1	7	235	10.00	33	1	32	534	14.00
9	1	8	242	7.00	34	1	33	548	14.00
10	1	9	253	11.00	35	1	34	561	13.00
11	1	10	262	9.00	36	1	35	575	14.00
12	1	11	272	10.00	37	1	36	587	12.00
13	1	12	280	8.00	38	1	37	600	13.00
14	1	13	291	11.00	39	1	38	614	14.00
15	1	14	302	11.00	40	1	39	626	12.00
16	1	15	314	12.00	41	1	40	640	14.00
17	1	16	325	11.00	42	1	41	653	13.00
18	1	17	346	21.00	43	1	42	667	14.00
19	1	18	358	12.00	44	1	43	682	15.00
20	1	19	371	13.00	45	1	44	695	13.00
21	1	20	380	9.00	46	1	45	710	15.00
22	1	21	392	12.00	47	1	46	726	16.00
23	1	22	405	13.00	48	1	47	740	14.00
24	1	23	416	11.00	49	1	48	750	10.00
25	1	24	430	14.00	50	1	49	770	20.00
51	1	50	783	13.00					
52	1	51	800	17.00					
53	1	52	810	10.00					
54	1	53	822	12.00					
55	1	54	833	11.00					
56	1	55	842	9.00					
57	1	56	854	12.00					
58	1	57	866	12.00					
59	1	58	876	10.00					
60	1	59	884	8.00					
61	1	60	896	12.00					
62	1	61	907	11.00					

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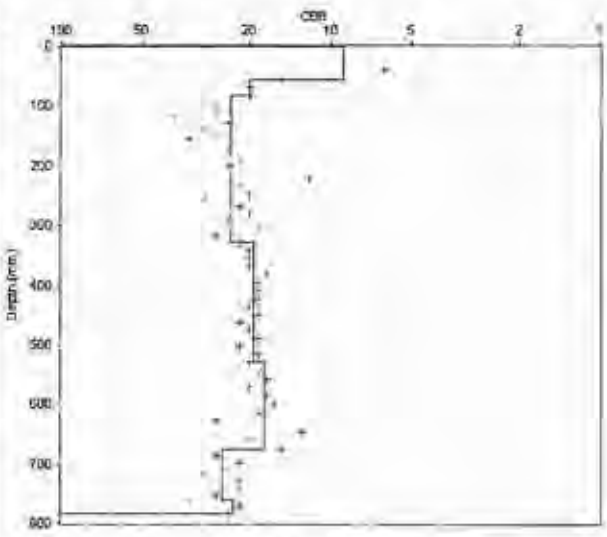
DCP Layer Strength Analysis Report

Project Name: TP114

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	28.00	9	56	56
2	13.00	20	26	82
3	11.18	24	246	328
4	13.40	19	201	529
5	14.70	18	147	676
6	10.50	25	84	760
7	11.50	23	23	783

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: TP115

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted

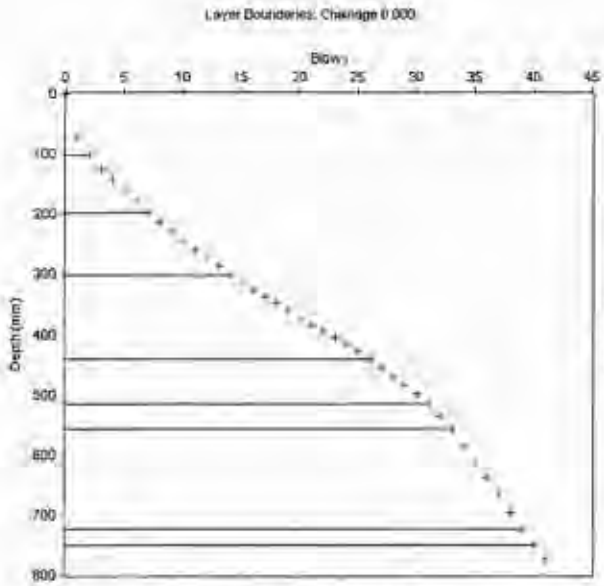
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	131	0.00	26	1	25	559	12.00
2	1	1	204	73.00	27	1	26	571	12.00
3	1	2	233	29.00	28	1	27	586	15.00
4	1	3	255	22.00	29	1	28	600	14.00
5	1	4	274	19.00	30	1	29	616	16.00
6	1	5	295	21.00	31	1	30	630	14.00
7	1	6	310	15.00	32	1	31	647	17.00
8	1	7	329	19.00	33	1	32	667	20.00
9	1	8	345	16.00	34	1	33	687	20.00
10	1	9	360	15.00	35	1	34	716	29.00
11	1	10	376	16.00	36	1	35	742	26.00
12	1	11	390	14.00	37	1	36	768	26.00
13	1	12	403	13.00	38	1	37	795	27.00
14	1	13	418	15.00	39	1	38	828	33.00
15	1	14	432	14.00	40	1	39	855	27.00
16	1	15	445	13.00	41	1	40	881	26.00
17	1	16	458	13.00	42	1	41	903	22.00
18	1	17	468	10.00					
19	1	18	478	10.00					
20	1	19	491	13.00					
21	1	20	504	13.00					
22	1	21	515	11.00					
23	1	22	526	11.00					
24	1	23	536	10.00					
25	1	24	547	11.00					

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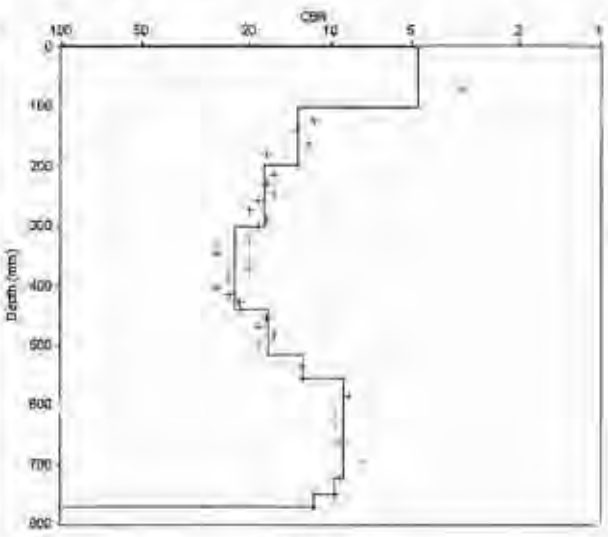
DCP Layer Strength Analysis Report

Project Name: TP115

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	51.00	5	102	102
2	19.20	13	96	198
3	14.71	18	103	301
4	11.58	23	139	440
5	15.20	17	76	516
6	20.00	13	40	556
7	28.00	9	168	724
8	26.00	10	26	750
9	22.00	12	22	772

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS205

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

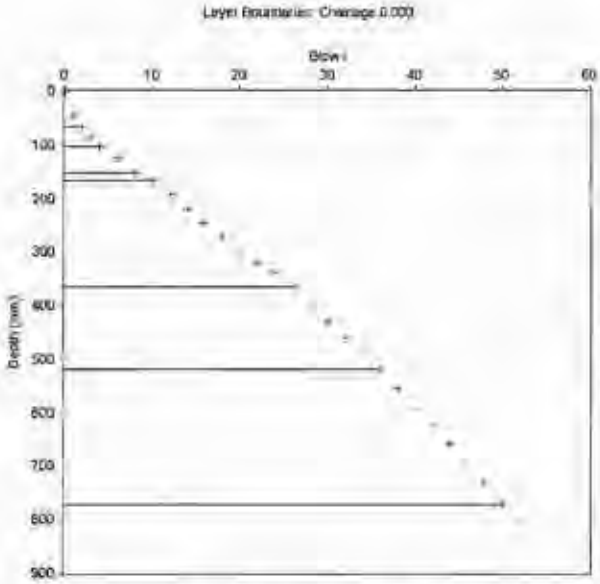
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	2	46	816	18.00
2	1	1	165	44.00	27	2	48	852	18.00
3	1	2	187	22.00	28	2	50	892	20.00
4	1	3	207	20.00	29	2	52	924	16.00
5	1	4	223	16.00					
6	2	6	246	11.50					
7	2	8	273	13.50					
8	2	10	286	6.50					
9	2	12	312	13.00					
10	2	14	340	14.00					
11	2	16	366	13.00					
12	2	18	390	12.00					
13	2	20	415	12.50					
14	2	22	441	13.00					
15	2	24	461	10.00					
16	2	26	486	12.50					
17	2	28	525	19.50					
18	2	30	552	13.50					
19	2	32	581	14.50					
20	2	34	610	14.50					
21	2	36	640	15.00					
22	2	38	675	17.50					
23	2	40	712	18.50					
24	2	42	746	17.00					
25	2	44	780	17.00					

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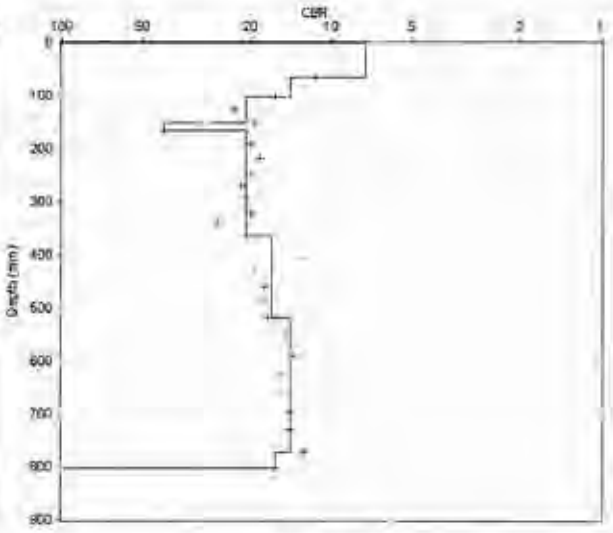
DCP Layer Strength Analysis Report

Project Name: WS205

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	33.00	7	66	66
2	18.00	14	36	102
3	12.50	21	50	152
4	6.50	42	13	165
5	12.50	21	200	365
6	15.40	17	154	519
7	18.00	14	252	771
8	16.00	16	32	803

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS207

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

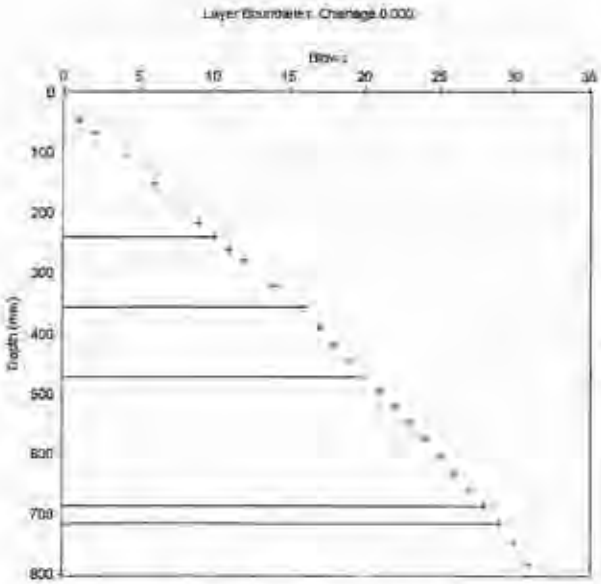
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	1	29	835	29.00
2	1	1	166	45.00	27	1	30	867	32.00
3	1	2	187	21.00	28	1	31	905	38.00
4	2	4	228	20.50					
5	2	6	271	21.50					
6	1	7	295	24.00					
7	1	8	316	21.00					
8	1	9	338	22.00					
9	1	10	360	22.00					
10	1	11	380	20.00					
11	1	12	400	20.00					
12	2	14	440	20.00					
13	2	16	477	18.50					
14	1	17	509	32.00					
15	1	18	539	30.00					
16	1	19	565	26.00					
17	1	20	593	28.00					
18	1	21	616	23.00					
19	1	22	641	25.00					
20	1	23	668	27.00					
21	1	24	695	27.00					
22	1	25	724	29.00					
23	1	26	753	29.00					
24	1	27	780	27.00					
25	1	28	806	26.00					

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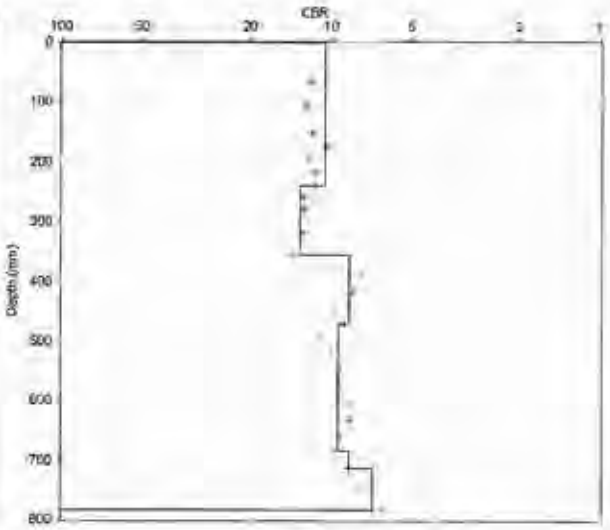
DCP Layer Strength Analysis Report

Project Name: WS207

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	23.90	11	239	239
2	19.50	13	117	356
3	29.00	9	116	472
4	26.63	9	213	685
5	29.00	9	29	714
6	35.00	7	70	784

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS208

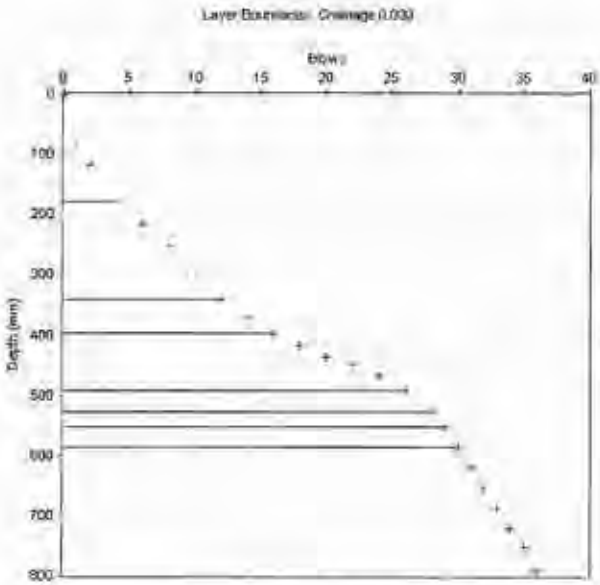
Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	122	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

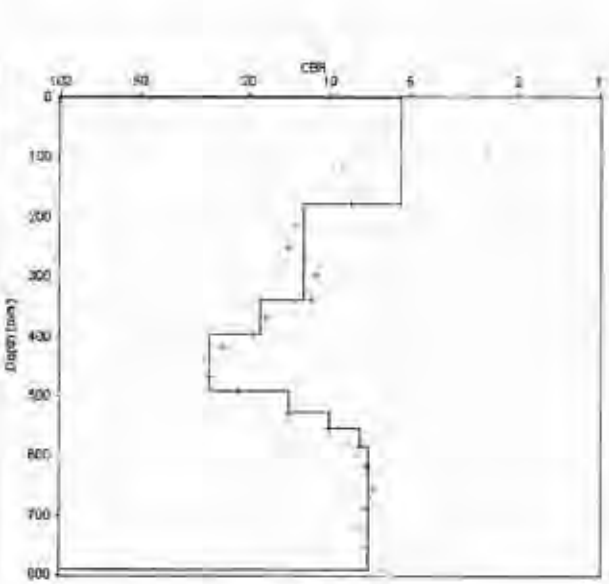
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	122	0.00					
2	1	1	212	90.00					
3	1	2	240	28.00					
4	2	4	300	30.00					
5	2	6	338	19.00					
6	2	8	374	18.00					
7	2	10	419	22.50					
8	2	12	462	21.50					
9	2	14	492	15.00					
10	2	16	519	13.50					
11	2	18	540	10.50					
12	2	20	558	9.00					
13	2	22	571	6.50					
14	2	24	590	9.50					
15	2	26	614	12.00					
16	2	28	650	18.00					
17	1	29	675	25.00					
18	1	30	707	32.00					
19	1	31	741	34.00					
20	1	32	777	36.00					
21	1	33	810	33.00					
22	1	34	842	32.00					
23	1	35	875	33.00					
24	1	36	914	39.00					

DCP Layer Strength Analysis Report

Project Name: WS208

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	122	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted





Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	44.50	5	178	178
2	20.25	13	162	340
3	14.25	18	57	397
4	9.50	28	95	492
5	18.00	14	36	528
6	25.00	10	25	553
7	32.00	8	32	585
8	34.50	7	207	792

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS210

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 125
Test Date: 24/09/2013

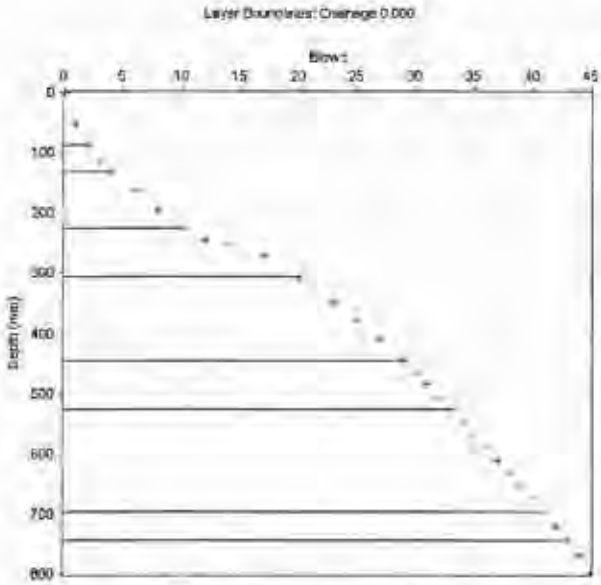
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	125	0.00	26	1	39	778	21.00
2	1	1	176	51.00	27	1	40	800	22.00
3	1	2	212	36.00	28	1	41	821	21.00
4	1	3	237	25.00	29	1	42	845	24.00
5	1	4	255	18.00	30	1	43	868	23.00
6	2	6	287	16.00	31	1	44	894	26.00
7	2	8	321	17.00	32	1	45	922	28.00
8	2	10	350	14.50					
9	2	12	371	10.50					
10	2	14	377	3.00					
11	3	17	395	6.00					
12	3	20	431	12.00					
13	3	23	473	14.00					
14	2	25	504	15.50					
15	2	27	535	15.50					
16	2	29	570	17.50					
17	1	30	590	20.00					
18	1	31	610	20.00					
19	1	32	632	22.00					
20	1	33	651	19.00					
21	1	34	674	23.00					
22	1	35	695	21.00					
23	1	36	713	18.00					
24	1	37	736	23.00					
25	1	38	757	21.00					

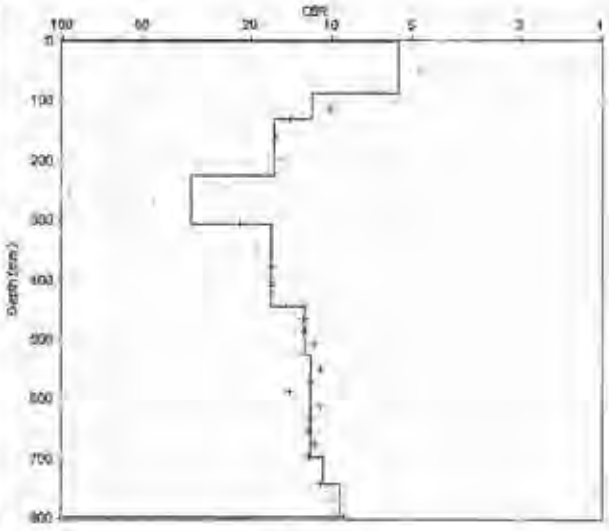
DCP Layer Strength Analysis Report

Project Name: WS210

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	125	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	43.50	6	87	87
2	21.50	12	43	130
3	15.83	16	95	225
4	8.10	33	81	306
5	15.44	17	139	445
6	20.25	13	81	526
7	21.25	12	170	696
8	23.50	11	47	743
9	27.00	9	54	797

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS211

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

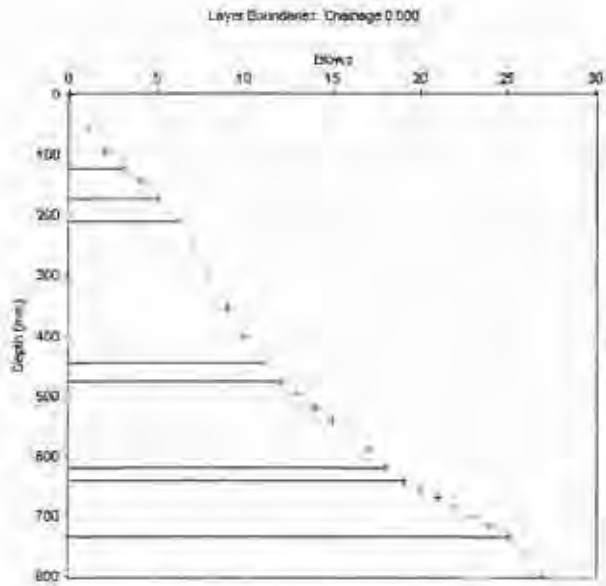
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00	26	1	25	657	19.00
2	1	1	180	56.00	27	1	26	686	29.00
3	1	2	218	38.00	28	1	27	923	37.00
4	1	3	247	29.00					
5	1	4	267	20.00					
6	1	5	296	29.00					
7	1	6	334	38.00					
8	1	7	376	42.00					
9	1	8	420	44.00					
10	1	9	478	58.00					
11	1	10	524	46.00					
12	1	11	569	45.00					
13	1	12	600	31.00					
14	1	13	621	21.00					
15	1	14	643	22.00					
16	1	15	663	20.00					
17	1	16	686	23.00					
18	1	17	713	27.00					
19	1	18	743	30.00					
20	1	19	764	21.00					
21	1	20	778	14.00					
22	1	21	793	15.00					
23	1	22	810	17.00					
24	1	23	825	15.00					
25	1	24	838	13.00					

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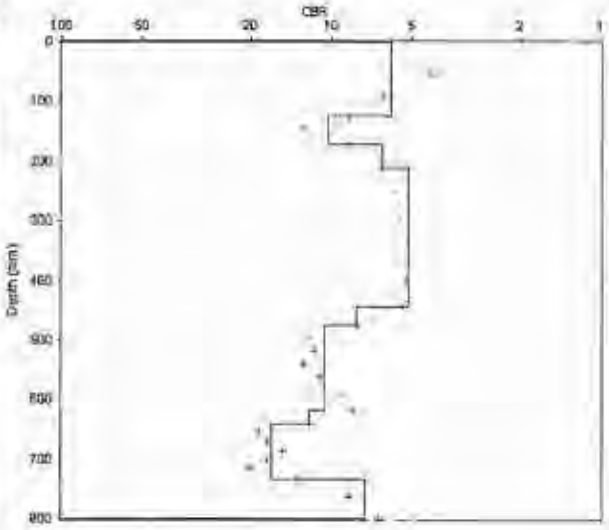
DCP Layer Strength Analysis Report

Project Name: WS211

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	41.00	6	123	123
2	24.50	10	49	172
3	38.00	6	38	210
4	47.00	5	235	445
5	31.00	8	31	476
6	23.83	11	143	619
7	21.00	12	21	640
8	15.50	17	93	733
9	33.00	7	66	799

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS217

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

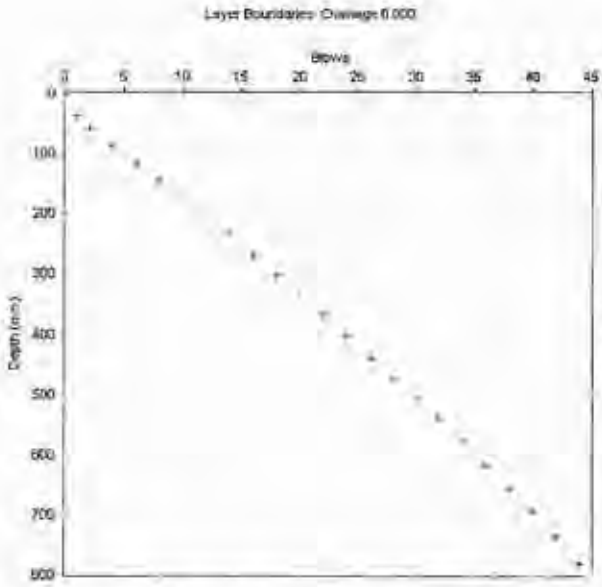
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00					
2	1	1	162	38.00					
3	1	2	182	20.00					
4	2	4	212	15.00					
5	2	6	241	14.50					
6	2	8	267	13.00					
7	2	10	294	13.50					
8	2	12	321	13.50					
9	2	14	356	17.50					
10	2	16	392	18.00					
11	2	18	426	17.00					
12	2	20	458	16.00					
13	2	22	490	16.00					
14	2	24	527	18.50					
15	2	26	564	18.50					
16	2	28	598	17.00					
17	2	30	632	17.00					
18	2	32	665	16.50					
19	2	34	701	18.00					
20	2	36	741	20.00					
21	2	38	780	19.50					
22	2	40	818	19.00					
23	2	42	860	21.00					
24	2	44	905	22.50					

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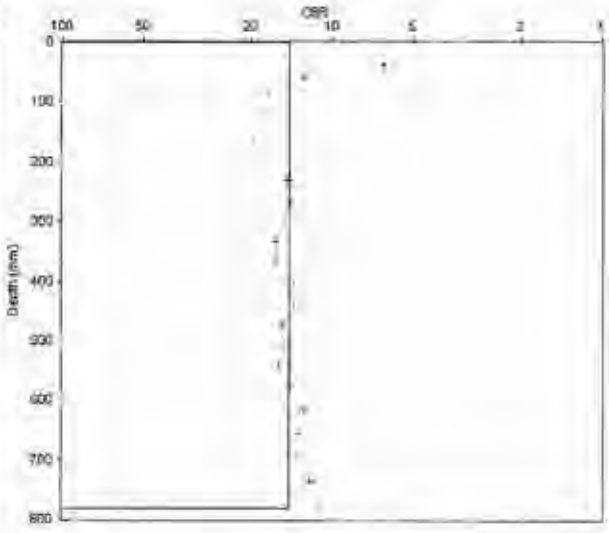
DCP Layer Strength Analysis Report

Project Name: WS217

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	17.75	14	781	781

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS219

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 124
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

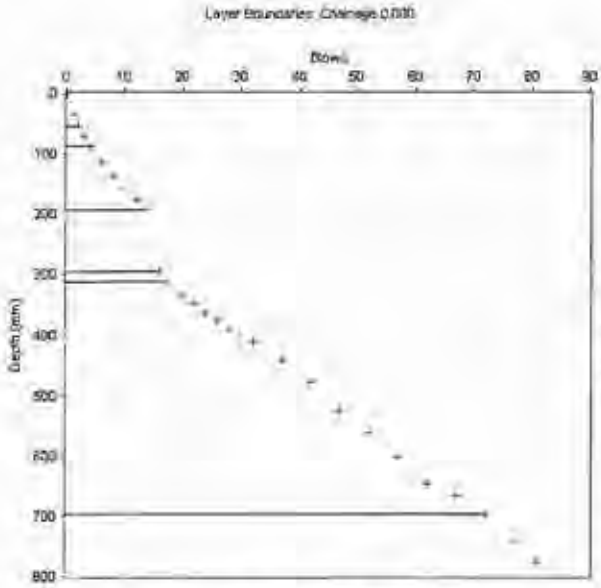
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00	26	5	62	771	9.00
2	1	1	159	35.00	27	5	67	790	3.80
3	1	2	178	19.00	28	5	72	821	6.20
4	1	3	195	17.00	29	5	77	865	8.80
5	1	4	211	16.00	30	4	81	901	9.00
6	2	6	238	13.50					
7	2	8	261	11.50					
8	2	10	282	10.50					
9	2	12	301	9.50					
10	2	14	317	8.00					
11	2	16	420	51.50					
12	1	17	436	16.00					
13	1	18	441	5.00					
14	2	20	456	7.50					
15	2	22	471	7.50					
16	2	24	487	8.00					
17	2	26	501	7.00					
18	2	28	514	6.50					
19	2	30	526	6.00					
20	2	32	536	5.00					
21	5	37	564	5.60					
22	5	42	602	7.60					
23	5	47	649	9.40					
24	5	52	684	7.00					
25	5	57	726	8.40					

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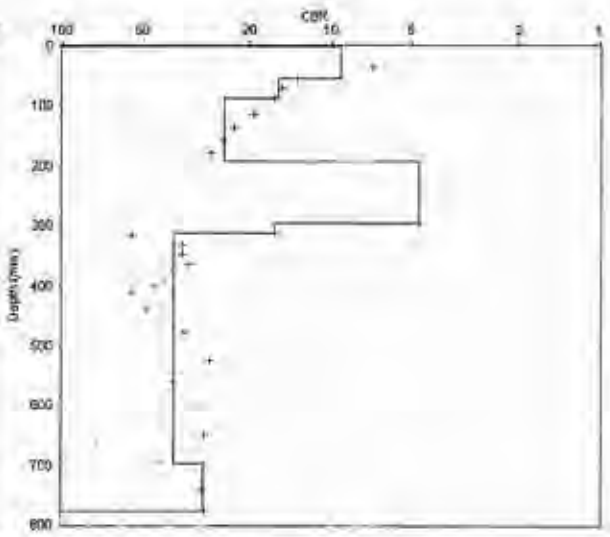
DCP Layer Strength Analysis Report

Project Name: WS219

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	27.00	9	54	54
2	16.50	16	33	87
3	10.60	25	106	193
4	51.50	5	103	296
5	16.00	16	16	312
6	7.00	39	385	697
7	8.89	30	80	777

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS220

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 119
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

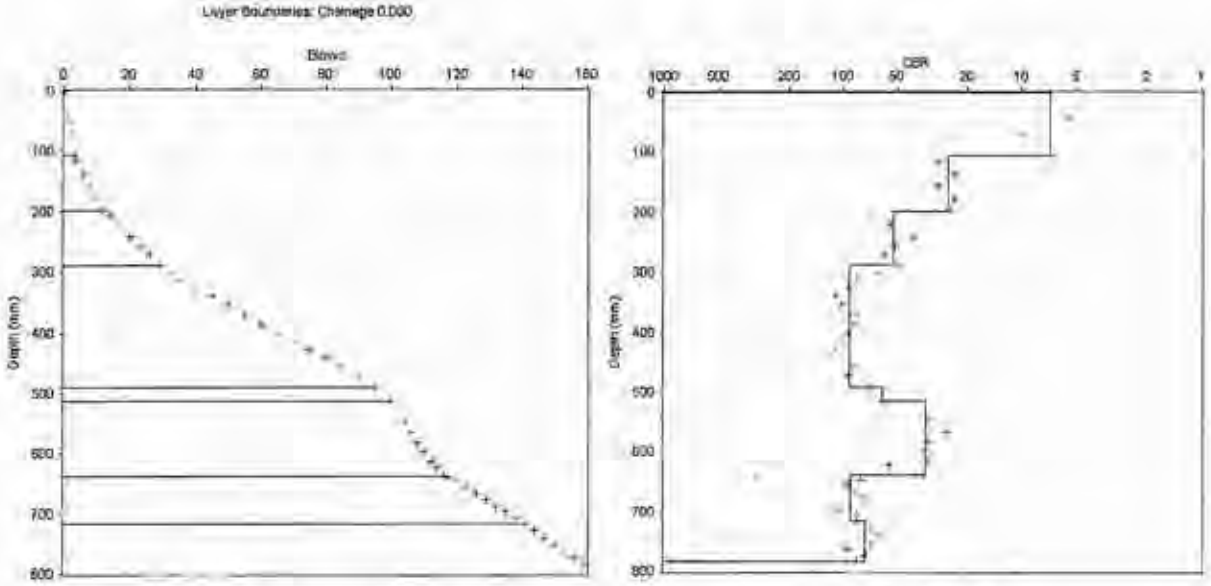
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	119	0.00	26	5	80	559	2.40
2	1	1	163	44.00	27	5	85	575	3.20
3	1	2	188	25.00	28	5	90	590	3.00
4	1	3	225	37.00	29	5	95	610	4.00
5	1	4	234	9.00	30	5	100	633	4.60
6	2	6	256	11.00	31	4	104	665	8.00
7	2	8	274	9.00	32	2	106	685	10.00
8	2	10	296	11.00	33	2	108	701	8.00
9	2	12	317	10.50	34	2	110	716	7.50
10	2	14	325	4.00	35	2	112	732	8.00
11	3	17	340	5.00	36	2	114	742	5.00
12	3	20	360	6.67	37	2	116	757	7.50
13	3	23	376	5.33	38	2	118	759	1.00
14	3	26	390	4.67	39	2	120	766	3.50
15	3	29	407	5.67	40	3	123	775	3.00
16	3	32	420	4.33	41	3	126	785	3.33
17	3	35	430	3.33	42	3	129	796	3.67
18	5	40	445	3.00	43	3	132	807	3.67
19	5	45	458	2.60	44	3	135	815	2.67
20	5	50	472	2.80	45	3	138	825	3.33
21	5	55	489	3.40	46	3	141	835	3.33
22	5	60	505	3.20	47	3	144	847	4.00
23	5	65	520	3.00	48	3	147	860	4.33
24	5	70	534	2.80	49	3	150	872	4.00
25	5	75	547	2.60	50	3	153	881	3.00
51	3	156	892	3.67					
52	3	159	902	3.33					

UK DCP V3.1

DCP Layer Strength Analysis Report

Project Name: WS220

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	119	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart

CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	35.33	7	106	106
2	10.22	26	92	198
3	5.29	52	90	288
4	3.08	92	203	491
5	4.60	60	23	514
6	7.75	35	124	638
7	3.12	91	78	716
8	3.72	75	67	783

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS221

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 133
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

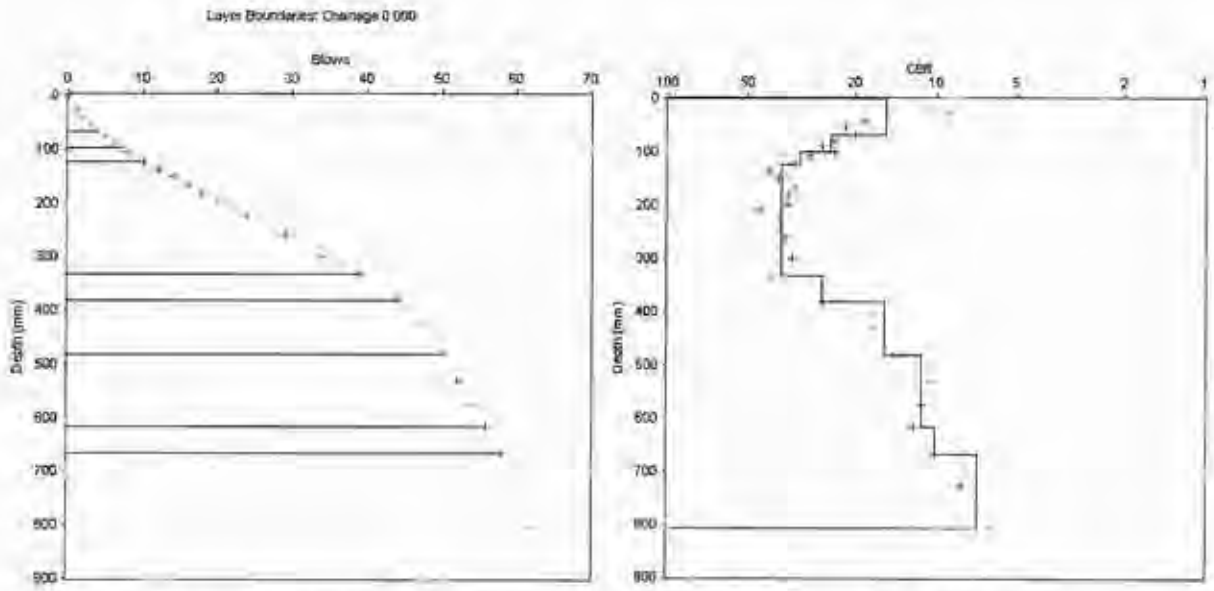
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	133	0.00	26	2	56	750	21.00
2	1	1	161	28.00	27	2	58	800	25.00
3	1	2	175	14.00	28	2	60	862	31.00
4	1	3	187	12.00	29	2	62	940	39.00
5	1	4	200	13.00					
6	1	5	211	11.00					
7	1	6	221	10.00					
8	1	7	232	11.00					
9	1	8	241	9.00					
10	2	10	257	8.00					
11	2	12	270	6.50					
12	2	14	284	7.00					
13	2	16	300	8.00					
14	2	18	315	7.50					
15	2	20	330	7.50					
16	2	22	342	6.00					
17	2	24	356	7.00					
18	5	29	393	7.40					
19	5	34	432	7.80					
20	5	39	465	6.60					
21	5	44	515	10.00					
22	3	47	561	15.33					
23	3	50	615	18.00					
24	2	52	663	24.00					
25	2	54	708	22.50					

UK DCP V3.1

DCP Layer Strength Analysis Report

Project Name: WS221

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	133	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart

CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	16.75	15	67	67
2	10.67	25	32	99
3	8.33	32	25	124
4	7.17	38	208	332
5	10.00	26	50	382
6	16.67	15	100	482
7	22.50	11	135	617
8	25.00	10	50	667
9	35.00	7	140	807

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS223

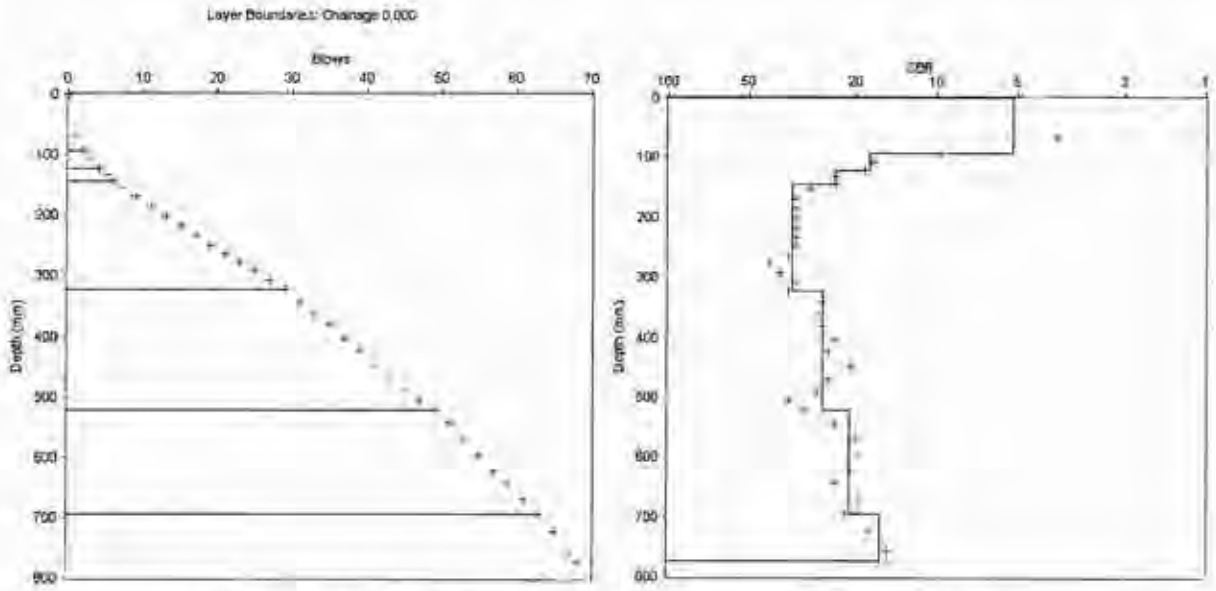
Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	133	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	133	0.00	26	2	43	603	10.50
2	1	1	200	67.00	27	2	45	622	9.50
3	1	2	226	26.00	28	2	47	637	7.50
4	1	3	241	15.00	29	2	49	654	8.50
5	1	4	255	14.00	30	2	51	676	11.00
6	1	5	266	11.00	31	2	53	702	13.00
7	1	6	277	11.00	32	2	55	729	13.50
8	1	7	286	9.00	33	2	57	754	12.50
9	2	9	302	8.00	34	2	59	776	11.00
10	2	11	318	8.00	35	2	61	803	13.50
11	2	13	334	8.00	36	2	63	827	12.00
12	2	15	350	8.00	37	2	65	856	14.50
13	2	17	366	8.00	38	2	67	890	17.00
14	2	19	382	8.00	39	1	68	907	17.00
15	2	21	397	7.50					
16	2	23	410	6.50					
17	2	25	424	7.00					
18	2	27	440	8.00					
19	2	29	455	7.50					
20	2	31	475	10.00					
21	2	33	494	9.50					
22	2	35	514	10.00					
23	2	37	536	11.00					
24	2	39	557	10.50					
25	2	41	582	12.50					

DCP Layer Strength Analysis Report

Project Name: WS223

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	133	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart

CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	46.50	5	93	93
2	14.50	18	29	122
3	11.00	24	22	144
4	7.74	35	178	322
5	9.95	27	199	521
6	12.36	21	173	694
7	16.00	16	80	774

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS224

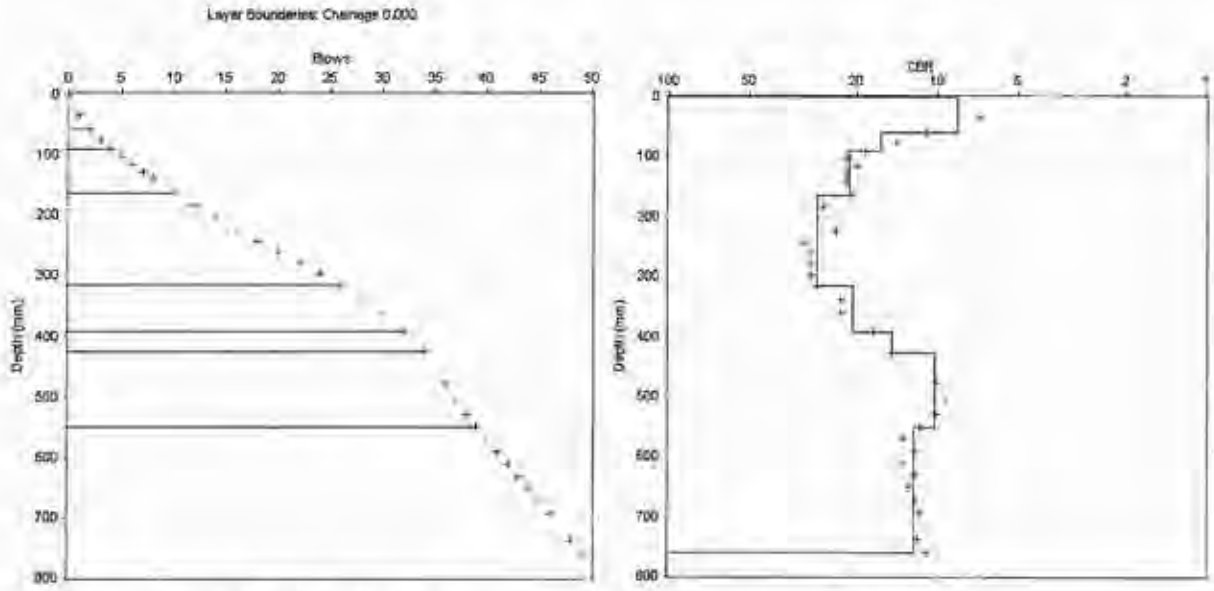
Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	155	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	155	0.00	26	1	39	706	22.00
2	1	1	191	36.00	27	1	40	725	19.00
3	1	2	214	23.00	28	1	41	746	21.00
4	1	3	232	18.00	29	1	42	765	19.00
5	1	4	246	14.00	30	1	43	786	21.00
6	1	5	258	12.00	31	1	44	806	20.00
7	1	6	271	13.00	32	1	45	827	21.00
8	1	7	283	12.00	33	1	46	849	22.00
9	1	8	295	12.00	34	2	48	892	21.50
10	2	10	320	12.50	35	1	49	915	23.00
11	2	12	340	10.00					
12	2	14	359	9.50					
13	2	16	381	11.00					
14	2	18	398	8.50					
15	2	20	416	9.00					
16	2	22	434	9.00					
17	2	24	452	9.00					
18	2	26	471	9.50					
19	2	28	494	11.50					
20	2	30	517	11.50					
21	2	32	547	15.00					
22	2	34	582	17.50					
23	2	36	632	25.00					
24	1	37	659	27.00					
25	1	38	684	25.00					

DCP Layer Strength Analysis Report

Project Name: WS224

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	155	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart

CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	29.50	8	59	59
2	16.00	16	32	91
3	12.33	21	74	165
4	9.44	28	151	316
5	12.67	21	76	392
6	17.50	15	35	427
7	24.80	10	124	551
8	20.90	12	209	760

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS225

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	153	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

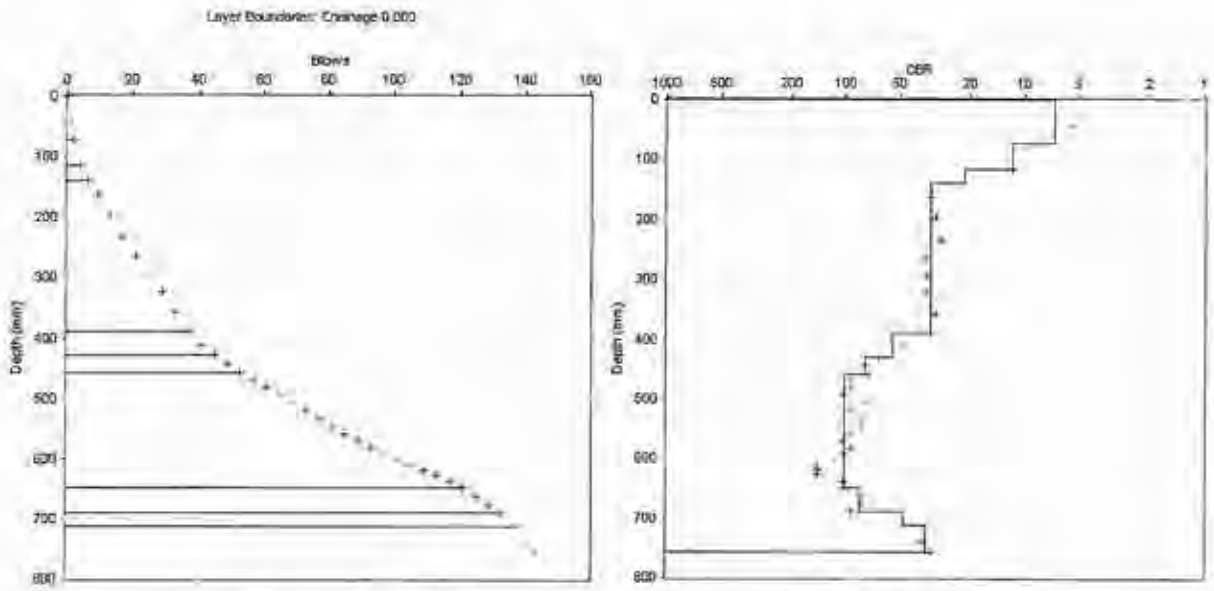
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	153	0.00	26	4	89	723	2.75
2	1	1	196	43.00	27	4	93	735	3.00
3	1	2	225	29.00	28	4	97	746	2.75
4	2	4	268	21.50	29	4	101	756	2.50
5	2	6	292	12.00	30	4	105	764	2.00
6	3	9	316	8.00	31	4	109	772	2.00
7	4	13	350	8.50	32	4	113	780	2.00
8	4	17	386	9.00	33	4	117	791	2.75
9	4	21	416	7.50	34	4	121	802	2.75
10	4	25	446	7.50	35	4	125	816	3.50
11	4	29	476	7.50	36	4	129	830	3.50
12	4	33	510	8.50	37	4	133	842	3.00
13	4	37	542	8.00	38	4	137	865	5.75
14	4	41	565	5.75	39	4	141	894	7.25
15	4	45	582	4.25	40	2	143	910	8.00
16	4	49	596	3.50					
17	4	53	611	3.75					
18	4	57	623	3.00					
19	4	61	635	3.00					
20	4	65	646	2.75					
21	4	69	660	3.50					
22	4	73	672	3.00					
23	4	77	686	3.50					
24	4	81	700	3.50					
25	4	85	712	3.00					

UK DCP V3.1

DCP Layer Strength Analysis Report

Project Name: WS225

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	153	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart

CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	36.00	7	72	72
2	21.50	12	43	115
3	12.00	22	24	139
4	8.06	33	250	389
5	5.00	55	40	429
6	3.63	77	29	458
7	2.81	101	191	649
8	3.33	85	40	689
9	5.75	48	23	712
10	7.50	36	45	757

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS227

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	122	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

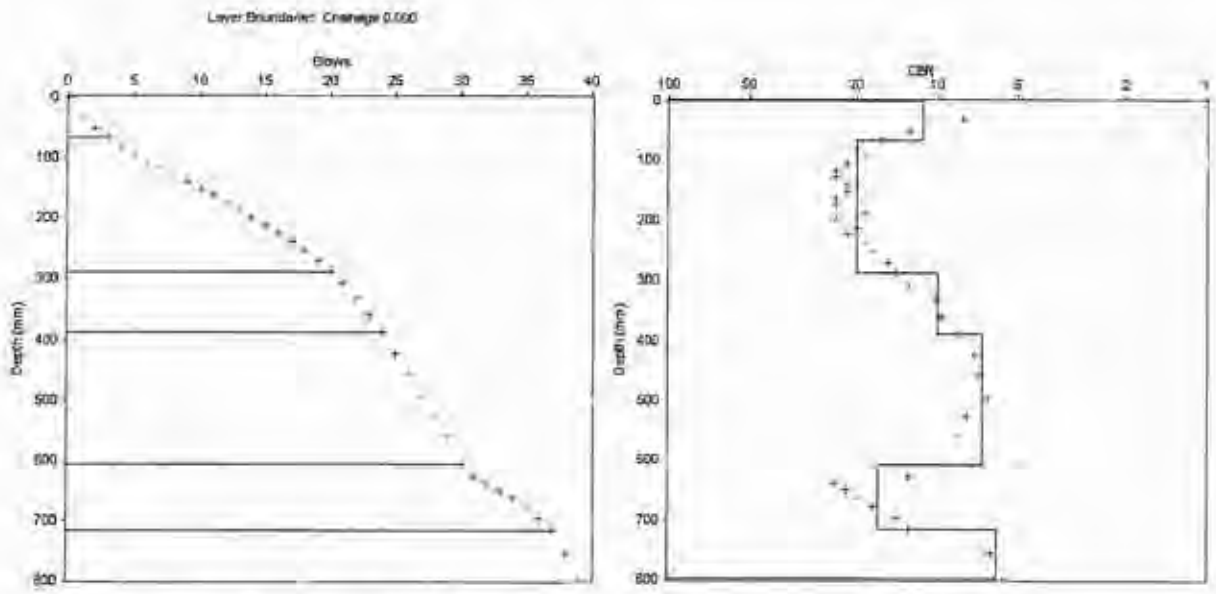
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	122	0.00	26	1	25	545	34.00
2	1	1	153	31.00	27	1	26	580	35.00
3	1	2	173	20.00	28	1	27	618	38.00
4	1	3	189	16.00	29	1	28	650	32.00
5	1	4	202	13.00	30	1	29	680	30.00
6	1	5	216	14.00	31	1	30	729	49.00
7	1	6	228	12.00	32	1	31	749	20.00
8	1	7	239	11.00	33	1	32	760	11.00
9	1	8	250	11.00	34	1	33	772	12.00
10	1	9	262	12.00	35	1	34	785	13.00
11	1	10	274	12.00	36	1	35	800	15.00
12	1	11	285	11.00	37	1	36	818	18.00
13	1	12	296	11.00	38	1	37	838	20.00
14	1	13	310	14.00	39	1	38	877	39.00
15	1	14	321	11.00	40	1	39	920	43.00
16	1	15	334	13.00					
17	1	16	346	12.00					
18	1	17	360	14.00					
19	1	18	375	15.00					
20	1	19	392	17.00					
21	1	20	410	18.00					
22	1	21	430	20.00					
23	1	22	455	25.00					
24	1	23	481	26.00					
25	1	24	511	30.00					

UK DCP V3.1

DCP Layer Strength Analysis Report

Project Name: WS227

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	122	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart

CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	22.33	11	67	67
2	13.00	20	221	288
3	25.25	10	101	389
4	36.33	7	218	607
5	15.57	17	109	716
6	41.00	6	82	798

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS229

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	112	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

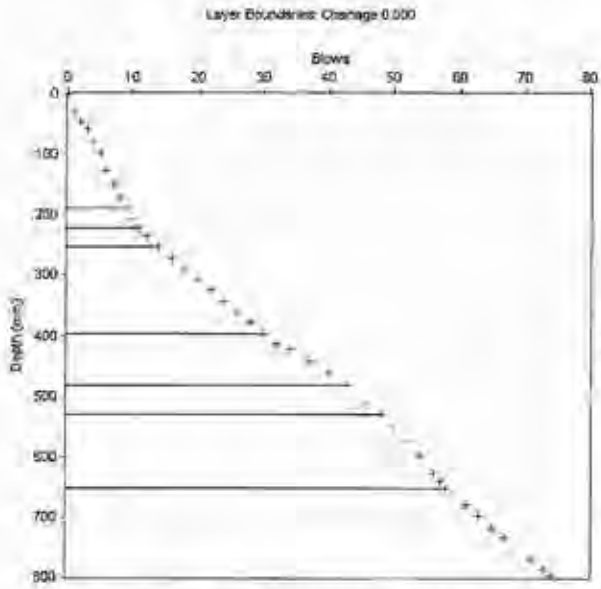
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	112	0.00	26	3	40	574	6.33
2	1	1	143	31.00	27	3	43	594	6.67
3	1	2	158	15.00	28	3	46	623	9.67
4	1	3	171	13.00	29	2	48	642	9.50
5	1	4	192	21.00	30	2	50	663	10.50
6	1	5	210	18.00	31	2	52	685	11.00
7	1	6	239	29.00	32	2	54	710	12.50
8	1	7	261	22.00	33	2	56	740	15.00
9	1	8	283	22.00	34	1	57	752	12.00
10	1	9	302	19.00	35	1	58	765	13.00
11	1	10	320	18.00	36	1	59	775	10.00
12	1	11	335	15.00	37	2	61	792	8.50
13	1	12	346	11.00	38	2	63	810	9.00
14	2	14	366	10.00	39	2	65	830	10.00
15	2	16	384	9.00	40	2	67	846	8.00
16	2	18	402	9.00	41	2	69	865	9.50
17	2	20	420	9.00	42	2	71	883	9.00
18	2	22	436	8.00	43	2	73	899	8.00
19	2	24	455	9.50	44	1	74	909	10.00
20	2	26	474	9.50					
21	2	28	490	8.00					
22	2	30	509	9.50					
23	2	32	525	8.00					
24	2	34	533	4.00					
25	3	37	555	7.33					

UK DCP V3.1

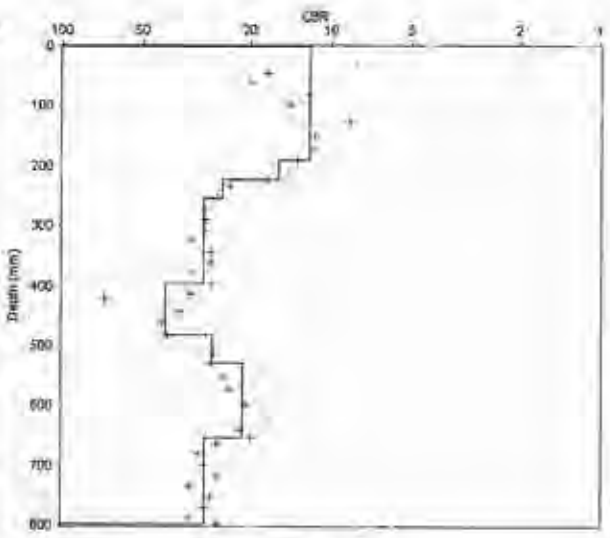
DCP Layer Strength Analysis Report

Project Name: WS229

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	112	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	21.11	12	190	190
2	16.50	16	33	223
3	10.33	26	31	254
4	8.94	30	143	397
5	6.54	41	85	482
6	9.60	28	48	530
7	12.30	21	123	653
8	9.00	30	144	797

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS230

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

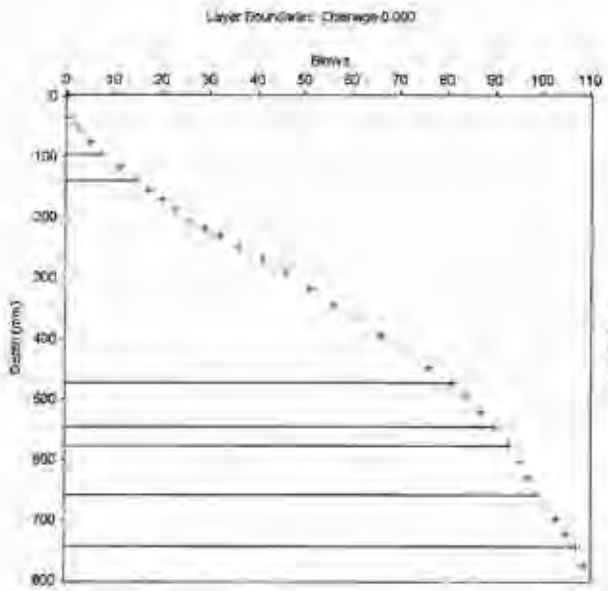
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	126	0.00	26	3	87	647	8.00
2	1	1	162	36.00	27	3	90	672	8.33
3	1	2	172	10.00	28	3	93	703	10.33
4	1	3	182	10.00	29	2	95	730	13.50
5	2	5	200	9.00	30	2	97	756	13.00
6	2	7	221	10.50	31	2	99	784	14.00
7	4	11	243	5.50	32	2	101	806	11.00
8	3	14	265	7.33	33	2	103	825	9.50
9	3	17	281	5.33	34	2	105	850	12.50
10	3	20	296	5.00	35	2	107	870	10.00
11	3	23	314	6.00	36	2	109	901	15.50
12	3	26	331	5.67					
13	3	29	344	4.33					
14	3	32	356	4.00					
15	4	36	375	4.75					
16	5	41	395	4.00					
17	5	46	417	4.40					
18	5	51	444	5.40					
19	5	56	470	5.20					
20	5	61	494	4.80					
21	5	66	521	5.40					
22	5	71	549	5.60					
23	5	76	574	5.00					
24	5	81	600	5.20					
25	3	84	623	7.67					

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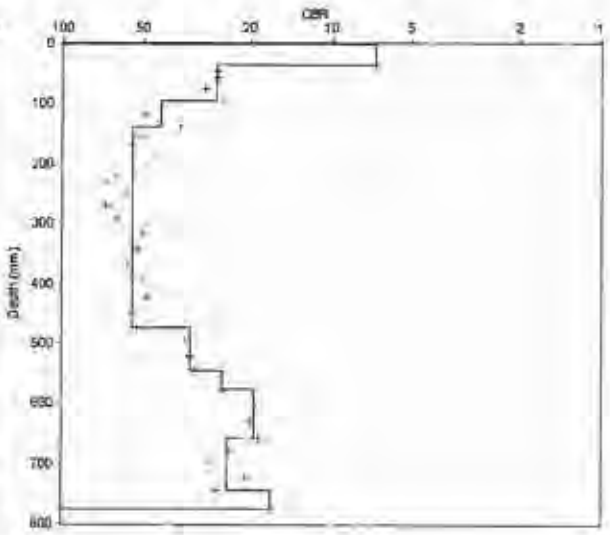
DCP Layer Strength Analysis Report

Project Name: WS230

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	36.00	7	36	36
2	9.83	27	59	95
3	6.29	43	44	139
4	5.00	55	335	474
5	8.00	34	72	546
6	10.33	26	31	577
7	13.50	19	81	658
8	10.75	25	86	744
9	15.50	17	31	775

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS232

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 131
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

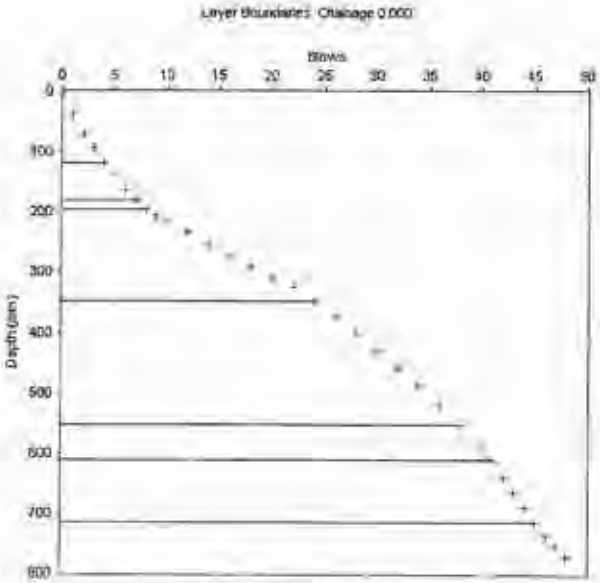
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	131	0.00	26	2	40	721	18.50
2	1	1	169	38.00	27	1	41	741	20.00
3	1	2	201	32.00	28	1	42	772	31.00
4	1	3	224	23.00	29	1	43	795	23.00
5	1	4	250	26.00	30	1	44	821	26.00
6	1	5	271	21.00	31	1	45	845	24.00
7	1	6	295	24.00	32	1	46	866	21.00
8	1	7	311	16.00	33	1	47	886	20.00
9	1	8	326	15.00	34	1	48	904	18.00
10	1	9	337	11.00					
11	1	10	346	9.00					
12	2	12	364	9.00					
13	2	14	384	10.00					
14	2	16	403	9.50					
15	2	18	422	9.50					
16	2	20	438	8.00					
17	2	22	455	8.50					
18	2	24	478	11.50					
19	2	26	503	12.50					
20	2	28	531	14.00					
21	2	30	561	15.00					
22	2	32	591	15.00					
23	2	34	620	14.50					
24	2	36	651	15.50					
25	2	38	684	16.50					

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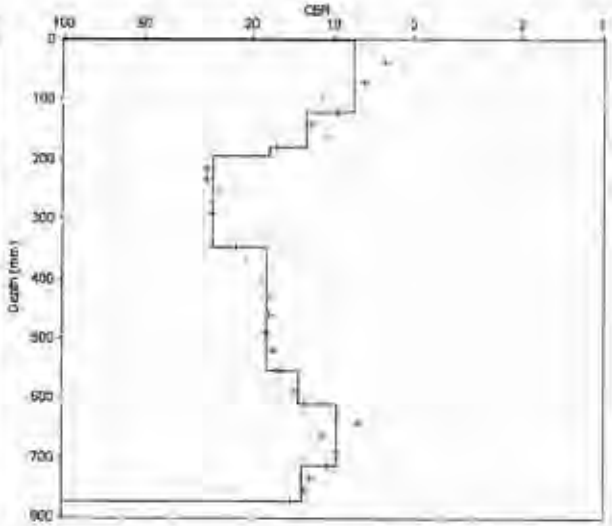
DCP Layer Strength Analysis Report

Project Name: WS232

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	29.75	8	119	119
2	20.33	13	61	180
3	15.00	17	15	195
4	9.50	28	152	347
5	14.71	18	206	553
6	19.00	13	57	610
7	26.00	10	104	714
8	19.67	13	59	773

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS234

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 149
Test Date: 24/09/2013

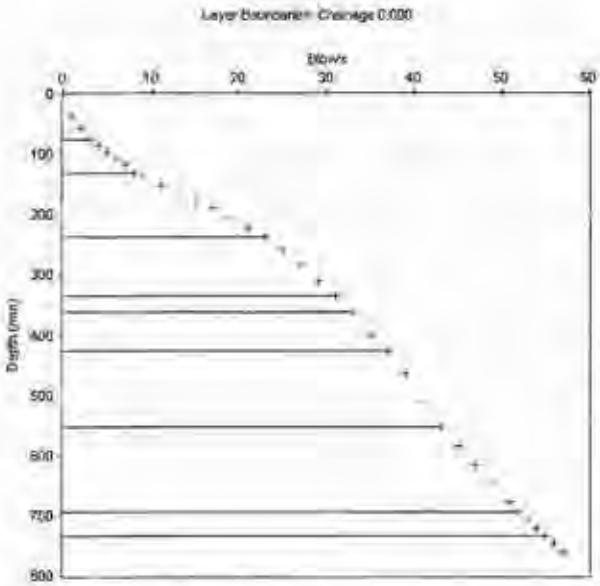
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	149	0.00	26	2	41	660	23.50
2	1	1	185	36.00	27	2	43	702	21.00
3	1	2	205	20.00	28	2	45	732	15.00
4	1	3	223	18.00	29	2	47	765	16.50
5	1	4	234	11.00	30	2	49	795	15.00
6	1	5	245	11.00	31	2	51	826	15.50
7	1	6	254	9.00	32	1	52	844	18.00
8	1	7	266	12.00	33	1	53	855	11.00
9	1	8	279	13.00	34	1	54	869	14.00
10	1	9	284	5.00	35	1	55	882	13.00
11	2	11	300	8.00	36	1	56	896	14.00
12	2	13	316	8.00	37	1	57	910	14.00
13	2	15	328	6.00					
14	2	17	339	5.50					
15	2	19	355	8.00					
16	2	21	372	8.50					
17	2	23	385	6.50					
18	2	25	407	11.00					
19	2	27	432	12.50					
20	2	29	458	13.00					
21	2	31	484	13.00					
22	2	33	511	13.50					
23	2	35	549	19.00					
24	2	37	575	13.00					
25	2	39	613	19.00					

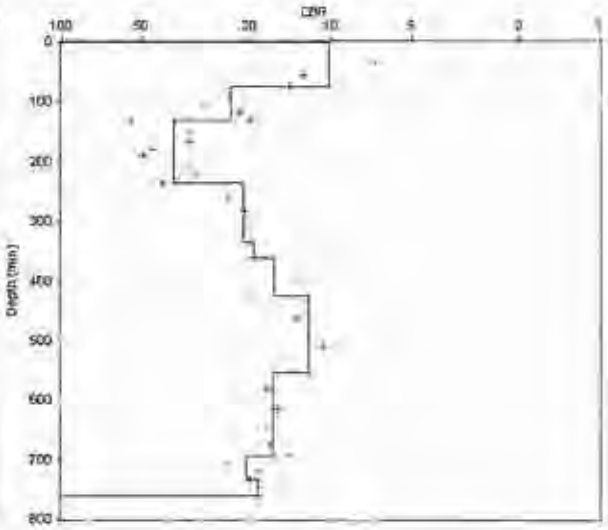
DCP Layer Strength Analysis Report

Project Name: WS234

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	149	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	24.67	10	74	74
2	11.20	23	56	130
3	7.07	38	106	236
4	12.38	21	99	335
5	13.50	19	27	362
6	16.00	16	64	426
7	21.17	12	127	553
8	15.78	16	142	695
9	12.67	21	38	733
10	14.00	19	28	761

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS235

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 158
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

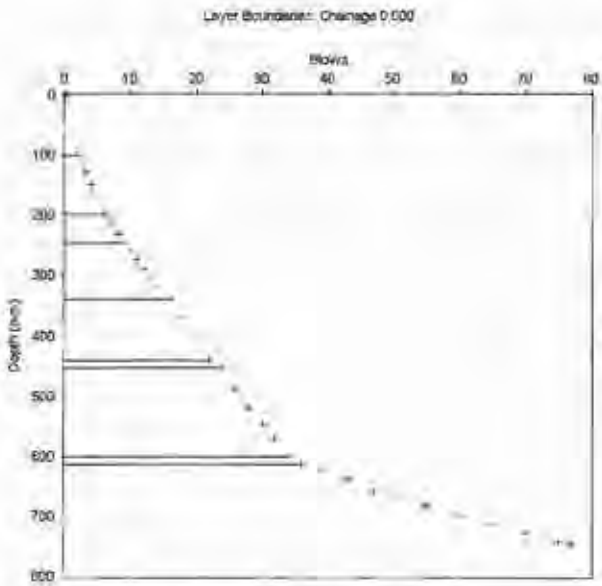
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	158	0.00	26	2	36	771	6.00
2	1	1	217	59.00	27	3	39	781	3.33
3	1	2	257	40.00	28	4	43	796	3.75
4	1	3	284	27.00	29	4	47	816	5.00
5	1	4	306	22.00	30	4	51	830	3.50
6	1	5	332	26.00	31	4	55	840	2.50
7	1	6	356	24.00	32	5	60	856	3.20
8	1	7	370	14.00	33	5	65	871	3.00
9	1	8	388	18.00	34	5	70	885	2.80
10	1	9	404	16.00	35	5	75	899	2.80
11	1	10	415	11.00	36	2	77	905	3.00
12	1	11	431	16.00					
13	1	12	447	16.00					
14	1	13	461	14.00					
15	1	14	476	15.00					
16	2	16	496	10.00					
17	2	18	528	16.00					
18	2	20	563	17.50					
19	2	22	598	17.50					
20	2	24	612	7.00					
21	2	26	646	17.00					
22	2	28	678	16.00					
23	2	30	704	13.00					
24	2	32	730	13.00					
25	2	34	759	14.50					

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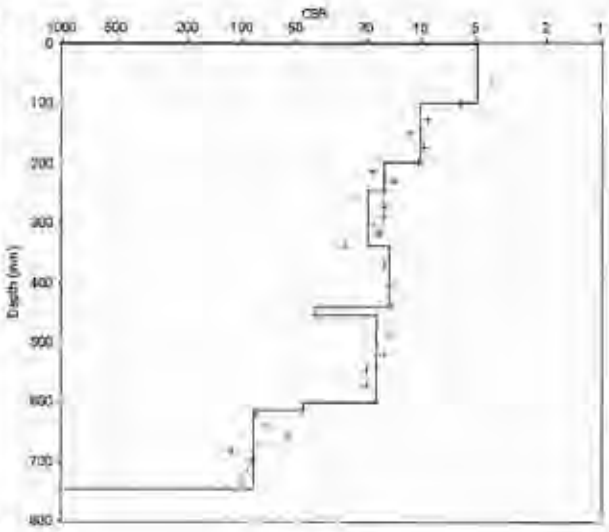
DCP Layer Strength Analysis Report

Project Name: WS235

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	158	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	49.50	5	99	99
2	24.75	10	99	198
3	16.00	16	48	246
4	13.14	20	92	338
5	17.00	15	102	440
6	7.00	39	14	454
7	14.70	18	147	601
8	6.00	45	12	613
9	3.27	86	134	747

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS236

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	120	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

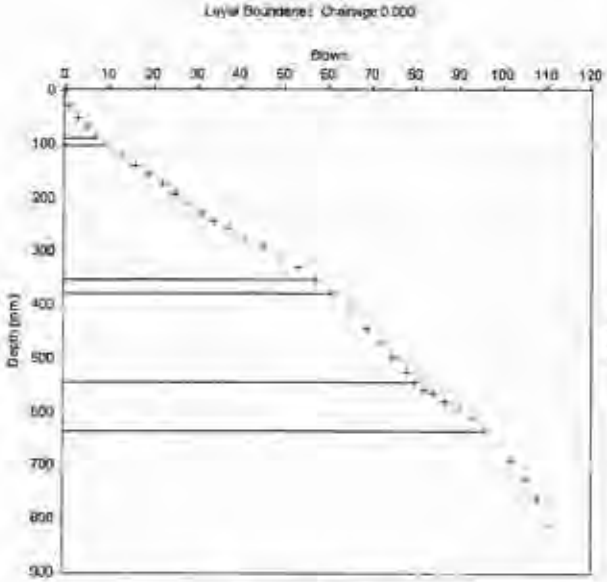
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	120	0.00	26	3	75	618	9.00
2	1	1	149	29.00	27	3	78	647	9.67
3	2	3	171	11.00	28	2	80	665	9.00
4	2	5	185	7.00	29	2	82	678	6.50
5	2	7	209	12.00	30	2	84	686	4.00
6	2	9	223	7.00	31	3	87	700	4.67
7	2	11	231	4.00	32	3	90	715	5.00
8	2	13	242	5.50	33	3	93	732	5.67
9	3	16	260	6.00	34	3	96	755	7.67
10	3	19	277	5.67	35	3	99	782	9.00
11	3	22	295	6.00	36	3	102	810	9.33
12	3	25	314	6.33	37	3	105	845	11.67
13	3	28	331	5.67	38	3	108	885	13.33
14	3	31	348	5.67	39	3	111	930	15.00
15	3	34	363	5.00					
16	3	37	376	4.33					
17	4	41	395	4.75					
18	4	45	413	4.50					
19	4	49	431	4.50					
20	4	53	450	4.75					
21	4	57	472	5.50					
22	4	61	498	6.50					
23	4	65	528	7.50					
24	4	69	565	9.25					
25	3	72	591	8.67					

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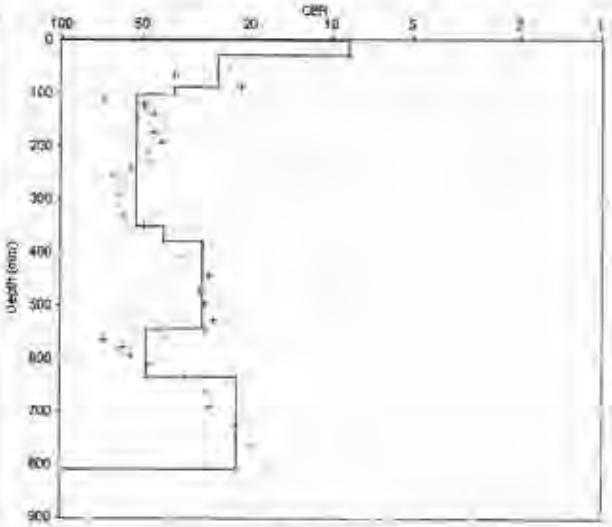
DCP Layer Strength Analysis Report

Project Name: WS236

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	120	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	29.00	9	29	29
2	10.00	26	60	89
3	7.00	39	14	103
4	5.19	53	249	352
5	6.50	42	26	378
6	8.79	30	167	545
7	5.53	49	90	635
8	11.67	23	175	810

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS237

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 126
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

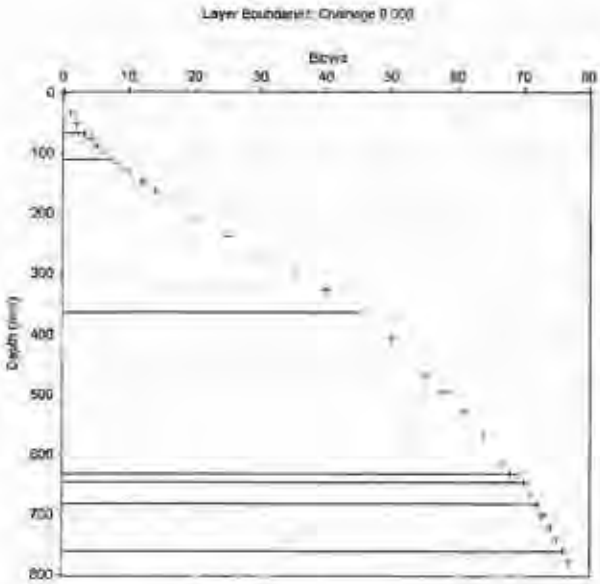
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	126	0.00	26	3	64	696	14.00
2	1	1	160	34.00	27	3	67	740	14.67
3	1	2	176	16.00	28	1	68	758	18.00
4	1	3	193	17.00	29	1	69	758	0.00
5	1	4	200	7.00	30	1	70	772	14.00
6	1	5	215	15.00	31	1	71	792	20.00
7	1	6	226	11.00	32	1	72	807	15.00
8	1	7	236	10.00	33	1	73	827	20.00
9	1	8	243	7.00	34	1	74	846	19.00
10	1	9	252	9.00	35	1	75	866	20.00
11	1	10	257	5.00	36	1	76	887	21.00
12	2	12	273	8.00	37	1	77	904	17.00
13	2	14	288	7.50					
14	2	16	304	8.00					
15	2	18	316	6.00					
16	2	20	331	7.50					
17	5	25	362	6.20					
18	5	30	394	6.40					
19	5	35	422	5.60					
20	5	40	453	6.20					
21	5	45	490	7.40					
22	5	50	533	8.60					
23	5	55	594	12.20					
24	3	58	622	9.33					
25	3	61	654	10.67					

UK DCP V3.1

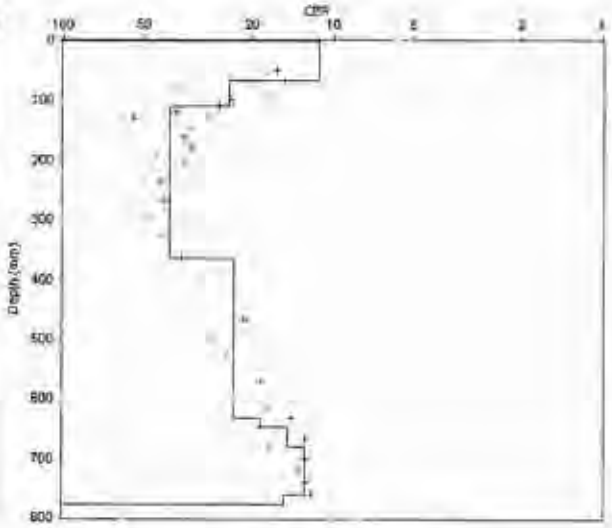
DCP Layer Strength Analysis Report

Project Name: WS237

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	22.33	11	67	67
2	10.75	25	43	110
3	6.68	41	254	364
4	11.17	24	268	632
5	14.00	19	14	646
6	17.50	15	35	681
7	20.00	13	80	761
8	17.00	15	17	778

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS238

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 116
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

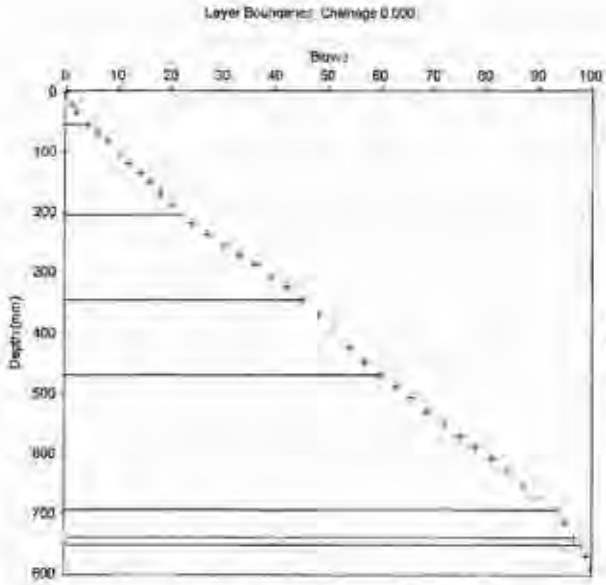
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	116	0.00	26	3	60	586	7.00
2	1	1	137	21.00	27	3	63	605	6.33
3	1	2	150	13.00	28	3	66	623	6.00
4	2	4	171	10.50	29	3	69	645	7.33
5	2	6	182	5.50	30	3	72	666	7.00
6	2	8	199	8.50	31	3	75	687	7.00
7	2	10	218	9.50	32	3	78	707	6.67
8	2	12	234	8.00	33	3	81	725	6.00
9	2	14	251	8.50	34	3	84	746	7.00
10	2	16	266	7.50	35	3	87	768	7.33
11	2	18	285	9.50	36	3	90	791	7.67
12	2	20	303	9.00	37	3	93	810	6.33
13	2	22	320	8.50	38	2	95	830	10.00
14	2	24	334	7.00	39	2	97	855	12.50
15	3	27	353	6.33	40	1	98	869	14.00
16	3	30	370	5.67	41	1	99	886	17.00
17	3	33	386	5.33	42	1	100	908	22.00
18	3	36	403	5.67					
19	3	39	421	6.00					
20	3	42	440	6.33					
21	3	45	460	6.67					
22	3	48	485	8.33					
23	3	51	508	7.67					
24	3	54	540	10.67					
25	3	57	565	8.33					

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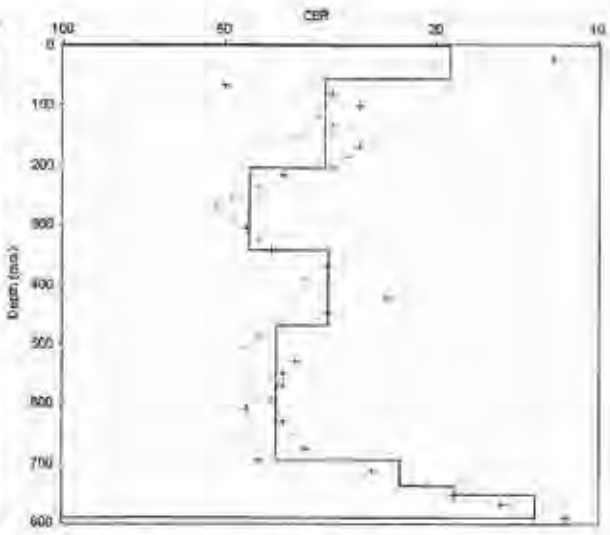
DCP Layer Strength Analysis Report

Project Name: WS238

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	116	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	13.75	19	55	55
2	8.28	32	149	204
3	6.09	45	140	344
4	8.40	32	126	470
5	6.79	40	224	694
6	11.25	23	45	739
7	14.00	19	14	753
8	19.50	13	39	792

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: DCP240

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	151	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

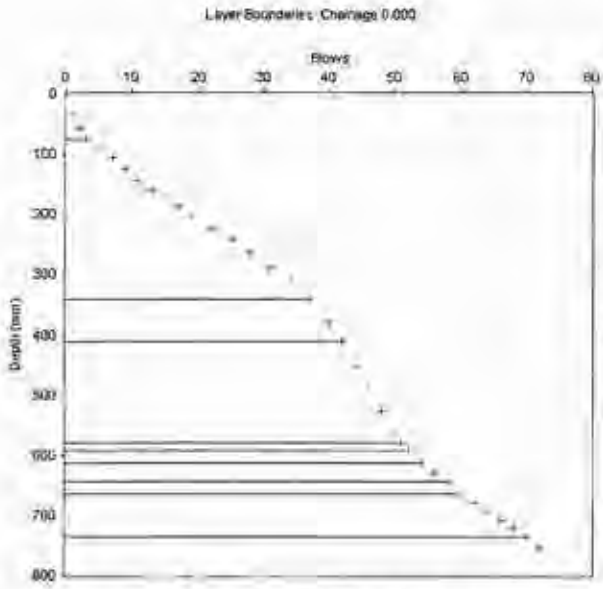
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	151	0.00	26	1	52	744	13.00
2	1	1	185	34.00	27	2	54	764	10.00
3	1	2	208	23.00	28	2	56	781	8.50
4	1	3	225	17.00	29	2	58	795	7.00
5	2	5	240	7.50	30	2	60	816	10.50
6	2	7	256	8.00	31	2	62	831	7.50
7	2	9	275	9.50	32	2	64	845	7.00
8	2	11	294	9.50	33	2	66	860	7.50
9	2	13	310	8.00	34	2	68	873	6.50
10	2	15	322	6.00	35	2	70	887	7.00
11	2	17	338	8.00	36	2	72	906	9.50
12	2	19	353	7.50					
13	3	22	375	7.33					
14	3	25	392	5.67					
15	3	28	415	7.67					
16	3	31	439	8.00					
17	3	34	462	7.67					
18	3	37	492	10.00					
19	3	40	530	12.67					
20	2	42	562	16.00					
21	2	44	601	19.50					
22	2	46	641	20.00					
23	2	48	679	19.00					
24	2	50	714	17.50					
25	1	51	731	17.00					

UK DCP V3.1

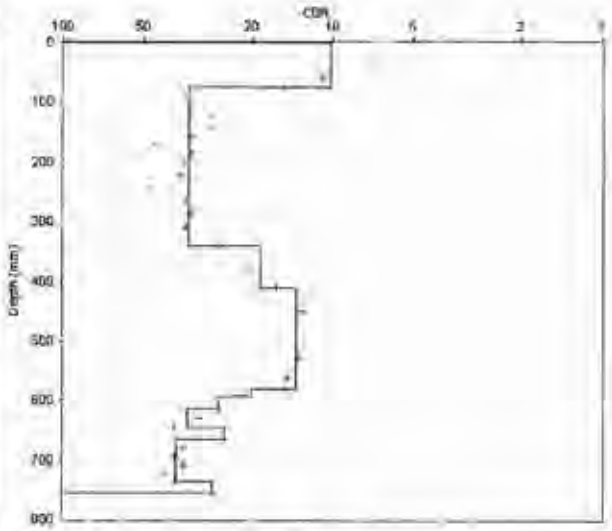
DCP Layer Strength Analysis Report

Project Name: DCP240

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	151	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	24.67	10	74	74
2	7.85	34	267	341
3	14.00	19	70	411
4	18.78	14	169	580
5	13.00	20	13	593
6	10.00	26	20	613
7	7.75	35	31	644
8	10.50	25	21	665
9	7.10	38	71	736
10	9.50	28	19	755

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS241

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 123
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

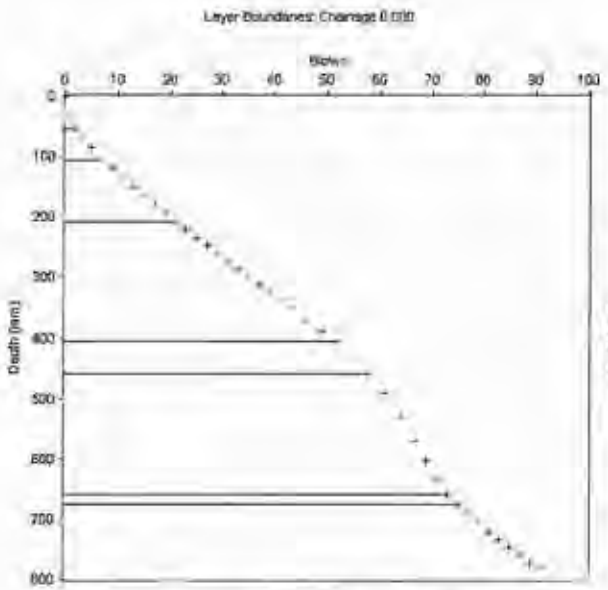
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	123	0.00	26	3	49	511	6.33
2	1	1	156	33.00	27	3	52	529	6.00
3	1	2	178	22.00	28	3	55	556	9.00
4	1	3	188	10.00	29	3	58	582	8.67
5	2	5	209	10.50	30	3	61	614	10.67
6	2	7	228	9.50	31	3	64	652	12.67
7	2	9	242	7.00	32	3	67	694	14.00
8	2	11	257	7.50	33	2	69	726	16.00
9	2	13	272	7.50	34	2	71	756	15.00
10	2	15	288	8.00	35	2	73	781	12.50
11	2	17	301	6.50	36	2	75	798	8.50
12	2	19	316	7.50	37	2	77	811	6.50
13	2	21	331	7.50	38	2	79	826	7.50
14	2	23	344	6.50	39	2	81	844	9.00
15	2	25	357	6.50	40	2	83	857	6.50
16	2	27	370	6.50	41	2	85	870	6.50
17	2	29	384	7.00	42	2	87	881	5.50
18	2	31	397	6.50	43	2	89	896	7.50
19	2	33	410	6.50	44	2	91	902	3.00
20	2	35	422	6.00					
21	2	37	434	6.00					
22	2	39	446	6.00					
23	2	41	461	7.50					
24	2	43	473	6.00					
25	3	46	492	6.33					

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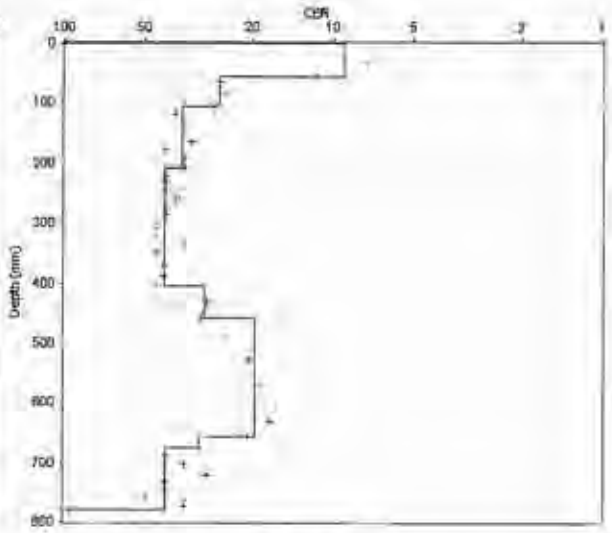
DCP Layer Strength Analysis Report

Project Name: WS241

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	123	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	27.50	9	55	55
2	10.00	26	50	105
3	7.36	37	103	208
4	6.39	43	198	406
5	8.83	30	53	459
6	13.27	20	199	658
7	8.50	31	17	675
8	6.50	42	104	779

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS244

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 130
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

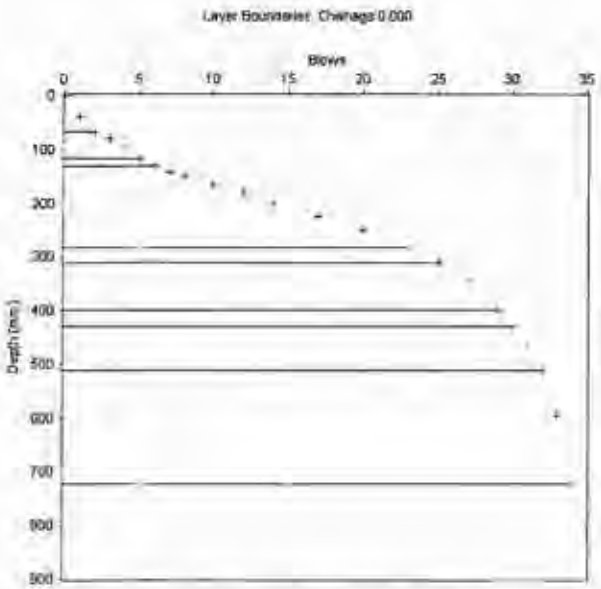
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	130	0.00					
2	1	1	169	39.00					
3	1	2	198	29.00					
4	1	3	210	12.00					
5	1	4	226	16.00					
6	1	5	248	22.00					
7	1	6	261	13.00					
8	1	7	273	12.00					
9	1	8	280	7.00					
10	2	10	296	8.00					
11	2	12	310	7.00					
12	2	14	330	10.00					
13	3	17	354	8.00					
14	3	20	380	8.67					
15	3	23	412	10.67					
16	2	25	440	14.00					
17	2	27	477	18.50					
18	2	29	530	26.50					
19	1	30	559	29.00					
20	1	31	595	36.00					
21	1	32	641	46.00					
22	1	33	726	85.00					
23	1	34	853	127.00					
24	1	35	935	82.00					

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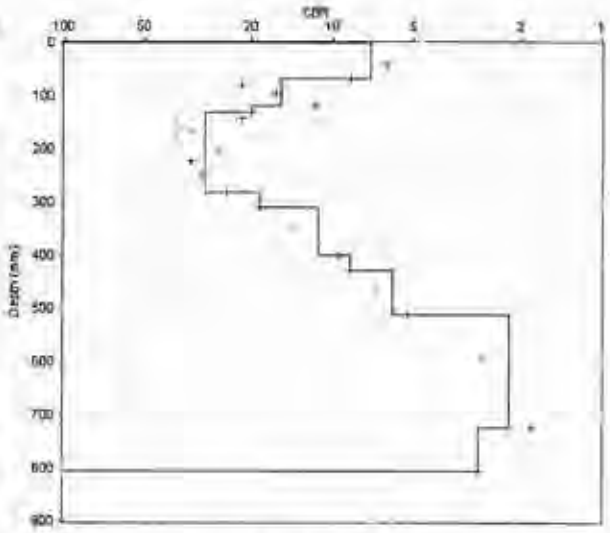
DCP Layer Strength Analysis Report

Project Name: WS244

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	130	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	34.00	7	68	68
2	16.67	15	50	118
3	13.00	20	13	131
4	8.88	30	151	282
5	14.00	19	28	310
6	22.50	11	90	400
7	29.00	9	29	429
8	41.00	6	82	511
9	106.00	2	212	723
10	82.00	3	82	805

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS245

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 120
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

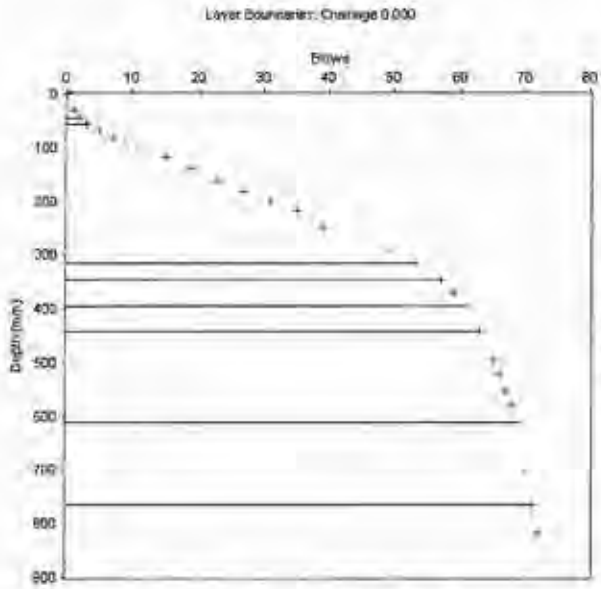
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	120	0.00	26	1	69	730	32.00
2	1	1	150	30.00	27	1	70	822	92.00
3	1	2	165	15.00	28	1	71	884	62.00
4	1	3	175	10.00	29	1	72	937	53.00
5	2	5	188	6.50					
6	2	7	201	6.50					
7	2	9	211	5.00					
8	2	11	221	5.00					
9	4	15	237	4.00					
10	4	19	257	5.00					
11	4	23	281	6.00					
12	4	27	302	5.25					
13	4	31	320	4.50					
14	4	35	337	4.25					
15	4	39	367	7.50					
16	10	49	412	4.50					
17	4	53	435	5.75					
18	4	57	466	7.75					
19	2	59	490	12.00					
20	2	61	516	13.00					
21	2	63	561	22.50					
22	2	65	615	27.00					
23	1	66	642	27.00					
24	1	67	671	29.00					
25	1	68	698	27.00					

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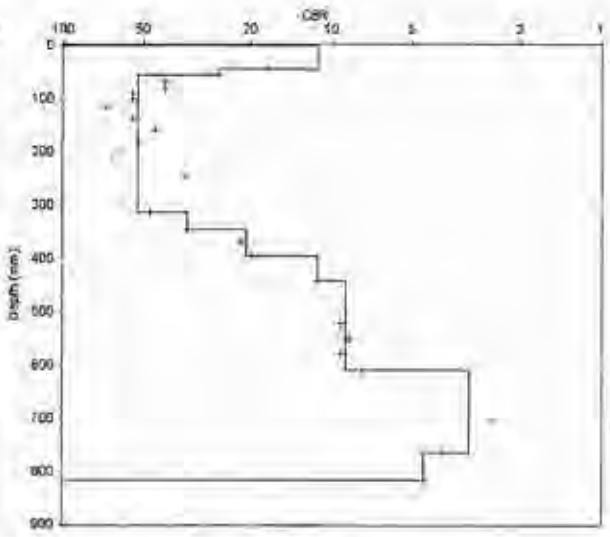
DCP Layer Strength Analysis Report

Project Name: WS245

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	120	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	22.50	11	45	45
2	10.00	26	10	55
3	5.20	53	260	315
4	7.75	35	31	346
5	12.50	21	50	396
6	22.50	11	45	441
7	28.17	9	169	610
8	77.00	3	154	764
9	53.00	5	53	817

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS246

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 167
Test Date: 25/09/2013

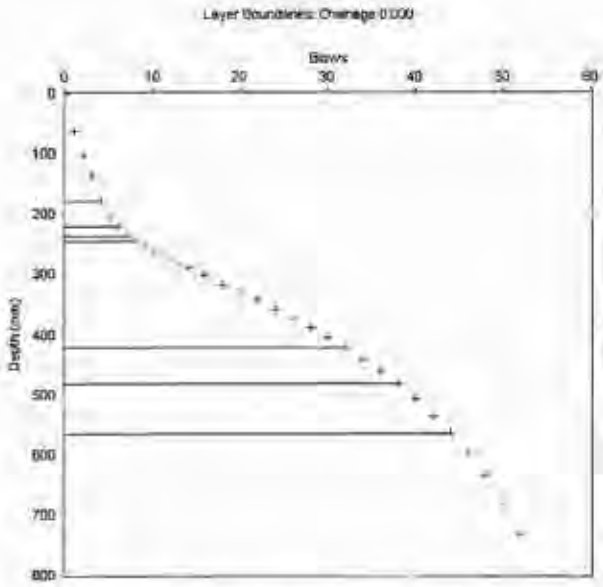
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	167	0.00	26	2	36	628	10.00
2	1	1	230	63.00	27	2	38	649	10.50
3	1	2	268	38.00	28	2	40	675	13.00
4	1	3	304	36.00	29	2	42	703	14.00
5	1	4	346	42.00	30	2	44	732	14.50
6	1	5	371	25.00	31	2	46	766	17.00
7	1	6	388	17.00	32	2	48	801	17.50
8	1	7	403	15.00	33	2	50	846	22.50
9	1	8	412	9.00	34	2	52	900	27.00
10	1	9	420	8.00					
11	1	10	427	7.00					
12	1	11	435	8.00					
13	1	12	442	7.00					
14	1	13	450	8.00					
15	1	14	456	6.00					
16	2	16	469	6.50					
17	2	18	484	7.50					
18	2	20	497	6.50					
19	2	22	510	6.50					
20	2	24	526	8.00					
21	2	26	540	7.00					
22	2	28	556	8.00					
23	2	30	573	8.50					
24	2	32	589	8.00					
25	2	34	608	9.50					

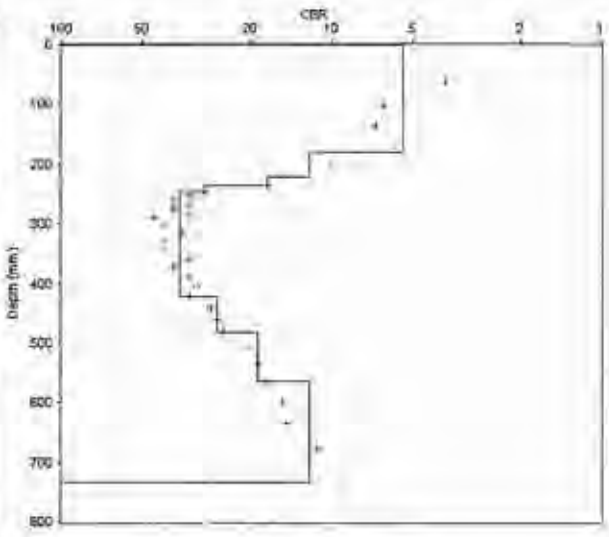
DCP Layer Strength Analysis Report

Project Name: WS246

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	167	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	44.75	5	179	179
2	21.00	12	42	221
3	15.00	17	15	236
4	9.00	30	9	245
5	7.38	37	177	422
6	10.00	26	60	482
7	13.83	19	83	565
8	21.00	12	168	733

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS248

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

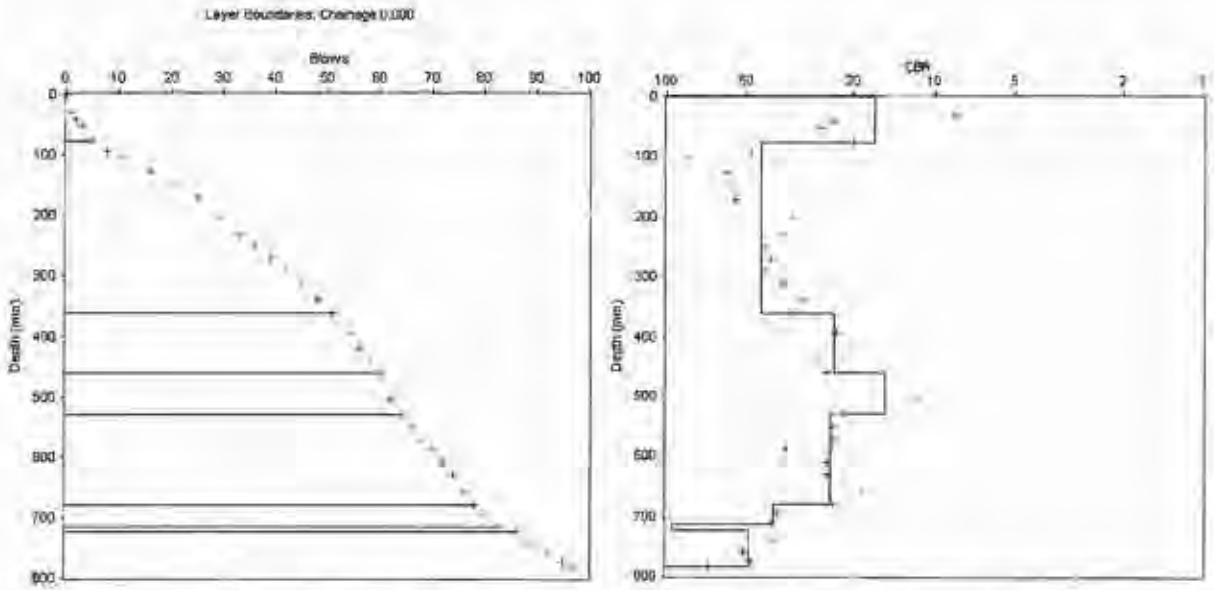
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	2	68	694	11.00
2	1	1	151	30.00	27	2	70	709	7.50
3	1	2	162	11.00	28	2	72	730	10.50
4	1	3	172	10.00	29	2	74	751	10.50
5	2	5	198	13.00	30	2	76	779	14.00
6	3	8	215	5.67	31	2	78	801	11.00
7	3	11	225	3.33	32	2	80	815	7.00
8	5	16	248	4.60	33	3	83	835	6.67
9	5	21	272	4.80	34	3	86	844	3.00
10	4	25	292	5.00	35	3	89	864	6.67
11	4	29	324	8.00	36	3	92	880	5.33
12	4	33	353	7.25	37	3	95	897	5.67
13	3	36	372	6.33	38	2	97	905	4.00
14	3	39	392	6.67					
15	3	42	411	6.33					
16	3	45	433	7.33					
17	3	48	459	8.67					
18	3	51	482	7.67					
19	3	54	516	11.33					
20	2	56	541	12.50					
21	2	58	561	10.00					
22	2	60	582	10.50					
23	2	62	626	22.00					
24	2	64	650	12.00					
25	2	66	672	11.00					

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DCP Layer Strength Analysis Report

Project Name: WS248

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart

CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	15.40	17	77	77
2	6.17	44	284	361
3	11.11	24	100	461
4	17.00	15	68	529
5	10.79	24	151	680
6	6.80	40	34	714
7	3.00	95	9	723
8	5.55	49	61	784

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS249

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 160
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

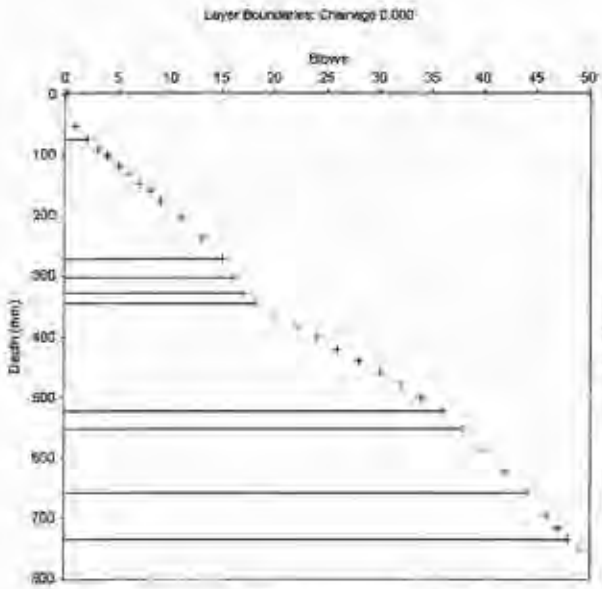
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	160	0.00	26	2	38	712	14.00
2	1	1	211	51.00	27	2	40	749	18.50
3	1	2	234	23.00	28	2	42	784	17.50
4	1	3	251	17.00	29	2	44	819	17.50
5	1	4	261	10.00	30	2	46	856	18.50
6	1	5	278	17.00	31	1	47	876	20.00
7	1	6	291	13.00	32	1	48	896	20.00
8	1	7	308	17.00	33	1	49	913	17.00
9	1	8	321	13.00					
10	1	9	336	15.00					
11	2	11	366	15.00					
12	2	13	396	15.00					
13	2	15	432	18.00					
14	1	16	464	32.00					
15	1	17	488	24.00					
16	1	18	504	16.00					
17	2	20	524	10.00					
18	2	22	544	10.00					
19	2	24	562	9.00					
20	2	26	581	9.50					
21	2	28	600	9.50					
22	2	30	619	9.50					
23	2	32	638	9.50					
24	2	34	661	11.50					
25	2	36	684	11.50					

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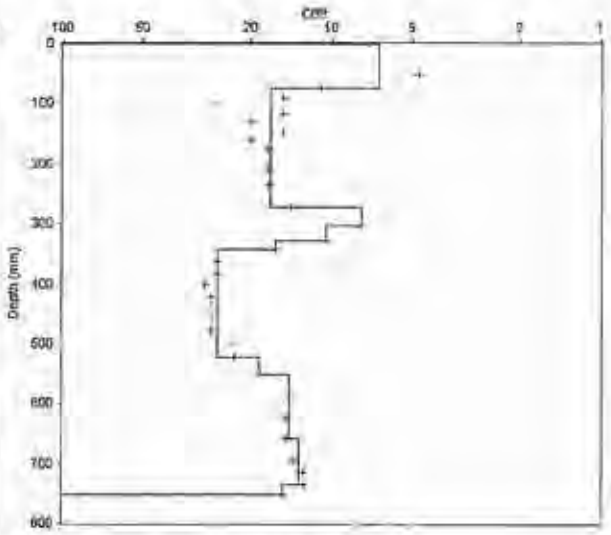
DCP Layer Strength Analysis Report

Project Name: WS249

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	160	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	37.00	7	74	74
2	15.23	17	198	272
3	32.00	8	32	304
4	24.00	10	24	328
5	16.00	16	16	344
6	10.00	26	180	524
7	14.00	19	28	552
8	17.83	14	107	659
9	19.25	13	77	736
10	17.00	15	17	753

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS250

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 134
Test Date: 24/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

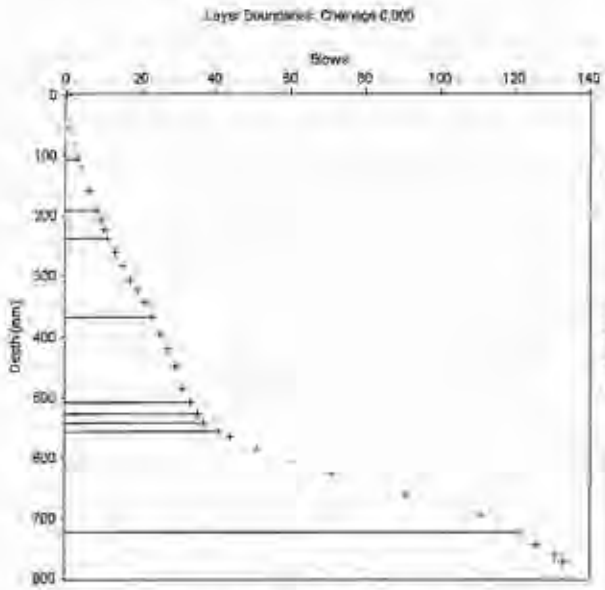
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	134	0.00	26	7	51	720	2.86
2	1	1	188	54.00	27	10	61	741	2.10
3	1	2	215	27.00	28	10	71	760	1.90
4	1	3	241	26.00	29	20	91	795	1.75
5	1	4	254	13.00	30	20	111	829	1.70
6	2	6	292	19.00	31	10	121	857	2.80
7	2	8	326	17.00	32	5	126	877	4.00
8	1	9	342	16.00	33	5	131	894	3.40
9	1	10	356	14.00	34	2	133	906	6.00
10	1	11	370	14.00					
11	2	13	394	12.00					
12	2	15	417	11.50					
13	2	17	439	11.00					
14	2	19	456	8.50					
15	2	21	476	10.00					
16	2	23	501	12.50					
17	2	25	528	13.50					
18	2	27	554	13.00					
19	2	29	583	14.50					
20	2	31	620	18.50					
21	2	33	643	11.50					
22	2	35	662	9.50					
23	2	37	676	7.00					
24	4	41	691	3.75					
25	3	44	700	3.00					

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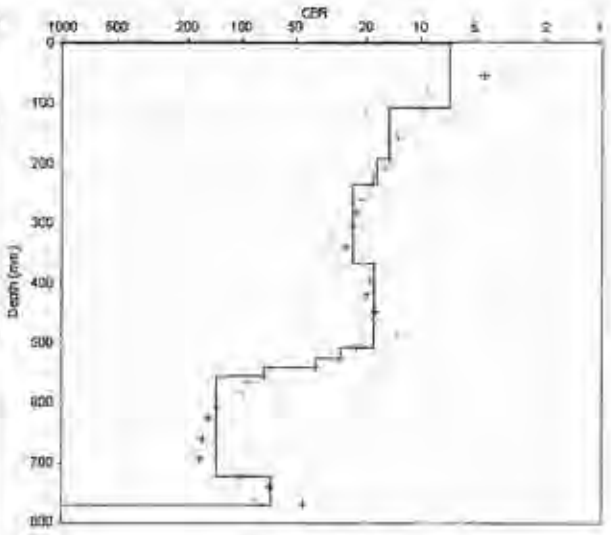
DCP Layer Strength Analysis Report

Project Name: WS250

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	134	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	35.67	7	107	107
2	17.00	15	85	192
3	14.67	18	44	236
4	10.92	24	131	367
5	14.20	18	142	509
6	9.50	28	19	528
7	7.00	39	14	542
8	3.75	75	15	557
9	2.08	140	166	723
10	4.08	68	49	772

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS251

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 120
Test Date: 24/09/2013

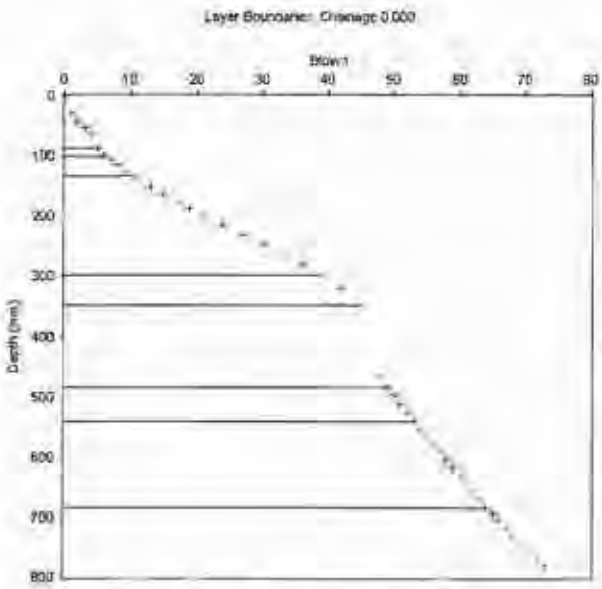
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	120	0.00	26	3	46	586	39.67
2	1	1	146	26.00	27	1	49	604	18.00
3	1	2	162	16.00	28	1	50	617	13.00
4	1	3	172	10.00	29	1	51	631	14.00
5	1	4	182	10.00	30	1	52	646	15.00
6	1	5	208	26.00	31	1	53	660	14.00
7	1	6	219	11.00	32	1	54	672	12.00
8	1	7	226	7.00	33	1	55	686	14.00
9	1	8	235	9.00	34	1	56	697	11.00
10	1	9	244	9.00	35	1	57	711	14.00
11	1	10	252	8.00	36	1	58	722	11.00
12	1	11	257	5.00	37	1	59	735	13.00
13	2	13	272	7.50	38	1	60	750	15.00
14	2	15	285	6.50	39	1	61	762	12.00
15	2	17	296	5.50	40	1	62	777	15.00
16	2	19	308	6.00	41	1	63	790	13.00
17	2	21	320	6.00	42	1	64	803	13.00
18	3	24	334	4.67	43	1	65	814	11.00
19	3	27	350	5.33	44	1	66	825	11.00
20	3	30	365	5.00	45	1	67	837	12.00
21	3	33	384	6.33	46	1	68	849	12.00
22	3	36	400	5.33	47	1	69	860	11.00
23	3	39	417	5.67	48	1	70	870	10.00
24	3	42	440	7.67	49	1	71	881	11.00
25	3	45	467	9.00	50	1	72	890	9.00
51	1	73	900	10.00					

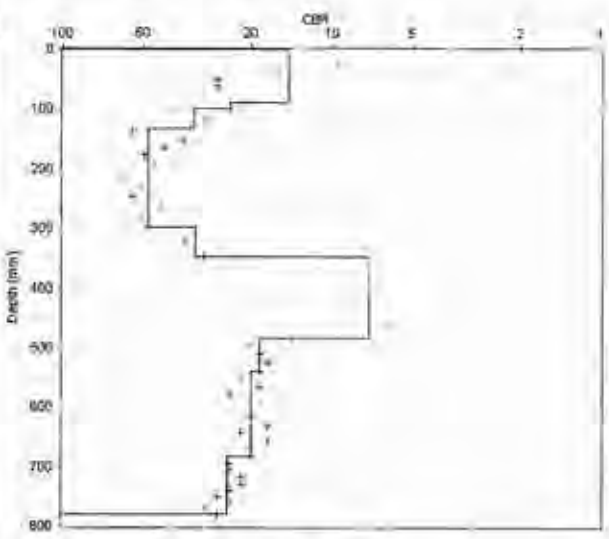
DCP Layer Strength Analysis Report

Project Name: WS251

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	120	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	17.60	15	88	88
2	11.00	24	11	99
3	8.25	32	33	132
4	5.69	48	165	297
5	8.33	32	50	347
6	34.25	7	137	484
7	14.00	19	56	540
8	13.00	20	143	683
9	10.78	24	97	780

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS253

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm)::	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	114	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted

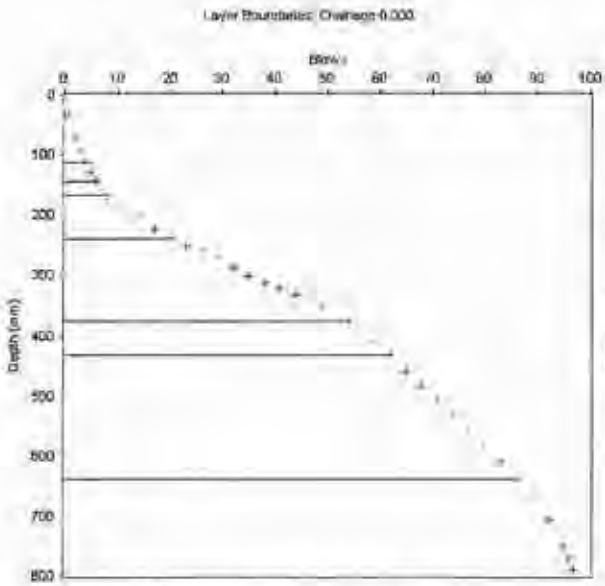
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	144	0.00	26	3	65	574	9.00
2	1	1	150	6.00	27	3	68	599	8.33
3	1	2	185	35.00	28	3	71	620	7.00
4	1	3	206	21.00	29	3	74	645	8.33
5	1	4	227	21.00	30	3	77	669	8.00
6	1	5	242	15.00	31	3	80	698	9.67
7	1	6	258	16.00	32	3	83	722	8.00
8	1	7	270	12.00	33	3	86	751	9.67
9	1	8	280	10.00	34	3	89	784	11.00
10	3	11	296	5.33	35	3	92	820	12.00
11	3	14	315	6.33	36	3	95	865	15.00
12	3	17	336	7.00	37	1	96	883	18.00
13	3	20	352	5.33	38	1	97	903	20.00
14	3	23	365	4.33					
15	3	26	372	2.33					
16	3	29	385	4.33					
17	3	32	400	5.00					
18	3	35	415	5.00					
19	3	38	426	3.67					
20	3	41	437	3.67					
21	3	44	446	3.00					
22	5	49	484	3.60					
23	5	54	490	5.20					
24	5	59	524	6.80					
25	3	62	547	7.67					

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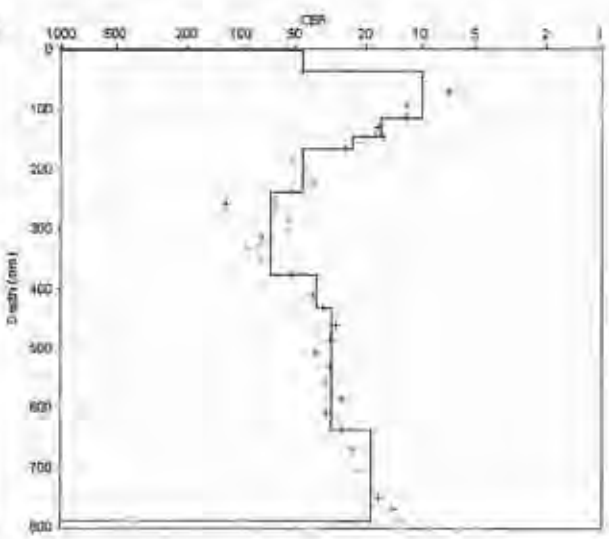
DCP Layer Strength Analysis Report

Project Name: WS253

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	114	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	6.00	45	36	36
2	25.67	10	77	113
3	15.50	17	31	144
4	11.00	24	22	166
5	6.00	45	72	238
6	4.06	69	138	376
7	7.13	38	57	433
8	8.50	31	204	637
9	13.82	19	152	789

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS254

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 139
Test Date: 24/09/2013

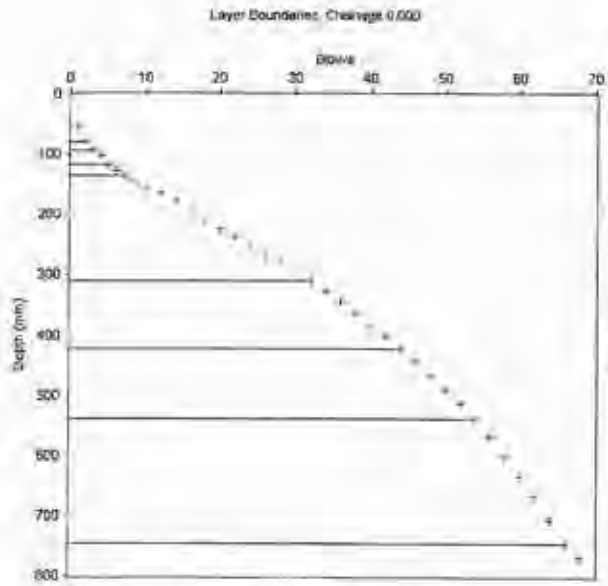
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	139	0.00	26	2	40	523	10.00
2	1	1	190	51.00	27	2	42	540	8.50
3	1	2	217	27.00	28	2	44	560	10.00
4	1	3	233	16.00	29	2	46	582	11.00
5	1	4	241	8.00	30	2	48	607	12.50
6	1	5	255	14.00	31	2	50	630	11.50
7	1	6	265	10.00	32	2	52	653	11.50
8	1	7	274	9.00	33	2	54	678	12.50
9	1	8	282	8.00	34	2	56	707	14.50
10	1	9	287	5.00	35	2	58	740	16.50
11	1	10	294	7.00	36	2	60	772	16.00
12	2	12	304	5.00	37	2	62	806	17.00
13	2	14	315	5.50	38	2	64	846	20.00
14	2	16	333	9.00	39	2	66	884	19.00
15	2	18	348	7.50	40	2	68	908	12.00
16	2	20	362	7.00					
17	2	22	376	7.00					
18	2	24	390	7.00					
19	2	26	405	7.50					
20	2	28	417	6.00					
21	2	30	432	7.50					
22	2	32	448	8.00					
23	2	34	465	8.50					
24	2	36	483	9.00					
25	2	38	503	10.00					

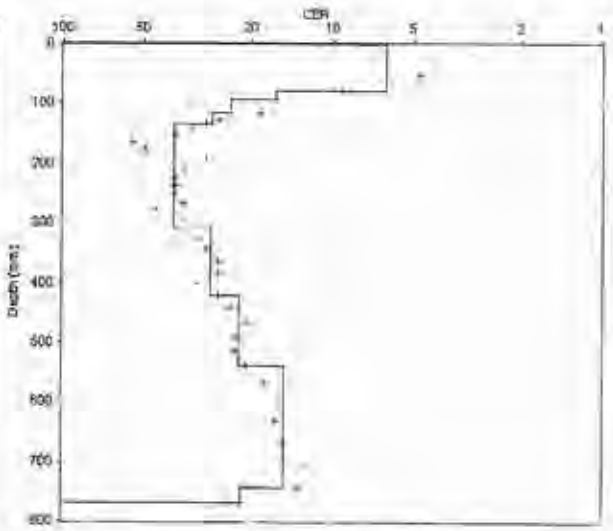
DCP Layer Strength Analysis Report

Project Name: WS254

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	139	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	39.00	6	78	78
2	16.00	16	16	94
3	11.00	24	22	116
4	9.50	28	19	135
5	6.96	39	174	309
6	9.33	28	112	421
7	11.80	22	118	539
8	17.17	15	206	745
9	12.00	22	24	769

CBR Relationship

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS255

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 148
Test Date: 24/09/2013

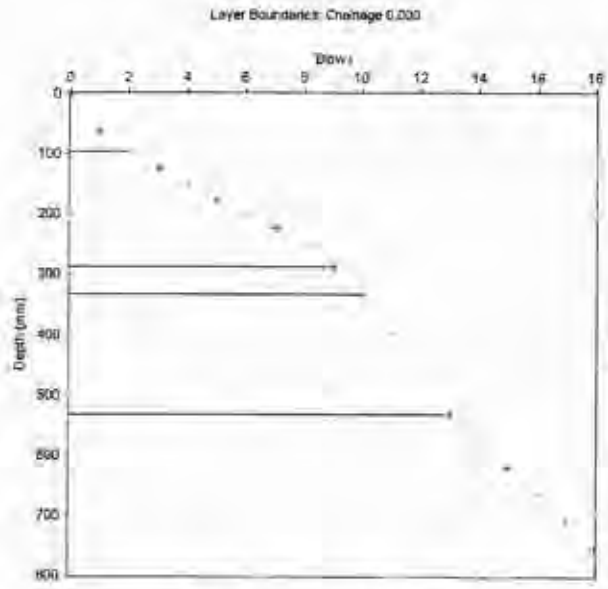
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	148	0.00					
2	1	1	210	62.00					
3	1	2	244	34.00					
4	1	3	270	26.00					
5	1	4	300	30.00					
6	1	5	324	24.00					
7	1	6	346	22.00					
8	1	7	370	24.00					
9	1	8	401	31.00					
10	1	9	434	33.00					
11	1	10	480	46.00					
12	1	11	544	64.00					
13	1	12	608	64.00					
14	1	13	680	72.00					
15	1	14	726	46.00					
16	1	15	768	42.00					
17	1	16	811	43.00					
18	1	17	858	47.00					
19	1	18	903	45.00					

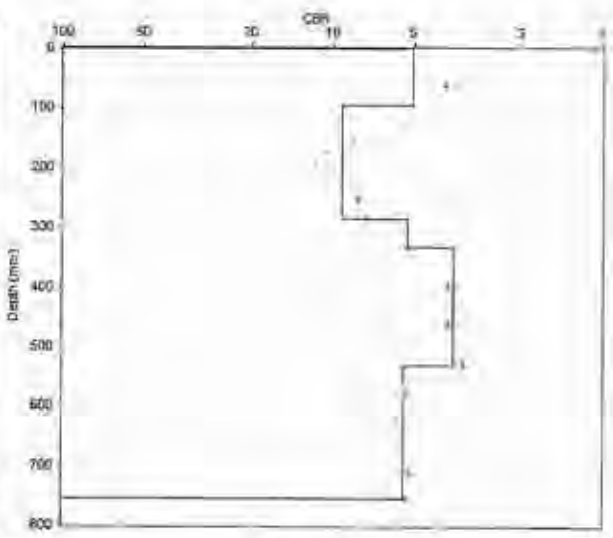
DCP Layer Strength Analysis Report

Project Name: WS255

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	148	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	48.00	5	96	96
2	27.14	9	190	286
3	46.00	5	46	332
4	66.67	4	200	532
5	44.60	5	223	755

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS258

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	117	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted

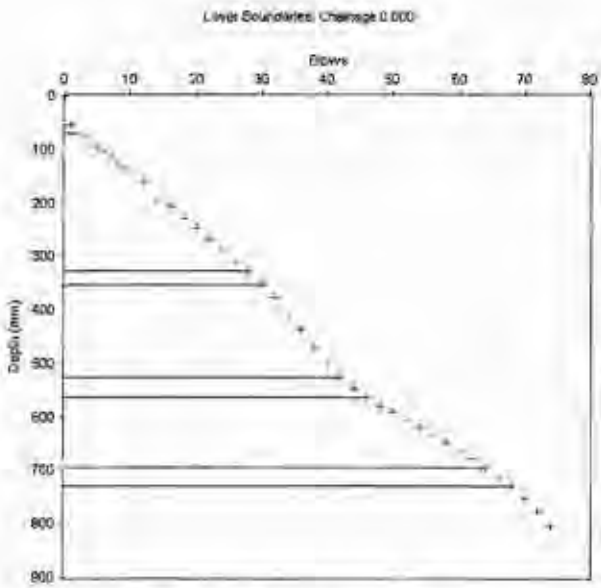
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	117	0.00	26	2	40	619	15.50
2	1	1	170	53.00	27	2	42	644	12.50
3	1	2	186	16.00	28	2	44	663	9.50
4	1	3	192	6.00	29	2	46	681	9.00
5	1	4	207	15.00	30	2	48	696	7.50
6	1	5	215	8.00	31	2	50	709	6.50
7	1	6	223	8.00	32	2	52	722	6.50
8	1	7	231	8.00	33	2	54	736	7.00
9	1	8	240	9.00	34	2	56	750	7.00
10	1	9	250	10.00	35	2	58	764	7.00
11	1	10	259	9.00	36	2	60	779	7.50
12	2	12	279	10.00	37	2	62	795	8.00
13	2	14	310	15.50	38	2	64	811	8.00
14	2	16	324	7.00	39	2	66	829	9.00
15	2	18	345	10.50	40	2	68	846	8.50
16	2	20	364	9.50	41	2	70	869	11.50
17	2	22	385	10.50	42	2	72	893	12.00
18	2	24	405	10.00	43	2	74	921	14.00
19	2	26	425	10.00					
20	2	28	445	10.00					
21	2	30	469	12.00					
22	2	32	494	12.50					
23	2	34	523	14.50					
24	2	36	555	16.00					
25	2	38	588	16.50					

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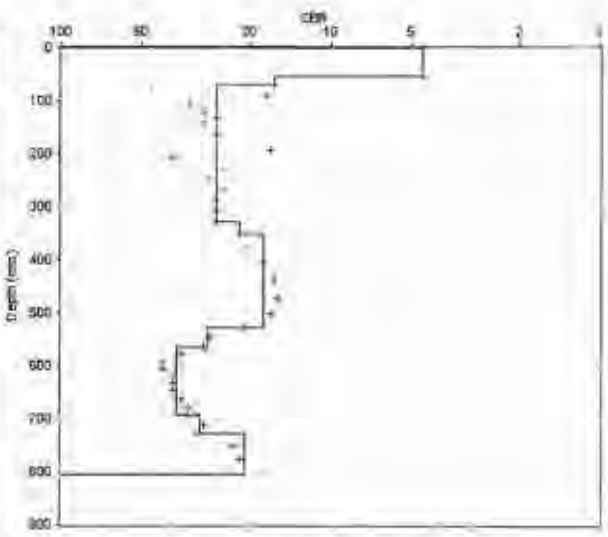
DCP Layer Strength Analysis Report

Project Name: WS258

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	117	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	53.00	5	53	53
2	16.00	16	16	69
3	9.96	27	259	328
4	12.00	22	24	352
5	14.58	18	175	527
6	9.25	29	37	564
7	7.22	37	130	694
8	8.75	30	35	729
9	12.50	21	75	804

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS261

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	155	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted

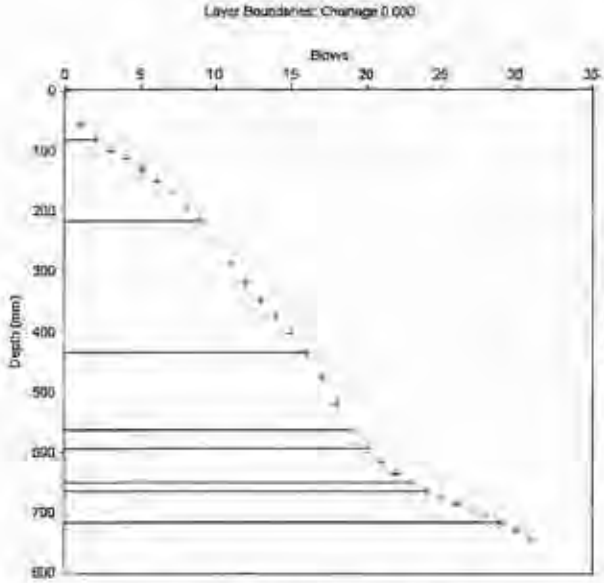
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	155	0.00	26	1	25	830	11.00
2	1	1	211	56.00	27	1	26	840	10.00
3	1	2	235	24.00	28	1	27	851	11.00
4	1	3	254	19.00	29	1	28	862	11.00
5	1	4	268	14.00	30	1	29	872	10.00
6	1	5	285	17.00	31	1	30	885	13.00
7	1	6	305	20.00	32	1	31	900	15.00
8	1	7	324	19.00					
9	1	8	349	25.00					
10	1	9	371	22.00					
11	1	10	407	36.00					
12	1	11	441	34.00					
13	1	12	472	31.00					
14	1	13	502	30.00					
15	1	14	530	28.00					
16	1	15	559	29.00					
17	1	16	589	30.00					
18	1	17	630	41.00					
19	1	18	675	45.00					
20	1	19	718	43.00					
21	1	20	750	32.00					
22	1	21	771	21.00					
23	1	22	790	19.00					
24	1	23	806	16.00					
25	1	24	819	13.00					

UK DCP V3.1

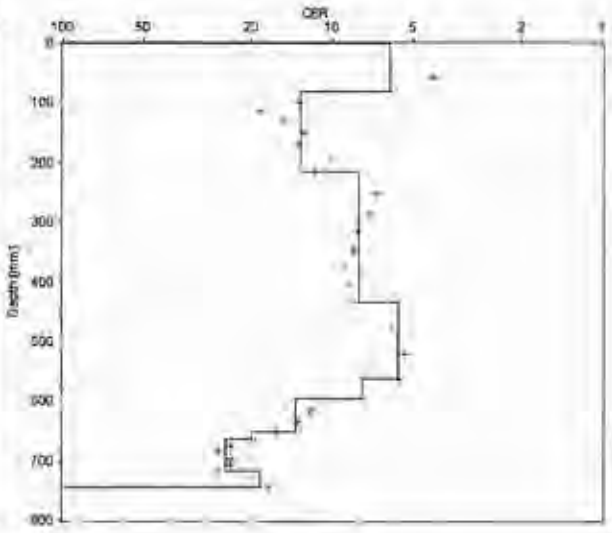
DCP Layer Strength Analysis Report

Project Name: WS261

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	155	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	40.00	6	80	80
2	19.43	13	136	216
3	31.14	8	218	434
4	43.00	6	129	563
5	32.00	8	32	595
6	18.67	14	56	651
7	13.00	20	13	664
8	10.60	25	53	717
9	14.00	19	28	745

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS262

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 111
Test Date: 25/09/2013

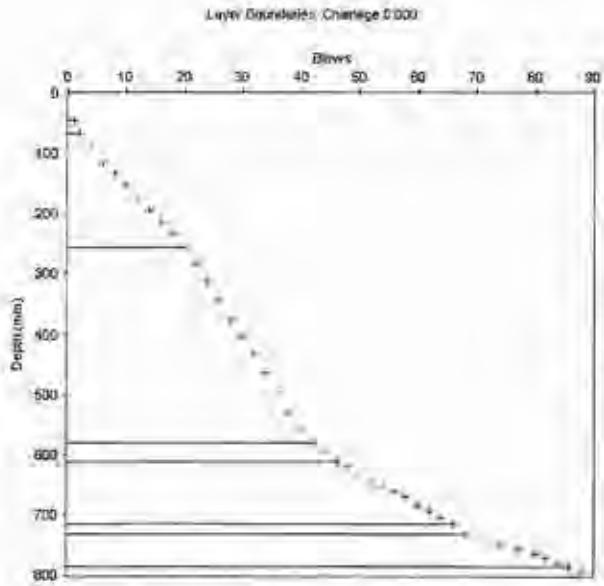
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	111	0.00	26	2	46	731	5.00
2	1	1	155	44.00	27	2	50	742	5.50
3	1	2	177	22.00	28	2	52	755	6.50
4	2	4	203	13.00	29	2	54	763	4.00
5	2	6	225	11.00	30	2	56	772	4.50
6	2	8	244	9.50	31	2	58	781	4.50
7	2	10	262	9.00	32	2	60	794	6.50
8	2	12	283	10.50	33	2	62	804	5.00
9	2	14	304	10.50	34	2	64	815	5.50
10	2	16	324	10.00	35	2	66	825	5.00
11	2	18	344	10.00	36	2	68	842	8.50
12	2	20	366	11.00	37	3	71	850	2.67
13	2	22	393	13.50	38	3	74	859	3.00
14	2	24	422	14.50	39	3	77	867	2.67
15	2	26	454	16.00	40	3	80	875	2.67
16	2	28	487	16.50	41	2	82	882	3.50
17	2	30	515	14.00	42	2	84	890	4.00
18	2	32	543	14.00	43	2	86	896	3.00
19	2	34	574	15.50	44	2	88	906	5.00
20	2	36	605	15.50					
21	2	38	640	17.50					
22	2	40	667	13.50					
23	2	42	690	11.50					
24	2	44	706	8.00					
25	2	46	721	7.50					

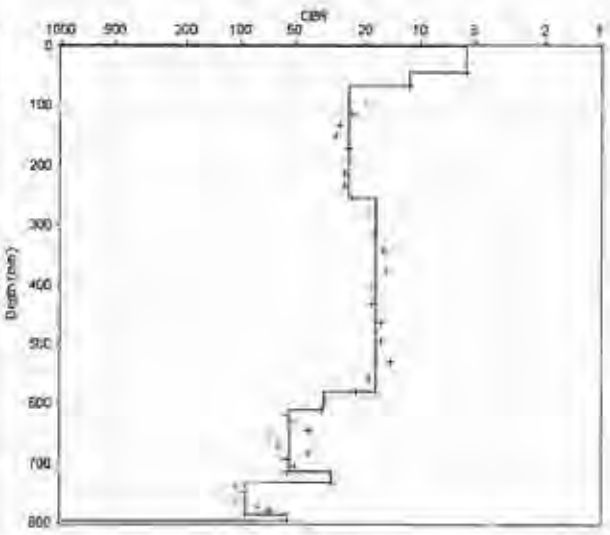
DCP Layer Strength Analysis Report

Project Name: WS262

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	111	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	44.00	6	44	44
2	22.00	12	22	66
3	10.50	25	189	255
4	14.73	18	324	579
5	7.75	35	31	610
6	5.20	53	104	714
7	8.50	31	17	731
8	3.00	95	54	785
9	5.00	55	10	795

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS264

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 141
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

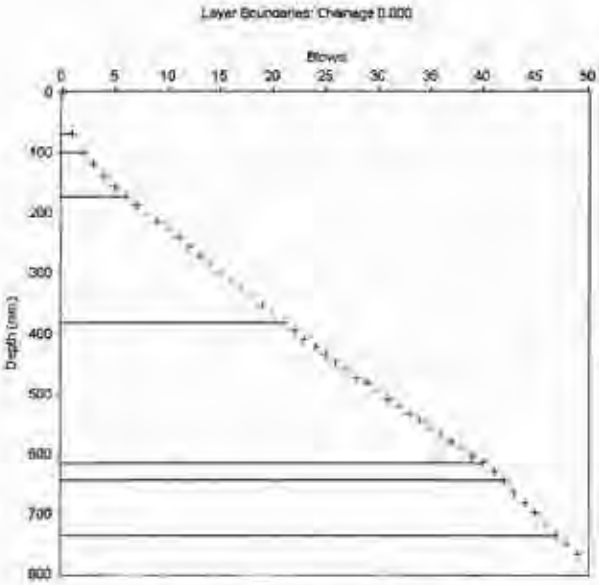
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	141	0.00	26	1	25	575	13.00
2	1	1	210	69.00	27	1	26	587	12.00
3	1	2	240	30.00	28	1	27	600	13.00
4	1	3	260	20.00	29	1	28	614	14.00
5	1	4	278	18.00	30	1	29	624	10.00
6	1	5	297	19.00	31	1	30	636	12.00
7	1	6	313	16.00	32	1	31	650	14.00
8	1	7	327	14.00	33	1	32	662	12.00
9	1	8	342	15.00	34	1	33	675	13.00
10	1	9	356	14.00	35	1	34	686	11.00
11	1	10	369	13.00	36	1	35	700	14.00
12	1	11	383	14.00	37	1	36	710	10.00
13	1	12	397	14.00	38	1	37	721	11.00
14	1	13	411	14.00	39	1	38	732	11.00
15	1	14	425	14.00	40	1	39	743	11.00
16	1	15	438	13.00	41	1	40	756	13.00
17	1	16	453	15.00	42	1	41	771	15.00
18	1	17	468	15.00	43	1	42	786	15.00
19	1	18	480	12.00	44	1	43	805	19.00
20	1	19	495	15.00	45	1	44	823	18.00
21	1	20	508	13.00	46	1	45	840	17.00
22	1	21	524	16.00	47	1	46	858	18.00
23	1	22	536	12.00	48	1	47	877	19.00
24	1	23	550	14.00	49	1	48	892	15.00
25	1	24	562	12.00	50	1	49	908	16.00

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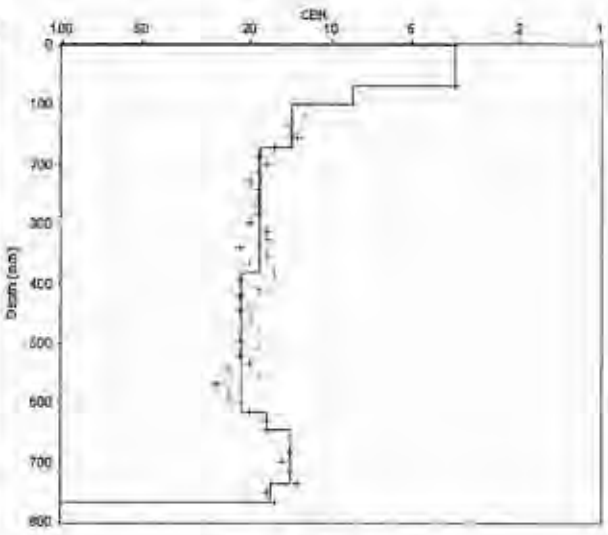
DCP Layer Strength Analysis Report

Project Name: WS264

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	141	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	69.00	3	69	69
2	30.00	8	30	99
3	18.25	14	73	172
4	14.07	18	211	383
5	12.21	21	232	615
6	15.00	17	30	645
7	18.20	14	91	736
8	15.50	17	31	767

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS265

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 140
Test Date: 24/09/2013

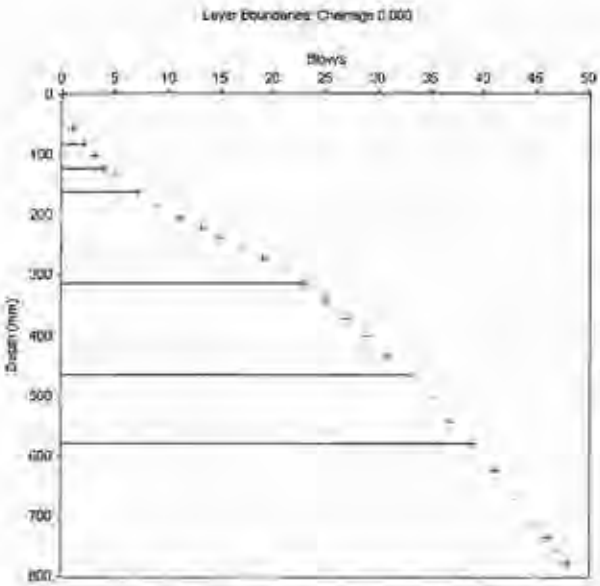
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	140	0.00	26	2	45	852	21.50
2	1	1	197	57.00	27	1	46	875	23.00
3	1	2	223	26.00	28	1	47	897	22.00
4	1	3	242	19.00	29	1	48	920	23.00
5	1	4	262	20.00					
6	1	5	275	13.00					
7	2	7	302	13.50					
8	2	9	325	11.50					
9	2	11	345	10.00					
10	2	13	362	8.50					
11	2	15	377	7.50					
12	2	17	393	8.00					
13	2	19	413	10.00					
14	2	21	433	10.00					
15	2	23	454	10.50					
16	2	25	481	13.50					
17	2	27	512	15.50					
18	2	29	542	15.00					
19	2	31	575	16.50					
20	2	33	606	15.50					
21	2	35	643	18.50					
22	2	37	682	19.50					
23	2	39	720	19.00					
24	2	41	764	22.00					
25	2	43	809	22.50					

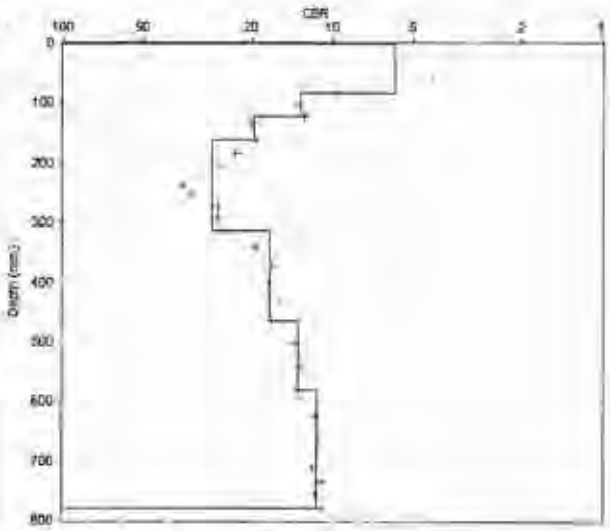
DCP Layer Strength Analysis Report

Project Name: WS265

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	140	Surface Moisture:	Moderate
Test Date:	24/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	41.50	6	83	83
2	19.50	13	39	122
3	13.33	20	40	162
4	9.50	28	152	314
5	15.20	17	152	466
6	19.00	13	114	580
7	22.22	11	200	780

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS267

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 118
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

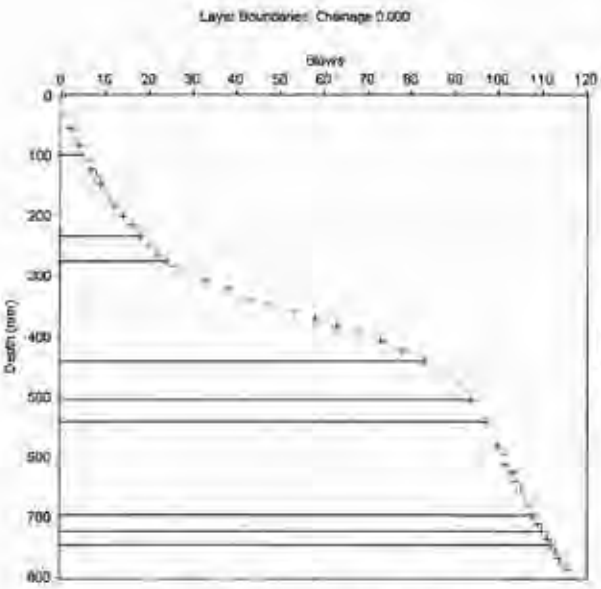
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	118	0.00	26	5	53	475	2.40
2	1	1	152	34.00	27	5	58	487	2.40
3	1	2	172	20.00	28	5	63	500	2.60
4	1	3	188	16.00	29	5	68	511	2.20
5	1	4	202	14.00	30	5	73	525	2.80
6	1	5	215	13.00	31	5	78	540	3.00
7	1	6	226	11.00	32	5	83	558	3.60
8	1	7	238	12.00	33	5	88	582	4.80
9	1	8	252	14.00	34	3	91	599	5.67
10	1	9	264	12.00	35	3	94	623	8.00
11	1	10	277	13.00	36	3	97	658	11.67
12	1	11	288	11.00	37	3	100	700	14.00
13	1	12	300	12.00	38	1	101	715	15.00
14	2	14	317	8.50	39	1	102	730	15.00
15	2	16	333	8.00	40	1	103	744	14.00
16	2	18	350	8.50	41	1	104	758	14.00
17	2	20	366	8.00	42	1	105	772	14.00
18	2	22	381	7.50	43	1	106	786	14.00
19	2	24	393	6.00	44	1	107	800	14.00
20	2	26	401	4.00	45	1	108	815	15.00
21	2	28	409	4.00	46	1	109	828	13.00
22	5	33	425	3.20	47	1	110	841	13.00
23	5	38	438	2.60	48	1	111	853	12.00
24	5	43	457	3.80	49	1	112	865	12.00
25	5	48	463	1.20	50	1	113	875	10.00
51	1	114	886	11.00					
52	1	115	897	11.00					
53	1	116	906	9.00					

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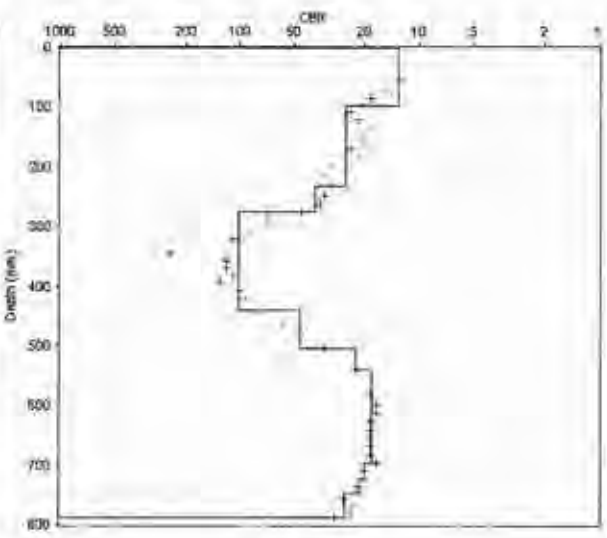
DCP Layer Strength Analysis Report

Project Name: WS267

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	118	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	19.40	13	97	97
2	10.38	25	135	232
3	7.17	38	43	275
4	2.80	102	165	440
5	5.91	46	65	505
6	11.67	23	35	540
7	14.27	18	157	697
8	13.00	20	26	723
9	12.00	22	24	747
10	10.25	26	41	788

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS268

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 131
Test Date: 25/09/2013

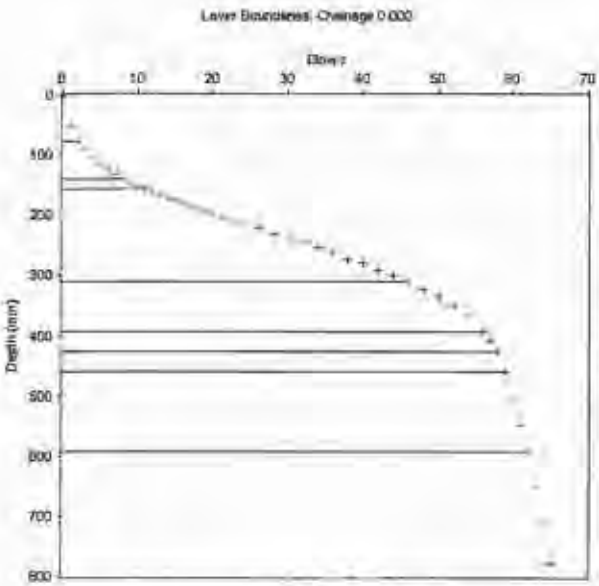
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	131	0.00	26	2	26	352	3.50
2	1	1	182	51.00	27	2	28	361	4.50
3	1	2	207	25.00	28	2	30	369	4.00
4	1	3	222	15.00	29	2	32	376	3.50
5	1	4	235	13.00	30	2	34	384	4.00
6	1	5	246	11.00	31	2	36	392	4.00
7	1	6	254	8.00	32	2	38	403	5.50
8	1	7	262	8.00	33	2	40	410	3.50
9	1	8	270	8.00	34	2	42	421	5.50
10	1	9	276	6.00	35	2	44	431	5.00
11	1	10	281	5.00	36	2	46	441	5.00
12	1	11	287	6.00	37	2	48	453	6.00
13	1	12	291	4.00	38	2	50	466	6.50
14	1	13	296	5.00	39	2	52	480	7.00
15	1	14	302	6.00	40	2	54	496	8.00
16	1	15	306	4.00	41	2	56	523	13.50
17	1	16	310	4.00	42	1	57	539	16.00
18	1	17	315	5.00	43	1	58	558	19.00
19	1	18	319	4.00	44	1	59	590	32.00
20	1	19	324	5.00	45	1	60	631	41.00
21	1	20	328	4.00	46	1	61	680	49.00
22	1	21	333	5.00	47	1	62	724	44.00
23	1	22	336	3.00	48	1	63	782	58.00
24	1	23	340	4.00	49	1	64	842	60.00
25	1	24	345	5.00	50	1	65	911	69.00

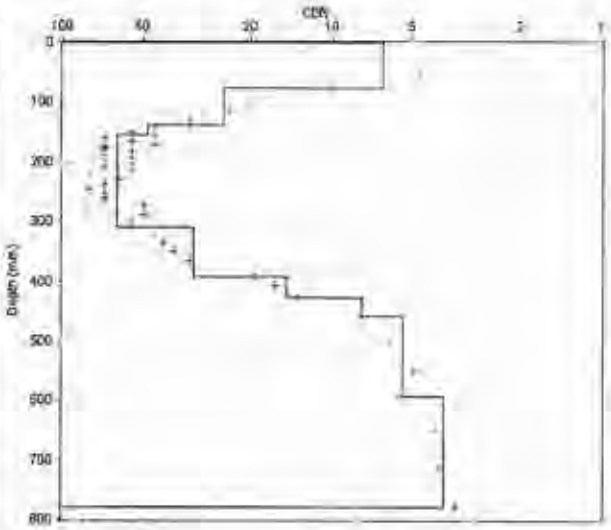
DCP Layer Strength Analysis Report

Project Name: WS268

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	38.00	6	76	76
2	10.50	25	63	139
3	5.67	48	17	156
4	4.40	63	154	310
5	8.20	33	82	392
6	17.50	15	35	427
7	32.00	8	32	459
8	44.67	5	134	593
9	62.33	4	187	780

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS269

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 135
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

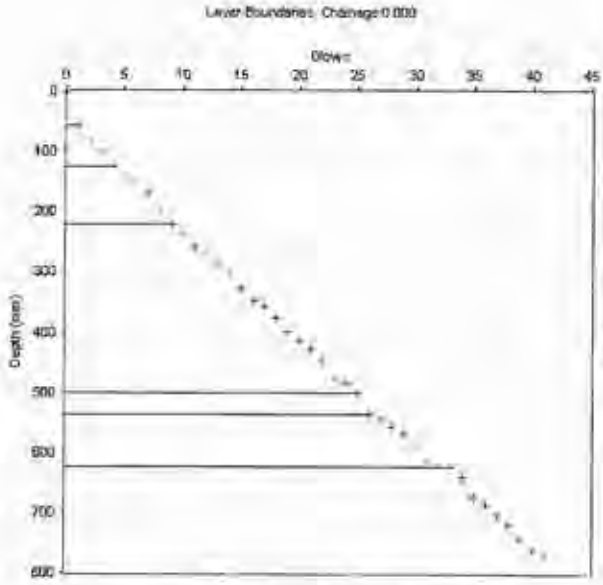
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	135	0.00	26	1	25	636	17.00
2	1	1	192	57.00	27	1	26	671	35.00
3	1	2	213	21.00	28	1	27	679	8.00
4	1	3	234	21.00	29	1	28	692	13.00
5	1	4	260	26.00	30	1	29	703	11.00
6	1	5	272	12.00	31	1	30	726	23.00
7	1	6	282	10.00	32	1	31	749	23.00
8	1	7	303	21.00	33	1	32	751	2.00
9	1	8	331	28.00	34	1	33	759	8.00
10	1	9	356	25.00	35	1	34	776	17.00
11	1	10	372	16.00	36	1	35	809	33.00
12	1	11	394	22.00	37	1	36	821	12.00
13	1	12	404	10.00	38	1	37	837	16.00
14	1	13	424	20.00	39	1	38	854	17.00
15	1	14	441	17.00	40	1	39	876	22.00
16	1	15	462	21.00	41	1	40	896	20.00
17	1	16	481	19.00	42	1	41	904	8.00
18	1	17	493	12.00					
19	1	18	512	19.00					
20	1	19	533	21.00					
21	1	20	549	16.00					
22	1	21	564	15.00					
23	1	22	581	17.00					
24	1	23	612	31.00					
25	1	24	619	7.00					

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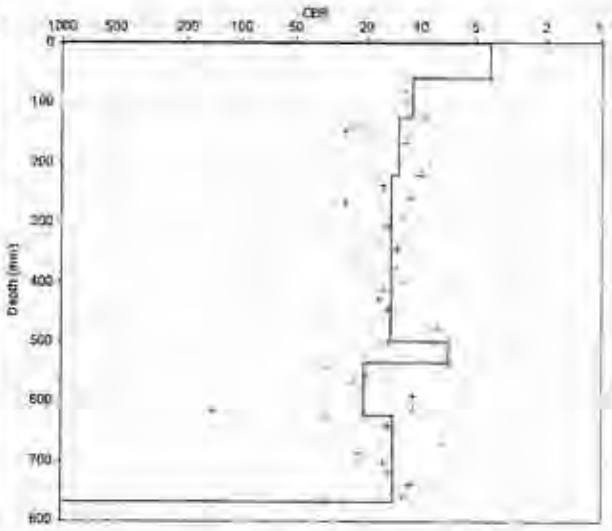
DCP Layer Strength Analysis Report

Project Name: WS269

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	135	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	57.00	4	57	57
2	22.67	11	68	125
3	19.20	13	96	221
4	17.50	15	280	501
5	35.00	7	35	536
6	12.57	21	88	624
7	18.13	14	145	769

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS270

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

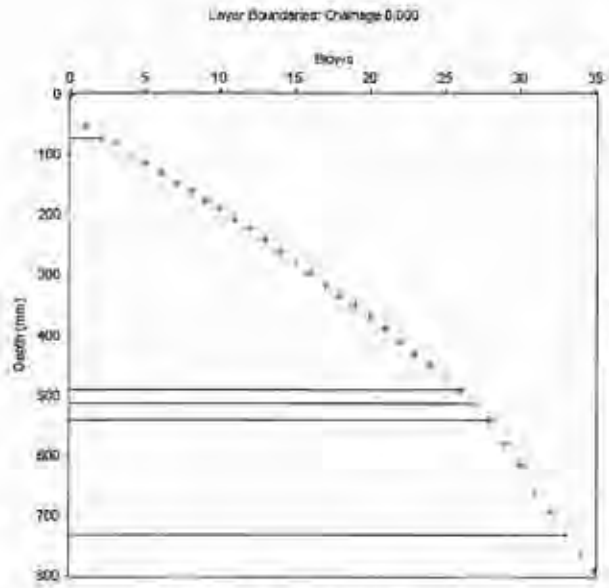
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	1	25	592	23.00
2	1	1	173	52.00	27	1	26	612	20.00
3	1	2	193	20.00	28	1	27	634	22.00
4	1	3	203	10.00	29	1	28	662	28.00
5	1	4	221	18.00	30	1	29	700	38.00
6	1	5	235	14.00	31	1	30	736	36.00
7	1	6	252	17.00	32	1	31	780	44.00
8	1	7	268	16.00	33	1	32	812	32.00
9	1	8	282	14.00	34	1	33	853	41.00
10	1	9	297	15.00	35	1	34	881	28.00
11	1	10	310	13.00	36	1	35	912	31.00
12	1	11	329	19.00					
13	1	12	344	15.00					
14	1	13	362	18.00					
15	1	14	383	21.00					
16	1	15	400	17.00					
17	1	16	419	19.00					
18	1	17	437	18.00					
19	1	18	456	19.00					
20	1	19	471	15.00					
21	1	20	490	19.00					
22	1	21	510	20.00					
23	1	22	532	22.00					
24	1	23	551	19.00					
25	1	24	569	18.00					

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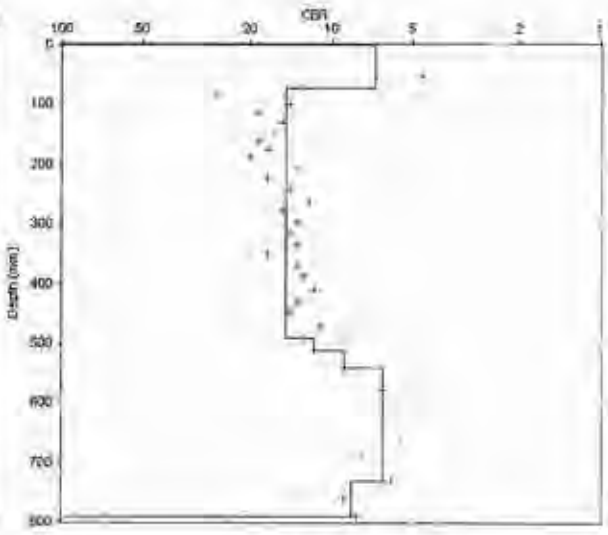
DCP Layer Strength Analysis Report

Project Name: WS270

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	36.00	7	72	72
2	17.46	15	419	491
3	22.00	12	22	513
4	28.00	9	28	541
5	38.20	6	191	732
6	29.50	8	59	791

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS271

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 137
Test Date: 02/10/2013

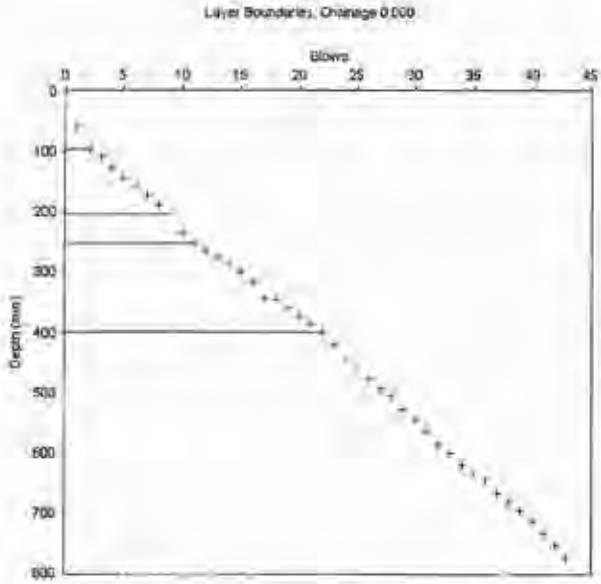
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	137	0.00	26	1	25	592	13.00
2	1	1	193	56.00	27	1	26	612	20.00
3	1	2	232	39.00	28	1	27	629	17.00
4	1	3	245	13.00	29	1	28	641	12.00
5	1	4	263	18.00	30	1	29	664	23.00
6	1	5	280	17.00	31	1	30	682	18.00
7	1	6	294	14.00	32	1	31	701	19.00
8	1	7	309	15.00	33	1	32	723	22.00
9	1	8	326	17.00	34	1	33	738	15.00
10	1	9	341	15.00	35	1	34	756	18.00
11	1	10	371	30.00	36	1	35	769	13.00
12	1	11	389	18.00	37	1	36	781	12.00
13	1	12	400	11.00	38	1	37	803	22.00
14	1	13	412	12.00	39	1	38	819	16.00
15	1	14	423	11.00	40	1	39	833	14.00
16	1	15	436	13.00	41	1	40	852	19.00
17	1	16	452	16.00	42	1	41	871	19.00
18	1	17	479	27.00	43	1	42	892	21.00
19	1	18	482	3.00	44	1	43	913	21.00
20	1	19	497	15.00					
21	1	20	512	15.00					
22	1	21	523	11.00					
23	1	22	536	13.00					
24	1	23	556	20.00					
25	1	24	579	23.00					

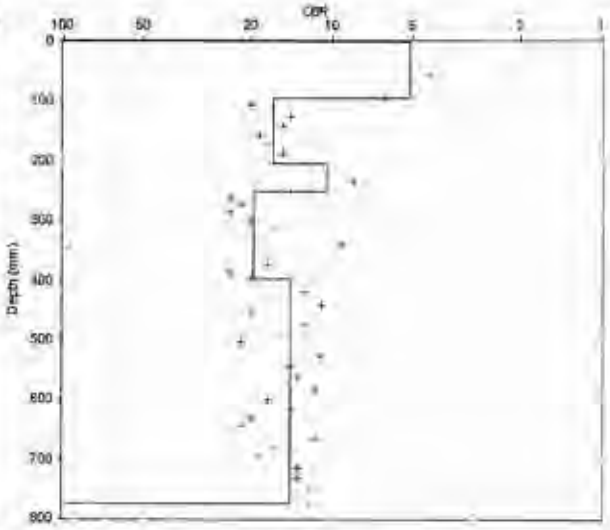
DCP Layer Strength Analysis Report

Project Name: WS271

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	137	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	47.50	5	95	95
2	15.57	17	109	204
3	24.00	10	48	252
4	13.36	19	147	399
5	17.95	14	377	776

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS272

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 153
Test Date: 02/10/2013

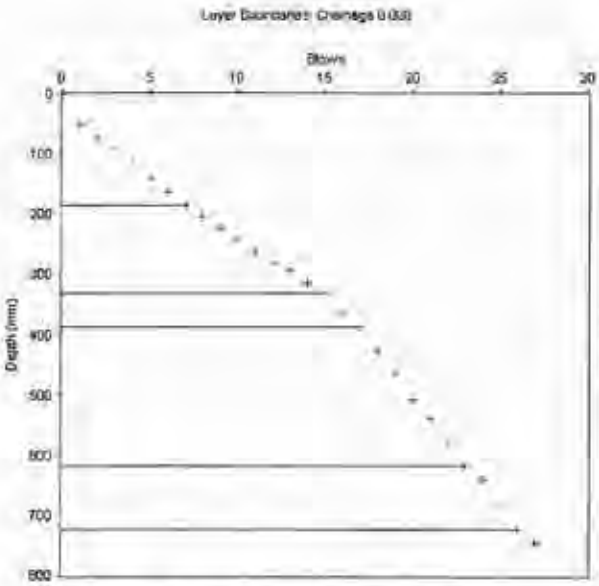
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	153	0.00	26	1	25	832	38.00
2	1	1	202	49.00	27	1	26	876	44.00
3	1	2	225	23.00	28	1	27	900	24.00
4	1	3	244	19.00					
5	1	4	268	24.00					
6	1	5	292	24.00					
7	1	6	316	24.00					
8	1	7	338	22.00					
9	1	8	356	18.00					
10	1	9	375	19.00					
11	1	10	394	19.00					
12	1	11	414	20.00					
13	1	12	434	20.00					
14	1	13	445	11.00					
15	1	14	466	21.00					
16	1	15	484	18.00					
17	1	16	512	28.00					
18	1	17	540	28.00					
19	1	18	578	38.00					
20	1	19	617	39.00					
21	1	20	661	44.00					
22	1	21	692	31.00					
23	1	22	732	40.00					
24	1	23	771	39.00					
25	1	24	794	23.00					

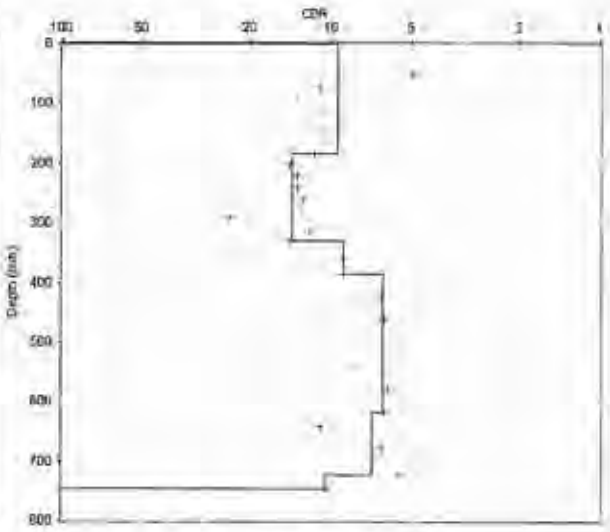
DCP Layer Strength Analysis Report

Project Name: WS272

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	153	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	26.43	9	185	185
2	18.25	14	146	331
3	28.00	9	56	387
4	38.50	6	231	618
5	35.00	7	105	723
6	24.00	10	24	747

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS273

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 126
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

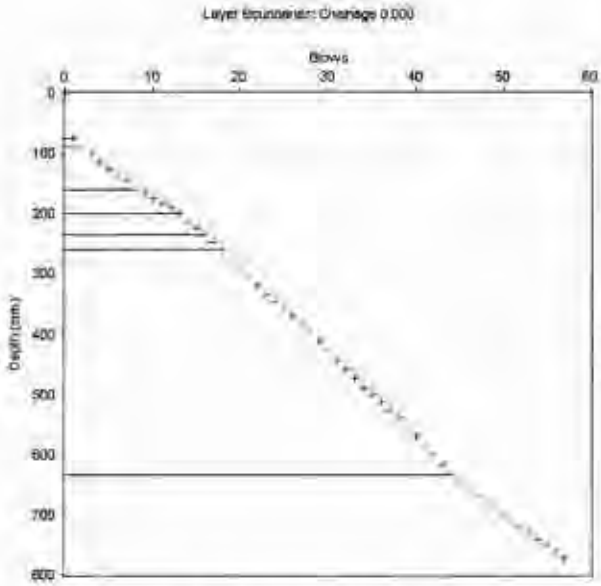
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	126	0.00	26	1	25	482	10.00
2	1	1	200	74.00	27	1	26	496	14.00
3	1	2	215	15.00	28	1	27	510	14.00
4	1	3	226	11.00	29	1	28	523	13.00
5	1	4	240	14.00	30	1	29	537	14.00
6	1	5	252	12.00	31	1	30	552	15.00
7	1	6	264	12.00	32	1	31	570	18.00
8	1	7	272	8.00	33	1	32	586	16.00
9	1	8	287	15.00	34	1	33	600	14.00
10	1	9	290	3.00	35	1	34	616	16.00
11	1	10	300	10.00	36	1	35	627	11.00
12	1	11	309	9.00	37	1	36	640	13.00
13	1	12	316	7.00	38	1	37	653	13.00
14	1	13	325	9.00	39	1	38	665	12.00
15	1	14	340	15.00	40	1	39	679	14.00
16	1	15	350	10.00	41	1	40	696	17.00
17	1	16	361	11.00	42	1	41	714	18.00
18	1	17	374	13.00	43	1	42	726	12.00
19	1	18	386	12.00	44	1	43	744	18.00
20	1	19	404	18.00	45	1	44	760	16.00
21	1	20	418	14.00	46	1	45	770	10.00
22	1	21	432	14.00	47	1	46	782	12.00
23	1	22	447	15.00	48	1	47	794	12.00
24	1	23	461	14.00	49	1	48	805	11.00
25	1	24	472	11.00	50	1	49	816	11.00
51	1	50	826	10.00					
52	1	51	837	11.00					
53	1	52	846	9.00					
54	1	53	855	9.00					
55	1	54	867	12.00					
56	1	55	877	10.00					
57	1	56	886	9.00					
58	1	57	900	14.00					

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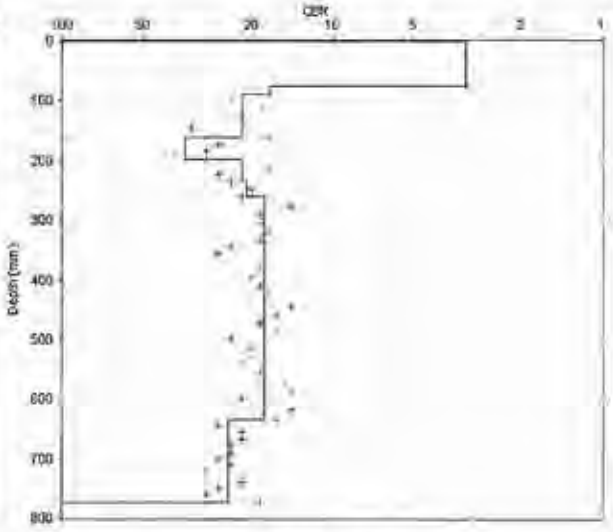
DCP Layer Strength Analysis Report

Project Name: WS273

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	74.00	3	74	74
2	15.00	17	15	89
3	12.00	22	72	161
4	7.60	35	38	199
5	12.00	22	36	235
6	12.50	21	25	260
7	14.38	18	374	634
8	10.77	24	140	774

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS274

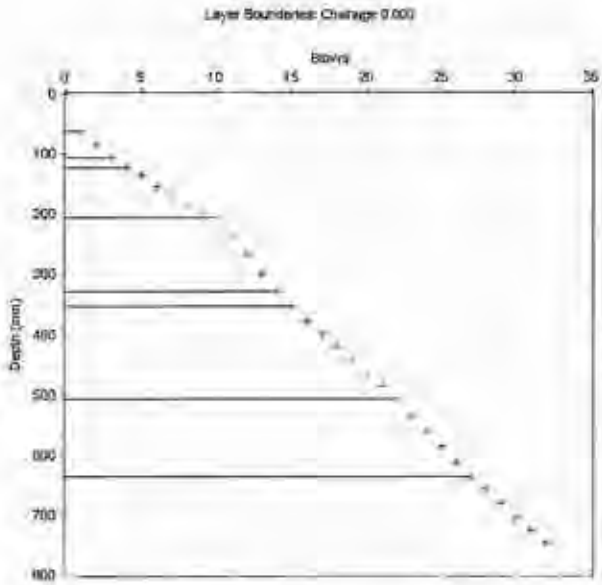
Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	134	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	134	0.00	26	1	25	721	26.00
2	1	1	197	63.00	27	1	26	746	25.00
3	1	2	220	23.00	28	1	27	770	24.00
4	1	3	240	20.00	29	1	28	791	21.00
5	1	4	257	17.00	30	1	29	813	22.00
6	1	5	269	12.00	31	1	30	839	26.00
7	1	6	287	18.00	32	1	31	860	21.00
8	1	7	300	13.00	33	1	32	881	21.00
9	1	8	316	16.00	34	1	33	904	23.00
10	1	9	327	11.00					
11	1	10	340	13.00					
12	1	11	372	32.00					
13	1	12	400	28.00					
14	1	13	434	34.00					
15	1	14	462	28.00					
16	1	15	488	26.00					
17	1	16	512	24.00					
18	1	17	532	20.00					
19	1	18	553	21.00					
20	1	19	576	23.00					
21	1	20	600	24.00					
22	1	21	621	21.00					
23	1	22	642	21.00					
24	1	23	670	28.00					
25	1	24	695	25.00					

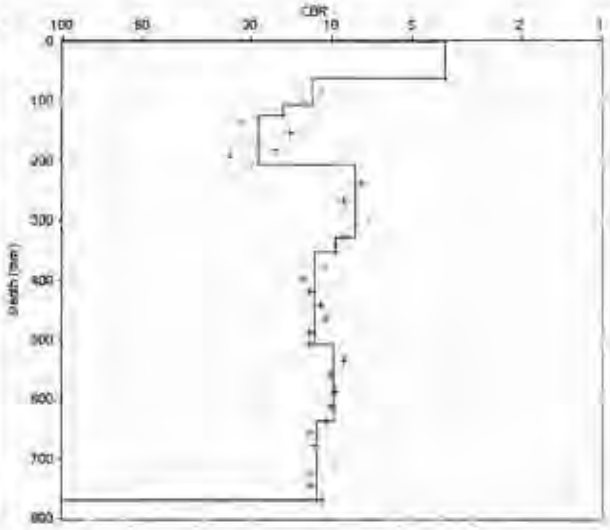
DCP Layer Strength Analysis Report

Project Name: WS274

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	134	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	63.00	4	63	63
2	21.50	12	43	106
3	17.00	15	17	123
4	13.83	19	83	206
5	30.50	8	122	328
6	26.00	10	26	354
7	22.00	12	154	508
8	25.60	10	128	636
9	22.33	11	134	770

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS276

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	125	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted

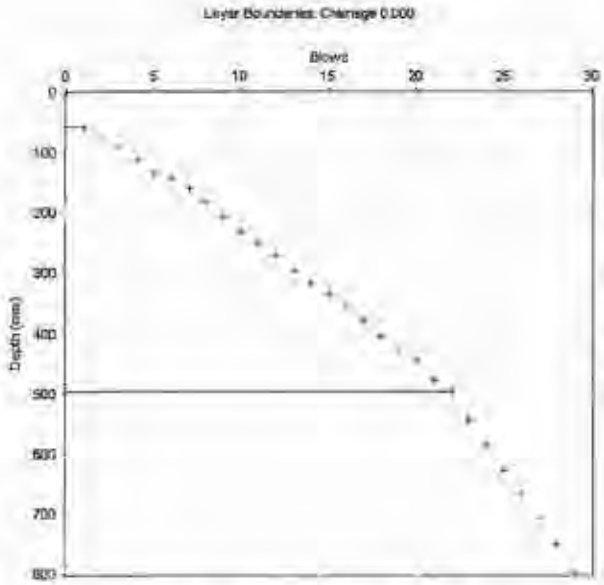
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	125	0.00	26	1	25	753	43.00
2	1	1	182	57.00	27	1	26	790	37.00
3	1	2	198	16.00	28	1	27	832	42.00
4	1	3	215	17.00	29	1	28	875	43.00
5	1	4	236	21.00	30	1	29	920	45.00
6	1	5	257	21.00					
7	1	6	266	9.00					
8	1	7	282	16.00					
9	1	8	305	23.00					
10	1	9	330	25.00					
11	1	10	355	25.00					
12	1	11	374	19.00					
13	1	12	395	21.00					
14	1	13	420	25.00					
15	1	14	441	21.00					
16	1	15	460	19.00					
17	1	16	481	21.00					
18	1	17	504	23.00					
19	1	18	530	26.00					
20	1	19	553	23.00					
21	1	20	570	17.00					
22	1	21	602	32.00					
23	1	22	621	19.00					
24	1	23	668	47.00					
25	1	24	710	42.00					

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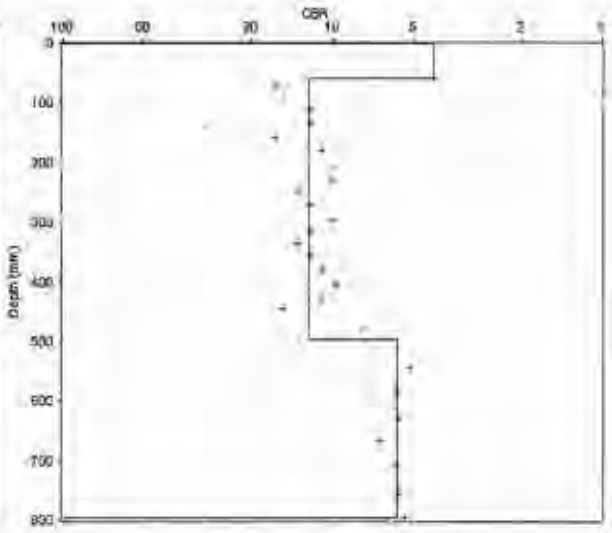
DCP Layer Strength Analysis Report

Project Name: WS276

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	125	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	57.00	4	57	57
2	20.90	12	439	496
3	42.71	6	299	795

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS277

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 112
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

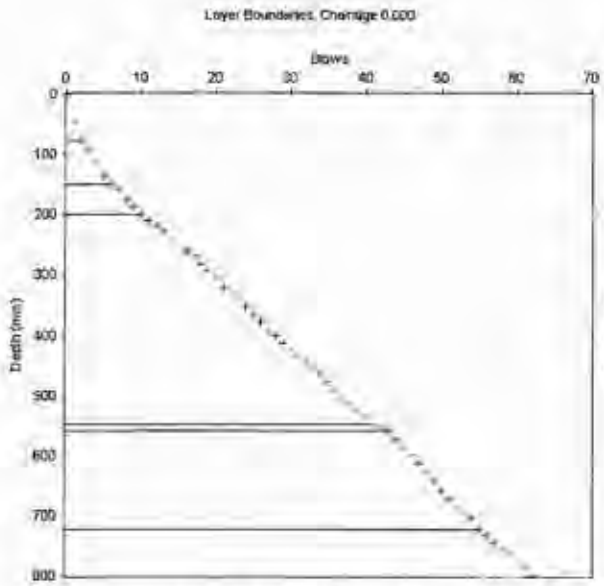
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	112	0.00	26	1	26	491	11.00
2	1	1	157	45.00	27	1	27	503	12.00
3	1	2	189	32.00	28	1	28	513	10.00
4	1	3	206	17.00	29	1	29	525	12.00
5	1	4	225	19.00	30	1	30	536	11.00
6	1	5	247	22.00	31	1	31	546	10.00
7	1	6	262	15.00	32	1	32	557	11.00
8	1	7	270	8.00	33	1	33	570	13.00
9	1	8	286	16.00	34	1	34	576	6.00
10	1	9	300	14.00	35	1	35	590	14.00
11	1	10	312	12.00	36	1	36	604	14.00
12	1	11	322	10.00	37	1	37	615	11.00
13	1	12	330	8.00	38	1	38	626	11.00
14	1	13	340	10.00	39	1	39	637	11.00
15	1	14	350	10.00	40	1	40	646	9.00
16	2	16	371	10.50	41	1	41	660	14.00
17	1	17	381	10.00	42	1	42	665	5.00
18	1	18	395	14.00	43	1	43	670	5.00
19	1	19	406	11.00	44	1	44	685	15.00
20	1	20	418	12.00	45	1	45	700	15.00
21	1	21	432	14.00	46	1	46	710	10.00
22	1	22	442	10.00	47	1	47	725	15.00
23	1	23	454	12.00	48	1	48	739	14.00
24	1	24	465	11.00	49	1	49	755	16.00
25	1	25	480	15.00	50	1	50	770	15.00
51	1	51	785	15.00					
52	1	52	797	12.00					
53	1	53	807	10.00					
54	1	54	815	8.00					
55	1	55	835	20.00					
56	1	56	844	9.00					
57	1	57	855	11.00					
58	1	58	866	11.00					
59	1	59	872	6.00					
60	1	60	883	11.00					
61	1	61	896	13.00					
62	1	62	911	15.00					

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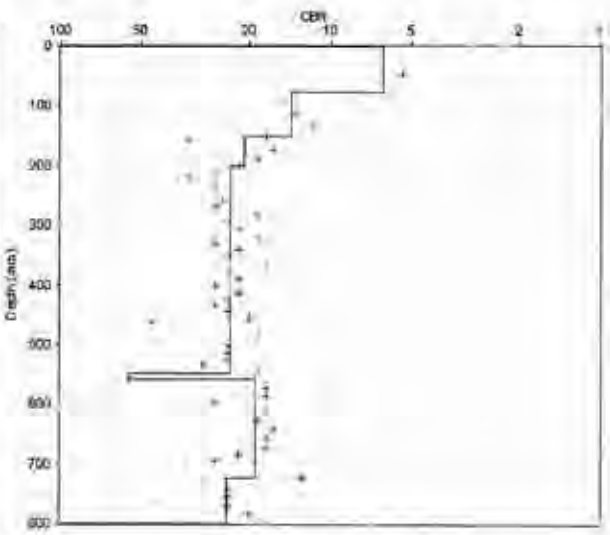
DCP Layer Strength Analysis Report

Project Name: WS277

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	112	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	38.50	6	77	77
2	18.25	14	73	150
3	12.50	21	50	200
4	11.23	23	348	548
5	5.00	55	10	558
6	13.75	19	165	723
7	10.86	24	76	799

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS279

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	145	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

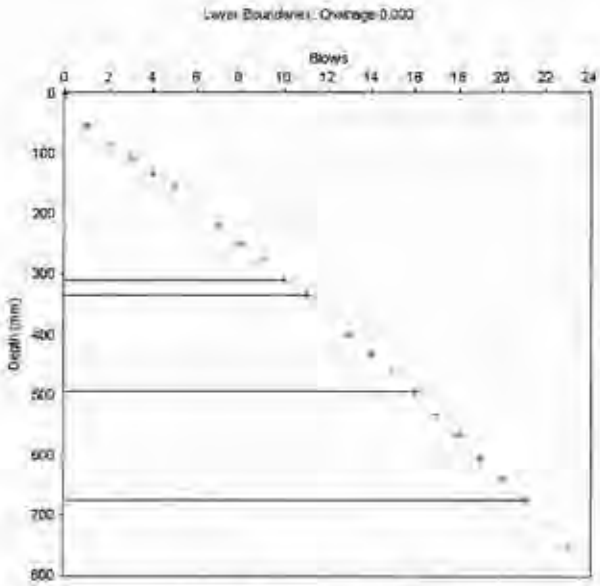
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	145	0.00					
2	1	1	200	55.00					
3	1	2	230	30.00					
4	1	3	253	23.00					
5	1	4	277	24.00					
6	1	5	301	24.00					
7	1	6	327	26.00					
8	1	7	363	36.00					
9	1	8	395	32.00					
10	1	9	421	26.00					
11	1	10	455	34.00					
12	1	11	480	25.00					
13	1	12	513	33.00					
14	1	13	545	32.00					
15	1	14	577	32.00					
16	1	15	607	30.00					
17	1	16	640	33.00					
18	1	17	677	37.00					
19	1	18	712	35.00					
20	1	19	750	38.00					
21	1	20	785	35.00					
22	1	21	820	35.00					
23	1	22	857	37.00					
24	1	23	900	43.00					

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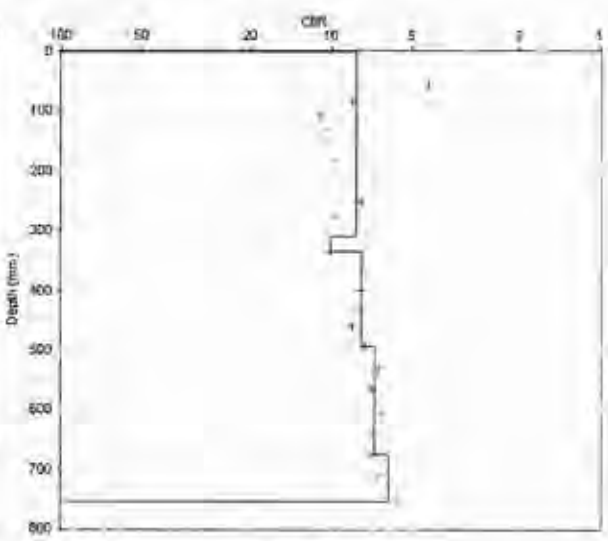
DCP Layer Strength Analysis Report

Project Name: WS279

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	145	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	31.00	8	310	310
2	25.00	10	25	335
3	32.00	8	160	495
4	36.00	7	180	675
5	40.00	6	80	755

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS280

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 150
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

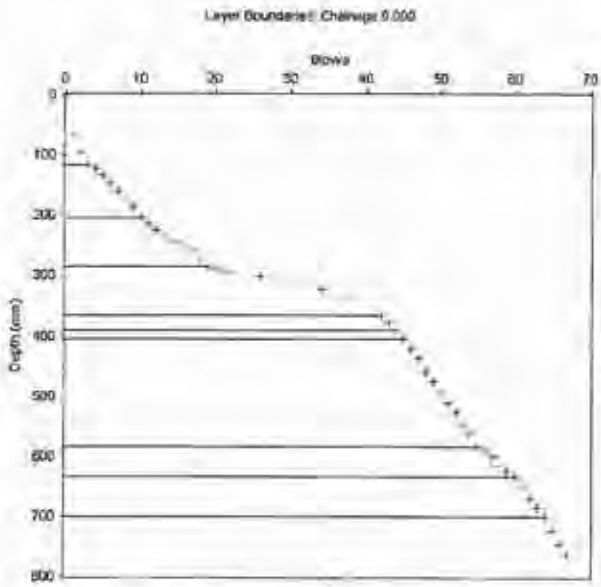
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	150	0.00	26	4	34	472	3.00
2	1	1	216	66.00	27	4	38	486	3.50
3	1	2	245	29.00	28	4	42	516	7.50
4	1	3	266	21.00	29	1	43	528	12.00
5	1	4	272	6.00	30	1	44	541	13.00
6	1	5	282	10.00	31	1	45	555	14.00
7	1	6	295	13.00	32	1	46	572	17.00
8	1	7	310	15.00	33	1	47	586	14.00
9	1	8	324	14.00	34	1	48	609	23.00
10	1	9	334	10.00	35	1	49	626	17.00
11	1	10	354	20.00	36	1	50	643	17.00
12	1	11	364	10.00	37	1	51	661	18.00
13	1	12	374	10.00	38	1	52	676	15.00
14	1	13	382	8.00	39	1	53	698	22.00
15	1	14	391	9.00	40	1	54	712	14.00
16	1	15	396	5.00	41	1	55	734	22.00
17	1	16	404	8.00	42	1	56	740	6.00
18	1	17	410	6.00	43	1	57	751	11.00
19	1	18	424	14.00	44	1	58	766	15.00
20	1	19	434	10.00	45	1	59	776	10.00
21	1	20	439	5.00	46	1	60	784	8.00
22	1	21	442	3.00	47	1	61	800	16.00
23	1	22	444	2.00	48	1	62	821	21.00
24	4	26	451	1.75	49	1	63	836	15.00
25	4	30	460	2.25	50	1	64	850	14.00
51	1	65	874	24.00					
52	1	66	896	22.00					
53	1	67	912	16.00					

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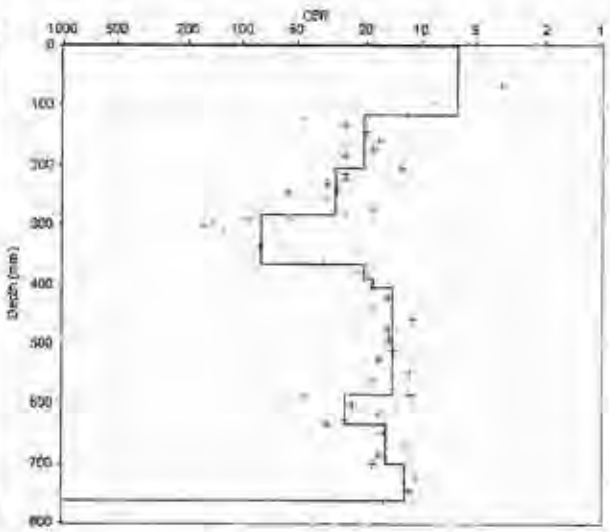
DCP Layer Strength Analysis Report

Project Name: WS280

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	150	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	38.67	6	116	116
2	12.57	21	88	204
3	8.89	30	80	284
4	3.57	79	82	366
5	12.50	21	25	391
6	14.00	19	14	405
7	17.90	14	179	584
8	10.00	26	50	634
9	16.50	16	66	700
10	20.67	12	62	762

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS281

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 135
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

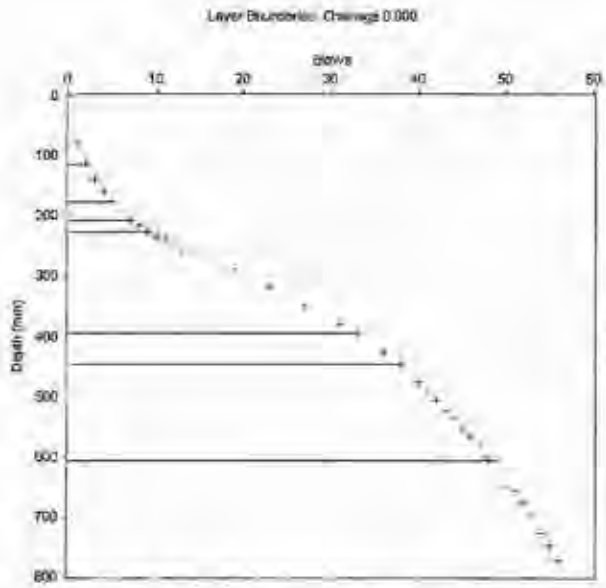
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	135	0.00	26	1	42	642	13.00
2	1	1	216	81.00	27	1	43	659	17.00
3	1	2	250	34.00	28	1	44	672	13.00
4	1	3	275	25.00	29	1	45	687	15.00
5	1	4	294	19.00	30	1	46	702	15.00
6	1	5	312	18.00	31	1	47	712	10.00
7	1	6	326	14.00	32	1	48	736	24.00
8	1	7	342	16.00	33	1	49	741	5.00
9	1	8	351	9.00	34	1	50	786	45.00
10	1	9	361	10.00	35	1	51	791	5.00
11	1	10	369	8.00	36	1	52	812	21.00
12	1	11	375	6.00	37	1	53	831	19.00
13	1	12	388	13.00	38	1	54	862	31.00
14	1	13	394	6.00	39	1	55	883	21.00
15	1	14	401	7.00	40	1	56	908	25.00
16	1	15	404	3.00					
17	4	19	423	4.75					
18	4	23	452	7.25					
19	4	27	481	7.25					
20	4	31	516	8.75					
21	2	33	530	7.00					
22	3	36	561	10.33					
23	2	38	581	10.00					
24	2	40	611	15.00					
25	1	41	629	18.00					

UK DCP V3.1

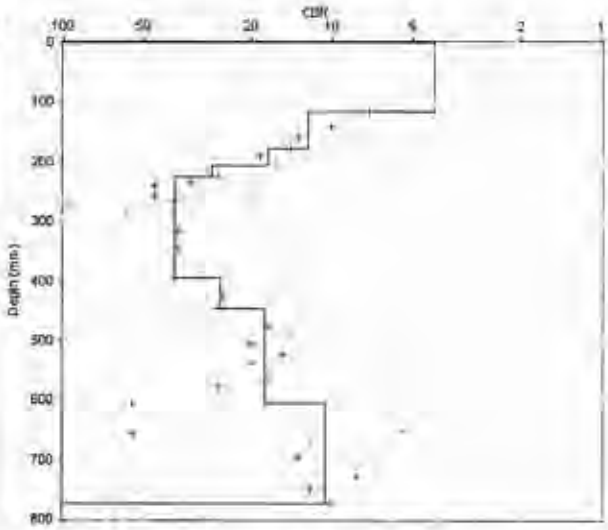
DCP Layer Strength Analysis Report

Project Name: WS281

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	135	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	57.50	4	115	115
2	20.67	12	62	177
3	15.00	17	30	207
4	9.50	28	19	226
5	7.04	38	169	395
6	10.20	26	51	446
7	14.55	18	160	606
8	23.86	11	167	773

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS282

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 130
Test Date: 02/10/2013

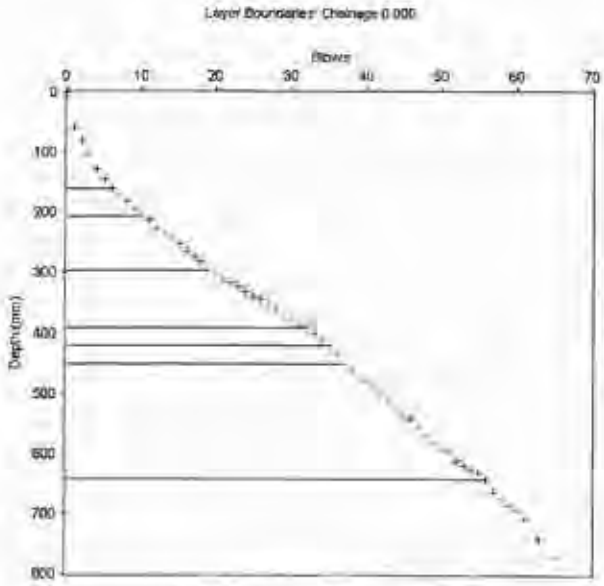
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	130	0.00	26	1	25	469	8.00
2	1	1	188	58.00	27	1	26	472	3.00
3	1	2	211	23.00	28	1	27	481	9.00
4	1	3	234	23.00	29	1	28	489	8.00
5	1	4	256	22.00	30	1	29	497	8.00
6	1	5	274	18.00	31	1	30	508	11.00
7	1	6	291	17.00	32	1	31	516	8.00
8	1	7	301	10.00	33	1	32	521	5.00
9	1	8	311	10.00	34	1	33	531	10.00
10	1	9	323	12.00	35	1	34	542	11.00
11	1	10	336	13.00	36	1	35	549	7.00
12	1	11	342	6.00	37	1	36	564	15.00
13	1	12	356	14.00	38	1	37	581	17.00
14	1	13	364	8.00	39	1	38	589	8.00
15	1	14	371	7.00	40	1	39	601	12.00
16	1	15	382	11.00	41	1	40	609	8.00
17	1	16	393	11.00	42	1	41	616	7.00
18	1	17	402	9.00	43	1	42	625	9.00
19	1	18	411	9.00	44	1	43	642	17.00
20	1	19	426	15.00	45	1	44	654	12.00
21	1	20	431	5.00	46	1	45	664	10.00
22	1	21	439	8.00	47	1	46	673	9.00
23	1	22	445	6.00	48	1	47	682	9.00
24	1	23	452	7.00	49	1	48	701	19.00
25	1	24	461	9.00	50	1	49	710	9.00
51	1	50	723	13.00					
52	1	51	726	3.00					
53	1	52	741	15.00					
54	1	53	749	8.00					
55	1	54	756	7.00					
56	1	55	762	6.00					
57	1	56	773	11.00					
58	1	57	792	19.00					
59	1	58	804	12.00					
60	1	59	816	12.00					
61	1	60	824	8.00					
62	1	61	836	12.00					
63	2	63	872	18.00					
64	2	65	901	14.50					

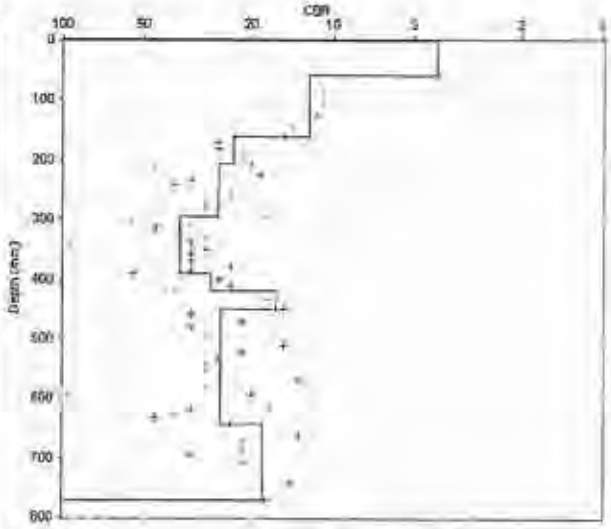
DCP Layer Strength Analysis Report

Project Name: WS282

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	130	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	58.00	4	58	58
2	20.60	12	103	161
3	11.25	23	45	206
4	10.00	26	90	296
5	7.31	37	95	391
6	9.33	28	28	419
7	16.00	16	32	451
8	10.11	26	192	643
9	14.22	18	128	771

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS283

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 156
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

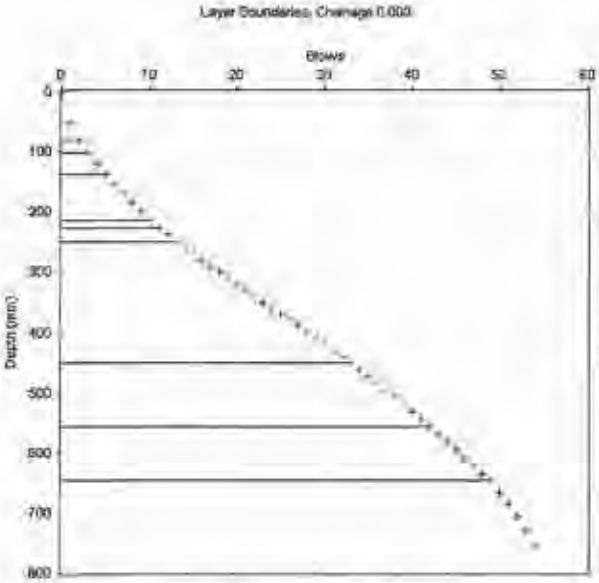
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	156	0.00	26	1	25	525	8.00
2	1	1	207	51.00	27	1	26	535	10.00
3	1	2	236	29.00	28	1	27	545	10.00
4	1	3	258	22.00	29	1	28	555	10.00
5	1	4	277	19.00	30	1	29	566	11.00
6	1	5	294	17.00	31	1	30	576	10.00
7	1	6	310	16.00	32	1	31	588	12.00
8	1	7	325	15.00	33	1	32	597	9.00
9	1	8	340	15.00	34	1	33	607	10.00
10	1	9	355	15.00	35	1	34	618	11.00
11	1	10	369	14.00	36	1	35	630	12.00
12	1	11	382	13.00	37	1	36	641	11.00
13	1	12	393	11.00	38	1	37	652	11.00
14	1	13	405	12.00	39	1	38	664	12.00
15	1	14	415	10.00	40	1	39	676	12.00
16	1	15	425	10.00	41	1	40	688	12.00
17	1	16	436	11.00	42	1	41	700	12.00
18	1	17	446	10.00	43	1	42	712	12.00
19	1	18	456	10.00	44	1	43	725	13.00
20	1	19	466	10.00	45	1	44	739	14.00
21	1	20	477	11.00	46	1	45	752	13.00
22	1	21	487	10.00	47	1	46	764	12.00
23	1	22	496	9.00	48	1	47	778	14.00
24	1	23	507	11.00	49	1	48	792	14.00
25	1	24	517	10.00	50	1	49	803	11.00
51	1	50	824	21.00					
52	1	51	842	18.00					
53	1	52	863	21.00					
54	1	53	885	22.00					
55	1	54	910	25.00					

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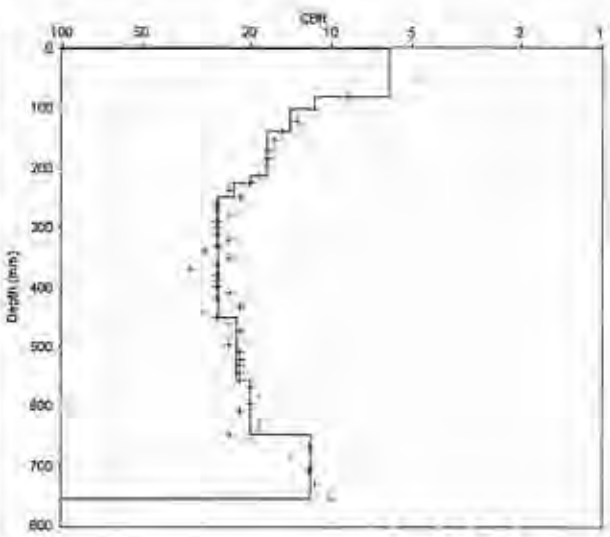
DCP Layer Strength Analysis Report

Project Name: WS283

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	156	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	40.00	6	80	80
2	22.00	12	22	102
3	18.00	14	36	138
4	15.00	17	75	213
5	13.00	20	13	226
6	11.50	23	23	249
7	10.10	26	202	451
8	11.67	23	105	556
9	13.00	20	91	647
10	21.40	12	107	754

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS284

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

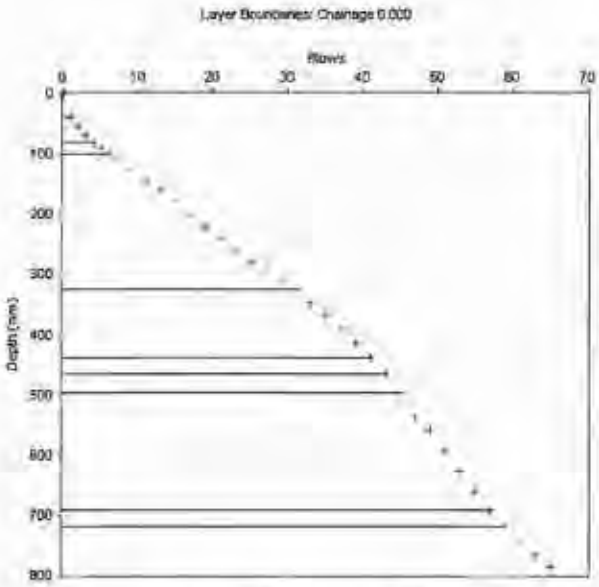
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	2	43	587	13.50
2	1	1	160	39.00	27	2	45	617	15.00
3	1	2	175	15.00	28	2	47	657	20.00
4	1	3	189	14.00	29	2	49	680	11.50
5	1	4	201	12.00	30	2	51	715	17.50
6	1	5	211	10.00	31	2	53	749	17.00
7	1	6	221	10.00	32	2	55	781	16.00
8	1	7	229	8.00	33	2	57	813	16.00
9	2	9	248	9.50	34	2	59	840	13.50
10	2	11	266	9.00	35	2	61	863	11.50
11	2	13	282	8.00	36	2	63	887	12.00
12	2	15	300	9.00	37	2	65	906	9.50
13	2	17	320	10.00					
14	2	19	342	11.00					
15	2	21	363	10.50					
16	2	23	382	9.50					
17	2	25	401	9.50					
18	2	27	415	7.00					
19	2	29	428	6.50					
20	2	31	446	9.00					
21	2	33	468	11.00					
22	2	35	489	10.50					
23	2	37	512	11.50					
24	2	39	536	12.00					
25	2	41	560	12.00					

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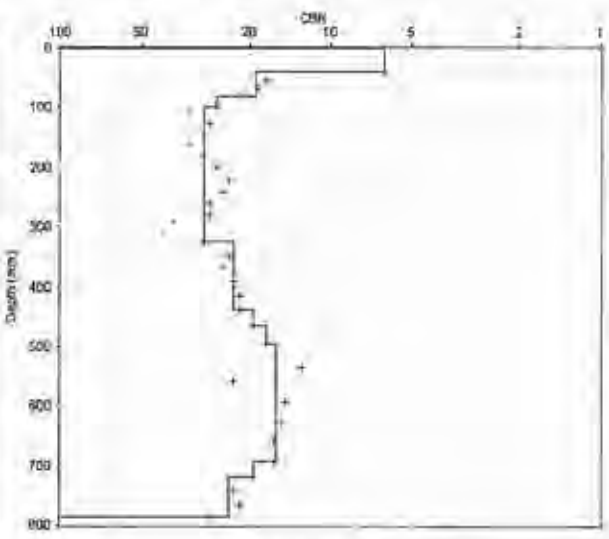
DCP Layer Strength Analysis Report

Project Name: WS284

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	39.00	6	39	39
2	13.67	19	41	80
3	10.00	26	20	100
4	9.00	30	225	325
5	11.40	23	114	439
6	13.50	19	27	466
7	15.00	17	30	496
8	16.33	16	196	692
9	13.50	19	27	719
10	11.00	24	66	785

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS285

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

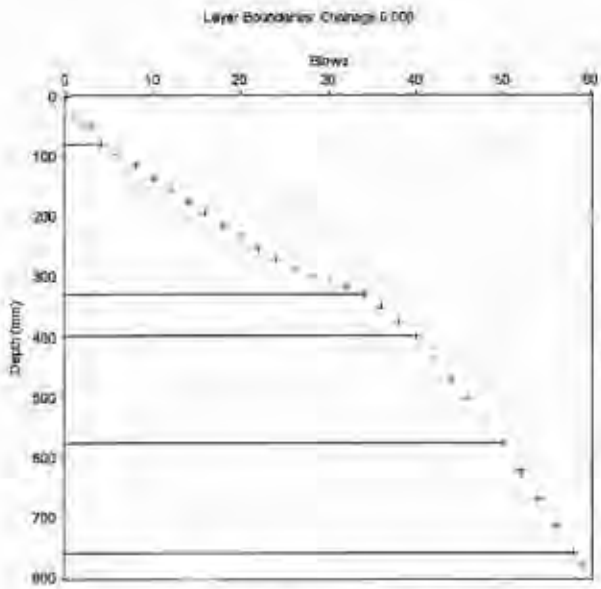
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	2	46	622	15.50
2	1	1	150	29.00	27	2	48	659	18.50
3	1	2	166	16.00	28	2	50	697	19.00
4	1	3	169	3.00	29	2	52	742	22.50
5	1	4	199	30.00	30	2	54	790	24.00
6	2	6	217	9.00	31	2	56	834	22.00
7	2	8	236	9.50	32	2	58	880	23.00
8	2	10	256	10.00	33	1	59	901	21.00
9	2	12	276	10.00					
10	2	14	295	9.50					
11	2	16	314	9.50					
12	2	18	334	10.00					
13	2	20	354	10.00					
14	2	22	372	9.00					
15	2	24	392	10.00					
16	2	26	408	8.00					
17	2	28	420	6.00					
18	2	30	428	4.00					
19	2	32	436	4.00					
20	2	34	450	7.00					
21	2	36	470	10.00					
22	2	38	494	12.00					
23	2	40	517	11.50					
24	2	42	555	19.00					
25	2	44	591	18.00					

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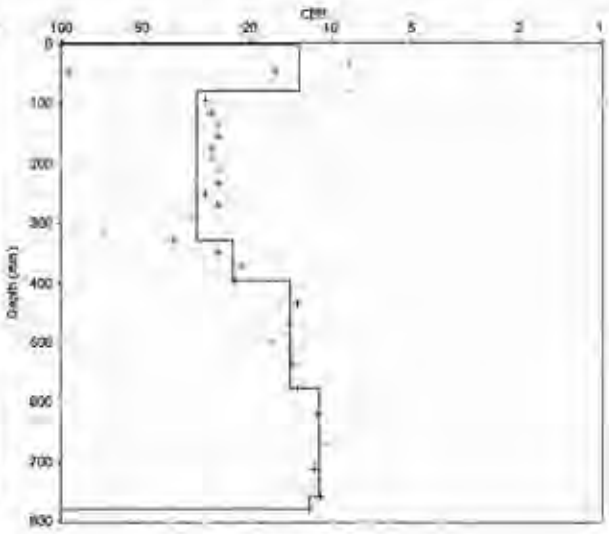
DCP Layer Strength Analysis Report

Project Name: WS285

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	19.50	13	78	78
2	8.37	32	251	329
3	11.17	24	67	396
4	18.00	14	180	576
5	22.88	11	183	759
6	21.00	12	21	780

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS286

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	150	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted

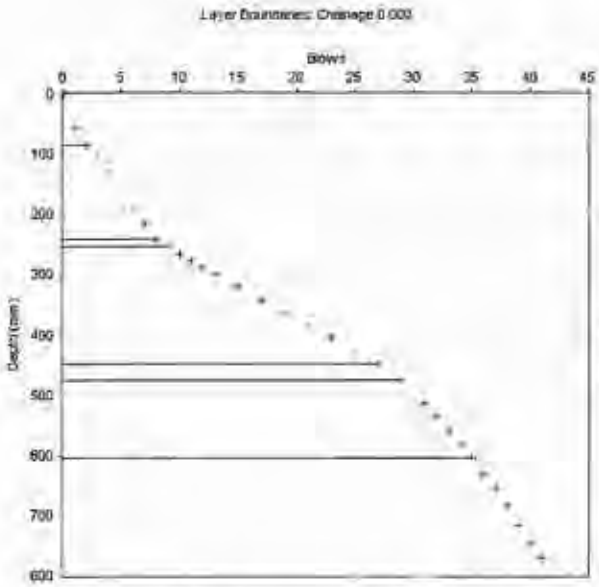
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	150	0.00	26	1	34	731	23.00
2	1	1	207	57.00	27	1	35	755	24.00
3	1	2	236	29.00	28	1	36	781	26.00
4	1	3	257	21.00	29	1	37	805	24.00
5	1	4	279	22.00	30	1	38	834	29.00
6	1	5	307	28.00	31	1	39	866	32.00
7	1	6	339	32.00	32	1	40	896	30.00
8	1	7	367	28.00	33	1	41	921	25.00
9	1	8	390	23.00					
10	1	9	404	14.00					
11	1	10	416	12.00					
12	1	11	427	11.00					
13	1	12	438	11.00					
14	1	13	449	11.00					
15	2	15	471	11.00					
16	2	17	492	10.50					
17	2	19	514	11.00					
18	2	21	534	10.00					
19	2	23	555	10.50					
20	2	25	576	10.50					
21	2	27	599	11.50					
22	2	29	626	13.50					
23	2	31	664	19.00					
24	1	32	686	22.00					
25	1	33	708	22.00					

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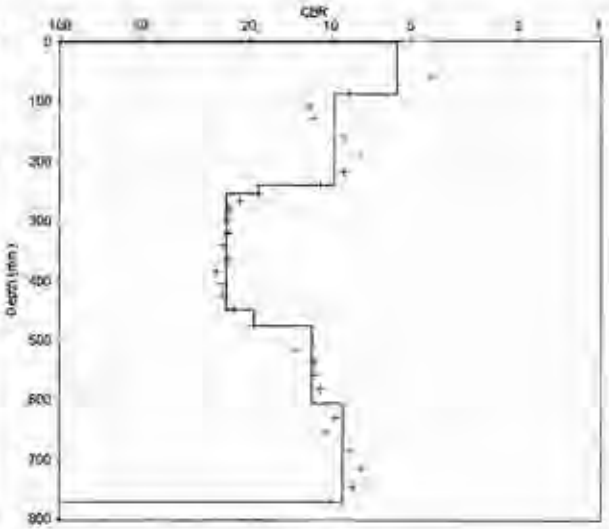
DCP Layer Strength Analysis Report

Project Name: WS286

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	150	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	43.00	6	86	86
2	25.67	10	154	240
3	14.00	19	14	254
4	10.83	24	195	449
5	13.50	19	27	476
6	21.50	12	129	605
7	27.67	9	166	771

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS288

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 161
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

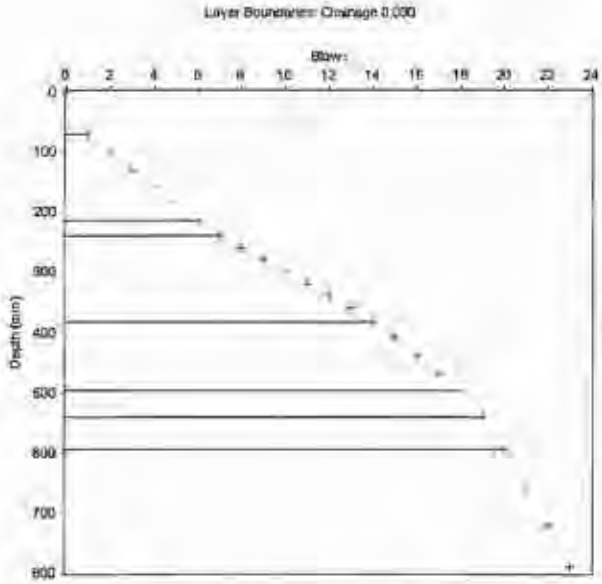
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	161	0.00					
2	1	1	232	71.00					
3	1	2	262	30.00					
4	1	3	291	29.00					
5	1	4	320	29.00					
6	1	5	346	26.00					
7	1	6	374	28.00					
8	1	7	400	26.00					
9	1	8	420	20.00					
10	1	9	440	20.00					
11	1	10	460	20.00					
12	1	11	480	20.00					
13	1	12	498	18.00					
14	1	13	520	22.00					
15	1	14	543	23.00					
16	1	15	569	26.00					
17	1	16	599	30.00					
18	1	17	628	29.00					
19	1	18	658	30.00					
20	1	19	701	43.00					
21	1	20	756	55.00					
22	1	21	818	62.00					
23	1	22	883	65.00					
24	1	23	950	67.00					

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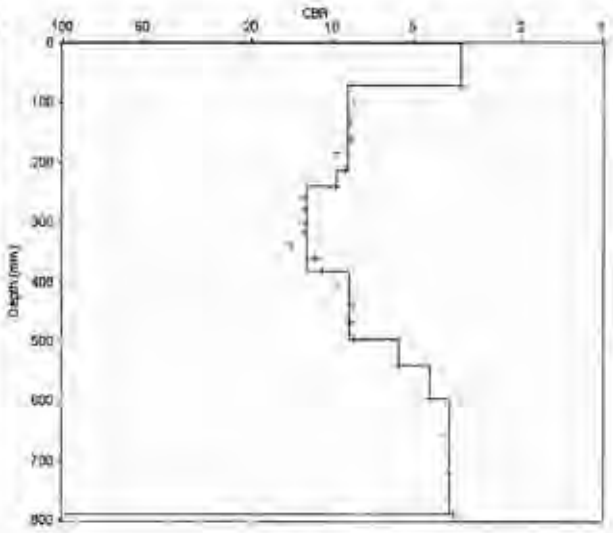
DCP Layer Strength Analysis Report

Project Name: WS288

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	161	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	71.00	3	71	71
2	28.40	9	142	213
3	26.00	10	26	239
4	20.43	12	143	382
5	28.75	9	115	497
6	43.00	6	43	540
7	55.00	4	55	595
8	64.67	4	194	789

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS290

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	142	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

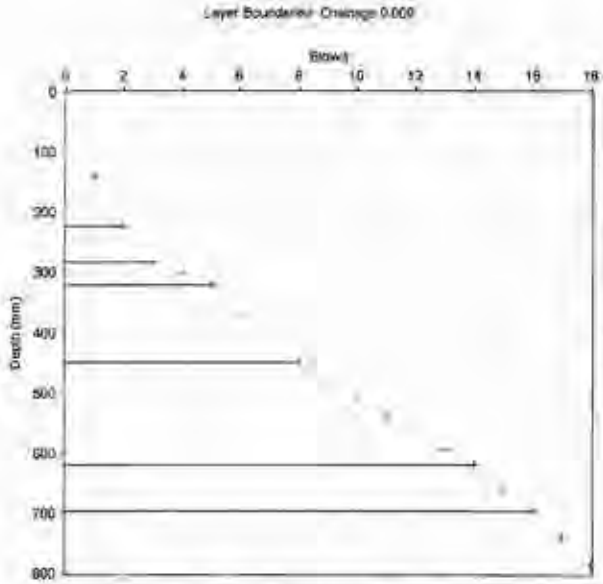
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	142	0.00					
2	1	1	281	139.00					
3	1	2	365	84.00					
4	1	3	424	59.00					
5	1	4	441	17.00					
6	1	5	462	21.00					
7	1	6	513	51.00					
8	1	7	556	43.00					
9	1	8	591	35.00					
10	1	9	623	32.00					
11	1	10	651	28.00					
12	1	11	680	29.00					
13	1	12	708	28.00					
14	1	13	736	28.00					
15	1	14	762	26.00					
16	1	15	802	40.00					
17	1	16	838	36.00					
18	1	17	881	43.00					
19	1	18	928	47.00					

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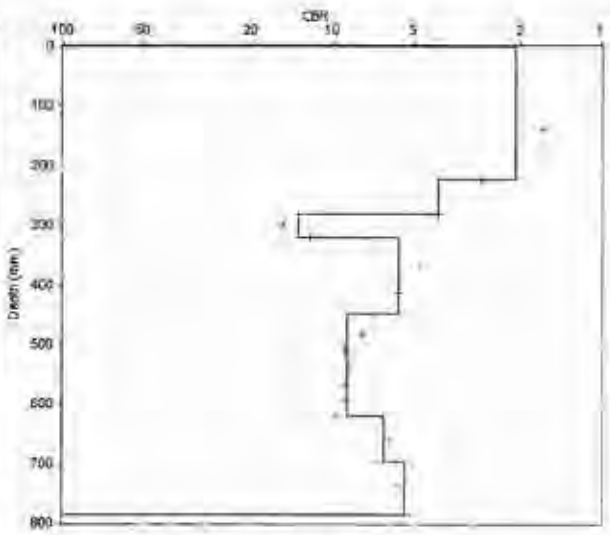
DCP Layer Strength Analysis Report

Project Name: WS290

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	142	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	111.50	2	223	223
2	59.00	4	59	282
3	19.00	13	38	320
4	43.00	6	129	449
5	28.50	9	171	620
6	38.00	6	76	696
7	45.00	5	90	786

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS291

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	147	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

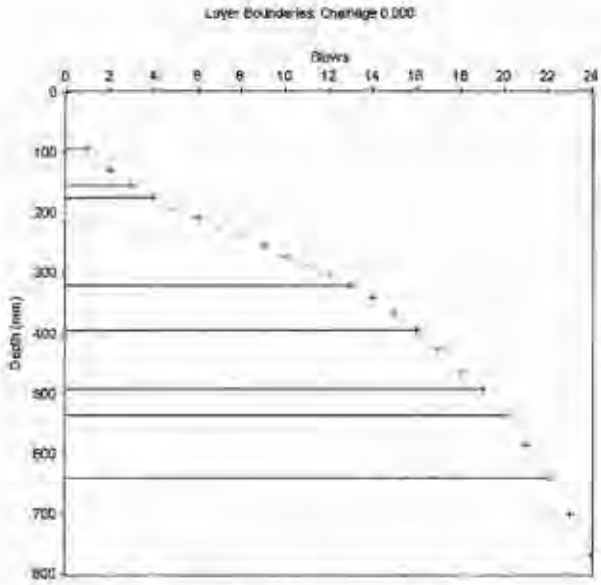
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	147	0.00					
2	1	1	241	94.00					
3	1	2	275	34.00					
4	1	3	301	26.00					
5	1	4	322	21.00					
6	1	5	340	18.00					
7	1	6	354	14.00					
8	1	7	370	16.00					
9	1	8	385	15.00					
10	1	9	401	16.00					
11	1	10	419	18.00					
12	1	11	434	15.00					
13	1	12	450	16.00					
14	1	13	467	17.00					
15	1	14	487	20.00					
16	1	15	512	25.00					
17	1	16	541	29.00					
18	1	17	573	32.00					
19	1	18	610	37.00					
20	1	19	640	30.00					
21	1	20	684	44.00					
22	1	21	732	48.00					
23	1	22	787	55.00					
24	1	23	847	60.00					
25	1	24	916	69.00					

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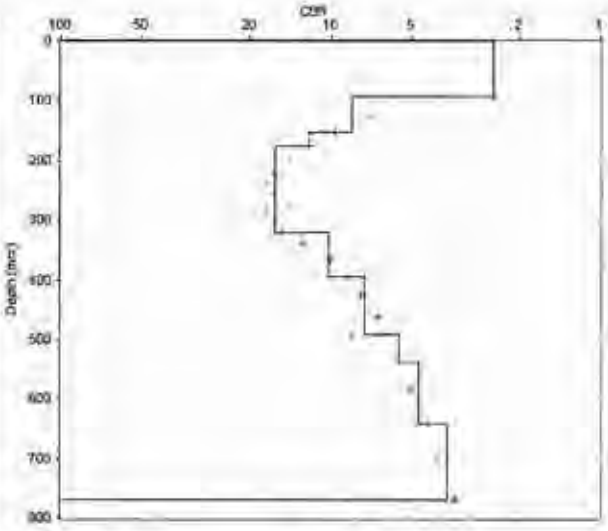
DCP Layer Strength Analysis Report

Project Name: WS291

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	147	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	94.00	2	94	94
2	30.00	8	60	154
3	21.00	12	21	175
4	16.11	16	145	320
5	24.67	10	74	394
6	33.00	7	99	493
7	44.00	6	44	537
8	51.50	5	103	640
9	64.50	4	129	769

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS292

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 130
Test Date: 02/10/2013

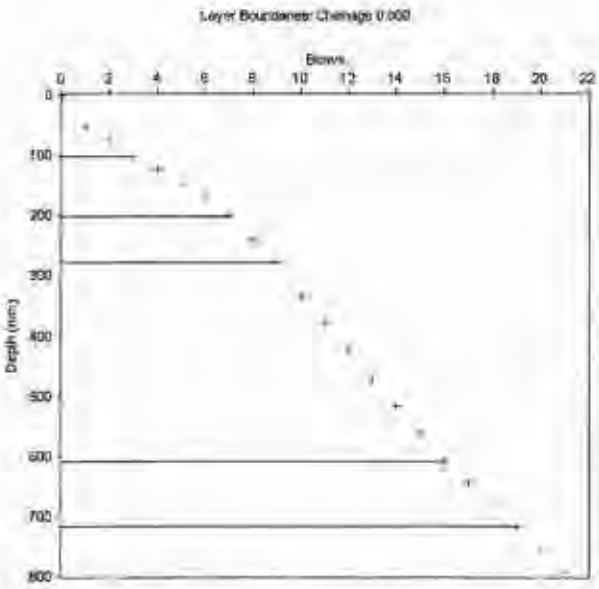
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	130	0.00					
2	1	1	181	51.00					
3	1	2	203	22.00					
4	1	3	232	29.00					
5	1	4	252	20.00					
6	1	5	278	26.00					
7	1	6	298	20.00					
8	1	7	331	33.00					
9	1	8	372	41.00					
10	1	9	409	37.00					
11	1	10	462	53.00					
12	1	11	508	46.00					
13	1	12	551	43.00					
14	1	13	601	50.00					
15	1	14	648	47.00					
16	1	15	692	44.00					
17	1	16	738	46.00					
18	1	17	774	36.00					
19	1	18	812	38.00					
20	1	19	846	34.00					
21	1	20	885	39.00					
22	1	21	924	39.00					

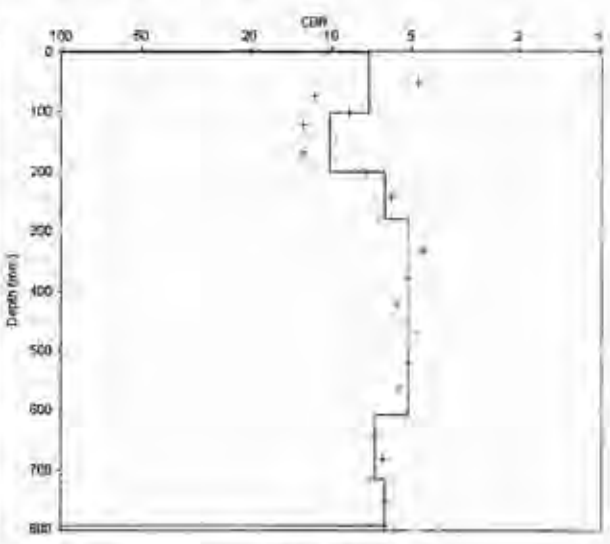
DCP Layer Strength Analysis Report

Project Name: WS292

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	130	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	34.00	7	102	102
2	24.75	10	99	201
3	39.00	6	78	279
4	47.00	5	329	608
5	36.00	7	108	716
6	39.00	6	78	794

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS293

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

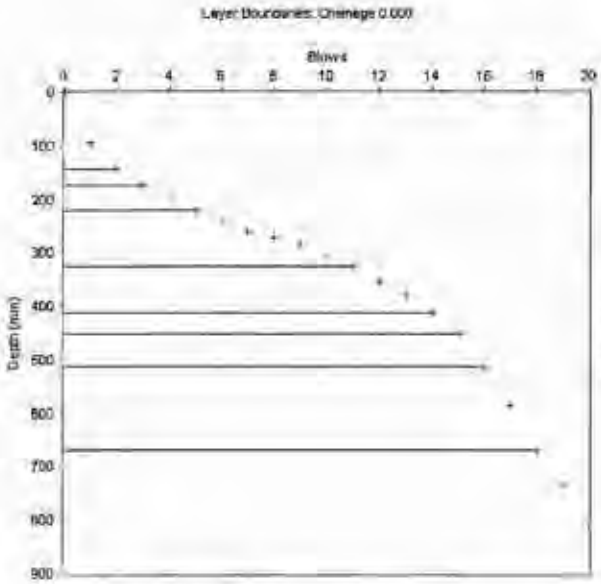
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00					
2	1	1	215	94.00					
3	1	2	263	48.00					
4	1	3	294	31.00					
5	1	4	314	20.00					
6	1	5	340	26.00					
7	1	6	360	20.00					
8	1	7	380	20.00					
9	1	8	392	12.00					
10	1	9	404	12.00					
11	1	10	428	24.00					
12	1	11	447	19.00					
13	1	12	475	28.00					
14	1	13	500	25.00					
15	1	14	533	33.00					
16	1	15	572	39.00					
17	1	16	632	60.00					
18	1	17	706	74.00					
19	1	18	790	84.00					
20	1	19	856	66.00					
21	1	20	930	74.00					

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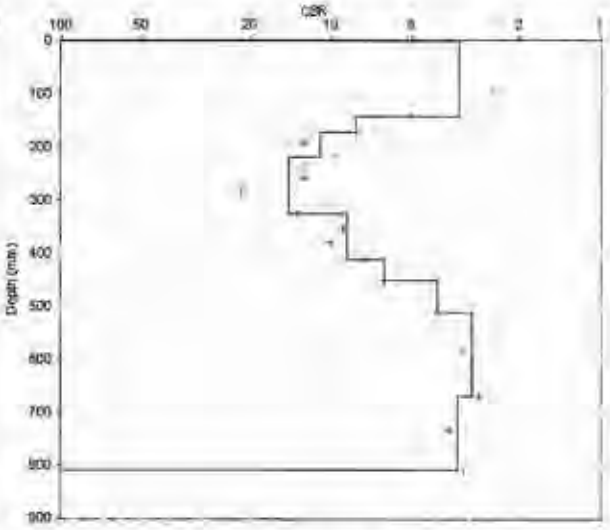
DCP Layer Strength Analysis Report

Project Name: WS293

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	71.00	3	142	142
2	31.00	8	31	173
3	23.00	11	46	219
4	17.83	14	107	326
5	28.67	9	86	412
6	39.00	6	39	451
7	60.00	4	60	511
8	79.00	3	158	669
9	70.00	3	140	809

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS298

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 135
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

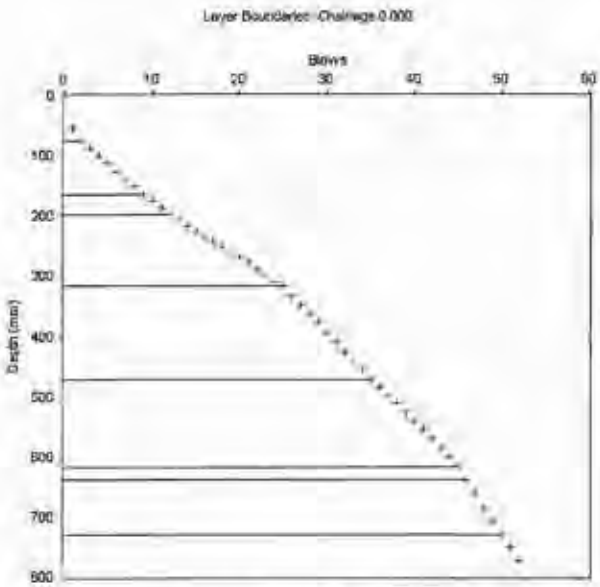
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	135	0.00	26	1	25	450	5.00
2	1	1	190	55.00	27	1	26	468	18.00
3	1	2	210	20.00	28	1	27	481	13.00
4	1	3	222	12.00	29	1	28	497	16.00
5	1	4	234	12.00	30	1	29	512	15.00
6	1	5	247	13.00	31	1	30	530	18.00
7	1	6	261	14.00	32	1	31	545	15.00
8	1	7	272	11.00	33	1	32	560	15.00
9	1	8	285	13.00	34	1	33	576	16.00
10	1	9	300	15.00	35	1	34	591	15.00
11	1	10	310	10.00	36	1	35	606	15.00
12	1	11	321	11.00	37	1	36	620	14.00
13	1	12	333	12.00	38	1	37	634	14.00
14	1	13	342	9.00	39	1	38	646	12.00
15	1	14	352	10.00	40	1	39	660	14.00
16	1	15	362	10.00	41	1	40	675	15.00
17	1	16	370	8.00	42	1	41	690	15.00
18	1	17	379	9.00	43	1	42	705	15.00
19	1	18	386	7.00	44	1	43	720	15.00
20	1	19	395	9.00	45	1	44	736	16.00
21	1	20	404	9.00	46	1	45	752	16.00
22	1	21	412	8.00	47	1	46	772	20.00
23	1	22	423	11.00	48	1	47	795	23.00
24	1	23	434	11.00	49	1	48	820	25.00
25	1	24	445	11.00	50	1	49	842	22.00
51	1	50	865	23.00					
52	1	51	885	20.00					
53	1	52	907	22.00					

UK DCP V3.1

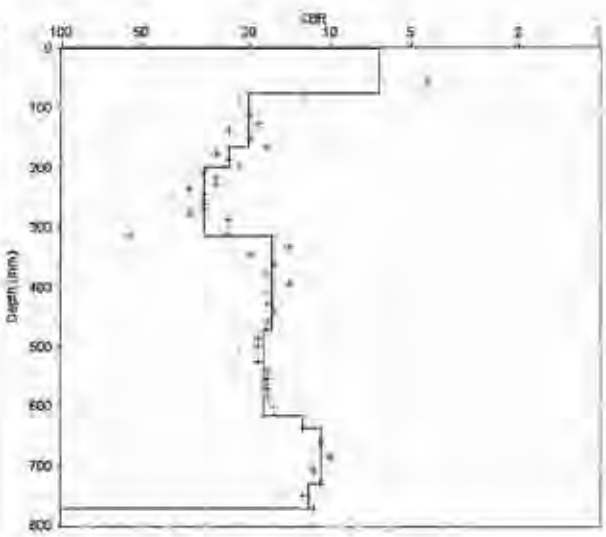
DCP Layer Strength Analysis Report

Project Name: WS298

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	135	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	37.50	7	75	75
2	12.86	20	90	165
3	11.00	24	33	198
4	9.00	30	117	315
5	15.60	17	156	471
6	14.60	18	146	617
7	20.00	13	20	637
8	23.25	11	93	730
9	21.00	12	42	772

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS299

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	123	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

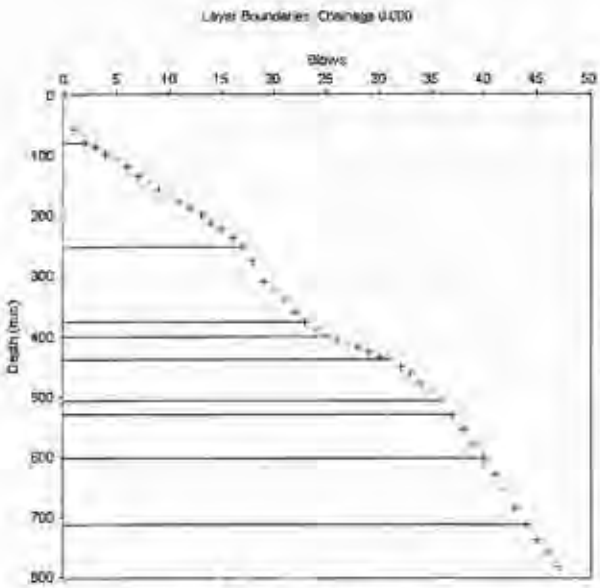
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	123	0.00	26	1	25	523	11.00
2	1	1	180	57.00	27	1	26	531	8.00
3	1	2	201	21.00	28	1	27	535	4.00
4	1	3	208	7.00	29	1	28	540	5.00
5	1	4	221	13.00	30	1	29	550	10.00
6	1	5	232	11.00	31	1	30	558	8.00
7	1	6	242	10.00	32	1	31	562	4.00
8	1	7	255	13.00	33	1	32	574	12.00
9	1	8	266	11.00	34	1	33	585	11.00
10	1	9	279	13.00	35	1	34	600	15.00
11	1	10	290	11.00	36	1	35	615	15.00
12	1	11	300	10.00	37	1	36	630	15.00
13	1	12	311	11.00	38	1	37	652	22.00
14	1	13	320	9.00	39	1	38	678	26.00
15	1	14	334	14.00	40	1	39	702	24.00
16	1	15	345	11.00	41	1	40	725	23.00
17	1	16	360	15.00	42	1	41	752	27.00
18	1	17	374	14.00	43	1	42	778	26.00
19	1	18	398	24.00	44	1	43	809	31.00
20	1	19	432	34.00	45	1	44	835	26.00
21	1	20	448	16.00	46	1	45	860	25.00
22	1	21	462	14.00	47	1	46	882	22.00
23	1	22	483	21.00	48	1	47	906	24.00
24	1	23	500	17.00					
25	1	24	512	12.00					

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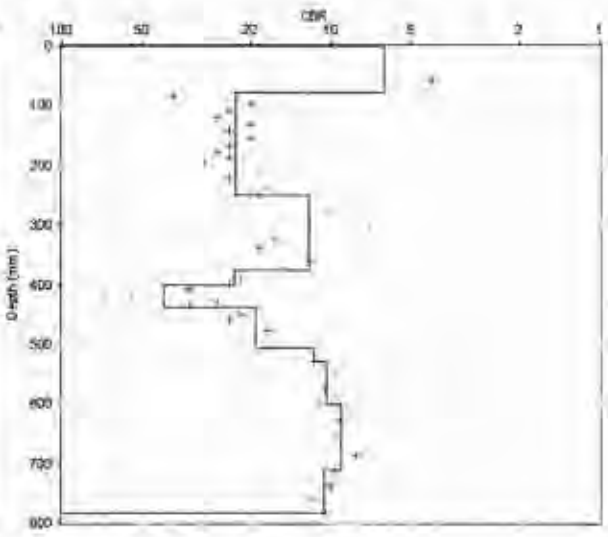
DCP Layer Strength Analysis Report

Project Name: WS299

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	123	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	39.00	6	78	78
2	11.53	23	173	251
3	21.00	12	126	377
4	11.50	23	23	400
5	6.50	42	39	439
6	13.60	19	68	507
7	22.00	12	22	529
8	24.33	10	73	602
9	27.50	9	110	712
10	23.67	11	71	783

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS300

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 120
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

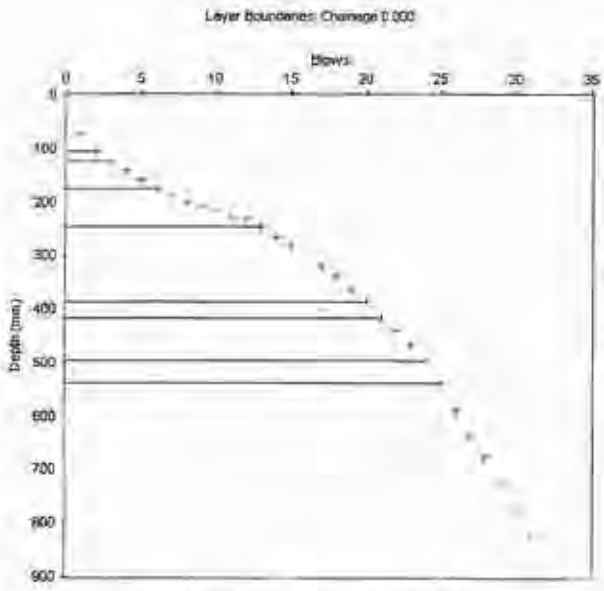
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	120	0.00	26	1	25	657	41.00
2	1	1	193	73.00	27	1	26	708	51.00
3	1	2	225	32.00	28	1	27	756	48.00
4	1	3	245	20.00	29	1	28	796	40.00
5	1	4	261	16.00	30	1	29	849	53.00
6	1	5	278	17.00	31	1	30	893	44.00
7	1	6	295	17.00	32	1	31	942	49.00
8	1	7	306	11.00					
9	1	8	320	14.00					
10	1	9	328	8.00					
11	1	10	336	8.00					
12	1	11	346	10.00					
13	1	12	352	6.00					
14	1	13	366	14.00					
15	1	14	385	19.00					
16	1	15	400	15.00					
17	1	16	418	18.00					
18	1	17	437	19.00					
19	1	18	456	19.00					
20	1	19	482	26.00					
21	1	20	506	24.00					
22	1	21	536	30.00					
23	1	22	560	24.00					
24	1	23	587	27.00					
25	1	24	616	29.00					

UK DCP V3.1

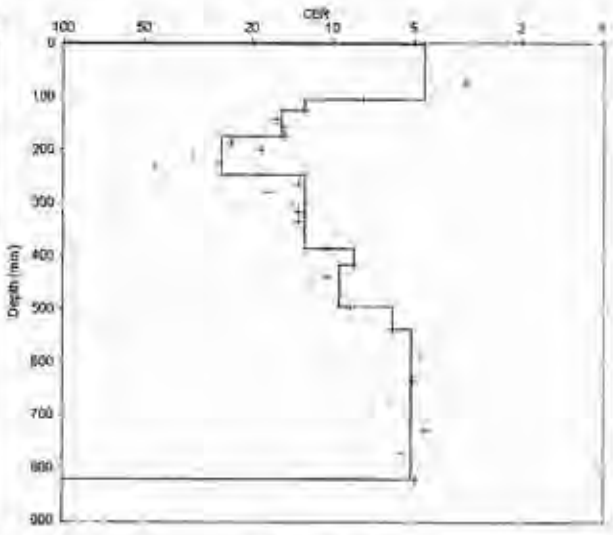
DCP Layer Strength Analysis Report

Project Name: WS300

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	120	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	52.50	5	105	105
2	20.00	13	20	125
3	16.67	15	50	175
4	10.14	26	71	246
5	20.00	13	140	386
6	30.00	8	30	416
7	26.67	9	80	496
8	41.00	6	41	537
9	47.50	5	285	822

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS301

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 137
Test Date: 02/10/2013

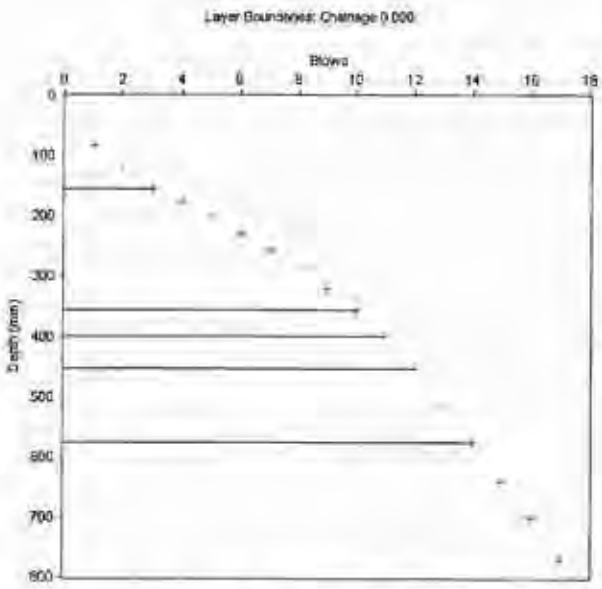
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	137	0.00					
2	1	1	221	84.00					
3	1	2	257	36.00					
4	1	3	291	34.00					
5	1	4	312	21.00					
6	1	5	335	23.00					
7	1	6	365	30.00					
8	1	7	392	27.00					
9	1	8	422	30.00					
10	1	9	456	34.00					
11	1	10	492	36.00					
12	1	11	535	43.00					
13	1	12	590	55.00					
14	1	13	652	62.00					
15	1	14	713	61.00					
16	1	15	778	65.00					
17	1	16	837	59.00					
18	1	17	907	70.00					

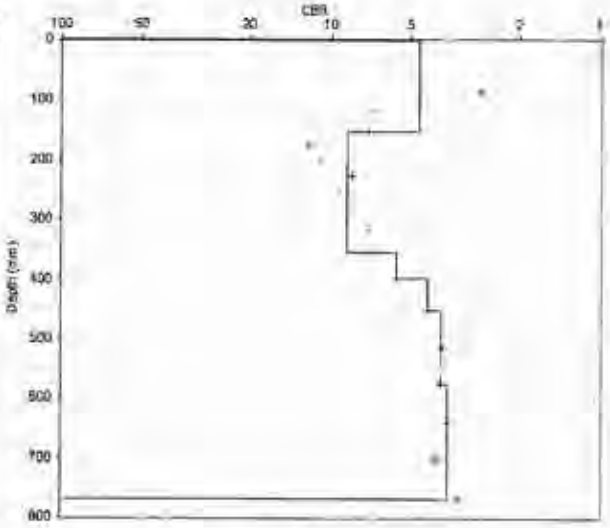
DCP Layer Strength Analysis Report

Project Name: WS301

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	137	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	51.33	5	154	154
2	28.71	9	201	355
3	43.00	6	43	398
4	55.00	4	55	453
5	61.50	4	123	576
6	64.67	4	194	770

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS302

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 134
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

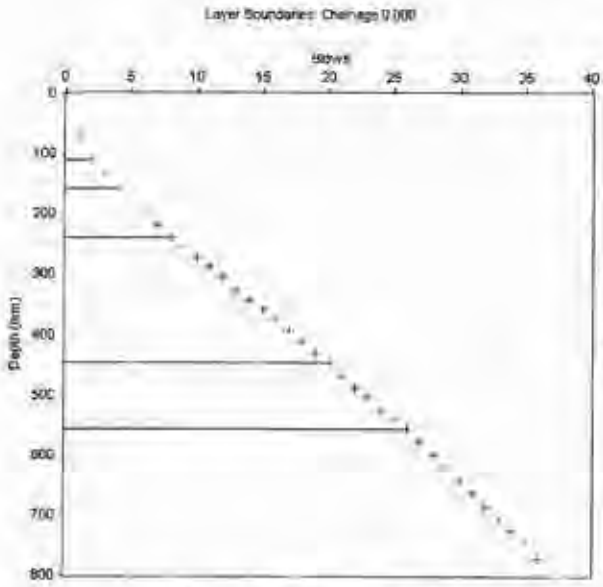
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	134	0.00	26	1	25	675	15.00
2	1	1	207	73.00	27	1	26	690	15.00
3	1	2	245	38.00	28	1	27	712	22.00
4	1	3	271	26.00	29	1	28	734	22.00
5	1	4	292	21.00	30	1	29	754	20.00
6	1	5	312	20.00	31	1	30	776	22.00
7	1	6	333	21.00	32	1	31	797	21.00
8	1	7	352	19.00	33	1	32	820	23.00
9	1	8	372	20.00	34	1	33	841	21.00
10	1	9	390	18.00	35	1	34	860	19.00
11	1	10	406	16.00	36	1	35	881	21.00
12	1	11	421	15.00	37	1	36	906	25.00
13	1	12	437	16.00					
14	1	13	460	23.00					
15	1	14	476	16.00					
16	1	15	492	16.00					
17	1	16	508	16.00					
18	1	17	527	19.00					
19	1	18	546	19.00					
20	1	19	565	19.00					
21	1	20	580	15.00					
22	1	21	603	23.00					
23	1	22	622	19.00					
24	1	23	637	15.00					
25	1	24	660	23.00					

UK DCP V3.1

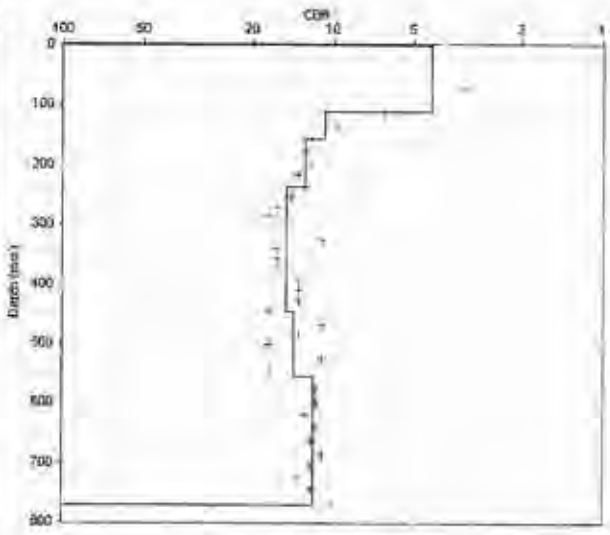
DCP Layer Strength Analysis Report

Project Name: WS302

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	134	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	55.50	4	111	111
2	23.50	11	47	158
3	20.00	13	80	238
4	17.33	15	208	446
5	18.33	14	110	556
6	21.60	12	216	772

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS303

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 02/10/2013

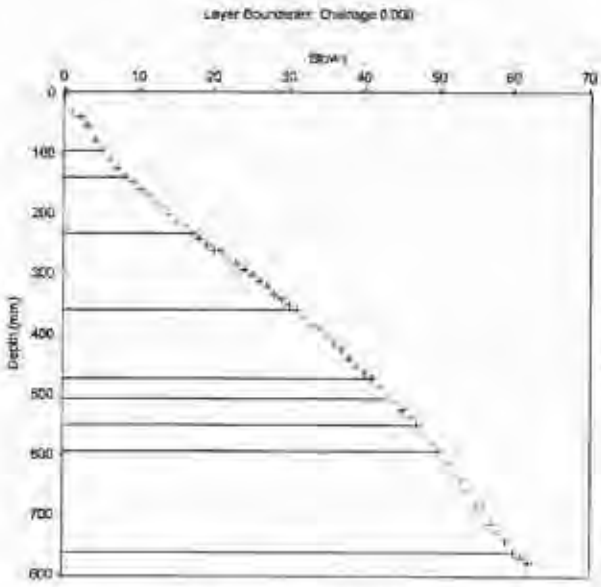
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	1	25	423	8.00
2	1	1	152	31.00	27	1	26	433	10.00
3	1	2	161	9.00	28	1	27	442	9.00
4	1	3	175	14.00	29	1	28	453	11.00
5	1	4	200	25.00	30	1	29	461	8.00
6	1	5	216	16.00	31	1	30	472	11.00
7	1	6	231	15.00	32	1	31	481	9.00
8	1	7	245	14.00	33	1	32	493	12.00
9	1	8	260	15.00	34	1	33	505	12.00
10	1	9	268	8.00	35	1	34	512	7.00
11	1	10	281	13.00	36	1	35	524	12.00
12	1	11	291	10.00	37	1	36	534	10.00
13	1	12	301	10.00	38	1	37	547	13.00
14	1	13	310	9.00	39	1	38	562	15.00
15	1	14	323	13.00	40	1	39	574	12.00
16	1	15	333	10.00	41	1	40	585	11.00
17	1	16	343	10.00	42	1	41	595	10.00
18	1	17	354	11.00	43	1	42	608	13.00
19	1	18	362	8.00	44	1	43	627	19.00
20	1	19	373	11.00	45	1	44	634	7.00
21	1	20	381	8.00	46	1	45	647	13.00
22	1	21	382	1.00	47	1	46	658	11.00
23	1	22	395	13.00	48	1	47	672	14.00
24	1	23	404	9.00	49	1	48	687	15.00
25	1	24	415	11.00	50	1	49	703	16.00
51	1	50	716	13.00					
52	1	51	732	16.00					
53	1	52	751	19.00					
54	1	53	762	11.00					
55	1	54	781	19.00					
56	1	55	802	21.00					
57	1	56	810	8.00					
58	1	57	836	26.00					
59	1	58	851	15.00					
60	1	59	862	11.00					
61	1	60	883	21.00					
62	1	61	892	9.00					
63	1	62	900	8.00					

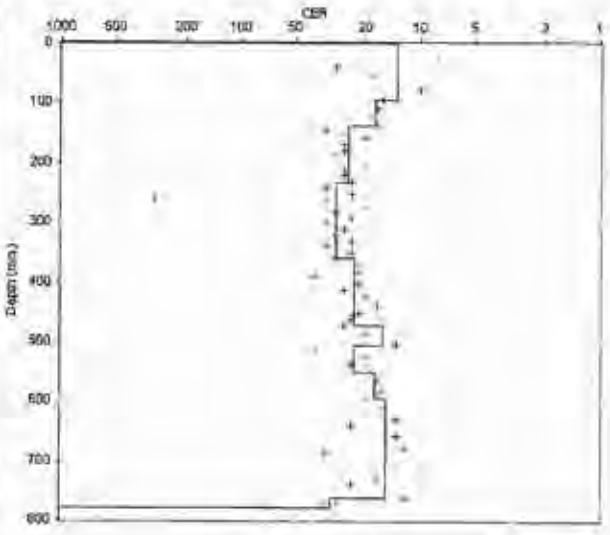
DCP Layer Strength Analysis Report

Project Name: WS303

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	19.00	13	95	95
2	14.67	18	44	139
3	10.44	25	94	233
4	9.07	29	127	360
5	11.40	23	114	474
6	16.00	16	32	506
7	11.25	23	45	551
8	14.67	18	44	595
9	16.70	15	167	762
10	8.50	31	17	779

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS305

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 131
Test Date: 02/10/2013

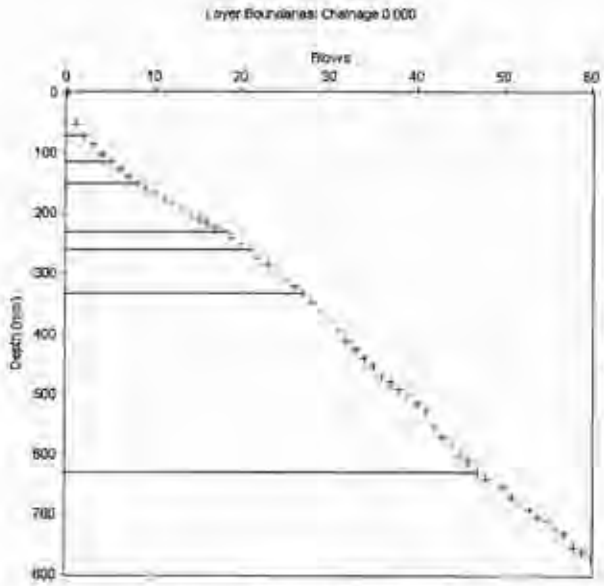
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	131	0.00	26	1	25	441	13.00
2	1	1	182	51.00	27	1	26	452	11.00
3	1	2	202	20.00	28	1	27	464	12.00
4	1	3	217	15.00	29	1	28	478	14.00
5	1	4	232	15.00	30	1	29	492	14.00
6	1	5	245	13.00	31	1	30	507	15.00
7	1	6	257	12.00	32	1	31	525	18.00
8	1	7	270	13.00	33	1	32	543	18.00
9	1	8	281	11.00	34	1	33	558	15.00
10	1	9	289	8.00	35	1	34	572	14.00
11	1	10	297	8.00	36	1	35	583	11.00
12	1	11	305	8.00	37	1	36	602	19.00
13	1	12	316	11.00	38	1	37	612	10.00
14	1	13	323	7.00	39	1	38	623	11.00
15	1	14	331	8.00	40	1	39	634	11.00
16	1	15	340	9.00	41	1	40	646	12.00
17	1	16	347	7.00	42	1	41	658	12.00
18	1	17	354	7.00	43	1	42	686	28.00
19	1	18	362	8.00	44	1	43	702	16.00
20	1	19	373	11.00	45	1	44	712	10.00
21	1	20	383	10.00	46	1	45	731	19.00
22	1	21	391	8.00	47	1	46	742	11.00
23	1	22	405	14.00	48	1	47	761	19.00
24	1	23	416	11.00	49	1	48	772	11.00
25	1	24	428	12.00	50	2	50	785	6.50
51	1	51	802	17.00					
52	1	52	812	10.00					
53	1	53	823	11.00					
54	1	54	836	13.00					
55	1	55	842	6.00					
56	1	56	854	12.00					
57	1	57	863	9.00					
58	1	58	886	23.00					
59	1	59	893	7.00					
60	1	60	901	8.00					

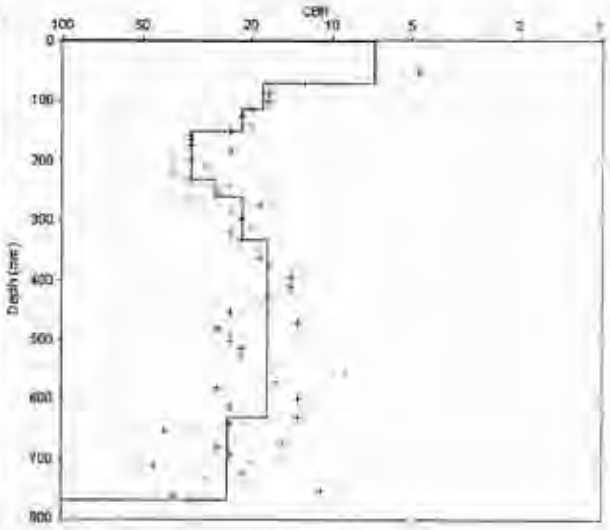
DCP Layer Strength Analysis Report

Project Name: WS305

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	35.50	7	71	71
2	14.33	18	43	114
3	12.00	22	36	150
4	8.10	33	81	231
5	9.67	27	29	260
6	12.17	22	73	333
7	14.85	17	297	630
8	10.77	24	140	770

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

UK DCP V3.1

Penetration Data Report

Project Name: WS306

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 158
Test Date: 02/10/2013

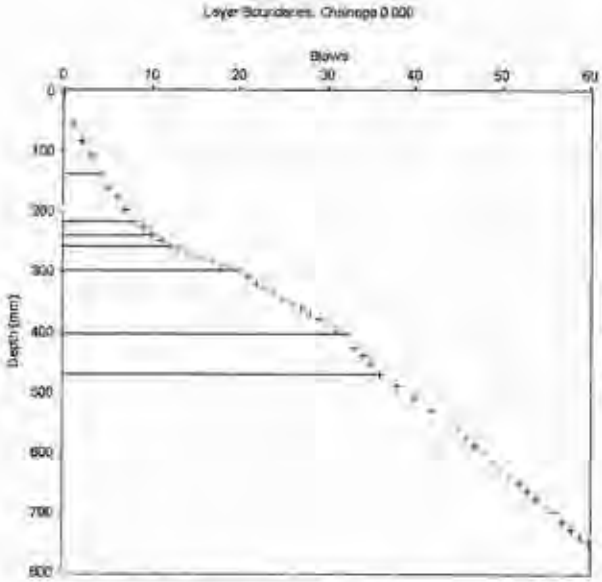
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	158	0.00	26	1	25	502	7.00
2	1	1	213	55.00	27	1	26	510	8.00
3	1	2	241	28.00	28	1	27	517	7.00
4	1	3	265	24.00	29	1	28	525	8.00
5	1	4	296	31.00	30	1	29	537	12.00
6	1	5	317	21.00	31	1	30	547	10.00
7	1	6	333	16.00	32	1	31	557	10.00
8	1	7	355	22.00	33	1	32	562	5.00
9	1	8	375	20.00	34	1	33	583	21.00
10	1	9	385	10.00	35	1	34	596	13.00
11	1	10	396	11.00	36	1	35	610	14.00
12	1	11	405	9.00	37	1	36	628	18.00
13	1	12	415	10.00	38	2	38	646	9.00
14	1	13	420	5.00	39	2	40	667	10.50
15	1	14	426	6.00	40	2	42	687	10.00
16	1	15	434	8.00	41	2	44	710	11.50
17	1	16	436	2.00	42	1	45	720	10.00
18	1	17	440	4.00	43	1	46	731	11.00
19	1	18	446	6.00	44	1	47	746	15.00
20	1	19	450	4.00	45	1	48	758	12.00
21	1	20	456	6.00	46	1	49	770	12.00
22	1	21	466	10.00	47	1	50	786	16.00
23	1	22	476	10.00	48	1	51	800	14.00
24	1	23	487	11.00	49	1	52	809	9.00
25	1	24	495	8.00	50	1	53	821	12.00
51	1	54	836	15.00					
52	1	55	847	11.00					
53	1	56	856	9.00					
54	1	57	872	16.00					
55	1	58	886	14.00					
56	1	59	898	12.00					
57	1	60	906	8.00					

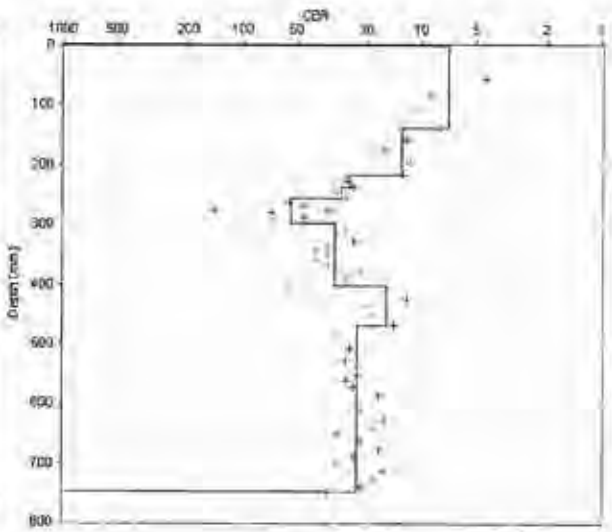
DCP Layer Strength Analysis Report

Project Name: WS306

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	158	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	34.50	7	138	138
2	19.75	13	79	217
3	10.50	25	21	238
4	9.50	28	19	257
5	5.13	54	41	298
6	8.83	30	106	404
7	16.50	16	66	470
8	11.58	23	278	748

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS309

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 124
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

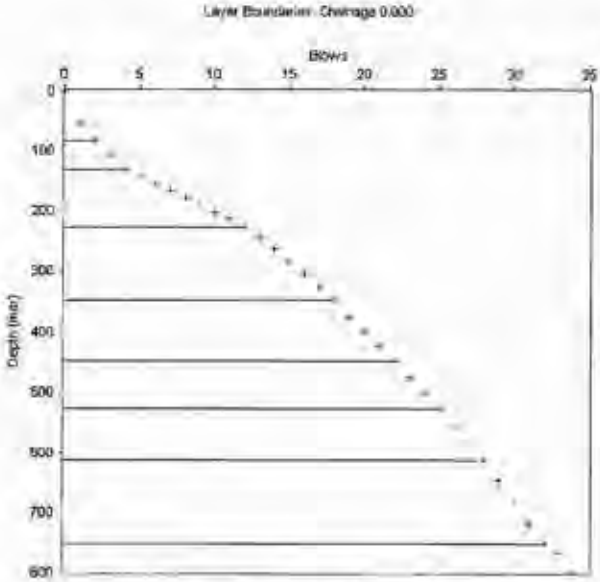
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00	26	1	25	652	26.00
2	1	1	178	54.00	27	1	26	681	29.00
3	1	2	208	30.00	28	1	27	708	27.00
4	1	3	232	24.00	29	1	28	737	29.00
5	1	4	255	23.00	30	1	29	771	34.00
6	1	5	268	13.00	31	1	30	803	32.00
7	1	6	280	12.00	32	1	31	842	39.00
8	1	7	291	11.00	33	1	32	876	34.00
9	1	8	302	11.00	34	1	33	891	15.00
10	1	9	313	11.00	35	1	34	924	33.00
11	1	10	325	12.00					
12	1	11	336	11.00					
13	1	12	351	15.00					
14	1	13	368	17.00					
15	1	14	386	18.00					
16	1	15	408	22.00					
17	1	16	427	19.00					
18	1	17	450	23.00					
19	1	18	472	22.00					
20	1	19	500	28.00					
21	1	20	523	23.00					
22	1	21	547	24.00					
23	1	22	572	25.00					
24	1	23	600	28.00					
25	1	24	626	26.00					

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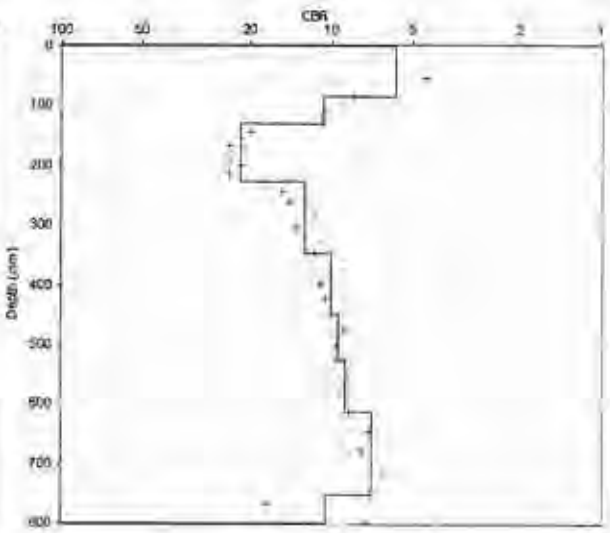
DCP Layer Strength Analysis Report

Project Name: WS309

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	42.00	6	84	84
2	23.50	11	47	131
3	12.00	22	96	227
4	20.17	13	121	348
5	25.00	10	100	448
6	26.67	9	80	528
7	28.33	9	85	613
8	34.75	7	139	752
9	24.00	10	48	800

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS314

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 168
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

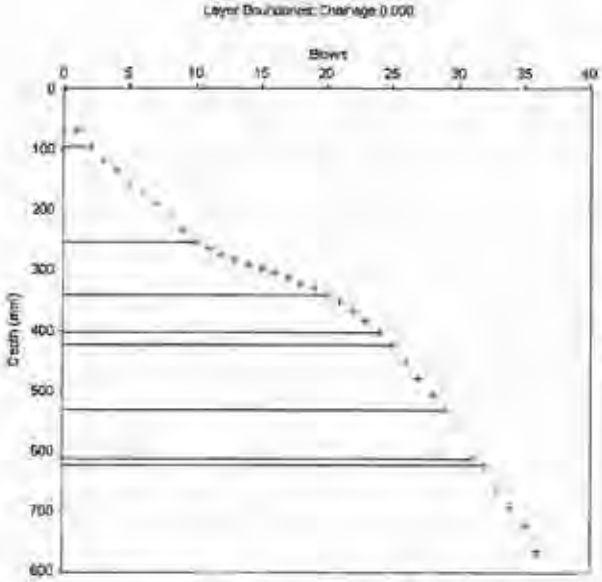
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	168	0.00	26	1	25	592	21.00
2	1	1	236	68.00	27	1	26	621	29.00
3	1	2	263	27.00	28	1	27	648	27.00
4	1	3	284	21.00	29	1	28	674	26.00
5	1	4	302	18.00	30	1	29	700	26.00
6	1	5	323	21.00	31	1	30	730	30.00
7	1	6	339	16.00	32	1	31	780	50.00
8	1	7	357	18.00	33	1	32	792	12.00
9	1	8	375	18.00	34	1	33	831	39.00
10	1	9	400	25.00	35	1	34	862	31.00
11	1	10	421	21.00	36	1	35	891	29.00
12	1	11	432	11.00	37	1	36	934	43.00
13	1	12	442	10.00					
14	1	13	450	8.00					
15	1	14	459	9.00					
16	1	15	465	6.00					
17	1	16	472	7.00					
18	1	17	480	8.00					
19	1	18	490	10.00					
20	1	19	498	8.00					
21	1	20	508	10.00					
22	1	21	521	13.00					
23	1	22	535	14.00					
24	1	23	552	17.00					
25	1	24	571	19.00					

UK DCP V3.1

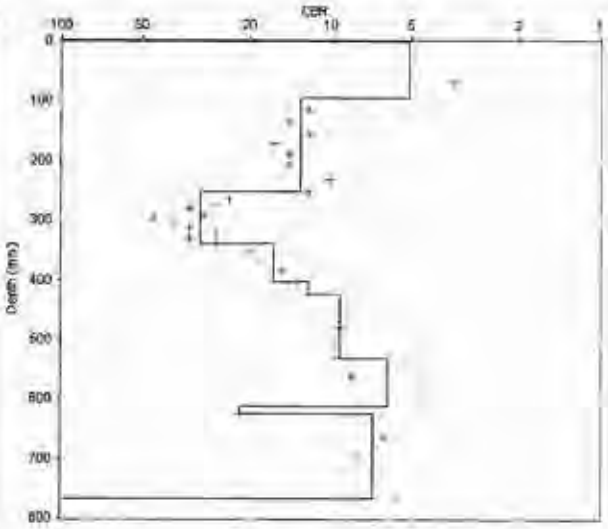
DCP Layer Strength Analysis Report

Project Name: WS314

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	168	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	47.50	5	95	95
2	19.75	13	158	253
3	8.70	31	87	340
4	15.75	16	63	403
5	21.00	12	21	424
6	27.00	9	108	532
7	40.00	6	80	612
8	12.00	22	12	624
9	35.50	7	142	766

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS315

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

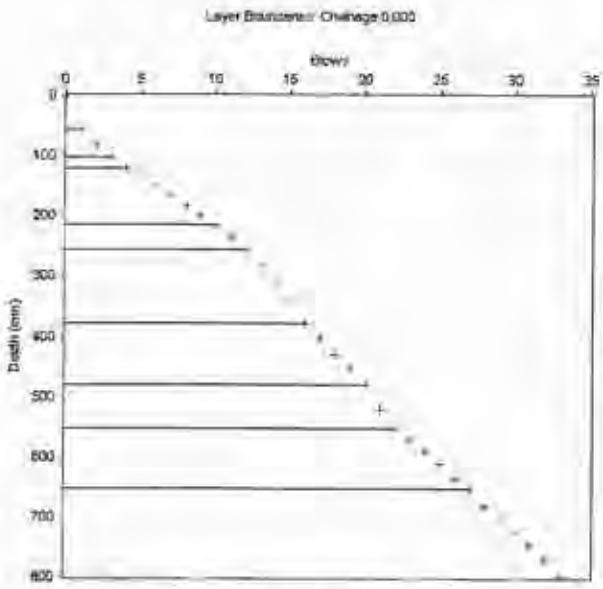
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	1	25	732	20.00
2	1	1	178	57.00	27	1	26	756	24.00
3	1	2	202	24.00	28	1	27	774	18.00
4	1	3	223	21.00	29	1	28	802	28.00
5	1	4	241	18.00	30	1	29	821	19.00
6	1	5	255	14.00	31	1	30	844	23.00
7	1	6	270	15.00	32	1	31	866	22.00
8	1	7	285	15.00	33	1	32	890	24.00
9	1	8	303	18.00	34	1	33	918	28.00
10	1	9	321	18.00					
11	1	10	336	15.00					
12	1	11	355	19.00					
13	1	12	376	21.00					
14	1	13	403	27.00					
15	1	14	431	28.00					
16	1	15	460	29.00					
17	1	16	500	40.00					
18	1	17	524	24.00					
19	1	18	552	28.00					
20	1	19	574	22.00					
21	1	20	601	27.00					
22	1	21	642	41.00					
23	1	22	673	31.00					
24	1	23	692	19.00					
25	1	24	712	20.00					

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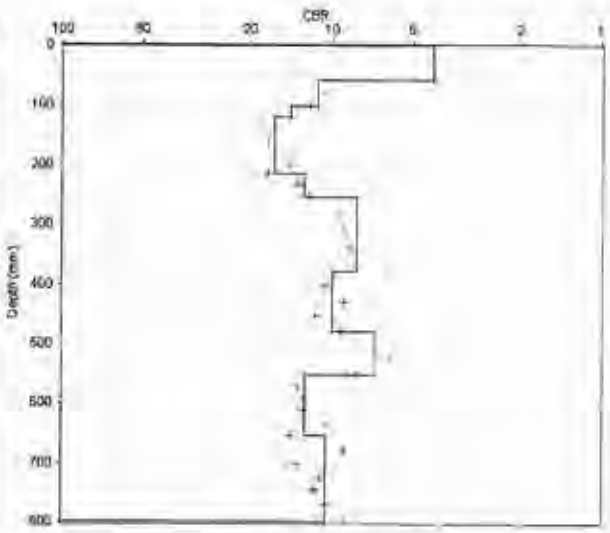
DCP Layer Strength Analysis Report

Project Name: WS315

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	57.00	4	57	57
2	22.50	11	45	102
3	18.00	14	18	120
4	15.83	16	95	215
5	20.00	13	40	255
6	31.00	8	124	379
7	25.25	10	101	480
8	36.00	7	72	552
9	20.20	13	101	653
10	24.00	10	144	797

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS317

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 132
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

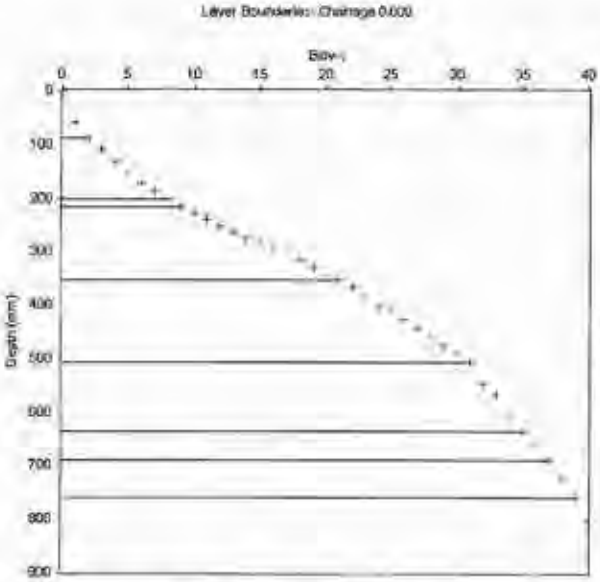
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	132	0.00	26	1	25	541	8.00
2	1	1	191	59.00	27	1	26	560	19.00
3	1	2	221	30.00	28	1	27	576	16.00
4	1	3	243	22.00	29	1	28	591	15.00
5	1	4	266	23.00	30	1	29	606	15.00
6	1	5	286	20.00	31	1	30	622	16.00
7	1	6	304	18.00	32	1	31	640	18.00
8	1	7	318	14.00	33	1	32	678	38.00
9	1	8	336	18.00	34	1	33	701	23.00
10	1	9	350	14.00	35	1	34	737	36.00
11	1	10	360	10.00	36	1	35	767	30.00
12	1	11	372	12.00	37	1	36	790	23.00
13	1	12	385	13.00	38	1	37	821	31.00
14	1	13	395	10.00	39	1	38	856	35.00
15	1	14	407	12.00	40	1	39	892	36.00
16	1	15	416	9.00	41	1	40	936	44.00
17	1	16	426	10.00					
18	1	17	436	10.00					
19	1	18	447	11.00					
20	1	19	465	18.00					
21	1	20	476	11.00					
22	1	21	486	10.00					
23	1	22	500	14.00					
24	1	23	515	15.00					
25	1	24	533	18.00					

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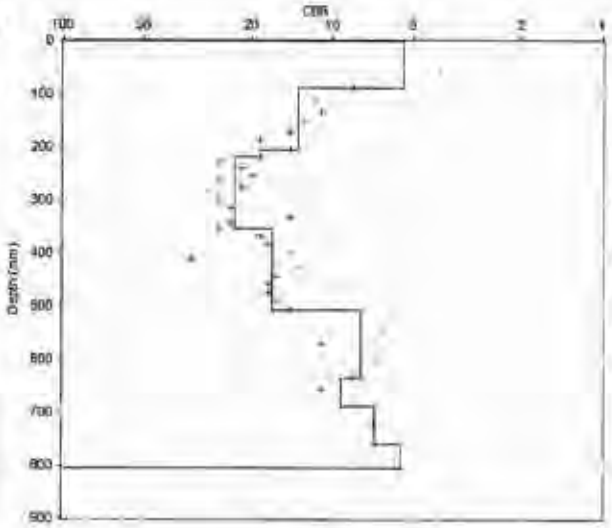
DCP Layer Strength Analysis Report

Project Name: WS317

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	132	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	44.50	5	89	89
2	19.17	13	115	204
3	14.00	19	14	218
4	11.33	23	136	354
5	15.40	17	154	508
6	31.75	8	127	635
7	27.00	9	54	689
8	35.50	7	71	760
9	44.00	6	44	804

CBR Relationship

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS318

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 126
Test Date: 02/10/2013

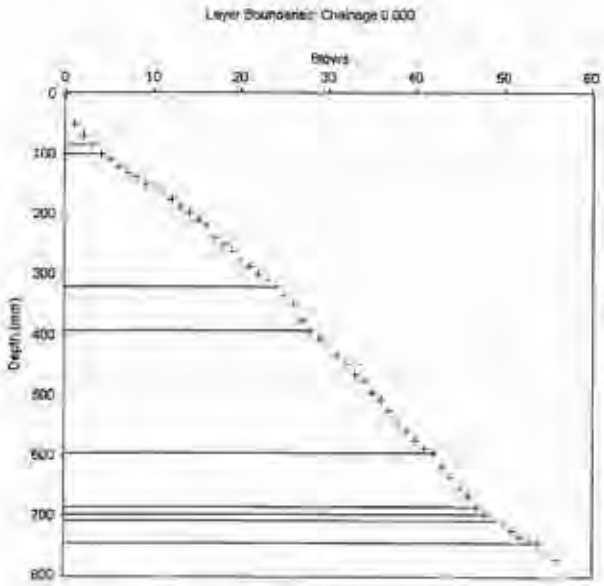
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	126	0.00	26	1	25	461	16.00
2	1	1	175	49.00	27	1	26	475	14.00
3	1	2	194	19.00	28	1	27	503	28.00
4	1	3	212	18.00	29	1	28	519	16.00
5	1	4	226	14.00	30	1	29	531	12.00
6	1	5	236	10.00	31	1	30	542	11.00
7	1	6	246	10.00	32	1	31	561	19.00
8	1	7	256	10.00	33	1	32	575	14.00
9	1	8	264	8.00	34	1	33	592	17.00
10	1	9	275	11.00	35	1	34	601	9.00
11	1	10	284	9.00	36	1	35	622	21.00
12	1	11	291	7.00	37	1	36	634	12.00
13	1	12	301	10.00	38	1	37	652	18.00
14	1	13	312	11.00	39	1	38	670	18.00
15	1	14	324	12.00	40	1	39	685	15.00
16	1	15	335	11.00	41	1	40	701	16.00
17	1	16	345	10.00	42	1	41	715	14.00
18	1	17	364	19.00	43	1	42	722	7.00
19	1	18	376	12.00	44	1	43	746	24.00
20	1	19	388	12.00	45	1	44	761	15.00
21	1	20	401	13.00	46	1	45	780	19.00
22	1	21	412	11.00	47	1	46	793	13.00
23	1	22	425	13.00	48	1	47	812	19.00
24	1	23	436	11.00	49	1	48	825	13.00
25	1	24	445	9.00	50	1	49	835	10.00
51	1	50	841	6.00					
52	1	51	851	10.00					
53	1	52	862	11.00					
54	1	53	866	4.00					
55	1	54	872	6.00					
56	1	55	888	16.00					
57	1	56	900	12.00					

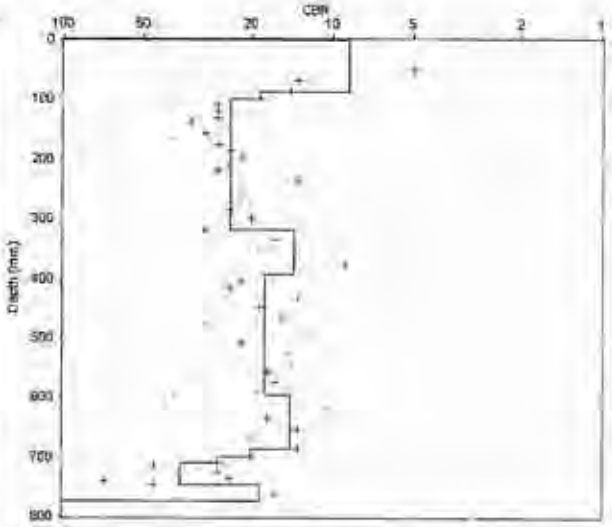
DCP Layer Strength Analysis Report

Project Name: WS318

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	28.67	9	86	86
2	14.00	19	14	100
3	10.95	24	219	319
4	18.50	14	74	393
5	14.50	18	203	596
6	18.00	14	90	686
7	13.00	20	13	699
8	10.00	26	10	709
9	7.40	36	37	746
10	14.00	19	28	774

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS319

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 151
Test Date: 02/10/2013

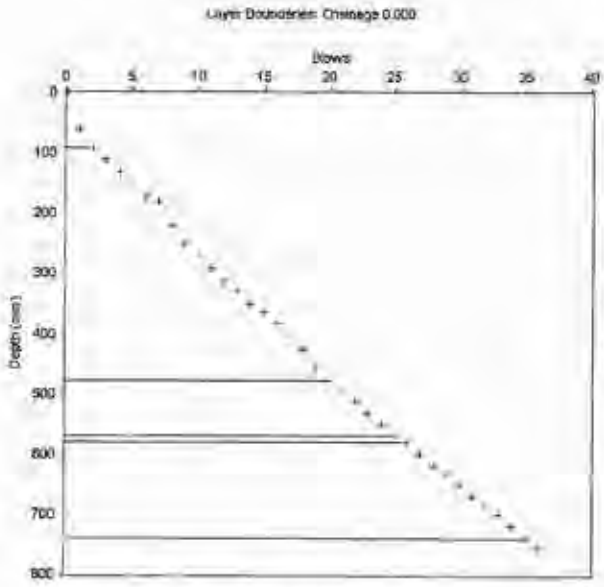
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	151	0.00	26	1	25	720	19.00
2	1	1	211	60.00	27	1	26	731	11.00
3	1	2	242	31.00	28	1	27	752	21.00
4	1	3	262	20.00	29	1	28	770	18.00
5	1	4	281	19.00	30	1	29	783	13.00
6	1	5	296	15.00	31	1	30	802	19.00
7	1	6	323	27.00	32	1	31	821	19.00
8	1	7	331	8.00	33	1	32	835	14.00
9	1	8	372	41.00	34	1	33	852	17.00
10	1	9	400	28.00	35	1	34	870	18.00
11	1	10	420	20.00	36	1	35	891	21.00
12	1	11	441	21.00	37	1	36	905	14.00
13	1	12	462	21.00					
14	1	13	480	18.00					
15	1	14	502	22.00					
16	1	15	515	13.00					
17	1	16	534	19.00					
18	1	17	554	20.00					
19	1	18	576	22.00					
20	1	19	603	27.00					
21	1	20	629	26.00					
22	1	21	643	14.00					
23	1	22	662	19.00					
24	1	23	682	20.00					
25	1	24	701	19.00					

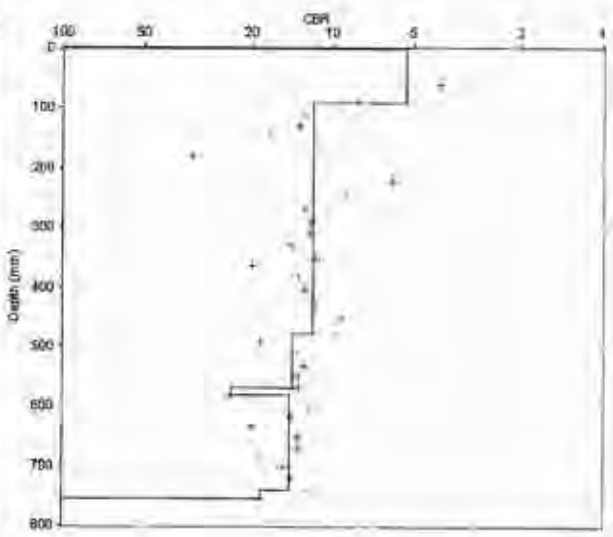
DCP Layer Strength Analysis Report

Project Name: WS319

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	151	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	45.50	5	91	91
2	21.50	12	387	478
3	18.20	14	91	569
4	11.00	24	11	580
5	17.78	14	160	740
6	14.00	19	14	754

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS320

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

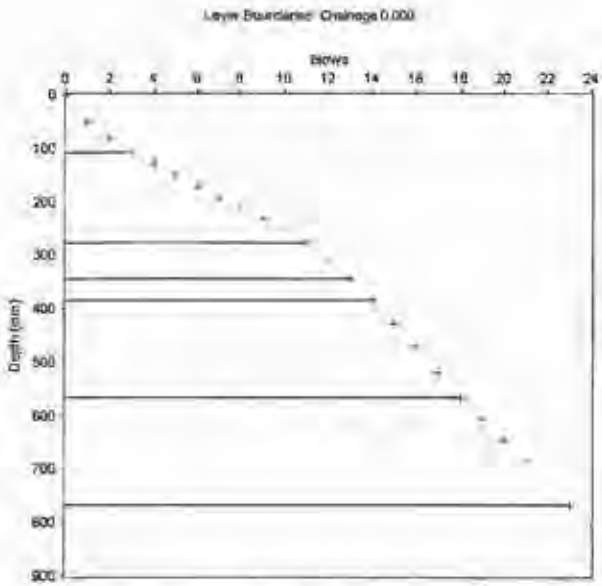
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	126	0.00					
2	1	1	177	51.00					
3	1	2	207	30.00					
4	1	3	233	26.00					
5	1	4	255	22.00					
6	1	5	276	21.00					
7	1	6	297	21.00					
8	1	7	319	22.00					
9	1	8	336	17.00					
10	1	9	357	21.00					
11	1	10	377	20.00					
12	1	11	403	26.00					
13	1	12	436	33.00					
14	1	13	470	34.00					
15	1	14	510	40.00					
16	1	15	554	44.00					
17	1	16	596	42.00					
18	1	17	646	50.00					
19	1	18	691	45.00					
20	1	19	731	40.00					
21	1	20	771	40.00					
22	1	21	810	39.00					
23	1	22	850	40.00					
24	1	23	893	43.00					
25	1	24	931	38.00					

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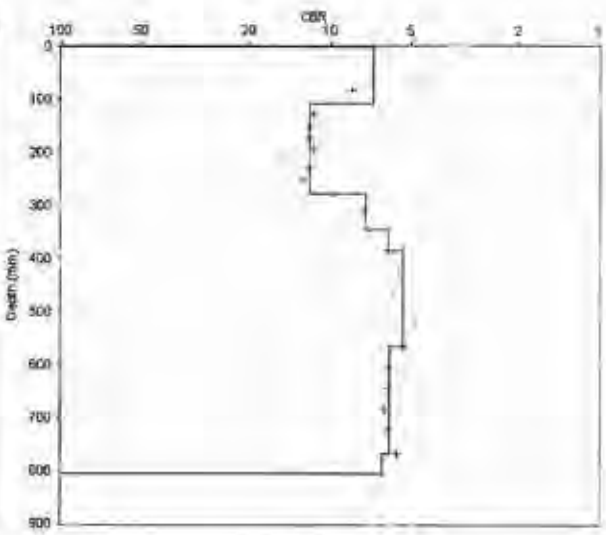
DCP Layer Strength Analysis Report

Project Name: WS320

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	35.67	7	107	107
2	21.25	12	170	277
3	33.50	7	67	344
4	40.00	6	40	384
5	45.25	5	181	565
6	40.40	6	202	767
7	38.00	6	38	805

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS322

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 137
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

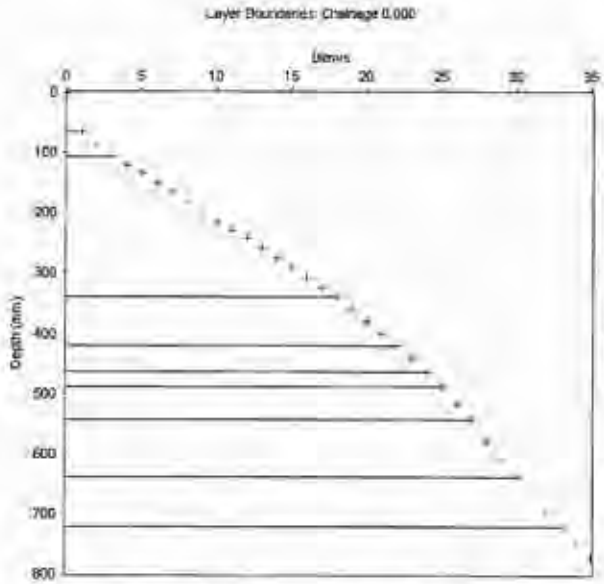
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	137	0.00	26	1	25	626	26.00
2	1	1	202	65.00	27	1	26	654	28.00
3	1	2	224	22.00	28	1	27	680	26.00
4	1	3	243	19.00	29	1	28	716	36.00
5	1	4	257	14.00	30	1	29	745	29.00
6	1	5	271	14.00	31	1	30	775	30.00
7	1	6	287	16.00	32	1	31	802	27.00
8	1	7	302	15.00	33	1	32	831	29.00
9	1	8	320	18.00	34	1	33	859	28.00
10	1	9	335	15.00	35	1	34	884	25.00
11	1	10	351	16.00	36	1	35	910	26.00
12	1	11	365	14.00					
13	1	12	379	14.00					
14	1	13	395	16.00					
15	1	14	411	16.00					
16	1	15	427	16.00					
17	1	16	445	18.00					
18	1	17	461	16.00					
19	1	18	476	15.00					
20	1	19	496	20.00					
21	1	20	517	21.00					
22	1	21	537	20.00					
23	1	22	556	19.00					
24	1	23	578	22.00					
25	1	24	600	22.00					

UK DCP V3.1

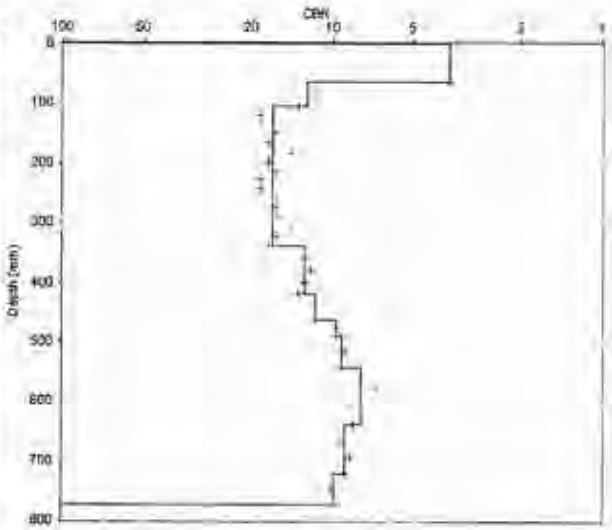
DCP Layer Strength Analysis Report

Project Name: WS322

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	137	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	65.00	4	65	65
2	20.50	12	41	106
3	15.53	17	233	339
4	20.00	13	80	419
5	22.00	12	44	463
6	26.00	10	26	489
7	27.00	9	54	543
8	31.67	8	95	638
9	28.00	9	84	722
10	25.50	10	51	773

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS325

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 145
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

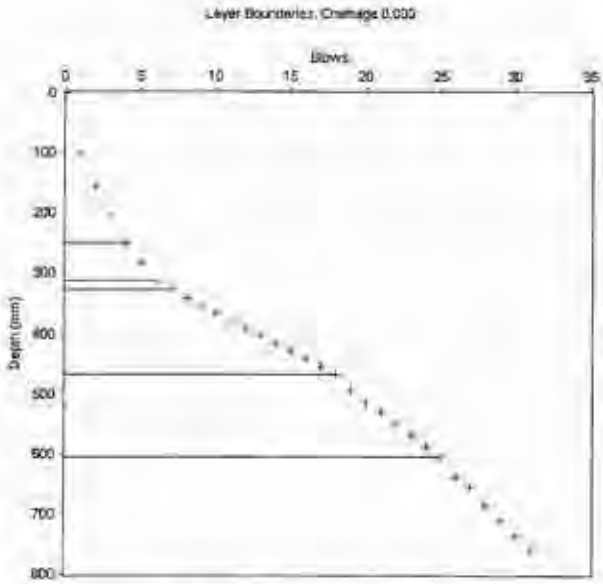
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	145	0.00	26	1	25	750	17.00
2	1	1	245	100.00	27	1	26	782	32.00
3	1	2	300	55.00	28	1	27	800	18.00
4	1	3	346	46.00	29	1	28	830	30.00
5	1	4	395	49.00	30	1	29	856	26.00
6	1	5	427	32.00	31	1	30	880	24.00
7	1	6	457	30.00	32	1	31	905	25.00
8	1	7	472	15.00					
9	1	8	485	13.00					
10	1	9	498	13.00					
11	1	10	510	12.00					
12	1	11	523	13.00					
13	1	12	534	11.00					
14	1	13	548	14.00					
15	1	14	560	12.00					
16	1	15	574	14.00					
17	1	16	586	12.00					
18	1	17	600	14.00					
19	1	18	612	12.00					
20	1	19	639	27.00					
21	1	20	658	19.00					
22	1	21	675	17.00					
23	1	22	693	18.00					
24	1	23	712	19.00					
25	1	24	733	21.00					

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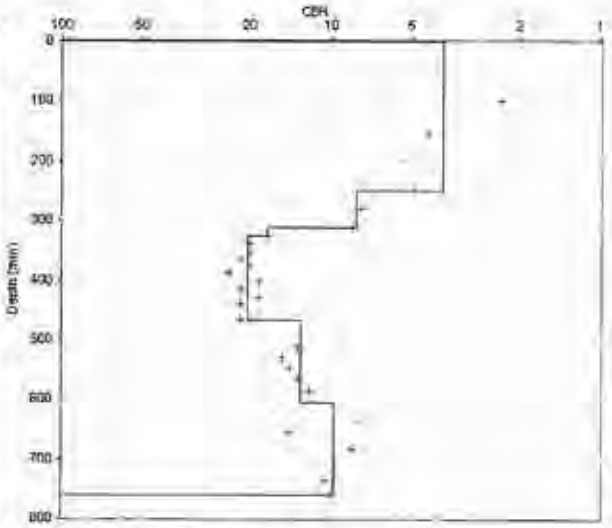
DCP Layer Strength Analysis Report

Project Name: WS325

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	145	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	62.50	4	250	250
2	31.00	8	62	312
3	15.00	17	15	327
4	12.73	21	140	467
5	19.71	13	138	605
6	25.83	10	155	760

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS326

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 143
Test Date: 02/10/2013

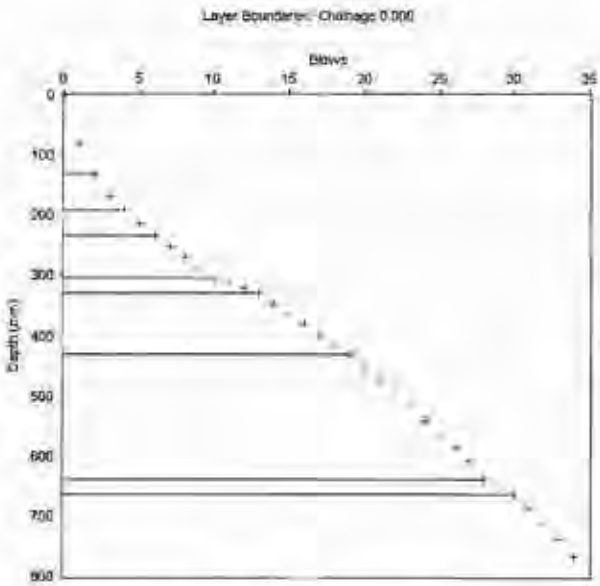
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	143	0.00	26	1	25	709	25.00
2	1	1	221	78.00	27	1	26	730	21.00
3	1	2	274	53.00	28	1	27	750	20.00
4	1	3	312	38.00	29	1	28	780	30.00
5	1	4	334	22.00	30	1	29	791	11.00
6	1	5	354	20.00	31	1	30	806	15.00
7	1	6	376	22.00	32	1	31	829	23.00
8	1	7	395	19.00	33	1	32	854	25.00
9	1	8	412	17.00	34	1	33	880	26.00
10	1	9	429	17.00	35	1	34	910	30.00
11	1	10	446	17.00					
12	1	11	455	9.00					
13	1	12	464	9.00					
14	1	13	471	7.00					
15	1	14	489	18.00					
16	1	15	506	17.00					
17	1	16	523	17.00					
18	1	17	541	18.00					
19	1	18	560	19.00					
20	1	19	574	14.00					
21	1	20	595	21.00					
22	1	21	614	19.00					
23	1	22	635	21.00					
24	1	23	655	20.00					
25	1	24	684	29.00					

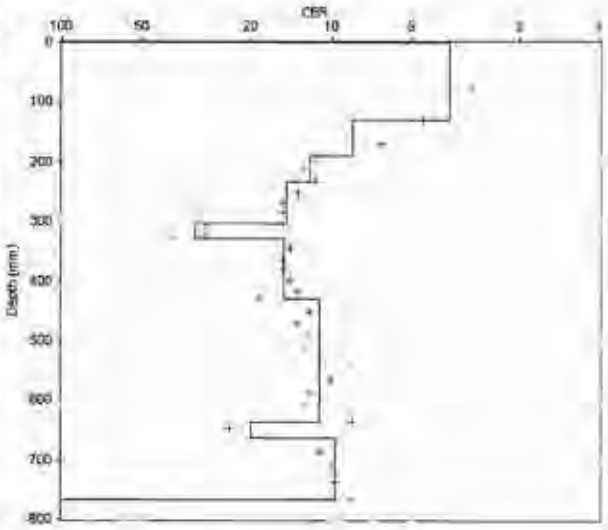
DCP Layer Strength Analysis Report

Project Name: WS326

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	143	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	65.50	4	131	131
2	30.00	8	60	191
3	21.00	12	42	233
4	17.50	15	70	303
5	8.33	32	25	328
6	17.17	15	103	431
7	22.89	11	206	637
8	13.00	20	26	663
9	26.00	10	104	767

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS327

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 124
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

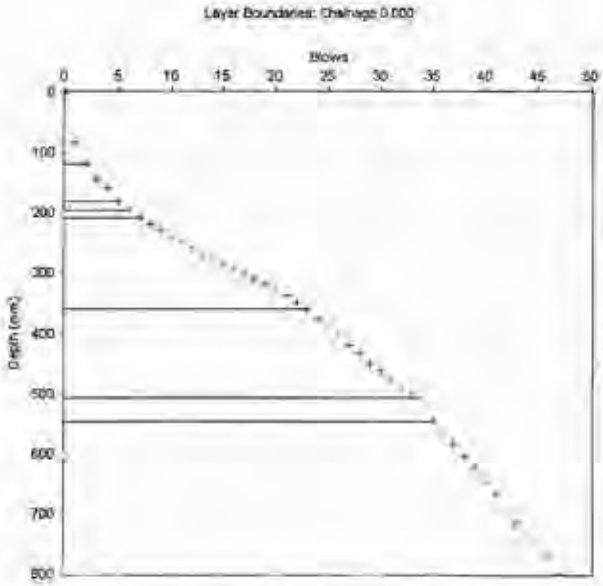
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00	26	1	25	512	12.00
2	1	1	207	83.00	27	1	26	527	15.00
3	1	2	242	35.00	28	1	27	543	16.00
4	1	3	267	25.00	29	1	28	556	13.00
5	1	4	282	15.00	30	1	29	575	19.00
6	1	5	304	22.00	31	1	30	586	11.00
7	1	6	319	15.00	32	1	31	601	15.00
8	1	7	332	13.00	33	1	32	616	15.00
9	1	8	342	10.00	34	1	33	623	7.00
10	1	9	353	11.00	35	1	34	631	8.00
11	1	10	364	11.00	36	1	35	671	40.00
12	1	11	371	7.00	37	1	36	691	20.00
13	1	12	382	11.00	38	1	37	707	16.00
14	1	13	395	13.00	39	1	38	729	22.00
15	1	14	400	5.00	40	1	39	746	17.00
16	1	15	408	8.00	41	1	40	770	24.00
17	1	16	416	8.00	42	1	41	792	22.00
18	1	17	423	7.00	43	1	42	816	24.00
19	1	18	433	10.00	44	1	43	839	23.00
20	1	19	441	8.00	45	1	44	860	21.00
21	1	20	452	11.00	46	1	45	874	14.00
22	1	21	461	9.00	47	1	46	892	18.00
23	1	22	474	13.00	48	1	47	924	32.00
24	1	23	483	9.00					
25	1	24	500	17.00					

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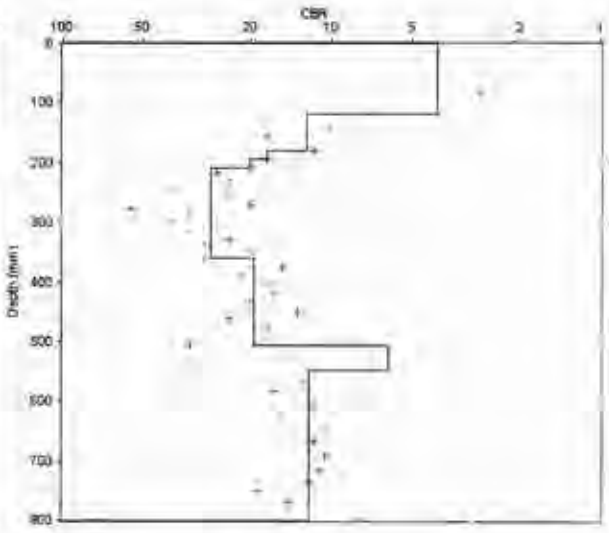
DCP Layer Strength Analysis Report

Project Name: WS327

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	59.00	4	118	118
2	20.67	12	62	180
3	15.00	17	15	195
4	13.00	20	13	208
5	9.44	28	151	359
6	13.45	19	148	507
7	40.00	6	40	547
8	21.08	12	253	800

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS328

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 122
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

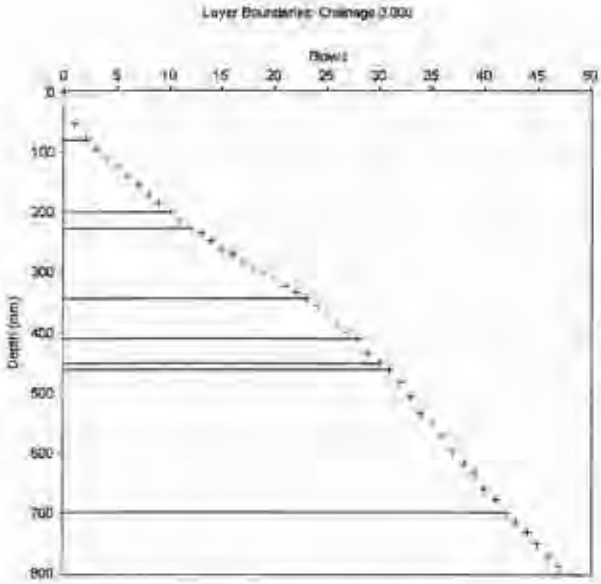
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	122	0.00	26	1	25	489	11.00
2	1	1	174	52.00	27	1	26	509	20.00
3	1	2	200	26.00	28	1	27	520	11.00
4	1	3	218	18.00	29	1	28	532	12.00
5	1	4	233	15.00	30	1	29	556	24.00
6	1	5	247	14.00	31	1	30	573	17.00
7	1	6	262	15.00	32	1	31	584	11.00
8	1	7	276	14.00	33	1	32	605	21.00
9	1	8	292	16.00	34	1	33	627	22.00
10	1	9	307	15.00	35	1	34	655	28.00
11	1	10	322	15.00	36	1	35	671	16.00
12	1	11	336	14.00	37	1	36	693	22.00
13	1	12	349	13.00	38	1	37	718	25.00
14	1	13	357	8.00	39	1	38	740	22.00
15	1	14	370	13.00	40	1	39	755	15.00
16	1	15	383	13.00	41	1	40	781	26.00
17	1	16	393	10.00	42	1	41	800	19.00
18	1	17	403	10.00	43	1	42	821	21.00
19	1	18	414	11.00	44	1	43	836	15.00
20	1	19	423	9.00	45	1	44	854	18.00
21	1	20	432	9.00	46	1	45	872	18.00
22	1	21	444	12.00	47	1	46	893	21.00
23	1	22	455	11.00	48	1	47	910	17.00
24	1	23	465	10.00					
25	1	24	478	13.00					

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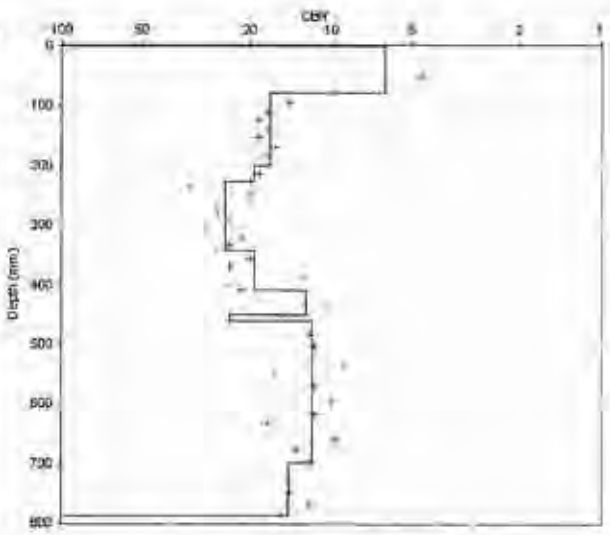
DCP Layer Strength Analysis Report

Project Name: WS328

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	122	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	39.00	6	78	78
2	15.25	17	122	200
3	13.50	19	27	227
4	10.55	25	116	343
5	13.40	19	67	410
6	20.50	12	41	451
7	11.00	24	11	462
8	21.55	12	237	699
9	17.80	14	89	788

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS329

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 117
Test Date: 02/10/2013

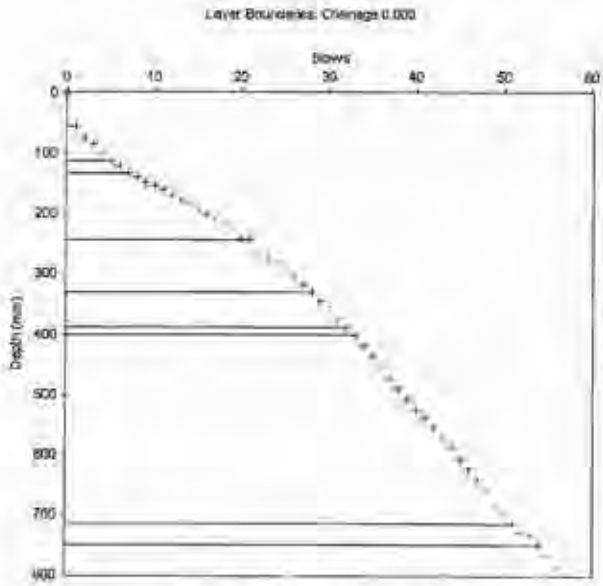
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	117	0.00	26	1	25	412	12.00
2	1	1	172	55.00	27	1	26	422	10.00
3	1	2	190	18.00	28	1	27	435	13.00
4	1	3	203	13.00	29	1	28	447	12.00
5	1	4	216	13.00	30	1	29	462	15.00
6	1	5	229	13.00	31	1	30	476	14.00
7	1	6	238	9.00	32	1	31	490	14.00
8	1	7	250	12.00	33	1	32	505	15.00
9	1	8	256	6.00	34	1	33	517	12.00
10	1	9	264	8.00	35	1	34	536	19.00
11	1	10	271	7.00	36	1	35	554	18.00
12	1	11	278	7.00	37	1	36	575	21.00
13	1	12	286	8.00	38	1	37	591	16.00
14	1	13	295	9.00	39	1	38	607	16.00
15	1	14	302	7.00	40	1	39	625	18.00
16	1	15	310	8.00	41	1	40	642	17.00
17	1	16	319	9.00	42	1	41	656	14.00
18	1	17	326	7.00	43	1	42	672	16.00
19	1	18	335	9.00	44	1	43	686	14.00
20	1	19	342	7.00	45	1	44	705	19.00
21	1	20	357	15.00	46	1	45	725	20.00
22	1	21	361	4.00	47	1	46	741	16.00
23	1	22	380	19.00	48	1	47	760	19.00
24	1	23	390	10.00	49	1	48	776	16.00
25	1	24	400	10.00	50	1	49	798	22.00
51	1	50	815	17.00					
52	1	51	832	17.00					
53	1	52	846	14.00					
54	1	53	851	5.00					
55	1	54	867	16.00					
56	1	55	886	19.00					
57	1	56	905	19.00					

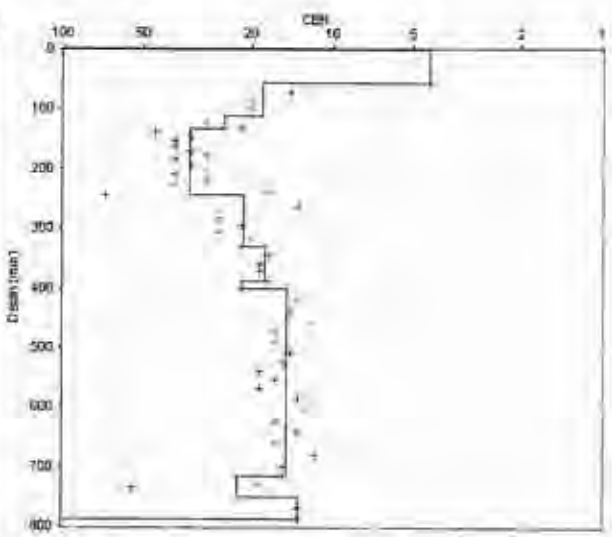
DCP Layer Strength Analysis Report

Project Name: WS329

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	117	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	55.00	4	55	55
2	14.25	18	57	112
3	10.50	25	21	133
4	7.93	34	111	244
5	12.29	21	86	330
6	14.50	18	58	388
7	12.00	22	12	400
8	17.50	15	315	715
9	11.67	23	35	750
10	19.00	13	38	788

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS336

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	160	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

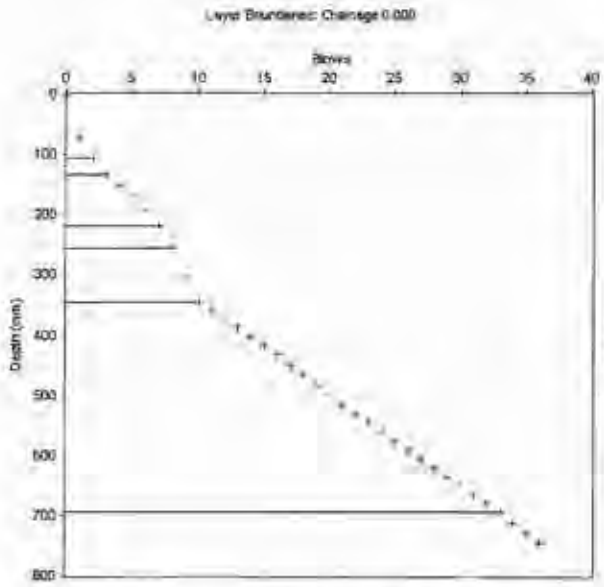
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	160	0.00	26	1	25	736	14.00
2	1	1	232	72.00	27	1	26	750	14.00
3	1	2	265	33.00	28	1	27	767	17.00
4	1	3	293	28.00	29	1	28	782	15.00
5	1	4	311	18.00	30	1	29	795	13.00
6	1	5	328	17.00	31	1	30	806	11.00
7	1	6	352	24.00	32	1	31	824	18.00
8	1	7	379	27.00	33	1	32	840	16.00
9	1	8	416	37.00	34	1	33	854	14.00
10	1	9	464	48.00	35	1	34	872	18.00
11	1	10	505	41.00	36	1	35	889	17.00
12	1	11	520	15.00	37	1	36	905	16.00
13	1	12	533	13.00					
14	1	13	546	13.00					
15	1	14	564	18.00					
16	1	15	578	14.00					
17	1	16	593	15.00					
18	1	17	610	17.00					
19	1	18	626	16.00					
20	1	19	644	18.00					
21	1	20	656	12.00					
22	1	21	676	20.00					
23	1	22	691	15.00					
24	1	23	705	14.00					
25	1	24	722	17.00					

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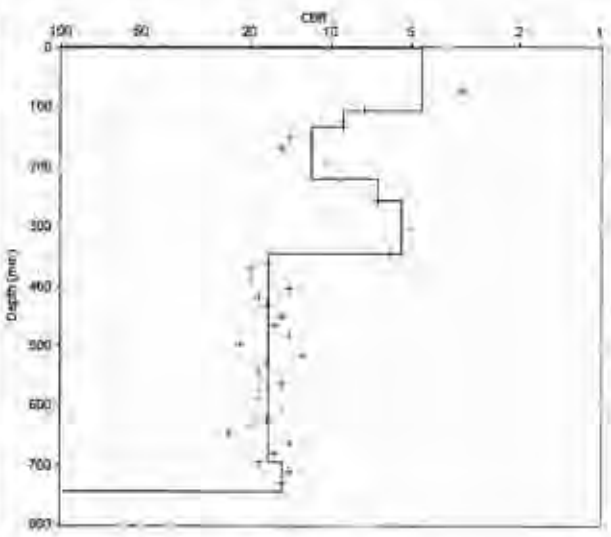
DCP Layer Strength Analysis Report

Project Name: WS336

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	160	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	52.50	5	105	105
2	28.00	9	28	133
3	21.50	12	86	219
4	37.00	7	37	256
5	44.50	5	89	345
6	15.17	17	349	694
7	17.00	15	51	745

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS338

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 111
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

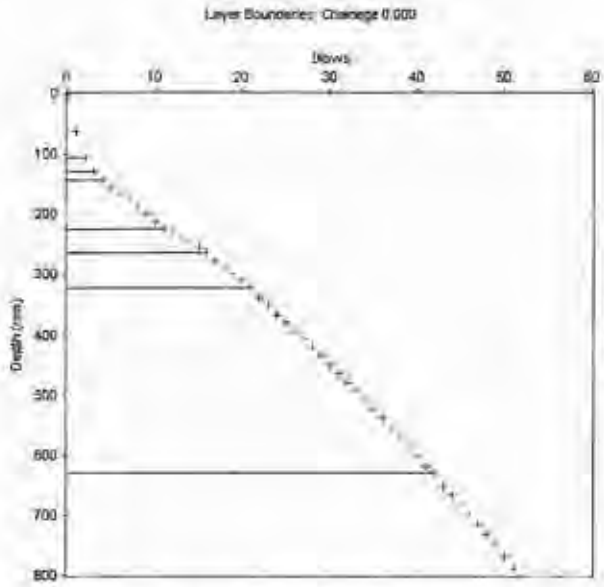
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	111	0.00	26	1	25	492	14.00
2	1	1	174	63.00	27	1	26	507	15.00
3	1	2	216	42.00	28	1	27	519	12.00
4	1	3	239	23.00	29	1	28	532	13.00
5	1	4	254	15.00	30	1	29	546	14.00
6	1	5	266	12.00	31	1	30	561	15.00
7	1	6	278	12.00	32	1	31	574	13.00
8	1	7	284	6.00	33	1	32	591	17.00
9	1	8	300	16.00	34	1	33	603	12.00
10	1	9	310	10.00	35	1	34	620	17.00
11	1	10	324	14.00	36	1	35	634	14.00
12	1	11	336	12.00	37	1	36	650	16.00
13	1	12	340	4.00	38	1	37	667	17.00
14	1	13	350	10.00	39	1	38	682	15.00
15	1	14	357	7.00	40	1	39	697	15.00
16	1	15	366	9.00	41	1	40	713	16.00
17	1	16	375	9.00	42	1	41	730	17.00
18	1	17	389	14.00	43	1	42	741	11.00
19	1	18	400	11.00	44	1	43	763	22.00
20	1	19	410	10.00	45	1	44	778	15.00
21	1	20	421	11.00	46	1	45	792	14.00
22	1	21	433	12.00	47	1	46	810	18.00
23	1	22	449	16.00	48	1	47	825	15.00
24	1	23	462	13.00	49	1	48	843	18.00
25	1	24	478	16.00	50	1	49	860	17.00
51	1	50	880	20.00					
52	1	51	900	20.00					

UK DCP V3.1

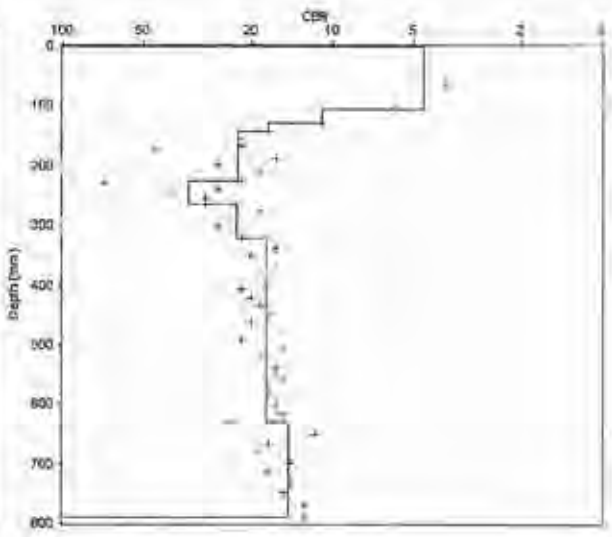
DCP Layer Strength Analysis Report

Project Name: WS338

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	111	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	52.50	5	105	105
2	23.00	11	23	128
3	15.00	17	15	143
4	11.71	22	82	225
5	7.80	34	39	264
6	11.60	23	58	322
7	14.67	18	308	630
8	17.67	15	159	789

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS339

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 125
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

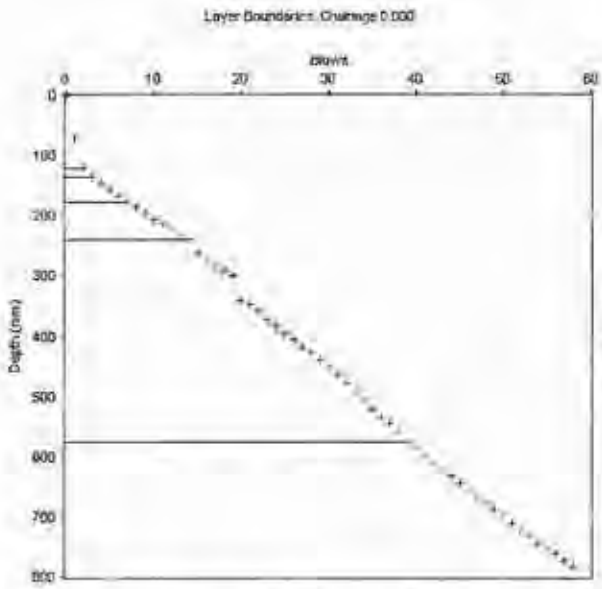
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	125	0.00	26	1	25	520	12.00
2	1	1	195	70.00	27	1	26	531	11.00
3	1	2	245	50.00	28	1	27	542	11.00
4	1	3	260	15.00	29	1	28	552	10.00
5	1	4	271	11.00	30	1	29	564	12.00
6	1	5	281	10.00	31	1	30	576	12.00
7	1	6	291	10.00	32	1	31	589	13.00
8	1	7	302	11.00	33	1	32	602	13.00
9	1	8	310	8.00	34	1	33	620	18.00
10	1	9	320	10.00	35	1	34	632	12.00
11	1	10	331	11.00	36	1	35	646	14.00
12	1	11	337	6.00	37	1	36	658	12.00
13	1	12	345	8.00	38	1	37	670	12.00
14	1	13	356	11.00	39	1	38	684	14.00
15	1	14	363	7.00	40	1	39	700	16.00
16	1	15	387	24.00	41	1	40	710	10.00
17	1	16	398	11.00	42	1	41	723	13.00
18	1	17	407	9.00	43	1	42	734	11.00
19	1	18	415	8.00	44	1	43	746	12.00
20	1	19	425	10.00	45	1	44	757	11.00
21	1	20	466	41.00	46	1	45	769	12.00
22	1	21	472	6.00	47	1	46	780	11.00
23	1	22	483	11.00	48	1	47	791	11.00
24	1	23	496	13.00	49	1	48	803	12.00
25	1	24	508	12.00	50	1	49	813	10.00
51	1	50	823	10.00					
52	1	51	836	13.00					
53	1	52	845	9.00					
54	1	53	857	12.00					
55	1	54	869	12.00					
56	1	55	878	9.00					
57	1	56	886	8.00					
58	1	57	898	12.00					
59	1	58	909	11.00					

UK DCP V3.1

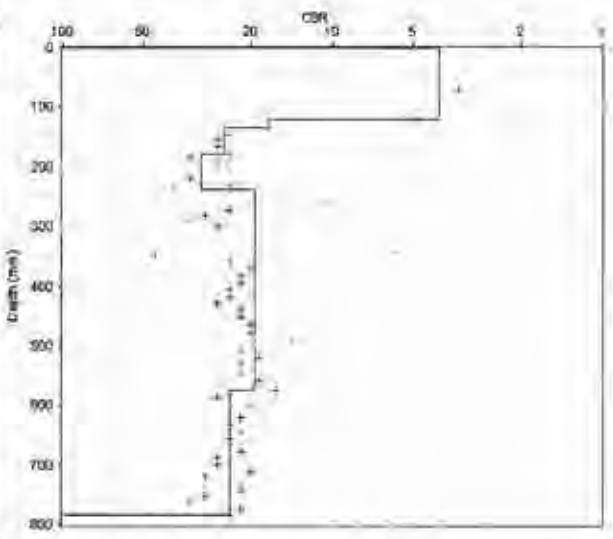
DCP Layer Strength Analysis Report

Project Name: WS339

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	125	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	60.00	4	120	120
2	15.00	17	15	135
3	10.50	25	42	177
4	8.71	31	61	238
5	13.48	19	337	575
6	11.00	24	209	784

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS340

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 135
Test Date: 25/09/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

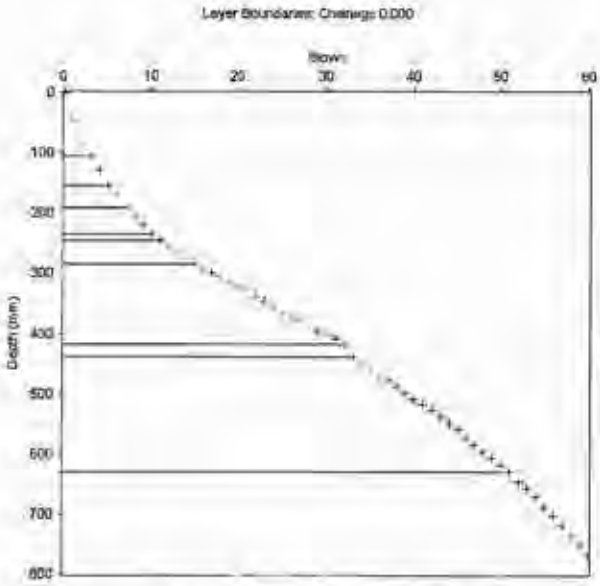
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	135	0.00	26	1	25	500	9.00
2	1	1	181	46.00	27	1	26	504	4.00
3	1	2	216	35.00	28	1	27	514	10.00
4	1	3	242	26.00	29	1	28	521	7.00
5	1	4	263	21.00	30	1	29	530	9.00
6	1	5	289	26.00	31	1	30	536	6.00
7	1	6	303	14.00	32	1	31	544	8.00
8	1	7	326	23.00	33	1	32	552	8.00
9	1	8	341	15.00	34	1	33	574	22.00
10	1	9	355	14.00	35	1	34	584	10.00
11	1	10	369	14.00	36	1	35	594	10.00
12	1	11	380	11.00	37	1	36	604	10.00
13	1	12	390	10.00	38	1	37	613	9.00
14	1	13	400	10.00	39	1	38	624	11.00
15	1	14	409	9.00	40	1	39	633	9.00
16	1	15	419	10.00	41	1	40	644	11.00
17	1	16	427	8.00	42	1	41	653	9.00
18	1	17	434	7.00	43	1	42	663	10.00
19	1	18	441	7.00	44	1	43	674	11.00
20	1	19	450	9.00	45	1	44	683	9.00
21	1	20	458	8.00	46	1	45	694	11.00
22	1	21	460	2.00	47	1	46	708	14.00
23	1	22	473	13.00	48	1	47	719	11.00
24	1	23	481	8.00	49	1	48	731	12.00
25	1	24	491	10.00	50	1	49	742	11.00
51	1	50	754	12.00					
52	1	51	764	10.00					
53	1	52	781	17.00					
54	1	53	791	10.00					
55	1	54	806	15.00					
56	1	55	823	17.00					
57	1	56	838	15.00					
58	1	57	854	16.00					
59	1	58	871	17.00					
60	1	59	886	15.00					
61	1	60	903	17.00					

UK DCP V3.1

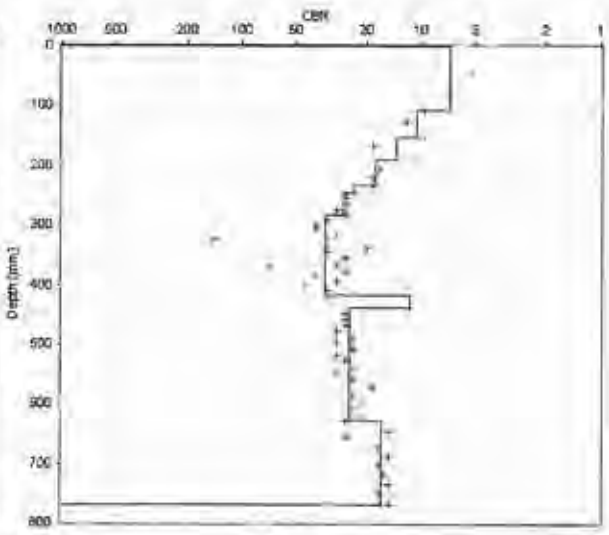
DCP Layer Strength Analysis Report

Project Name: WS340

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	135	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	35.67	7	107	107
2	23.50	11	47	154
3	18.50	14	37	191
4	14.33	18	43	234
5	11.00	24	11	245
6	9.75	27	39	284
7	7.82	34	133	417
8	22.00	12	22	439
9	10.56	25	190	629
10	15.44	17	139	768

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS341

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted

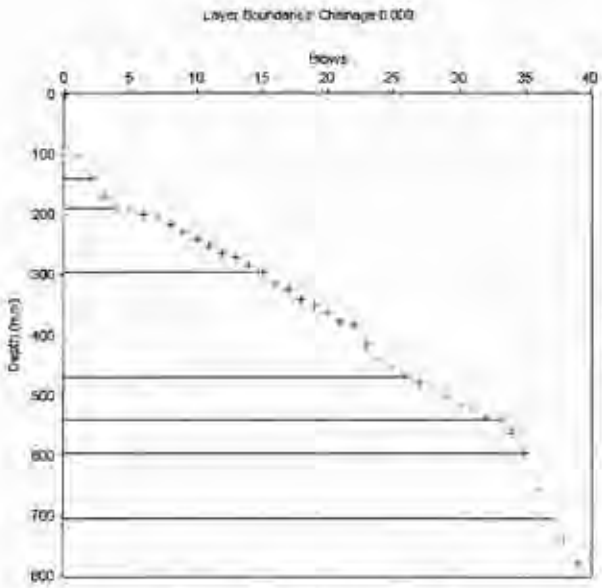
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	131	0.00	26	1	25	585	13.00
2	1	1	232	101.00	27	1	26	600	15.00
3	1	2	270	38.00	28	1	27	610	10.00
4	1	3	301	31.00	29	1	28	622	12.00
5	1	4	320	19.00	30	1	29	636	14.00
6	1	5	322	2.00	31	1	30	646	10.00
7	1	6	330	8.00	32	1	31	652	6.00
8	1	7	335	5.00	33	1	32	667	15.00
9	1	8	347	12.00	34	1	33	672	5.00
10	1	9	360	13.00	35	1	34	694	22.00
11	1	10	371	11.00	36	1	35	728	34.00
12	1	11	383	12.00	37	1	36	787	59.00
13	1	12	395	12.00	38	1	37	836	49.00
14	1	13	402	7.00	39	1	38	872	36.00
15	1	14	415	13.00	40	1	39	910	38.00
16	1	15	426	11.00					
17	1	16	445	19.00					
18	1	17	455	10.00					
19	1	18	471	16.00					
20	1	19	481	10.00					
21	1	20	493	12.00					
22	1	21	509	16.00					
23	1	22	514	5.00					
24	1	23	547	33.00					
25	1	24	572	25.00					

UK DCP V3.1

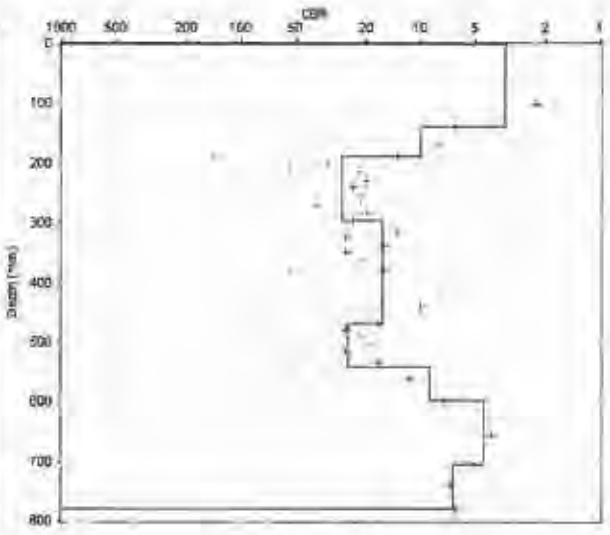
DCP Layer Strength Analysis Report

Project Name: WS341

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	69.50	3	139	139
2	25.00	10	50	189
3	9.64	28	106	295
4	15.82	16	174	469
5	10.29	26	72	541
6	28.00	9	56	597
7	54.00	4	108	705
8	37.00	7	74	779

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS342

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 128
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

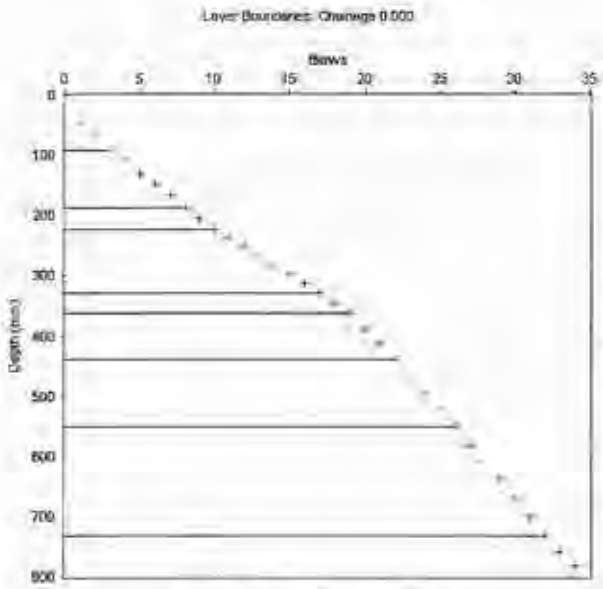
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	128	0.00	26	1	25	650	25.00
2	1	1	175	47.00	27	1	26	676	26.00
3	1	2	191	16.00	28	1	27	709	31.00
4	1	3	220	29.00	29	1	28	736	27.00
5	1	4	237	17.00	30	1	29	764	28.00
6	1	5	259	22.00	31	1	30	797	33.00
7	1	6	276	17.00	32	1	31	828	31.00
8	1	7	295	19.00	33	1	32	859	31.00
9	1	8	314	19.00	34	1	33	886	27.00
10	1	9	331	17.00	35	1	34	910	24.00
11	1	10	350	19.00					
12	1	11	365	15.00					
13	1	12	380	15.00					
14	1	13	394	14.00					
15	1	14	410	16.00					
16	1	15	425	15.00					
17	1	16	440	15.00					
18	1	17	456	16.00					
19	1	18	473	17.00					
20	1	19	489	16.00					
21	1	20	516	27.00					
22	1	21	540	24.00					
23	1	22	567	27.00					
24	1	23	597	30.00					
25	1	24	625	28.00					

UK DCP V3.1

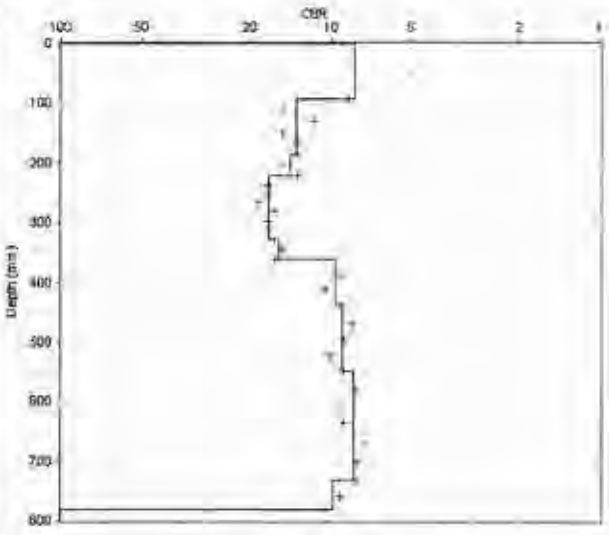
DCP Layer Strength Analysis Report

Project Name: WS342

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	128	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	30.67	8	92	92
2	18.80	14	94	186
3	18.00	14	36	222
4	15.14	17	106	328
5	16.50	16	33	361
6	26.00	10	78	439
7	27.75	9	111	550
8	30.17	8	181	731
9	25.50	10	51	782

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS344

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 102
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

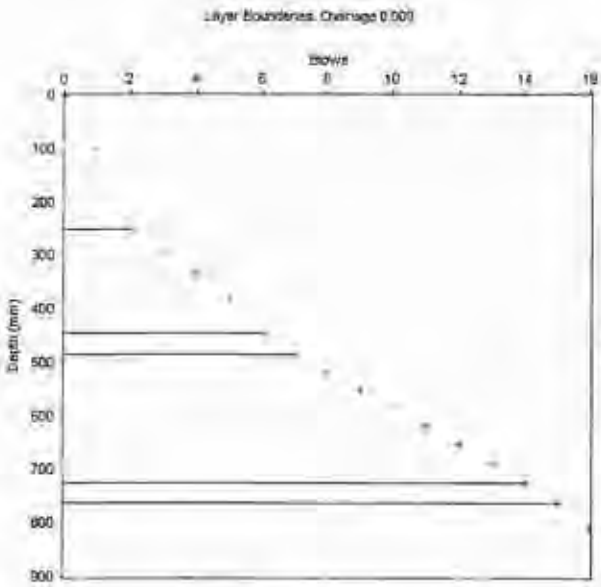
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	102	0.00					
2	1	1	202	100.00					
3	1	2	352	150.00					
4	1	3	395	43.00					
5	1	4	435	40.00					
6	1	5	486	51.00					
7	1	6	546	60.00					
8	1	7	587	41.00					
9	1	8	620	33.00					
10	1	9	652	32.00					
11	1	10	683	31.00					
12	1	11	720	37.00					
13	1	12	755	35.00					
14	1	13	792	37.00					
15	1	14	826	34.00					
16	1	15	864	38.00					
17	1	16	911	47.00					

UK DCP V3.1

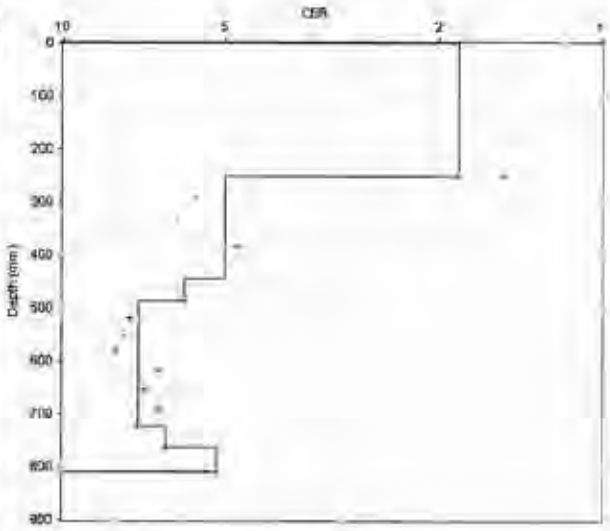
DCP Layer Strength Analysis Report

Project Name: WS344

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	102	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	125.00	2	250	250
2	48.50	5	194	444
3	41.00	6	41	485
4	34.14	7	239	724
5	38.00	6	38	762
6	47.00	5	47	809

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS345

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 02/10/2013

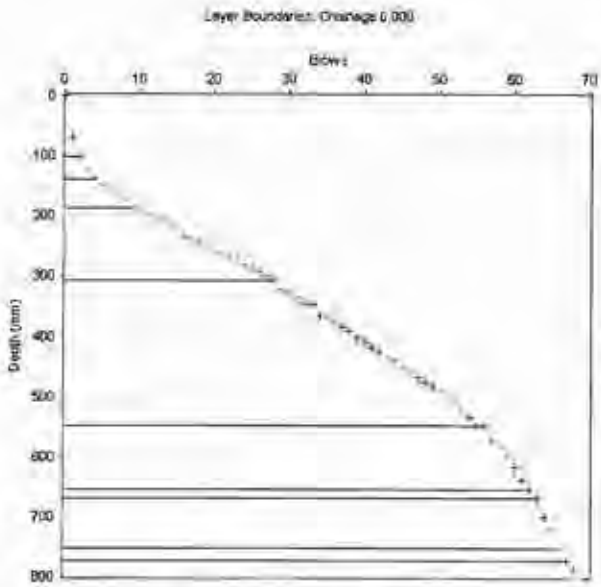
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	1	25	408	7.00
2	1	1	190	69.00	27	1	26	414	6.00
3	1	2	223	33.00	28	1	27	422	8.00
4	1	3	245	22.00	29	1	28	428	6.00
5	1	4	261	16.00	30	1	29	443	15.00
6	1	5	269	8.00	31	1	30	449	6.00
7	1	6	278	9.00	32	1	31	456	7.00
8	1	7	286	8.00	33	1	32	466	10.00
9	1	8	295	9.00	34	1	33	469	3.00
10	1	9	308	13.00	35	1	34	487	18.00
11	1	10	312	4.00	36	1	35	489	2.00
12	1	11	319	7.00	37	1	36	494	5.00
13	1	12	324	5.00	38	1	37	505	11.00
14	1	13	329	5.00	39	1	38	512	7.00
15	1	14	334	5.00	40	1	39	524	12.00
16	1	15	342	8.00	41	1	40	530	6.00
17	1	16	356	14.00	42	1	41	539	9.00
18	1	17	360	4.00	43	1	42	547	8.00
19	1	18	366	6.00	44	1	43	555	8.00
20	1	19	372	6.00	45	1	44	562	7.00
21	1	20	378	6.00	46	1	45	571	9.00
22	1	21	383	5.00	47	1	46	580	9.00
23	1	22	389	6.00	48	1	47	588	8.00
24	1	23	395	6.00	49	1	48	596	8.00
25	1	24	401	6.00	50	1	49	603	7.00
51	1	50	612	9.00					
52	1	51	624	12.00					
53	1	52	633	9.00					
54	1	53	644	11.00					
55	1	54	656	12.00					
56	1	55	669	13.00					
57	1	56	670	1.00					
58	1	57	695	25.00					
59	1	58	705	10.00					
60	1	59	721	16.00					
61	1	60	739	18.00					
62	1	61	758	19.00					
63	1	62	776	18.00					
64	1	63	791	15.00					
65	1	64	822	31.00					
66	1	65	841	19.00					
67	1	66	873	32.00					
68	1	67	894	21.00					
69	1	68	910	16.00					

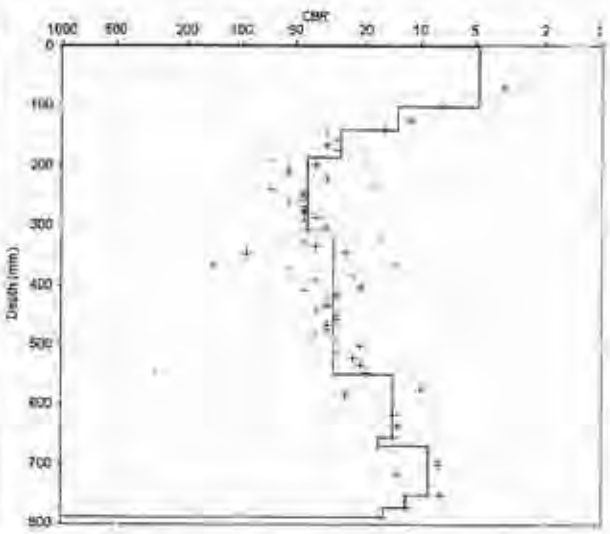
DCP Layer Strength Analysis Report

Project Name: WS345

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	51.00	5	102	102
2	19.00	13	38	140
3	9.40	28	47	187
4	6.32	43	120	307
5	8.64	31	242	549
6	17.67	15	106	655
7	15.00	17	15	670
8	27.33	9	82	752
9	21.00	12	21	773
10	16.00	16	16	789

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS347

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 121
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

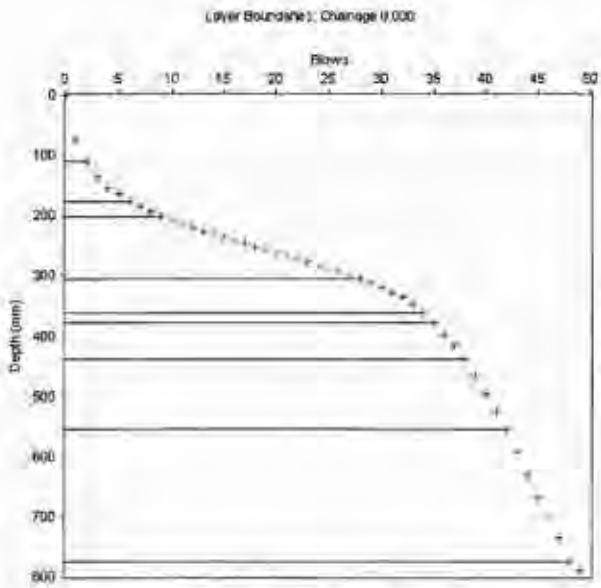
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	121	0.00	26	1	25	409	4.00
2	1	1	195	74.00	27	1	26	415	6.00
3	1	2	232	37.00	28	1	27	420	5.00
4	1	3	256	24.00	29	1	28	426	6.00
5	1	4	274	18.00	30	1	29	433	7.00
6	1	5	286	12.00	31	1	30	440	7.00
7	1	6	298	12.00	32	1	31	450	10.00
8	1	7	306	8.00	33	1	32	456	6.00
9	1	8	315	9.00	34	1	33	467	11.00
10	1	9	323	8.00	35	1	34	482	15.00
11	1	10	329	6.00	36	1	35	500	18.00
12	1	11	336	7.00	37	1	36	520	20.00
13	1	12	342	6.00	38	1	37	537	17.00
14	1	13	347	5.00	39	1	38	559	22.00
15	1	14	352	5.00	40	1	39	587	28.00
16	1	15	356	4.00	41	1	40	617	30.00
17	1	16	362	6.00	42	1	41	646	29.00
18	1	17	367	5.00	43	1	42	676	30.00
19	1	18	373	6.00	44	1	43	714	38.00
20	1	19	378	5.00	45	1	44	752	38.00
21	1	20	383	5.00	46	1	45	791	39.00
22	1	21	388	5.00	47	1	46	823	32.00
23	1	22	392	4.00	48	1	47	856	33.00
24	1	23	398	6.00	49	1	48	896	40.00
25	1	24	405	7.00	50	1	49	910	14.00

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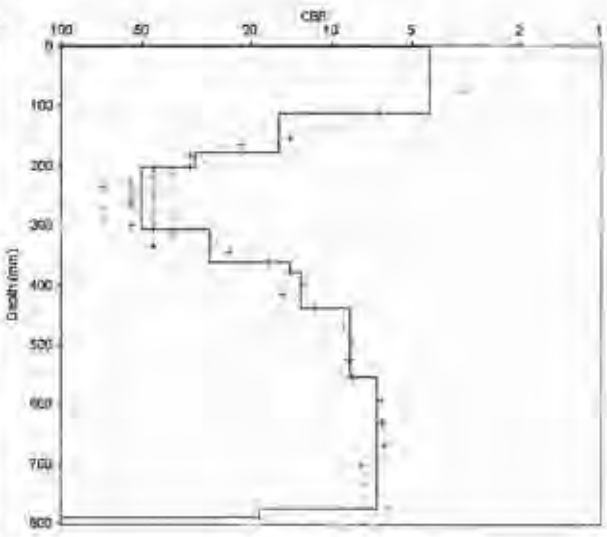
DCP Layer Strength Analysis Report

Project Name: WS347

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	121	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	55.50	4	111	111
2	16.50	16	66	177
3	8.33	32	25	202
4	5.42	51	103	305
5	9.33	28	56	361
6	18.00	14	18	379
7	19.67	13	59	438
8	29.25	9	117	555
9	36.67	7	220	775
10	14.00	19	14	789

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS350

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 119
Test Date: 02/10/2013

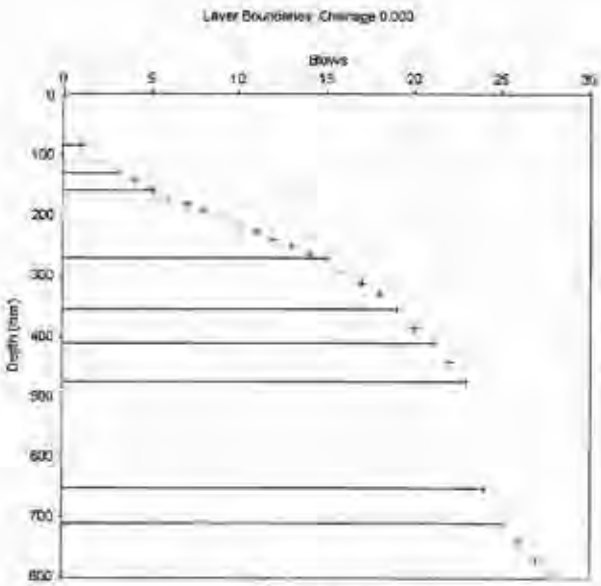
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	119	0.00	26	1	25	829	57.00
2	1	1	202	83.00	27	1	26	859	30.00
3	1	2	229	27.00	28	1	27	890	31.00
4	1	3	247	18.00	29	1	28	915	25.00
5	1	4	261	14.00					
6	1	5	276	15.00					
7	1	6	289	13.00					
8	1	7	300	11.00					
9	1	8	310	10.00					
10	1	9	321	11.00					
11	1	10	333	12.00					
12	1	11	345	12.00					
13	1	12	357	12.00					
14	1	13	370	13.00					
15	1	14	382	12.00					
16	1	15	389	7.00					
17	1	16	411	22.00					
18	1	17	430	19.00					
19	1	18	450	20.00					
20	1	19	475	25.00					
21	1	20	506	31.00					
22	1	21	531	25.00					
23	1	22	562	31.00					
24	1	23	594	32.00					
25	1	24	772	178.00					

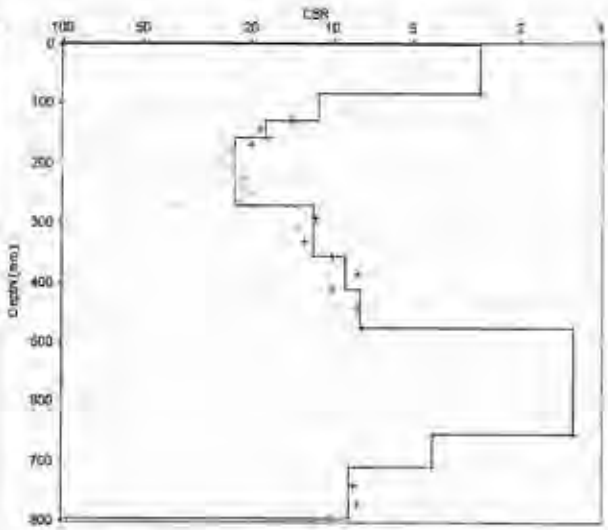
DCP Layer Strength Analysis Report

Project Name: WS350

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	119	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	83.00	3	83	83
2	22.50	11	45	128
3	14.50	18	29	157
4	11.30	23	113	270
5	21.50	12	86	356
6	28.00	9	56	412
7	31.50	8	63	475
8	178.00	1	178	653
9	57.00	4	57	710
10	28.67	9	86	796

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS352

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 126
Test Date: 02/10/2013

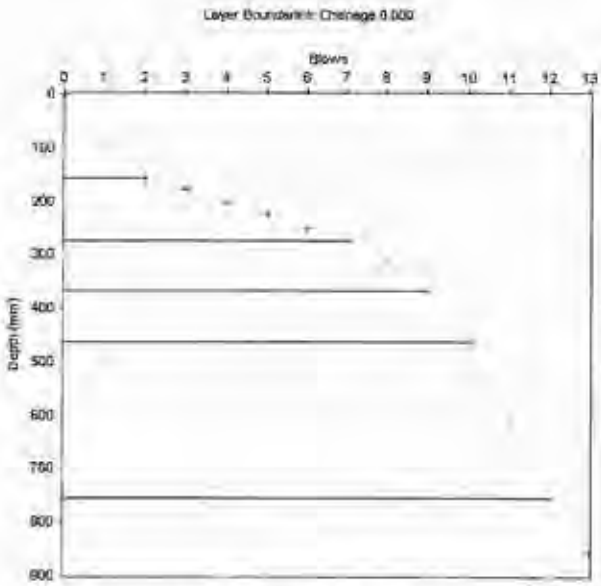
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	126	0.00					
2	1	1	222	96.00					
3	1	2	283	61.00					
4	1	3	304	21.00					
5	1	4	330	26.00					
6	1	5	350	20.00					
7	1	6	375	25.00					
8	1	7	400	25.00					
9	1	8	435	35.00					
10	1	9	493	58.00					
11	1	10	590	97.00					
12	1	11	732	142.00					
13	1	12	880	148.00					
14	1	13	985	105.00					

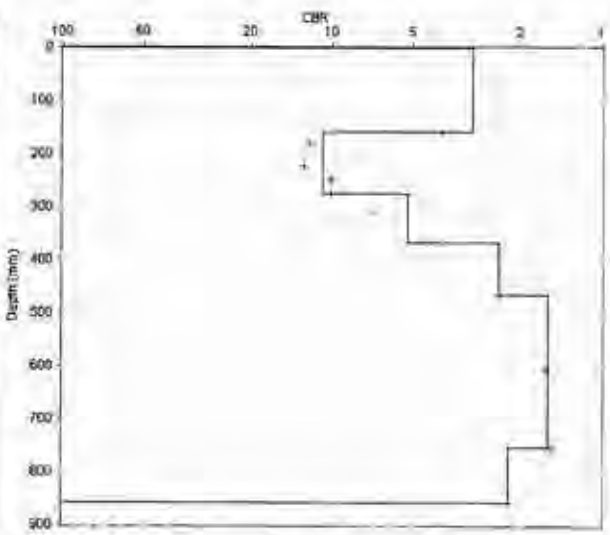
DCP Layer Strength Analysis Report

Project Name: WS352

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	78.50	3	157	157
2	23.40	11	117	274
3	46.50	5	93	367
4	97.00	2	97	464
5	145.00	2	290	754
6	105.00	2	105	859

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS353

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 126
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

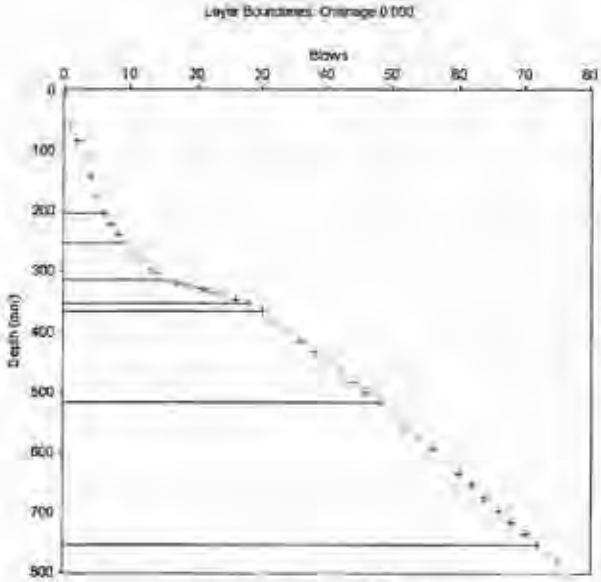
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	126	0.00	26	2	26	472	3.50
2	1	1	185	59.00	27	2	28	480	4.00
3	1	2	210	25.00	28	2	30	492	6.00
4	1	3	236	26.00	29	2	32	510	9.00
5	1	4	267	31.00	30	2	34	525	7.50
6	1	5	301	34.00	31	2	36	541	8.00
7	1	6	330	29.00	32	2	38	560	9.50
8	1	7	348	18.00	33	2	40	571	5.50
9	1	8	365	17.00	34	2	42	592	10.50
10	1	9	379	14.00	35	2	44	610	9.00
11	1	10	390	11.00	36	2	46	626	8.00
12	1	11	400	10.00	37	2	48	643	8.50
13	1	12	411	11.00	38	2	50	662	9.50
14	1	13	423	12.00	39	2	52	684	11.00
15	1	14	430	7.00	40	2	54	702	9.00
16	1	15	439	9.00	41	2	56	721	9.50
17	1	16	442	3.00	42	2	58	740	9.50
18	1	17	445	3.00	43	2	60	761	10.50
19	1	18	447	2.00	44	2	62	781	10.00
20	1	19	450	3.00	45	2	64	802	10.50
21	1	20	454	4.00	46	2	66	825	11.50
22	1	21	456	2.00	47	2	68	843	9.00
23	1	22	460	4.00	48	2	70	861	9.00
24	1	23	461	1.00	49	2	72	880	9.50
25	1	24	465	4.00	50	2	74	896	8.00
51	1	75	906	10.00					

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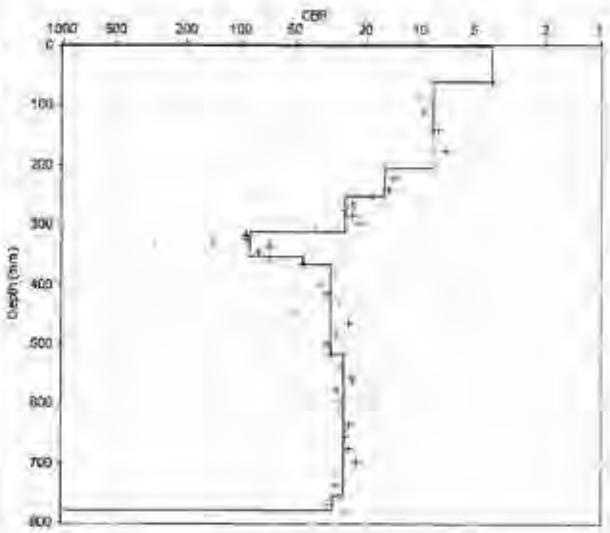
DCP Layer Strength Analysis Report

Project Name: WS353

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	126	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	59.00	4	59	59
2	29.00	9	145	204
3	16.33	16	49	253
4	10.00	26	60	313
5	3.15	90	41	354
6	6.00	45	12	366
7	8.39	32	151	517
8	9.88	27	237	754
9	8.67	31	26	780

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS355

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 124
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

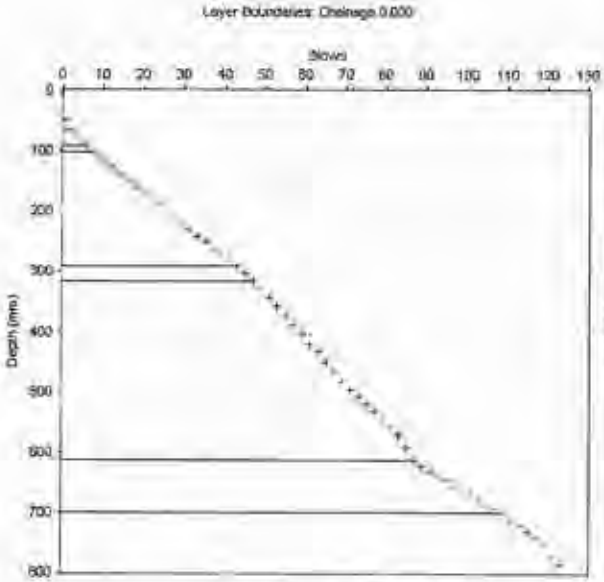
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00	26	2	29	345	6.00
2	1	1	172	48.00	27	2	31	355	5.00
3	1	2	188	16.00	28	2	33	365	5.00
4	1	3	194	6.00	29	2	35	374	4.50
5	1	4	203	9.00	30	2	37	386	6.00
6	1	5	211	8.00	31	2	39	393	3.50
7	1	6	216	5.00	32	2	41	404	5.50
8	1	7	225	9.00	33	2	43	415	5.50
9	1	8	230	5.00	34	2	45	427	6.00
10	1	9	236	6.00	35	2	47	439	6.00
11	1	10	240	4.00	36	2	49	453	7.00
12	1	11	246	6.00	37	2	51	467	7.00
13	1	12	250	4.00	38	2	53	482	7.50
14	1	13	256	6.00	39	2	55	497	7.50
15	1	14	261	5.00	40	2	57	513	8.00
16	1	15	266	5.00	41	2	59	527	7.00
17	1	16	271	5.00	42	2	61	543	8.00
18	1	17	276	5.00	43	2	63	557	7.00
19	1	18	283	7.00	44	2	65	575	9.00
20	1	19	287	4.00	45	2	67	590	7.50
21	1	20	293	6.00	46	2	69	606	8.00
22	1	21	298	5.00	47	2	71	620	7.00
23	2	23	310	6.00	48	2	73	631	5.50
24	2	25	323	6.50	49	2	75	644	6.50
25	2	27	333	5.00	50	2	77	655	5.50
51	2	79	688	6.50					
52	2	81	680	6.00					
53	2	83	695	7.50					
54	2	85	717	11.00					
55	2	87	738	10.50					
56	2	89	747	4.50					
57	2	91	756	4.50					
58	2	93	763	3.50					
59	2	95	770	3.50					
60	2	97	780	5.00					
61	2	99	787	3.50					
62	2	101	795	4.00					
63	2	103	803	4.00					
64	2	105	811	4.00					
65	2	107	818	3.50					
66	2	109	825	3.50					
67	2	111	836	5.50					
68	2	113	846	5.00					
69	2	115	856	5.00					
70	2	117	866	5.00					
71	2	119	876	5.00					
72	2	121	897	10.50					
73	2	123	910	6.50					

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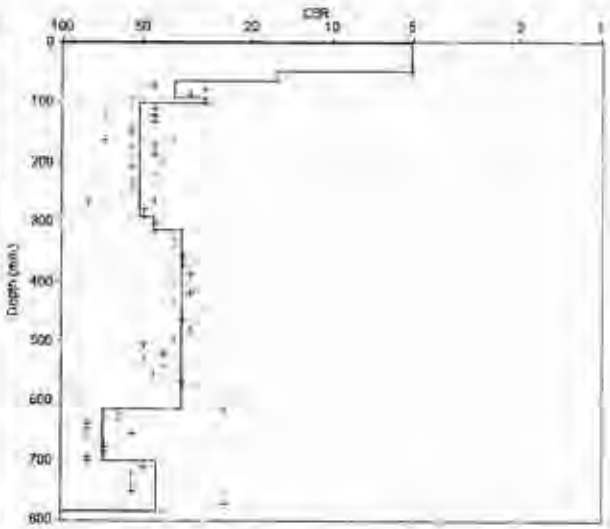
DCP Layer Strength Analysis Report

Project Name: WS355

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	48.00	5	48	48
2	16.00	16	16	64
3	7.00	39	28	92
4	9.00	30	9	101
5	5.28	52	190	291
6	6.00	45	24	315
7	7.48	36	299	614
8	3.95	71	87	701
9	6.07	45	85	786

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS356

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 127
Test Date: 25/09/2013

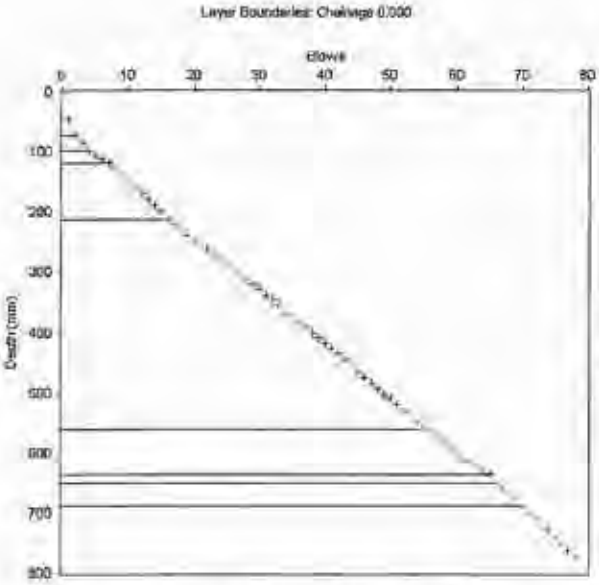
Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	127	0.00	26	1	25	412	9.00
2	1	1	173	46.00	27	1	26	419	7.00
3	1	2	200	27.00	28	1	27	429	10.00
4	1	3	213	13.00	29	1	28	439	10.00
5	1	4	225	12.00	30	1	29	446	7.00
6	1	5	232	7.00	31	1	30	455	9.00
7	1	6	239	7.00	32	1	31	465	10.00
8	1	7	245	6.00	33	1	32	472	7.00
9	1	8	255	10.00	34	1	33	482	10.00
10	1	9	264	9.00	35	1	34	496	14.00
11	1	10	272	8.00	36	1	35	500	4.00
12	1	11	285	13.00	37	1	36	509	9.00
13	1	12	296	11.00	38	1	37	518	9.00
14	1	13	306	10.00	39	1	38	528	10.00
15	1	14	317	11.00	40	1	39	537	9.00
16	1	15	327	10.00	41	1	40	544	7.00
17	1	16	339	12.00	42	1	41	553	9.00
18	1	17	347	8.00	43	1	42	562	9.00
19	1	18	356	9.00	44	1	43	572	10.00
20	1	19	365	9.00	45	1	44	582	10.00
21	1	20	374	9.00	46	1	45	592	10.00
22	1	21	382	8.00	47	1	46	602	10.00
23	1	22	389	7.00	48	1	47	612	10.00
24	1	23	396	7.00	49	1	48	620	8.00
25	1	24	403	7.00	50	1	49	629	9.00
51	1	50	637	8.00	76	1	75	869	12.00
52	1	51	647	10.00	77	1	76	879	10.00
53	1	52	654	7.00	78	1	77	890	11.00
54	1	53	662	8.00	79	1	78	900	10.00
55	1	54	673	11.00					
56	1	55	688	15.00					
57	1	56	692	4.00					
58	1	57	700	8.00					
59	1	58	709	9.00					
60	1	59	717	8.00					
61	1	60	727	10.00					
62	1	61	737	10.00					
63	1	62	740	3.00					
64	1	63	749	9.00					
65	1	64	755	6.00					
66	1	65	763	8.00					
67	1	66	778	15.00					
68	1	67	786	8.00					
69	1	68	795	9.00					
70	1	69	805	10.00					
71	1	70	814	9.00					
72	1	71	825	11.00					
73	1	72	835	10.00					
74	1	73	846	11.00					
75	1	74	857	11.00					

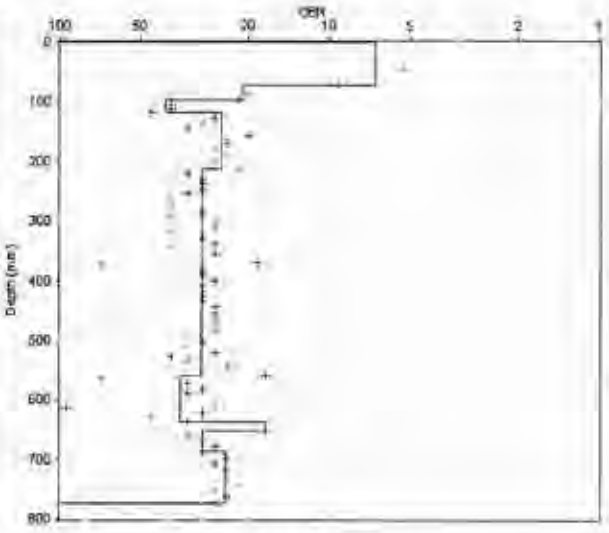
DCP Layer Strength Analysis Report

Project Name: WS356

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	127	Surface Moisture:	Moderate
Test Date:	25/09/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	36.50	7	73	73
2	12.50	21	25	98
3	6.67	41	20	118
4	10.44	25	94	212
5	8.95	30	349	561
6	7.50	36	75	636
7	15.00	17	15	651
8	9.00	30	36	687
9	10.75	25	86	773

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS358

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 124
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

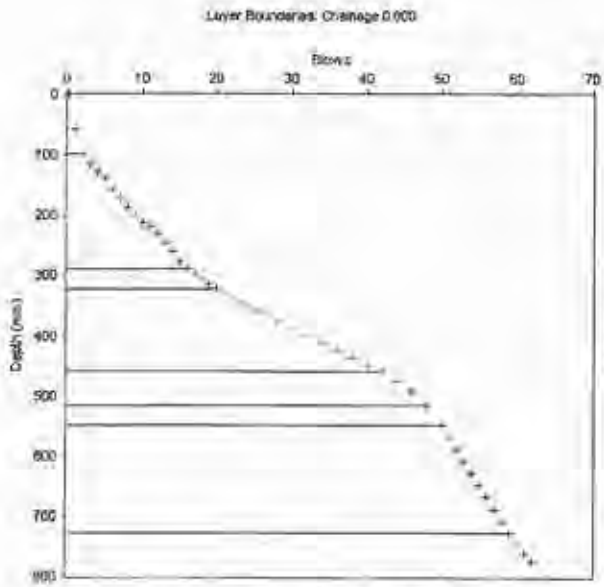
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	124	0.00	26	1	25	481	6.00
2	1	1	180	56.00	27	1	26	485	4.00
3	1	2	221	41.00	28	1	27	490	5.00
4	1	3	238	17.00	29	1	28	501	11.00
5	1	4	251	13.00	30	2	30	512	5.50
6	1	5	262	11.00	31	2	32	526	7.00
7	1	6	281	19.00	32	2	34	535	4.50
8	1	7	295	14.00	33	2	36	548	6.50
9	1	8	310	15.00	34	2	38	560	6.00
10	1	9	323	13.00	35	2	40	572	6.00
11	1	10	336	13.00	36	2	42	584	6.00
12	1	11	342	6.00	37	2	44	600	8.00
13	1	12	354	12.00	38	2	46	617	8.50
14	1	13	370	16.00	39	2	48	640	11.50
15	1	14	384	14.00	40	2	50	672	16.00
16	1	15	401	17.00	41	1	51	693	21.00
17	1	16	413	12.00	42	1	52	712	19.00
18	1	17	421	8.00	43	1	53	732	20.00
19	1	18	430	9.00	44	1	54	752	20.00
20	1	19	438	8.00	45	1	55	773	21.00
21	1	20	447	9.00	46	1	56	792	19.00
22	1	21	453	6.00	47	1	57	812	20.00
23	1	22	460	7.00	48	1	58	833	21.00
24	1	23	468	8.00	49	1	59	852	19.00
25	1	24	475	7.00	50	1	60	870	18.00
51	1	61	885	15.00					
52	1	62	900	15.00					

UK DCP V3.1

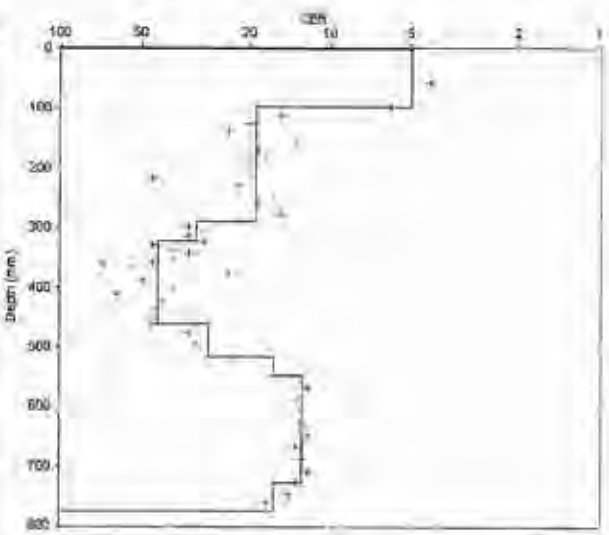
DCP Layer Strength Analysis Report

Project Name: WS358

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	124	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	48.50	5	97	97
2	13.71	19	192	289
3	8.50	31	34	323
4	6.23	44	137	460
5	9.33	28	56	516
6	16.00	16	32	548
7	20.00	13	180	728
8	16.00	16	48	776

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS361

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 131
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

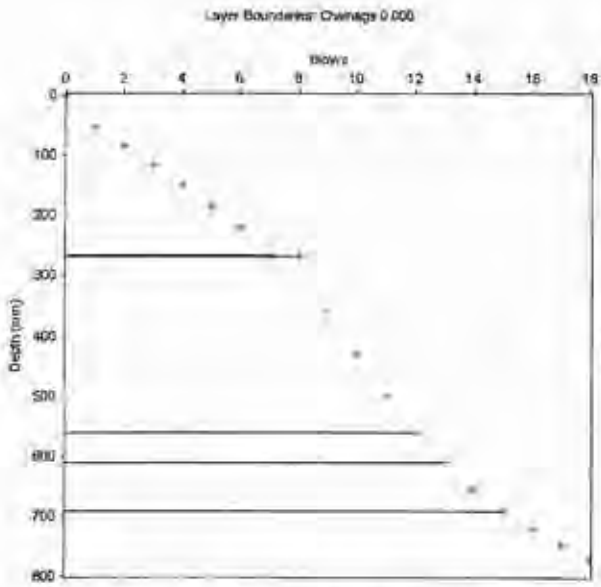
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	131	0.00					
2	1	1	185	54.00					
3	1	2	216	31.00					
4	1	3	247	31.00					
5	1	4	281	34.00					
6	1	5	315	34.00					
7	1	6	352	37.00					
8	1	7	396	44.00					
9	1	8	400	4.00					
10	1	9	490	90.00					
11	1	10	562	72.00					
12	1	11	632	70.00					
13	1	12	693	61.00					
14	1	13	742	49.00					
15	1	14	786	44.00					
16	1	15	822	36.00					
17	1	16	853	31.00					
18	1	17	880	27.00					
19	1	18	905	25.00					

UK DCP V3.1

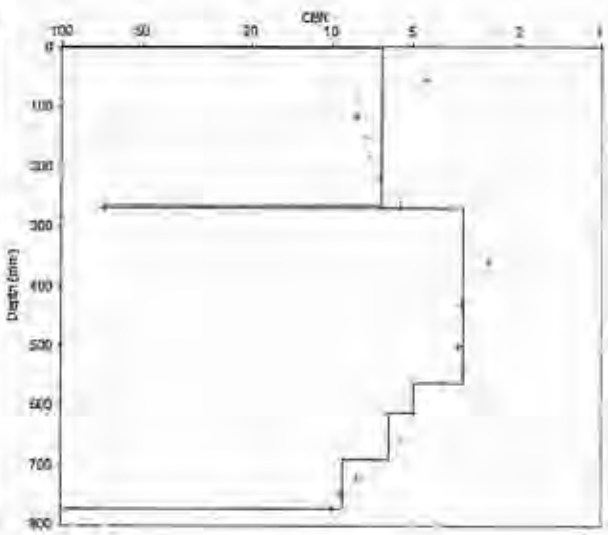
DCP Layer Strength Analysis Report

Project Name: WS361

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	131	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	37.86	6	265	265
2	4.00	70	4	269
3	73.25	3	293	562
4	49.00	5	49	611
5	40.00	6	80	691
6	27.67	9	83	774

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Penetration Data Report

Project Name: WS364

Chainage (km): 0.000
Direction:
Location/Offset: Carriageway
Cone Angle: 60 degrees
Zero Error (mm): 111
Test Date: 02/10/2013

Surface Type: Unpaved
Thickness (mm): 0
Base Type:
Thickness (mm):
Surface Moisture: Moderate
Moisture adjustment factor: Not adjusted

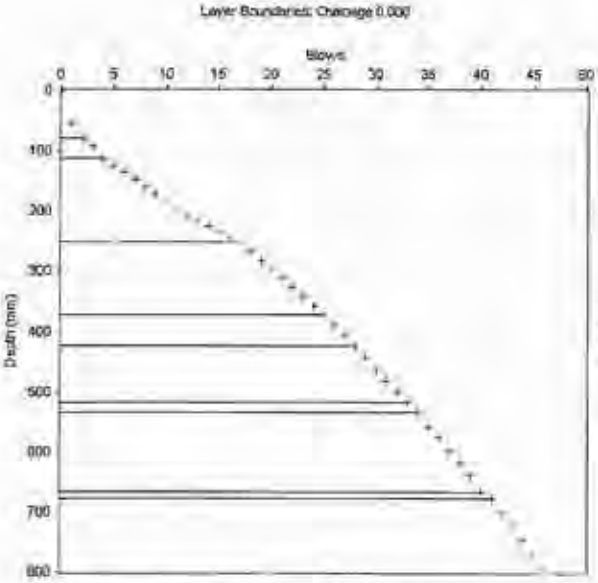
No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)	No.	Blows	Cumulative Blows	Penetration Depth (mm)	Penetration Rate (mm/blow)
1	0	0	111	0.00	26	1	25	483	14.00
2	1	1	165	54.00	27	1	26	500	17.00
3	1	2	190	25.00	28	1	27	517	17.00
4	1	3	202	12.00	29	1	28	534	17.00
5	1	4	223	21.00	30	1	29	554	20.00
6	1	5	235	12.00	31	1	30	574	20.00
7	1	6	247	12.00	32	1	31	593	19.00
8	1	7	258	11.00	33	1	32	611	18.00
9	1	8	272	14.00	34	1	33	629	18.00
10	1	9	283	11.00	35	1	34	644	15.00
11	1	10	296	13.00	36	1	35	669	25.00
12	1	11	310	14.00	37	1	36	686	17.00
13	1	12	319	9.00	38	1	37	709	23.00
14	1	13	328	9.00	39	1	38	729	20.00
15	1	14	336	8.00	40	1	39	748	19.00
16	1	15	345	9.00	41	1	40	779	31.00
17	1	16	357	12.00	42	1	41	789	10.00
18	1	17	362	5.00	43	1	42	812	23.00
19	1	18	378	16.00	44	1	43	832	20.00
20	1	19	393	15.00	45	1	44	856	24.00
21	1	20	406	13.00	46	1	45	881	25.00
22	1	21	421	15.00	47	1	46	904	23.00
23	1	22	437	16.00					
24	1	23	452	15.00					
25	1	24	469	17.00					

UK DCP V3.1

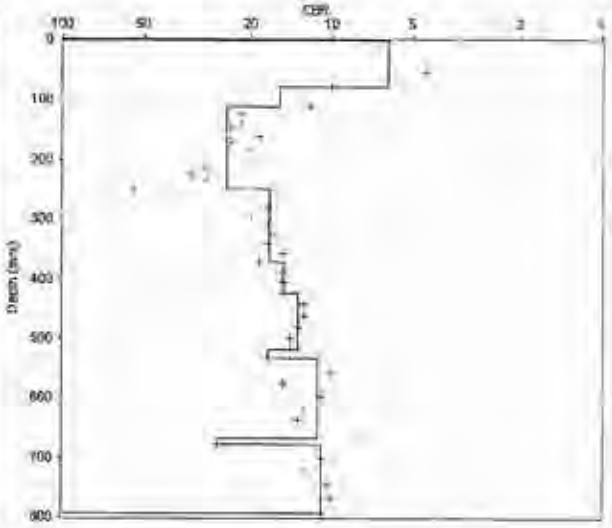
DCP Layer Strength Analysis Report

Project Name: WS364

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	111	Surface Moisture:	Moderate
Test Date:	02/10/2013	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	39.50	6	79	79
2	16.50	16	33	112
3	10.69	25	139	251
4	15.13	17	121	372
5	17.00	15	51	423
6	19.00	13	95	518
7	15.00	17	15	533
8	22.50	11	135	668
9	10.00	26	10	678
10	23.00	11	115	793

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

APPENDIX D

BRE Soakage Testing Results

Geo-Environmental Services Ltd
28 Crescent Road, Brighton, BN2 3RP
www.gesl.net
Tel: 01273 699 399

Boorley Green		Revision	
	Job No:	**GE9523**	Page:
Section: **TP101 Deep**	Prepared By:	**AB**	Date: **11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	18.57	14.90	10.86
	ring soakaways		
diameter of ring *[mm]* :	2100	2400	2700
required pit side length *[m]* :	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	8.81	m^3
provided storage volume 'V_{prov}' =	21.20	m^3
utilisation factor =	**0.42**	***.OK***
required time to discharge 50% 't_{50}' =	90.79	*hours*
utilisation factor =	**3.78**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**3.50**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**3000**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	7.82
storage volume between 75-25% 'V_p' [m^3] =	1.37
time for water to fall from 75-25% 't_p' [min] =	1440.00
soil infiltration rate 'f' [m/s] =	1.85E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.35**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.67**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.33
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.01	1.71
10	0.51	10.13	1.22	12.37	2.47							0.02	2.45
15	0.62	12.33	1.23	15.16	3.03							0.03	3.00
30	0.79	15.73	1.24	19.51	3.90							0.06	3.84
60	1.00	20.00	1.24	24.80	4.96							0.12	4.84
120	1.22	24.47	1.24	30.34	6.07							0.23	5.83
240	1.50	29.93	1.22	36.53	7.31							0.47	6.84
360	1.69	33.80	1.21	40.85	8.17							0.70	7.47
600	1.95	38.93	1.19	46.46	9.29							1.17	8.12
1440	2.48	49.60	1.17	58.07	11.61							2.80	**8.81**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**1592**	**2782**													
	depth to water *[m]* =	**0.67**	**0.67**	**0.67**	**0.67**	**1.44**	**2.17**													
Soakage Trial 2	time *[min]* =																			
	depth to water *[m]* =																			
Soakage Trial 3	time *[min]* =																			
	depth to water *[m]* =																			

Spreadsheet provided by: ***www.YourSpreadsheets.co.uk***

calculations are based on **BRE Guidelines (Digest 365)**

Geo-Environmental Services Ltd
28 Crescent Road, Brighton, BN2 3RP
www.gesl.net
Tel: 01273 699 399

Boorley Green		Revision	
Job No:	**GE9523**	Page:	
Section: **TP101 Shallow**	Prepared By:	**AB**	Date: **11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	#DIV/0!	#DIV/0!	#DIV/0!
	ring soakaways		
diameter of ring *[mm]* :	1350	1800	2100
required pit side length *[m]* :	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	#DIV/0!	*min*
required storage volume 'V_{req}' =	#DIV/0!	m^3
provided storage volume 'V_{prov}' =	3.85	m^3
utilisation factor =	**#DIV/0!**	***#DIV/0!***
required time to discharge 50% 't_{50}' =	#DIV/0!	*hours*
utilisation factor =	**#DIV/0!**	***#DIV/0!***

#DIV/0!

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1500**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.30**
soakaway effective depth 'D_{eff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.15
storage volume between 75-25% 'V_p' [m^3] =	0.24
time for water to fall from 75-25% 't_p' [min] =	#DIV/0!
soil infiltration rate 'f' [m/s] =	#DIV/0!

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**1.92**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.51**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.49
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							#DIV/0!	#DIV/0!
10	0.51	10.13	1.22	12.37	1.24							#DIV/0!	#DIV/0!
15	0.62	12.33	1.23	15.16	1.52							#DIV/0!	#DIV/0!
30	0.79	15.73	1.24	19.51	1.95							#DIV/0!	#DIV/0!
60	1.00	20.00	1.24	24.80	2.48							#DIV/0!	#DIV/0!
120	1.22	24.47	1.24	30.34	3.03							#DIV/0!	#DIV/0!
240	1.50	29.93	1.22	36.53	3.65							#DIV/0!	#DIV/0!
360	1.69	33.80	1.21	40.85	4.09							#DIV/0!	#DIV/0!
600	1.95	38.93	1.19	46.46	4.65							#DIV/0!	#DIV/0!
1440	2.48	49.60	1.17	58.07	5.81							#DIV/0!	#DIV/0!

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**1592**	**2780**										
	depth to water *[m]* =	**0.51**	**0.51**	**0.51**	**0.51**	**0.51**	**0.51**	**0.51**	**0.53**	**0.55**										
Soakage Trial 2	time *[min]* =																			
	depth to water *[m]* =																			
Soakage Trial 3	time *[min]* =																			
	depth to water *[m]* =																			

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calculations are based on **BRE Guidelines (Digest 365)**

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Section: **TP102 Deep**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	19.67	15.83	11.43
	ring soakaways		
diameter of ring *[mm]* :	1500	2100	2400
required pit side length *[m]* :	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	10.28	m^3
provided storage volume 'V_{prov}' =	7.54	m^3
utilisation factor =	**1.36**	***.NOT OK***
required time to discharge 50% 't_{50}' =	68.08	*hours*
utilisation factor =	**2.84**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.10**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1800**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	7.73
storage volume between 75-25% 'V_p' [m^3] =	1.35
time for water to fall from 75-25% 't_p' [min] =	1440.00
soil infiltration rate 'f' [m/s] =	1.47E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.30**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.65**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.35
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.00	1.71
10	0.51	10.13	1.22	12.37	2.47							0.01	2.46
15	0.62	12.33	1.23	15.16	3.03							0.01	3.02
30	0.79	15.73	1.24	19.51	3.90							0.03	3.87
60	1.00	20.00	1.24	24.80	4.96							0.06	4.90
120	1.22	24.47	1.24	30.34	6.07							0.11	5.96
240	1.50	29.93	1.22	36.53	7.31							0.22	7.08
360	1.69	33.80	1.21	40.85	8.17							0.33	7.84
600	1.95	38.93	1.19	46.46	9.29							0.55	8.74
1440	2.48	49.60	1.17	58.07	11.61							1.33	**10.28**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**1586**	**2614**	**4400**												
	depth to water *[m]* =	**0.65**	**0.65**	**0.65**	**0.65**	**0.90**	**1.32**	**1.92**												
Soakage Trial 2	time *[min]* =																			
	depth to water *[m]* =																			
Soakage Trial 3	time *[min]* =																			
	depth to water *[m]* =																			

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	25.86	21.08	15.60
	ring soakaways		
diameter of ring *[mm]* :	1350	1800	2100
required pit side length *[m]* :	2.32	1.84	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	3.59	m^3
provided storage volume 'V_{prov}' =	3.85	m^3
utilisation factor =	**0.93**	***.OK***
required time to discharge 50% 't_{50}' =	18.22	*hours*
utilisation factor =	**0.76**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1500**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.30**
soakaway effective depth 'D_{eff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.21
storage volume between 75-25% 'V_p' [m^3] =	0.25
time for water to fall from 75-25% 't_p' [min] =	411.20
soil infiltration rate 'f' [m/s] =	4.56E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**1.91**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.48**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.52
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.01	0.85
10	0.51	10.13	1.22	12.37	1.24							0.02	1.22
15	0.62	12.33	1.23	15.16	1.52							0.03	1.49
30	0.79	15.73	1.24	19.51	1.95							0.05	1.90
60	1.00	20.00	1.24	24.80	2.48							0.11	2.37
120	1.22	24.47	1.24	30.34	3.03							0.21	2.82
240	1.50	29.93	1.22	36.53	3.65							0.42	3.23
360	1.69	33.80	1.21	40.85	4.09							0.63	3.45
600	1.95	38.93	1.19	46.46	4.65							1.06	**3.59**
1440	2.48	49.60	1.17	58.07	5.81							2.54	3.27

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**1586**	**2614**										
	depth to water *[m]* =	**0.48**	**0.48**	**0.48**	**0.48**	**0.48**	**0.48**	**0.48**	**0.52**	**0.67**										
Soakage Trial 2	time *[min]* =																			
	depth to water *[m]* =																			
Soakage Trial 3	time *[min]* =																			
	depth to water *[m]* =																			

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Section: **TP103 Deep**	Prepared By:	**AB**	Date: **11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	13.53	10.80	7.99
	ring soakaways		
diameter of ring *[mm]*:	2100	2700	3000
required pit side length *[m]*:	2.95	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	7.36	m^3
provided storage volume 'V_{prov}' =	8.63	m^3
utilisation factor =	**0.85**	***.OK***
required time to discharge 50% 't_{50}' =	22.31	*hours*
utilisation factor =	**0.93**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**3.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**2400**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	7.75
storage volume between 75-25% 'V_p' [m^3] =	1.35
time for water to fall from 75-25% 't_p' [min] =	357.57
soil infiltration rate 'f' [m/s] =	5.97E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.00**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.30**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.70
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.02	1.70
10	0.51	10.13	1.22	12.37	2.47							0.03	2.44
15	0.62	12.33	1.23	15.16	3.03							0.05	2.98
30	0.79	15.73	1.24	19.51	3.90							0.10	3.81
60	1.00	20.00	1.24	24.80	4.96							0.19	4.77
120	1.22	24.47	1.24	30.34	6.07							0.39	5.68
240	1.50	29.93	1.22	36.53	7.31							0.77	6.53
360	1.69	33.80	1.21	40.85	8.17							1.16	7.01
600	1.95	38.93	1.19	46.46	9.29							1.93	**7.36**
1440	2.48	49.60	1.17	58.07	11.61							4.64	6.98

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**4**	**5**	**6**	**7**	**8**	**50**	**141**	**192**	**1393**									
	depth to water *[m]* =	**0.37**	**0.39**	**0.39**	**0.39**	**0.40**	**0.40**	**0.49**	**0.59**	**0.63**	**1.21**									
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**151**	**292**	**1356**													
	depth to water *[m]* =	**0.30**	**0.31**	**0.32**	**0.47**	**0.57**	**1.18**													
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**33**	**128**	**275**	**1290**												
	depth to water *[m]* =	**0.35**	**0.35**	**0.36**	**0.39**	**0.46**	**0.55**	**1.25**												

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	25.87	21.01	15.35
	ring soakaways		
diameter of ring *[mm]*:	2100	2400	2700
required pit side length *[m]*:	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	3.34	m^3
provided storage volume 'V_{prov}' =	15.37	m^3
utilisation factor =	**0.22**	***.OK***
required time to discharge 50% 't_{50}' =	58.72	*hours*
utilisation factor =	**2.45**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**4.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**3000**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.48
storage volume between 75-25% 'V_p' [m^3] =	0.32
time for water to fall from 75-25% 't_p' [min] =	505.50
soil infiltration rate 'f' [m/s] =	2.84E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**1.60**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.20**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.01	0.85
10	0.51	10.13	1.22	12.37	1.24							0.02	1.22
15	0.62	12.33	1.23	15.16	1.52							0.03	1.48
30	0.79	15.73	1.24	19.51	1.95							0.07	1.89
60	1.00	20.00	1.24	24.80	2.48							0.13	2.35
120	1.22	24.47	1.24	30.34	3.03							0.26	2.77
240	1.50	29.93	1.22	36.53	3.65							0.52	3.13
360	1.69	33.80	1.21	40.85	4.09							0.79	3.30
600	1.95	38.93	1.19	46.46	4.65							1.31	**3.34**
1440	2.48	49.60	1.17	58.07	5.81							3.14	2.67

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**5**	**10**	**141**	**200**	**1375**													
	depth to water *[m]* =	**0.19**	**0.21**	**0.21**	**0.34**	**0.35**	**0.46**													
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**150**	**280**	**1362**													
	depth to water *[m]* =	**0.22**	**0.22**	**0.23**	**0.33**	**0.37**	**0.47**													
Soakage Trial 3	time *[min]* =	**0**	**11**	**30**	**126**	**262**	**1273**													
	depth to water *[m]* =	**0.20**	**0.23**	**0.24**	**0.30**	**0.35**	**0.45**													

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calculations are based on **BRE Guidelines (Digest 365)**

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	10.50	8.43	6.25
	ring soakaways		
diameter of ring *[mm]*:	1500	2100	2400
required pit side length *[m]*:	1.83	1.04	15.93

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	240	*min*
required storage volume 'V_{req}' =	5.13	m^3
provided storage volume 'V_{prov}' =	7.54	m^3
utilisation factor =	**0.68**	***.OK***
required time to discharge 50% 't_{50}' =	6.94	*hours*
utilisation factor =	**0.29**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.10**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1800**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	7.87
storage volume between 75-25% 'V_p' [m^3] =	1.38
time for water to fall from 75-25% 't_p' [min] =	180.70
soil infiltration rate 'f' [m/s] =	1.44E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.30**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.60**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.40
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.05	1.67
10	0.51	10.13	1.22	12.37	2.47							0.09	2.38
15	0.62	12.33	1.23	15.16	3.03							0.14	2.90
30	0.79	15.73	1.24	19.51	3.90							0.27	3.63
60	1.00	20.00	1.24	24.80	4.96							0.54	4.42
120	1.22	24.47	1.24	30.34	6.07							1.09	4.98
240	1.50	29.93	1.22	36.53	7.31							2.17	**5.13**
360	1.69	33.80	1.21	40.85	8.17							3.26	4.91
600	1.95	38.93	1.19	46.46	9.29							5.44	3.85
1440	2.48	49.60	1.17	58.07	11.61							13.05	0.00

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**10**	**15**	**20**	**120**	**220**													
	depth to water *[m]* =	**0.63**	**1.08**	**1.16**	**1.28**	**1.92**	**2.42**													
Soakage Trial 2	time *[min]* =	**0**	**10**	**128**	**265**															
	depth to water *[m]* =	**0.70**	**1.05**	**1.87**	**2.55**															
Soakage Trial 3	time *[min]* =	**0**	**10**	**124**	**215**															
	depth to water *[m]* =	**0.77**	**1.07**	**1.68**	**2.26**															

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calculations are based on **BRE Guidelines (Digest 365)**

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Job No:	**GE9523**	Page:	
Section: **TP104 Shallow**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	23.82	19.05	14.18
	ring soakaways		
diameter of ring *[mm]* :	1350	1800	2100
required pit side length *[m]* :	2.15	1.68	6.10

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	360	*min*
required storage volume 'V_{req}' =	3.20	m^3
provided storage volume 'V_{prov}' =	3.85	m^3
utilisation factor =	**0.83**	***.OK***
required time to discharge 50% 't_{50}' =	12.98	*hours*
utilisation factor =	**0.54**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1500**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.30**
soakaway effective depth 'D_{eff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.75
storage volume between 75-25% 'V_p' [m^3] =	0.36
time for water to fall from 75-25% 't_p' [min] =	252.33
soil infiltration rate 'f' [m/s] =	6.40E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**1.88**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.24**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.76
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.01	0.85
10	0.51	10.13	1.22	12.37	1.24							0.02	1.21
15	0.62	12.33	1.23	15.16	1.52							0.04	1.48
30	0.79	15.73	1.24	19.51	1.95							0.07	1.88
60	1.00	20.00	1.24	24.80	2.48							0.15	2.33
120	1.22	24.47	1.24	30.34	3.03							0.30	2.74
240	1.50	29.93	1.22	36.53	3.65							0.59	3.06
360	1.69	33.80	1.21	40.85	4.09							0.89	**3.20**
600	1.95	38.93	1.19	46.46	4.65							1.48	3.16
1440	2.48	49.60	1.17	58.07	5.81							3.56	2.25

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**20**	**120**	**319**															
	depth to water *[m]* =	**0.24**	**0.36**	**0.51**	**0.71**															
Soakage Trial 2	time *[min]* =	**0**	**10**	**20**	**115**	**330**														
	depth to water *[m]* =	**0.40**	**0.45**	**0.49**	**0.63**	**0.72**														
Soakage Trial 3	time *[min]* =	**0**	**10**	**20**	**120**	**341**														
	depth to water *[m]* =	**0.42**	**0.46**	**0.50**	**0.60**	**0.67**														

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Section: **TP105 Deep**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	9.42	7.70	5.61
	ring soakaways		
diameter of ring *[mm]*:	2100	2700	3000
required pit side length *[m]*:	0.84	22.49	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	120	*min*
required storage volume 'V_{req}' =	4.19	m^3
provided storage volume 'V_{prov}' =	12.70	m^3
utilisation factor =	**0.33**	***.OK***
required time to discharge 50% 't_{50}' =	6.78	*hours*
utilisation factor =	**0.28**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' $[m^2]$ =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.60**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**2400**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	7.25
storage volume between 75-25% 'V_p' [m^3] =	1.25
time for water to fall from 75-25% 't_p' [min] =	111.46
soil infiltration rate 'f' [m/s] =	2.00E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.00**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.50**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	outflow from soakaway $[m^3]$	required storage $[m^3]$
5	0.36	7.13	1.20	8.58	1.72							0.08	1.64
10	0.51	10.13	1.22	12.37	2.47							0.16	2.32
15	0.62	12.33	1.23	15.16	3.03							0.23	2.80
30	0.79	15.73	1.24	19.51	3.90							0.47	3.43
60	1.00	20.00	1.24	24.80	4.96							0.94	4.02
120	1.22	24.47	1.24	30.34	6.07							1.87	**4.19**
240	1.50	29.93	1.22	36.53	7.31							3.75	3.56
360	1.69	33.80	1.21	40.85	8.17							5.62	2.55
600	1.95	38.93	1.19	46.46	9.29							9.37	0.00
1440	2.48	49.60	1.17	58.07	11.61							22.48	0.00

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**10**	**15**	**76**	**176**								
	depth to water *[m]* =	**0.45**	**0.56**	**0.61**	**0.67**	**0.72**	**0.76**	**0.79**	**0.86**	**0.97**	**1.48**	**2.06**								
Soakage Trial 2	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**134**	**280**	**324**									
	depth to water *[m]* =	**0.45**	**0.49**	**0.52**	**0.54**	**0.57**	**0.58**	**0.66**	**1.02**	**1.35**	**1.39**									
Soakage Trial 3	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**124**	**244**	**307**									
	depth to water *[m]* =	**0.52**	**0.55**	**0.57**	**0.59**	**0.60**	**0.61**	**0.65**	**0.97**	**1.23**	**1.27**									

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calculations are based on **BRE Guidelines (Digest 365)**

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Section: **TP105 Shallow**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	16.51	13.27	9.93
	ring soakaways		
diameter of ring *[mm]*:	1500	2100	2400
required pit side length *[m]*:	2.75	2.19	1.79

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	360	*min*
required storage volume 'V_{req}' =	2.85	m^3
provided storage volume 'V_{prov}' =	2.86	m^3
utilisation factor =	**1.00**	***.OK***
required time to discharge 50% 't_{50}' =	6.96	*hours*
utilisation factor =	**0.29**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' $[m^2]$ =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.50**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1800**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	3.22
storage volume between 75-25% 'V_p' [m^3] =	0.43
time for water to fall from 75-25% 't_p' [min] =	10.17
soil infiltration rate 'f' [m/s] =	1.43E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.17**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.20**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	outflow from soakaway $[m^3]$	required storage $[m^3]$
5	0.36	7.13	1.20	8.58	0.86							0.02	0.84
10	0.51	10.13	1.22	12.37	1.24							0.03	1.20
15	0.62	12.33	1.23	15.16	1.52							0.05	1.46
30	0.79	15.73	1.24	19.51	1.95							0.10	1.85
60	1.00	20.00	1.24	24.80	2.48							0.21	2.27
120	1.22	24.47	1.24	30.34	3.03							0.41	2.62
240	1.50	29.93	1.22	36.53	3.65							0.82	2.83
360	1.69	33.80	1.21	40.85	4.09							1.23	**2.85**
600	1.95	38.93	1.19	46.46	4.65							2.05	2.59
1440	2.48	49.60	1.17	58.07	5.81							4.93	0.88

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**10**	**15**	**76**									
	depth to water *[m]* =	**0.22**	**0.24**	**0.24**	**0.25**	**0.27**	**0.27**	**0.27**	**0.30**	**0.30**	**0.42**									
Soakage Trial 2	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**134**	**280**	**324**									
	depth to water *[m]* =	**0.20**	**0.21**	**0.21**	**0.21**	**0.22**	**0.22**	**0.23**	**0.38**	**0.47**	**0.50**									
Soakage Trial 3	time *[min]* =	**0**	**1**	**3**	**5**	**10**	**115**	**221**	**293**											
	depth to water *[m]* =	**0.25**	**0.26**	**0.26**	**0.26**	**0.27**	**0.37**	**0.42**	**0.48**											

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Section: **TP106 Deep**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	16.59	13.44	9.78
	ring soakaways		
diameter of ring *[mm]*:	1050	1350	1500
required pit side length *[m]*:	1.78	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	7.28	m^3
provided storage volume 'V_{prov}' =	9.66	m^3
utilisation factor =	**0.75**	***.OK***
required time to discharge 50% 't_{50}' =	24.00	*hours*
utilisation factor =	**1.00**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1200**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	9.83
storage volume between 75-25% 'V_p' [m^3] =	1.79
time for water to fall from 75-25% 't_p' [min] =	9.33
soil infiltration rate 'f' [m/s] =	2.80E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.75**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.40**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.60
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.02	1.70
10	0.51	10.13	1.22	12.37	2.47							0.03	2.44
15	0.62	12.33	1.23	15.16	3.03							0.05	2.98
30	0.79	15.73	1.24	19.51	3.90							0.10	3.80
60	1.00	20.00	1.24	24.80	4.96							0.20	4.76
120	1.22	24.47	1.24	30.34	6.07							0.40	5.67
240	1.50	29.93	1.22	36.53	7.31							0.81	6.50
360	1.69	33.80	1.21	40.85	8.17							1.21	6.96
600	1.95	38.93	1.19	46.46	9.29							2.01	**7.28**
1440	2.48	49.60	1.17	58.07	11.61							4.83	6.78

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**153**	**206**	**1244**												
	depth to water *[m]* =	**0.50**	**0.52**	**0.60**	**0.63**	**1.04**	**1.12**	**2.05**												
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**95**	**245**	**383**	**1325**												
	depth to water *[m]* =	**0.40**	**0.45**	**0.46**	**0.66**	**0.87**	**1.01**	**1.88**												
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**123**	**265**	**321**													
	depth to water *[m]* =	**0.51**	**0.54**	**0.56**	**0.86**	**1.00**	**1.06**													

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	29.45	23.73	17.26
	ring soakaways		
diameter of ring *[mm]* :	1050	1200	1350
required pit side length *[m]* :	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	4.43	m^3
provided storage volume 'V_{prov}' =	4.54	m^3
utilisation factor =	**0.98**	***.OK***
required time to discharge 50% 't_{50}' =	39.47	*hours*
utilisation factor =	**1.64**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.85**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**900**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.83
storage volume between 75-25% 'V_p' [m^3] =	0.36
time for water to fall from 75-25% 't_p' [min] =	28.00
soil infiltration rate 'f' [m/s] =	1.75E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.07**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.30**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.00	0.85
10	0.51	10.13	1.22	12.37	1.24							0.01	1.23
15	0.62	12.33	1.23	15.16	1.52							0.01	1.50
30	0.79	15.73	1.24	19.51	1.95							0.03	1.92
60	1.00	20.00	1.24	24.80	2.48							0.06	2.42
120	1.22	24.47	1.24	30.34	3.03							0.12	2.92
240	1.50	29.93	1.22	36.53	3.65							0.23	3.42
360	1.69	33.80	1.21	40.85	4.09							0.35	3.74
600	1.95	38.93	1.19	46.46	4.65							0.58	4.07
1440	2.48	49.60	1.17	58.07	5.81							1.38	**4.43**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**153**	**206**	**1244**												
	depth to water *[m]* =	**0.45**	**0.47**	**0.47**	**0.47**	**0.51**	**0.47**	**0.51**												
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**95**	**245**	**383**	**1325**											
	depth to water *[m]* =	**0.34**	**0.35**	**0.39**	**0.40**	**0.43**	**0.43**	**0.44**	**0.50**											
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**123**	**265**	**321**													
	depth to water *[m]* =	**0.41**	**0.41**	**0.42**	**0.44**	**0.46**	**0.49**													

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calculations are based on **BRE Guidelines (Digest 365)**

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Section: **TP107 Deep**	Prepared By:	**AB**	Date: **11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	12.23	9.91	7.16
	ring soakaways		
diameter of ring *[mm]*:	1500	2100	2400
required pit side length *[m]*:	2.11	1.36	8.62

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	360	*min*
required storage volume 'V_{req}' =	5.87	m^3
provided storage volume 'V_{prov}' =	8.92	m^3
utilisation factor =	**0.66**	***.OK***
required time to discharge 50% 't_{50}' =	11.66	*hours*
utilisation factor =	**0.49**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.50**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1800**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	8.60
storage volume between 75-25% 'V_p' [m^3] =	1.53
time for water to fall from 75-25% 't_p' [min] =	299.84
soil infiltration rate 'f' [m/s] =	8.51E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.40**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.45**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.55
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.03	1.68
10	0.51	10.13	1.22	12.37	2.47							0.06	2.41
15	0.62	12.33	1.23	15.16	3.03							0.10	2.94
30	0.79	15.73	1.24	19.51	3.90							0.19	3.71
60	1.00	20.00	1.24	24.80	4.96							0.38	4.58
120	1.22	24.47	1.24	30.34	6.07							0.77	5.30
240	1.50	29.93	1.22	36.53	7.31							1.53	5.77
360	1.69	33.80	1.21	40.85	8.17							2.30	**5.87**
600	1.95	38.93	1.19	46.46	9.29							3.83	5.46
1440	2.48	49.60	1.17	58.07	11.61							9.19	2.43

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**68**	**126**	**392**												
	depth to water *[m]* =	**0.60**	**0.69**	**0.84**	**0.91**	**1.41**	**1.61**	**2.40**												
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**72**	**220**	**366**												
	depth to water *[m]* =	**0.60**	**0.64**	**0.72**	**0.77**	**1.19**	**1.59**	**1.90**												
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**93**	**230**	**358**												
	depth to water *[m]* =	**0.62**	**0.65**	**0.73**	**0.78**	**1.31**	**1.63**	**1.87**												

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Section: **TP107 Shallow**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	11.55	9.45	7.12
	ring soakaways		
diameter of ring *[mm]*:	1050	1200	1350
required pit side length *[m]*:	1.40	1.23	1.06

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	30	*min*
required storage volume 'V_{req}' =	1.28	m^3
provided storage volume 'V_{prov}' =	4.54	m^3
utilisation factor =	**0.28**	***.OK***
required time to discharge 50% 't_{50}' =	1.70	*hours*
utilisation factor =	**0.07**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.85**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**900**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.87
storage volume between 75-25% 'V_p' [m^3] =	0.37
time for water to fall from 75-25% 't_p' [min] =	15.50
soil infiltration rate 'f' [m/s] =	4.07E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.10**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.30**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.11	0.75
10	0.51	10.13	1.22	12.37	1.24							0.22	1.01
15	0.62	12.33	1.23	15.16	1.52							0.33	1.18
30	0.79	15.73	1.24	19.51	1.95							0.67	**1.28**
60	1.00	20.00	1.24	24.80	2.48							1.34	1.14
120	1.22	24.47	1.24	30.34	3.03							2.67	0.36
240	1.50	29.93	1.22	36.53	3.65							5.35	0.00
360	1.69	33.80	1.21	40.85	4.09							8.02	0.00
600	1.95	38.93	1.19	46.46	4.65							13.37	0.00
1440	2.48	49.60	1.17	58.07	5.81							32.08	0.00

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**15**	**20**										
	depth to water *[m]* =	**0.32**	**0.38**	**0.42**	**0.44**	**0.46**	**0.49**	**0.59**	**0.68**	**0.75**										
Soakage Trial 2	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**72**											
	depth to water *[m]* =	**0.34**	**0.44**	**0.49**	**0.52**	**0.55**	**0.58**	**0.64**	**0.90**											
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**15**	**22**	**44**												
	depth to water *[m]* =	**0.35**	**0.40**	**0.55**	**0.59**	**0.63**	**0.68**	**0.85**												

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calculations are based on **BRE Guidelines (Digest 365)**

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Section: **TP108 Deep**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	10.90	8.78	6.51
	ring soakaways		
diameter of ring *[mm]*:	1200	1500	1800
required pit side length *[m]*:	2.17	1.90	1.56

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	240	*min*
required storage volume 'V_{req}' =	5.27	m^3
provided storage volume 'V_{prov}' =	6.14	m^3
utilisation factor =	**0.86**	***.OK***
required time to discharge 50% 't_{50}' =	6.04	*hours*
utilisation factor =	**0.25**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' $[m^2]$ =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.25**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1350**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	8.21
storage volume between 75-25% 'V_p' [m^3] =	1.45
time for water to fall from 75-25% 't_p' [min] =	87.01
soil infiltration rate 'f' [m/s] =	1.25E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.23**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.40**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.60
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	outflow from soakaway $[m^3]$	required storage $[m^3]$
5	0.36	7.13	1.20	8.58	1.72							0.04	1.67
10	0.51	10.13	1.22	12.37	2.47							0.08	2.39
15	0.62	12.33	1.23	15.16	3.03							0.13	2.91
30	0.79	15.73	1.24	19.51	3.90							0.25	3.65
60	1.00	20.00	1.24	24.80	4.96							0.51	4.45
120	1.22	24.47	1.24	30.34	6.07							1.02	5.05
240	1.50	29.93	1.22	36.53	7.31							2.03	**5.27**
360	1.69	33.80	1.21	40.85	8.17							3.05	5.12
600	1.95	38.93	1.19	46.46	9.29							5.08	4.21
1440	2.48	49.60	1.17	58.07	11.61							12.18	0.00

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**74**	**140**													
	depth to water *[m]* =	**0.52**	**0.59**	**0.78**	**0.92**	**1.84**	**2.89**													
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**158**	**310**														
	depth to water *[m]* =	**0.42**	**0.72**	**0.85**	**1.96**	**2.52**														
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**129**	**315**														
	depth to water *[m]* =	**0.47**	**0.72**	**0.86**	**1.68**	**2.55**														

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calculations are based on **BRE Guidelines (Digest 365)**

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Section: **TP108 Shallow**	Prepared By:	**AB**	Date: **11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	16.22	13.08	9.74
	ring soakaways		
diameter of ring *[mm]*:	1500	2100	2400
required pit side length *[m]*:	2.72	2.14	1.74

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	240	*min*
required storage volume 'V_{req}' =	2.78	m^3
provided storage volume 'V_{prov}' =	2.86	m^3
utilisation factor =	**0.97**	***.OK***
required time to discharge 50% 't_{50}' =	6.54	*hours*
utilisation factor =	**0.27**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.50**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1800**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.74
storage volume between 75-25% 'V_p' [m^3] =	0.34
time for water to fall from 75-25% 't_p' [min] =	65.75
soil infiltration rate 'f' [m/s] =	1.52E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.10**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.35**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.65
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.02	0.84
10	0.51	10.13	1.22	12.37	1.24							0.04	1.20
15	0.62	12.33	1.23	15.16	1.52							0.05	1.46
30	0.79	15.73	1.24	19.51	1.95							0.11	1.84
60	1.00	20.00	1.24	24.80	2.48							0.22	2.26
120	1.22	24.47	1.24	30.34	3.03							0.44	2.60
240	1.50	29.93	1.22	36.53	3.65							0.87	**2.78**
360	1.69	33.80	1.21	40.85	4.09							1.31	2.78
600	1.95	38.93	1.19	46.46	4.65							2.18	2.46
1440	2.48	49.60	1.17	58.07	5.81							5.24	0.57

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**74**														
	depth to water *[m]* =	**0.40**	**0.43**	**0.48**	**0.53**	**0.74**														
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**158**														
	depth to water *[m]* =	**0.35**	**0.40**	**0.51**	**0.56**	**0.94**														
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**12**	**160**														
	depth to water *[m]* =	**0.38**	**0.42**	**0.49**	**0.53**	**0.87**														

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Section: **TP109 Deep**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	15.50	12.48	9.19
	ring soakaways		
diameter of ring *[mm]*:	1200	1500	1800
required pit side length *[m]*:	1.55	2.76	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	6.69	m^3
provided storage volume 'V_{prov}' =	10.68	m^3
utilisation factor =	**0.63**	***.OK***
required time to discharge 50% 't_{50}' =	20.51	*hours*
utilisation factor =	**0.85**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' $[m^2]$ =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1350**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	8.83
storage volume between 75-25% 'V_p' [m^3] =	1.58
time for water to fall from 75-25% 't_p' [min] =	26.13
soil infiltration rate 'f' [m/s] =	3.62E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.31**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.27**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.73
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	outflow from soakaway $[m^3]$	required storage $[m^3]$
5	0.36	7.13	1.20	8.58	1.72							0.02	1.69
10	0.51	10.13	1.22	12.37	2.47							0.04	2.43
15	0.62	12.33	1.23	15.16	3.03							0.07	2.97
30	0.79	15.73	1.24	19.51	3.90							0.13	3.77
60	1.00	20.00	1.24	24.80	4.96							0.26	4.70
120	1.22	24.47	1.24	30.34	6.07							0.52	5.55
240	1.50	29.93	1.22	36.53	7.31							1.04	6.26
360	1.69	33.80	1.21	40.85	8.17							1.56	6.61
600	1.95	38.93	1.19	46.46	9.29							2.60	**6.69**
1440	2.48	49.60	1.17	58.07	11.61							6.25	5.37

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**227**	**1223**										
	depth to water *[m]* =	**0.33**	**0.33**	**0.34**	**0.35**	**0.35**	**0.36**	**0.39**	**0.76**	**1.87**										
Soakage Trial 2	time *[min]* =	**1**	**5**	**10**	**84**	**294**	**1330**													
	depth to water *[m]* =	**0.27**	**0.29**	**0.30**	**0.44**	**0.61**	**1.61**													
Soakage Trial 3	time *[min]* =	**1**	**5**	**10**	**80**	**422**														
	depth to water *[m]* =	**0.50**	**0.51**	**0.52**	**0.62**	**0.98**														

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	27.53	22.10	16.25
	ring soakaways		
diameter of ring *[mm]*:	1500	2100	2400
required pit side length *[m]*:	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	4.53	m^3
provided storage volume 'V_{prov}' =	4.63	m^3
utilisation factor =	**0.98**	***.OK***
required time to discharge 50% 't_{50}' =	43.67	*hours*
utilisation factor =	**1.82**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1800**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	3.30
storage volume between 75-25% 'V_p' [m^3] =	0.45
time for water to fall from 75-25% 't_p' [min] =	59.15
soil infiltration rate 'f' [m/s] =	2.30E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.13**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.15**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.85
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.00	0.85
10	0.51	10.13	1.22	12.37	1.24							0.01	1.23
15	0.62	12.33	1.23	15.16	1.52							0.01	1.50
30	0.79	15.73	1.24	19.51	1.95							0.03	1.92
60	1.00	20.00	1.24	24.80	2.48							0.05	2.43
120	1.22	24.47	1.24	30.34	3.03							0.11	2.93
240	1.50	29.93	1.22	36.53	3.65							0.21	3.44
360	1.69	33.80	1.21	40.85	4.09							0.32	3.77
600	1.95	38.93	1.19	46.46	4.65							0.53	4.12
1440	2.48	49.60	1.17	58.07	5.81							1.27	**4.53**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**227**	**1200**													
	depth to water *[m]* =	**0.25**	**0.26**	**0.28**	**0.29**	**0.37**	**0.52**													
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**84**	**294**	**1325**												
	depth to water *[m]* =	**0.15**	**0.16**	**0.18**	**0.19**	**0.25**	**0.29**	**0.45**												
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**74**	**412**														
	depth to water *[m]* =	**0.20**	**0.21**	**0.23**	**0.28**	**0.38**														

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	15.91	12.85	9.40
	ring soakaways		
diameter of ring *[mm]*:	1200	1500	1800
required pit side length *[m]*:	1.58	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	6.92	m^3
provided storage volume 'V_{prov}' =	10.68	m^3
utilisation factor =	**0.65**	***.OK***
required time to discharge 50% 't_{50}' =	22.55	*hours*
utilisation factor =	**0.94**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' $[m^2]$ =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1350**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	9.77
storage volume between 75-25% 'V_p' [m^3] =	1.78
time for water to fall from 75-25% 't_p' [min] =	3.36
soil infiltration rate 'f' [m/s] =	3.29E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.70**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.37**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.63
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	outflow from soakaway $[m^3]$	required storage $[m^3]$
5	0.36	7.13	1.20	8.58	1.72							0.02	1.70
10	0.51	10.13	1.22	12.37	2.47							0.04	2.43
15	0.62	12.33	1.23	15.16	3.03							0.06	2.97
30	0.79	15.73	1.24	19.51	3.90							0.12	3.78
60	1.00	20.00	1.24	24.80	4.96							0.24	4.72
120	1.22	24.47	1.24	30.34	6.07							0.47	5.59
240	1.50	29.93	1.22	36.53	7.31							0.95	6.36
360	1.69	33.80	1.21	40.85	8.17							1.42	6.75
600	1.95	38.93	1.19	46.46	9.29							2.37	**6.92**
1440	2.48	49.60	1.17	58.07	11.61							5.68	5.93

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**96**	**1308**										
	depth to water *[m]* =	**0.37**	**0.39**	**0.42**	**0.44**	**0.44**	**0.47**	**0.49**	**0.80**	**2.53**										
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**176**	**267**	**347**	**1277**											
	depth to water *[m]* =	**0.40**	**0.41**	**0.45**	**0.49**	**0.81**	**0.89**	**0.97**	**2.35**											
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**121**	**403**													
	depth to water *[m]* =	**0.50**	**0.50**	**0.53**	**0.57**	**0.82**	**1.03**													

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	29.73	24.01	17.41
	ring soakaways		
diameter of ring *[mm]*:	1800	2400	2700
required pit side length *[m]*:	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	4.74	m^3
provided storage volume 'V_{prov}' =	6.26	m^3
utilisation factor =	**0.76**	***.OK***
required time to discharge 50% 't_{50}' =	70.45	*hours*
utilisation factor =	**2.94**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**2100**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.72
storage volume between 75-25% 'V_p' [m^3] =	0.35
time for water to fall from 75-25% 't_p' [min] =	306.25
soil infiltration rate 'f' [m/s] =	1.68E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**1.86**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.24**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.76
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.00	0.85
10	0.51	10.13	1.22	12.37	1.24							0.01	1.23
15	0.62	12.33	1.23	15.16	1.52							0.01	1.51
30	0.79	15.73	1.24	19.51	1.95							0.02	1.93
60	1.00	20.00	1.24	24.80	2.48							0.04	2.44
120	1.22	24.47	1.24	30.34	3.03							0.09	2.95
240	1.50	29.93	1.22	36.53	3.65							0.18	3.48
360	1.69	33.80	1.21	40.85	4.09							0.27	3.82
600	1.95	38.93	1.19	46.46	4.65							0.44	4.20
1440	2.48	49.60	1.17	58.07	5.81							1.07	**4.74**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**96**	**1298**													
	depth to water *[m]* =	**0.26**	**0.39**	**0.42**	**0.44**	**0.52**	**0.70**													
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**176**	**267**	**347**	**1270**											
	depth to water *[m]* =	**0.24**	**0.25**	**0.32**	**0.35**	**0.44**	**0.44**	**0.46**	**0.59**											
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**111**	**392**													
	depth to water *[m]* =	**0.30**	**0.31**	**0.33**	**0.40**	**0.44**	**0.51**													

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	12.70	10.22	7.46
	ring soakaways		
diameter of ring *[mm]*:	1050	1350	1500
required pit side length *[m]*:	1.43	1.08	0.87

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	240	*min*
required storage volume 'V_{req}' =	5.13	m^3
provided storage volume 'V_{prov}' =	9.66	m^3
utilisation factor =	**0.53**	***.OK***
required time to discharge 50% 't_{50}' =	8.91	*hours*
utilisation factor =	**0.37**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1200**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	8.74
storage volume between 75-25% 'V_p' [m^3] =	1.56
time for water to fall from 75-25% 't_p' [min] =	21.18
soil infiltration rate 'f' [m/s] =	7.54E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.40**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.40**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.60
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.05	1.67
10	0.51	10.13	1.22	12.37	2.47							0.09	2.38
15	0.62	12.33	1.23	15.16	3.03							0.14	2.90
30	0.79	15.73	1.24	19.51	3.90							0.27	3.63
60	1.00	20.00	1.24	24.80	4.96							0.54	4.42
120	1.22	24.47	1.24	30.34	6.07							1.09	4.98
240	1.50	29.93	1.22	36.53	7.31							2.17	**5.13**
360	1.69	33.80	1.21	40.85	8.17							3.26	4.91
600	1.95	38.93	1.19	46.46	9.29							5.43	3.86
1440	2.48	49.60	1.17	58.07	11.61							13.02	0.00

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**5**	**10**	**20**	**30**	**40**	**50**	**1175**											
	depth to water *[m]* =	**0.48**	**0.53**	**0.55**	**0.59**	**0.62**	**0.65**	**0.68**	**1.25**											
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**11**	**117**	**244**	**297**	**890**											
	depth to water *[m]* =	**0.40**	**0.41**	**0.45**	**0.47**	**0.60**	**0.68**	**0.78**	**1.06**											
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**233**	**402**	**1108**												
	depth to water *[m]* =	**0.45**	**0.46**	**0.46**	**0.49**	**0.64**	**0.75**	**1.13**												

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Section: **TP111 Shallow**	Prepared By:	**AB**	Date: **11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	28.88	23.20	16.97
	ring soakaways		
diameter of ring *[mm]*:	1800	2400	2700
required pit side length *[m]*:	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	4.60	m^3
provided storage volume 'V_{prov}' =	6.26	m^3
utilisation factor =	**0.73**	***.OK***
required time to discharge 50% 't_{50}' =	61.98	*hours*
utilisation factor =	**2.58**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**2100**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.90
storage volume between 75-25% 'V_p' [m^3] =	0.37
time for water to fall from 75-25% 't_p' [min] =	76.05
soil infiltration rate 'f' [m/s] =	1.90E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.10**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.29**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.71
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.00	0.85
10	0.51	10.13	1.22	12.37	1.24							0.01	1.23
15	0.62	12.33	1.23	15.16	1.52							0.01	1.50
30	0.79	15.73	1.24	19.51	1.95							0.03	1.93
60	1.00	20.00	1.24	24.80	2.48							0.05	2.43
120	1.22	24.47	1.24	30.34	3.03							0.10	2.93
240	1.50	29.93	1.22	36.53	3.65							0.20	3.45
360	1.69	33.80	1.21	40.85	4.09							0.30	3.78
600	1.95	38.93	1.19	46.46	4.65							0.50	4.14
1440	2.48	49.60	1.17	58.07	5.81							1.21	**4.60**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**20**	**30**	**40**	**50**	**1160**										
	depth to water *[m]* =	**0.29**	**0.34**	**0.40**	**0.43**	**0.44**	**0.46**	**0.48**	**0.48**	**0.69**										
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**11**	**117**	**244**	**297**	**875**											
	depth to water *[m]* =	**0.32**	**0.32**	**0.35**	**0.36**	**0.43**	**0.47**	**0.49**	**0.56**											
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**233**	**402**													
	depth to water *[m]* =	**0.30**	**0.32**	**0.34**	**0.35**	**0.44**	**0.49**													

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calculations are based on **BRE Guidelines (Digest 365)**

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	16.85	13.62	9.93
	ring soakaways		
diameter of ring *[mm]*:	1050	1350	1500
required pit side length *[m]*:	1.79	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	7.38	m^3
provided storage volume 'V_{prov}' =	9.66	m^3
utilisation factor =	**0.76**	***.OK***
required time to discharge 50% 't_{50}' =	25.24	*hours*
utilisation factor =	**1.05**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1200**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	9.67
storage volume between 75-25% 'V_p' [m^3] =	1.76
time for water to fall from 75-25% 't_p' [min] =	31.96
soil infiltration rate 'f' [m/s] =	2.66E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.65**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.35**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.65
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.02	1.70
10	0.51	10.13	1.22	12.37	2.47							0.03	2.44
15	0.62	12.33	1.23	15.16	3.03							0.05	2.98
30	0.79	15.73	1.24	19.51	3.90							0.10	3.81
60	1.00	20.00	1.24	24.80	4.96							0.19	4.77
120	1.22	24.47	1.24	30.34	6.07							0.38	5.68
240	1.50	29.93	1.22	36.53	7.31							0.77	6.54
360	1.69	33.80	1.21	40.85	8.17							1.15	7.02
600	1.95	38.93	1.19	46.46	9.29							1.91	**7.38**
1440	2.48	49.60	1.17	58.07	11.61							4.59	7.02

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**5**	**10**	**135**	**1260**														
	depth to water *[m]* =	**0.37**	**0.45**	**0.51**	**1.07**	**2.00**														
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**194**	**285**	**364**	**1323**											
	depth to water *[m]* =	**0.35**	**0.35**	**0.39**	**0.43**	**0.90**	**1.00**	**1.10**	**1.85**											
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**124**	**303**													
	depth to water *[m]* =	**0.41**	**0.42**	**0.44**	**0.47**	**0.84**	**1.05**													

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	27.28	21.94	16.11
	ring soakaways		
diameter of ring *[mm]*:	1800	2400	2700
required pit side length *[m]*:	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	4.30	m^3
provided storage volume 'V_{prov}' =	6.26	m^3
utilisation factor =	**0.69**	***.OK***
required time to discharge 50% 't_{50}' =	49.66	*hours*
utilisation factor =	**2.07**	***.NOT OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**2100**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.20**
soakaway effective depth 'D_{eff}' *[m]* =	0.80
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.94
storage volume between 75-25% 'V_p' [m^3] =	0.39
time for water to fall from 75-25% 't_p' [min] =	777.34
soil infiltration rate 'f' [m/s] =	2.38E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**1.92**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.18**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.82
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.01	0.85
10	0.51	10.13	1.22	12.37	1.24							0.01	1.23
15	0.62	12.33	1.23	15.16	1.52							0.02	1.50
30	0.79	15.73	1.24	19.51	1.95							0.03	1.92
60	1.00	20.00	1.24	24.80	2.48							0.06	2.42
120	1.22	24.47	1.24	30.34	3.03							0.13	2.91
240	1.50	29.93	1.22	36.53	3.65							0.25	3.40
360	1.69	33.80	1.21	40.85	4.09							0.38	3.71
600	1.95	38.93	1.19	46.46	4.65							0.63	4.02
1440	2.48	49.60	1.17	58.07	5.81							1.51	**4.30**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**135**	**1255**													
	depth to water *[m]* =	**0.18**	**0.21**	**0.22**	**0.24**	**0.37**	**0.86**													
Soakage Trial 2	time *[min]* =	**0**	**1**	**5**	**10**	**194**	**285**	**364**	**1318**											
	depth to water *[m]* =	**0.27**	**0.28**	**0.28**	**0.28**	**0.35**	**0.37**	**0.39**	**0.90**											
Soakage Trial 3	time *[min]* =	**0**	**1**	**5**	**10**	**124**	**303**	**1260**												
	depth to water *[m]* =	**0.30**	**0.30**	**0.31**	**0.32**	**0.35**	**0.37**	**0.77**												

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	#DIV/0!	#DIV/0!	#DIV/0!
	ring soakaways		
diameter of ring *[mm]*:	1050	1350	1500
required pit side length *[m]*:	N/A	N/A	N/A

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	#DIV/0!	*min*
required storage volume 'V_{req}' =	#DIV/0!	m^3
provided storage volume 'V_{prov}' =	9.66	m^3
utilisation factor =	**#DIV/0!**	***#DIV/0!***
required time to discharge 50% 't_{50}' =	#DIV/0!	*hours*
utilisation factor =	**#DIV/0!**	***#DIV/0!***

#DIV/0!

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1200**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	9.42
storage volume between 75-25% 'V_p' [m^3] =	1.70
time for water to fall from 75-25% 't_p' [min] =	#DIV/0!
soil infiltration rate 'f' [m/s] =	#DIV/0!

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.60**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.38**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.62
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							#DIV/0!	#DIV/0!
10	0.51	10.13	1.22	12.37	2.47							#DIV/0!	#DIV/0!
15	0.62	12.33	1.23	15.16	3.03							#DIV/0!	#DIV/0!
30	0.79	15.73	1.24	19.51	3.90							#DIV/0!	#DIV/0!
60	1.00	20.00	1.24	24.80	4.96							#DIV/0!	#DIV/0!
120	1.22	24.47	1.24	30.34	6.07							#DIV/0!	#DIV/0!
240	1.50	29.93	1.22	36.53	7.31							#DIV/0!	#DIV/0!
360	1.69	33.80	1.21	40.85	8.17							#DIV/0!	#DIV/0!
600	1.95	38.93	1.19	46.46	9.29							#DIV/0!	#DIV/0!
1440	2.48	49.60	1.17	58.07	11.61							#DIV/0!	#DIV/0!

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**5**	**10**	**165**	**255**	**336**	**1260**												
	depth to water *[m]* =	**0.42**	**0.44**	**0.44**	**0.51**	**0.54**	**0.55**	**0.66**												
Soakage Trial 2	time *[min]* =																			
	depth to water *[m]* =																			
Soakage Trial 3	time *[min]* =																			
	depth to water *[m]* =																			

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	22.08	17.90	13.10
	ring soakaways		
diameter of ring *[mm]*:	1350	1800	2100
required pit side length *[m]*:	2.04	1.53	8.73

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	360	*min*
required storage volume 'V_{req}' =	2.92	m^3
provided storage volume 'V_{prov}' =	3.85	m^3
utilisation factor =	**0.76**	***.OK***
required time to discharge 50% 't_{50}' =	9.95	*hours*
utilisation factor =	**0.41**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' $[m^2]$ =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1500**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.30**
soakaway effective depth 'D_{eff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	3.31
storage volume between 75-25% 'V_p' [m^3] =	0.45
time for water to fall from 75-25% 't_p' [min] =	254.17
soil infiltration rate 'f' [m/s] =	8.35E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.20**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.18**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.82
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	ignore Z2	ignore rainfalls *[mm]*	ignore inflow $[m^3]$	outflow from soakaway $[m^3]$	required storage $[m^3]$
5	0.36	7.13	1.20	8.58	0.86							0.02	0.84
10	0.51	10.13	1.22	12.37	1.24							0.03	1.20
15	0.62	12.33	1.23	15.16	1.52							0.05	1.47
30	0.79	15.73	1.24	19.51	1.95							0.10	1.85
60	1.00	20.00	1.24	24.80	2.48							0.19	2.29
120	1.22	24.47	1.24	30.34	3.03							0.39	2.65
240	1.50	29.93	1.22	36.53	3.65							0.77	2.88
360	1.69	33.80	1.21	40.85	4.09							1.16	**2.92**
600	1.95	38.93	1.19	46.46	4.65							1.94	2.71
1440	2.48	49.60	1.17	58.07	5.81							4.64	1.16

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**165**	**255**	**336**												
	depth to water *[m]* =	**0.31**	**0.33**	**0.34**	**0.35**	**0.45**	**0.47**	**0.49**												
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**140**	**230**	**340**													
	depth to water *[m]* =	**0.33**	**0.34**	**0.35**	**0.41**	**0.44**	**0.46**													
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**95**	**260**	**310**													
	depth to water *[m]* =	**0.35**	**0.36**	**0.37**	**0.40**	**0.43**	**0.44**													

Spreadsheet provided by: ***www.YourSpreadsheets.co.uk***

calculations are based on **BRE Guidelines (Digest 365)**

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Section: **TP114 Deep**	Prepared By: **AB**	Date:	**11/10/2013**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	8.28	6.83	5.09
	ring soakaways		
diameter of ring *[mm]* :	1050	1350	1500
required pit side length *[m]* :	1.91	1.65	1.48

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	120	*min*
required storage volume 'V_{req}' =	4.03	m^3
provided storage volume 'V_{prov}' =	4.83	m^3
utilisation factor =	**0.84**	***.OK***
required time to discharge 50% 't_{50}' =	2.38	*hours*
utilisation factor =	**0.10**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1200**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	8.46
storage volume between 75-25% 'V_p' [m^3] =	1.50
time for water to fall from 75-25% 't_p' [min] =	93.33
soil infiltration rate 'f' [m/s] =	2.82E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.31**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.40**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.60
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.08	1.63
10	0.51	10.13	1.22	12.37	2.47							0.17	2.30
15	0.62	12.33	1.23	15.16	3.03							0.25	2.78
30	0.79	15.73	1.24	19.51	3.90							0.51	3.39
60	1.00	20.00	1.24	24.80	4.96							1.02	3.94
120	1.22	24.47	1.24	30.34	6.07							2.03	**4.03**
240	1.50	29.93	1.22	36.53	7.31							4.07	3.24
360	1.69	33.80	1.21	40.85	8.17							6.10	2.07
600	1.95	38.93	1.19	46.46	9.29							10.16	0.00
1440	2.48	49.60	1.17	58.07	11.61							24.39	0.00

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**120**											
	depth to water *[m]* =	**0.40**	**0.46**	**0.50**	**0.55**	**0.60**	**0.62**	**0.85**	**2.17**											
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**60**	**125**														
	depth to water *[m]* =	**0.50**	**0.58**	**0.85**	**1.40**	**1.97**														
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**56**	**135**														
	depth to water *[m]* =	**0.49**	**0.57**	**0.83**	**1.33**	**1.94**														

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calculations are based on **BRE Guidelines (Digest 365)**

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	22.59	18.24	13.42
	ring soakaways		
diameter of ring *[mm]* :	1350	1800	2100
required pit side length *[m]* :	2.07	1.58	7.94

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	360	*min*
required storage volume 'V_{req}' =	3.01	m^3
provided storage volume 'V_{prov}' =	3.85	m^3
utilisation factor =	**0.78**	***.OK***
required time to discharge 50% 't_{50}' =	10.73	*hours*
utilisation factor =	**0.45**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1500**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.30**
soakaway effective depth 'D_{eff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	3.02
storage volume between 75-25% 'V_p' [m^3] =	0.40
time for water to fall from 75-25% 't_p' [min] =	244.22
soil infiltration rate 'f' [m/s] =	7.74E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.14**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.26**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.74
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.01	0.84
10	0.51	10.13	1.22	12.37	1.24							0.03	1.21
15	0.62	12.33	1.23	15.16	1.52							0.04	1.47
30	0.79	15.73	1.24	19.51	1.95							0.09	1.86
60	1.00	20.00	1.24	24.80	2.48							0.18	2.30
120	1.22	24.47	1.24	30.34	3.03							0.36	2.67
240	1.50	29.93	1.22	36.53	3.65							0.72	2.93
360	1.69	33.80	1.21	40.85	4.09							1.08	**3.01**
600	1.95	38.93	1.19	46.46	4.65							1.79	2.85
1440	2.48	49.60	1.17	58.07	5.81							4.31	1.50

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**120**	**380**										
	depth to water *[m]* =	**0.26**	**0.28**	**0.29**	**0.30**	**0.31**	**0.31**	**0.32**	**0.43**	**0.70**										
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**128**	**402**														
	depth to water *[m]* =	**0.30**	**0.34**	**0.35**	**0.42**	**0.65**														
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**420**															
	depth to water *[m]* =	**0.32**	**0.35**	**0.37**	**0.61**															

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	15.22	12.27	9.05
	ring soakaways		
diameter of ring *[mm]*:	1050	1350	1500
required pit side length *[m]*:	2.82	2.62	3.23

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	1440	*min*
required storage volume 'V_{req}' =	8.29	m^3
provided storage volume 'V_{prov}' =	4.83	m^3
utilisation factor =	**1.72**	***.NOT OK***
required time to discharge 50% 't_{50}' =	17.46	*hours*
utilisation factor =	**0.73**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**200**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**1**
square pit side length 'L' [m] =	**2.00**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1200**
total depth from ground level 'D_b' *[m]* =	**3.00**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	2.50
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	8.70
storage volume between 75-25% 'V_p' [m^3] =	1.55
time for water to fall from 75-25% 't_p' [min] =	3.04
soil infiltration rate 'f' [m/s] =	3.84E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**2.37**
total depth from ground level 'D_{tb}' *[m]* =	**3.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.38**
soakage trial pit effective depth 'D_{teff}' *[m]* =	2.62
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	1.72							0.01	1.70
10	0.51	10.13	1.22	12.37	2.47							0.02	2.45
15	0.62	12.33	1.23	15.16	3.03							0.03	3.00
30	0.79	15.73	1.24	19.51	3.90							0.07	3.83
60	1.00	20.00	1.24	24.80	4.96							0.14	4.82
120	1.22	24.47	1.24	30.34	6.07							0.28	5.79
240	1.50	29.93	1.22	36.53	7.31							0.55	6.75
360	1.69	33.80	1.21	40.85	8.17							0.83	7.34
600	1.95	38.93	1.19	46.46	9.29							1.38	7.91
1440	2.48	49.60	1.17	58.07	11.61							3.32	**8.29**

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**5**	**10**	**161**	**311**	**1280**												
	depth to water *[m]* =	**0.38**	**0.39**	**0.41**	**0.44**	**0.84**	**1.14**	**2.76**												
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**72**	**330**														
	depth to water *[m]* =	**0.45**	**0.47**	**0.48**	**0.65**	**1.05**														
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**87**	**318**														
	depth to water *[m]* =	**0.50**	**0.51**	**0.53**	**0.66**	**1.04**														

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ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]*:	**450**	**600**	**900**
required trench length *[m]*:	21.35	17.41	12.70
	ring soakaways		
diameter of ring *[mm]*:	1350	1800	2100
required pit side length *[m]*:	1.99	1.47	9.88

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	360	*min*
required storage volume 'V_{req}' =	2.80	m^3
provided storage volume 'V_{prov}' =	3.85	m^3
utilisation factor =	**0.73**	***.OK***
required time to discharge 50% 't_{50}' =	8.98	*hours*
utilisation factor =	**0.37**	***.OK***

GENERAL DATA

site location:	**England and Wales**
soakaway type:	**perforated concrete ring**
pit shape:	**square pit around ring**
impermeable area drained to soakaway 'A' *[m^2]* =	**100**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.35**
allowance for climate change:	**No**

SOAKAWAY DATA

number of ring soakaways:	**2**
square pit side length 'L' [m] =	**2.30**
soakaway ring internal diameter 'D_{int}' *[mm]* =	**1500**
total depth from ground level 'D_b' *[m]* =	**1.00**
depth to drain invert level 'D_d' *[m]* =	**0.30**
soakaway effective depth 'D_{eff}' *[m]* =	0.70
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	**No**
available on-site infiltration test results:	(●) Yes ( ) No
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' [m^2] =	2.68
storage volume between 75-25% 'V_p' [m^3] =	0.34
time for water to fall from 75-25% 't_p' [min] =	150.00
soil infiltration rate 'f' [m/s] =	9.25E-06

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* =	**0.50**
soakage trial pit length 'L_t' *[m]* =	**1.90**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.28**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.72
free volume in infill aggregate *[%]* =	**100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	M10-D Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.36	7.13	1.20	8.58	0.86							0.02	0.84
10	0.51	10.13	1.22	12.37	1.24							0.04	1.20
15	0.62	12.33	1.23	15.16	1.52							0.05	1.46
30	0.79	15.73	1.24	19.51	1.95							0.11	1.84
60	1.00	20.00	1.24	24.80	2.48							0.21	2.27
120	1.22	24.47	1.24	30.34	3.03							0.43	2.60
240	1.50	29.93	1.22	36.53	3.65							0.86	2.79
360	1.69	33.80	1.21	40.85	4.09							1.29	**2.80**
600	1.95	38.93	1.19	46.46	4.65							2.15	2.50
1440	2.48	49.60	1.17	58.07	5.81							5.15	0.66

** Z2 is a growth factor from M5 rainfalls*

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

	water level measurement N°:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time *[min]* =	**0**	**1**	**2**	**3**	**4**	**5**	**10**	**161**	**311**										
	depth to water *[m]* =	**0.28**	**0.32**	**0.33**	**0.35**	**0.35**	**0.35**	**0.37**	**0.46**	**0.53**										
Soakage Trial 2	time *[min]* =	**0**	**5**	**10**	**70**	**325**														
	depth to water *[m]* =	**0.35**	**0.38**	**0.40**	**0.42**	**0.52**														
Soakage Trial 3	time *[min]* =	**0**	**5**	**10**	**80**	**310**														
	depth to water *[m]* =	**0.40**	**0.42**	**0.44**	**0.46**	**0.50**														

Spreadsheet provided by: ***www.YourSpreadsheets.co.uk***

calculations are based on **BRE Guidelines (Digest 365)**

APPENDIX E

Groundwater and Ground Gas Monitoring

Project: Boorley Green
Ref: GE9523
Client: MA Botley Ltd

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
WS348	03/10/13	10	0.0	1.1	20.6	0.0	0.0	1007	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	03/10/13	20	0.0	0.1	20.7	0.0	0.00	1007	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	03/10/13	30	0.0	0.0	20.7	0.0	0.00	1007	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	03/10/13	60	0.0	0.0	20.8	0.0	0.00	1007	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	03/10/13	120	0.0	0.0	20.8	0.0	0.00	1007	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	03/10/13	10	0.0	1.6	19.5	0.0	0.0	1005	3.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	03/10/13	20	0.0	2.5	18.2	0.0	0.00	1005	3.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	03/10/13	30	0.0	2.5	18.1	0.0	0.00	1005	3.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	03/10/13	60	0.0	2.5	18.1	0.0	0.00	1005	3.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	03/10/13	120	0.0	2.6	18.0	0.0	0.00	1005	3.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	03/10/13	10	0.0	0.9	20.4	0.0	0.0	1007	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	03/10/13	20	0.0	1.3	20.1	0.0	0.00	1007	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	03/10/13	30	0.0	1.3	20.0	0.0	0.00	1007	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	03/10/13	60	0.0	1.3	20.0	0.0	0.00	1007	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	03/10/13	120	0.0	1.3	20.0	0.0	0.00	1007	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	03/10/13	10	0.0	1.0	20.2	0.0	0.0	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	03/10/13	20	0.0	1.2	19.4	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	03/10/13	30	0.0	1.2	19.3	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	03/10/13	60	0.0	1.3	19.1	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	03/10/13	120	0.0	1.5	18.8	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	03/10/13	10	0.0	1.2	20.1	0.0	0.0	1007	3.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	03/10/13	20	0.0	1.3	19.6	0.0	0.00	1007	3.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	03/10/13	30	0.0	1.6	19.5	0.0	0.00	1007	3.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	03/10/13	60	0.0	1.3	19.5	0.0	0.00	1007	3.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	03/10/13	120	0.0	1.3	19.5	0.0	0.00	1007	3.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	03/10/13	10	0.0	0.0	20.7	0.0	0.0	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	03/10/13	20	0.0	0.0	20.7	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	03/10/13	30	0.0	0.0	20.7	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	03/10/13	60	0.0	0.0	20.7	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	03/10/13	120	0.0	0.0	20.7	0.0	0.00	1006	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	03/10/13	10	0.0	0.5	19.8	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	03/10/13	20	0.0	1.3	19.5	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	03/10/13	30	0.0	1.3	19.5	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	03/10/13	60	0.0	1.3	19.4	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	03/10/13	120	0.0	1.9	19.0	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	03/10/13	10	0.0	0.1	20.7	0.0	0.0	1004	0.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	03/10/13	20	0.0	0.0	20.7	0.0	0.00	1004	0.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	03/10/13	30	0.0	0.5	20.4	0.0	0.00	1004	0.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	03/10/13	60	0.0	0.6	20.3	0.0	0.00	1004	0.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	03/10/13	120	0.0	1.0	20.2	0.0	0.00	1004	0.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	03/10/13	10	0.0	0.0	20.7	0.0	0.0	1004	2.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	03/10/13	20	0.0	1.2	19.6	0.0	0.00	1004	2.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	03/10/13	30	0.0	1.2	19.6	0.0	0.00	1004	2.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	03/10/13	60	0.0	1.2	19.5	0.0	0.00	1004	2.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	03/10/13	120	0.0	1.2	19.5	0.0	0.00	1004	2.72	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	03/10/13	10	0.0	0.2	20.6	0.0	0.0	1005	0.88	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	03/10/13	20	0.0	0.1	20.7	0.0	0.00	1005	0.88	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	03/10/13	30	0.0	0.1	20.7	0.0	0.00	1005	0.88	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Boorley Green
Ref: GE9523
Client: MA Botley Ltd

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
BH203	03/10/13	60	0.0	0.0	20.8	0.0	0.00	1005	0.88	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	03/10/13	120	0.0	0.3	20.8	0.0	0.00	1005	0.88	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	03/10/13	10	0.0	0.8	20.2	0.2	0.0	1004	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	03/10/13	20	0.0	1.4	19.5	0.2	0.00	1004	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	03/10/13	30	0.0	1.7	19.2	0.2	0.00	1004	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	03/10/13	60	0.0	2.6	18.1	0.2	0.00	1004	Dry	0.000	0.004	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	03/10/13	120	0.0	3.4	17.2	0.2	0.00	1004	Dry	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	03/10/13	10	0.0	3.6	19.1	0.0	0.0	1003	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	03/10/13	20	0.0	4.0	18.7	0.0	0.00	1003	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	03/10/13	30	0.0	4.1	18.7	0.0	0.00	1003	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	03/10/13	60	0.0	4.1	18.7	0.0	0.00	1003	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	03/10/13	120	0.0	4.2	17.2	0.0	0.00	1003	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	03/10/13	10	0.0	1.0	19.7	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	03/10/13	20	0.0	4.6	16.5	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	03/10/13	30	0.0	5.1	15.4	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS205	03/10/13	60	0.0	5.4	14.8	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS205	03/10/13	120	0.0	5.3	15.1	0.0	0.00	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
BH206	03/10/13	10	0.0	1.4	20.2	0.0	0.0	1004	2.30	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	03/10/13	20	0.0	1.6	19.9	0.0	0.00	1004	2.30	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	03/10/13	30	0.0	1.6	19.9	0.0	0.00	1004	2.30	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	03/10/13	60	0.0	1.6	19.8	0.0	0.00	1004	2.30	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	03/10/13	120	0.0	1.7	19.8	0.0	0.00	1004	2.30	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	03/10/13	10	0.0	2.3	17.0	0.9	0.0	1003	2.75	0.000	0.021	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	03/10/13	20	0.0	3.8	13.0	0.9	0.00	1003	2.75	0.000	0.034	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	03/10/13	30	0.0	3.8	12.9	0.9	0.00	1003	2.75	0.000	0.034	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	03/10/13	60	0.0	1.3	18.0	0.9	0.00	1003	2.75	0.000	0.012	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	03/10/13	120	0.0	0.8	19.0	0.9	0.00	1003	2.75	0.000	0.007	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	10/10/13	10	0.0	1.2	19.0	0.1	0.0	1022	1.50	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	10/10/13	20	0.0	1.1	20.1	0.1	0.00	1022	1.50	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	10/10/13	30	0.0	1.4	20.3	0.1	0.00	1022	1.50	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	10/10/13	60	0.0	2.7	20.1	0.1	0.00	1022	1.50	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	10/10/13	120	0.0	2.7	20.1	0.1	0.00	1022	1.50	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	10/10/13	10	0.0	2.5	20.1	0.2	0.0	1022	3.80	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	10/10/13	20	0.0	2.7	18.8	0.2	0.00	1022	3.80	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	10/10/13	30	0.0	2.7	18.5	0.2	0.00	1022	3.80	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	10/10/13	60	0.0	2.7	18.4	0.2	0.00	1022	3.80	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	10/10/13	120	0.0	2.7	18.4	0.2	0.00	1022	3.80	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	10/10/13	10	0.0	0.7	21.3	0.1	0.0	1022	3.15	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	10/10/13	20	0.0	1.8	20.4	0.1	0.00	1022	3.15	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	10/10/13	30	0.0	1.9	20.3	0.1	0.00	1022	3.15	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	10/10/13	60	0.0	1.9	20.2	0.1	0.00	1022	3.15	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	10/10/13	120	0.0	1.8	20.2	0.1	0.00	1022	3.15	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	10/10/13	10	0.0	0.7	20.8	0.8	0.0	1022	4.01	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	10/10/13	20	0.0	0.0	20.2	0.8	0.00	1022	4.01	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	10/10/13	30	0.0	1.1	20.0	0.8	0.00	1022	4.01	0.000	0.008	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	10/10/13	60	0.0	1.2	20.1	0.8	0.00	1022	4.01	0.000	0.009	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	10/10/13	120	0.0	1.3	20.1	0.8	0.00	1022	4.01	0.000	0.010	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	10/10/13	10	0.0	1.0	20.9	0.1	0.0	1022	3.20	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Boorley Green
Ref: GE9523
Client: MA Botley Ltd

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
BH207	10/10/13	20	0.0	1.3	20.5	0.1	0.00	1022	3.20	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	10/10/13	30	0.0	1.3	20.4	0.1	0.00	1022	3.20	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	10/10/13	60	0.0	1.3	20.3	0.1	0.00	1022	3.20	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	10/10/13	120	0.0	1.4	20.4	0.1	0.00	1022	3.20	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	10/10/13	10	0.0	2.6	19.7	0.1	0.0	1022	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	10/10/13	20	0.0	2.7	19.8	0.1	0.00	1022	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	10/10/13	30	0.0	2.7	19.9	0.1	0.00	1022	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	10/10/13	60	0.0	2.7	19.9	0.1	0.00	1022	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	10/10/13	120	0.0	2.7	19.8	0.1	0.00	1022	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	10/10/13	10	0.0	0.4	20.0	0.1	0.0	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	10/10/13	20	0.0	0.3	20.5	0.1	0.00	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	10/10/13	30	0.0	0.3	20.6	0.1	0.00	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	10/10/13	60	0.0	0.5	20.6	0.1	0.00	1022	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	10/10/13	120	0.0	0.6	20.6	0.1	0.00	1022	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	10/10/13	10	0.0	0.5	20.6	0.1	0.0	1022	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	10/10/13	20	0.0	0.7	20.6	0.1	0.00	1022	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	10/10/13	30	0.0	1.0	20.5	0.1	0.00	1022	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	10/10/13	60	0.0	1.4	20.2	0.1	0.00	1022	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	10/10/13	120	0.0	1.1	20.4	0.1	0.00	1022	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	10/10/13	10	0.0	1.4	19.7	0.1	0.0	1022	2.78	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	10/10/13	20	0.0	1.2	19.8	0.1	0.00	1022	2.78	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	10/10/13	30	0.0	1.2	19.9	0.1	0.00	1022	2.78	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	10/10/13	60	0.0	1.2	19.9	0.1	0.00	1022	2.78	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	10/10/13	120	0.0	1.2	19.8	0.1	0.00	1022	2.78	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	10/10/13	10	0.0	0.7	19.7	0.1	0.0	1022	0.89	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	10/10/13	20	0.0	0.3	19.8	0.1	0.00	1022	0.89	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	10/10/13	30	0.0	0.2	19.9	0.1	0.00	1022	0.89	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	10/10/13	60	0.0	0.1	19.9	0.1	0.00	1022	0.89	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	10/10/13	120	0.0	0.0	19.8	0.1	0.00	1022	0.89	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	10/10/13	10	0.0	0.5	20.1	2.1	0.0	1022	Dry	0.000	0.011	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	10/10/13	20	0.0	1.0	19.9	2.1	0.00	1022	Dry	0.000	0.021	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	10/10/13	30	0.0	1.0	19.9	2.1	0.00	1022	Dry	0.000	0.021	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	10/10/13	60	0.0	1.0	19.9	2.1	0.00	1022	Dry	0.000	0.021	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	10/10/13	120	0.0	1.0	20.0	2.1	0.00	1022	Dry	0.000	0.021	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	10/10/13	10	0.0	2.7	20.5	0.0	0.0	1022	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	10/10/13	20	0.0	3.9	19.2	0.0	0.00	1022	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	10/10/13	30	0.0	3.9	19.0	0.0	0.00	1022	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	10/10/13	60	0.0	3.9	19.0	0.0	0.00	1022	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	10/10/13	120	0.0	3.9	18.9	0.0	0.00	1022	3.45	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	10/10/13	10	0.0	1.0	20.2	0.0	0.0	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	10/10/13	20	0.0	1.4	20.0	0.0	0.00	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	10/10/13	30	0.0	1.4	20.0	0.0	0.00	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	10/10/13	60	0.0	1.2	20.1	0.0	0.00	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	10/10/13	120	0.0	1.2	20.1	0.0	0.00	1022	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	10/10/13	10	0.0	0.9	20.4	0.0	0.0	1022	2.40	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	10/10/13	20	0.0	1.6	20.0	0.0	0.00	1022	2.40	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	10/10/13	30	0.0	1.6	20.0	0.0	0.00	1022	2.40	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	10/10/13	60	0.0	1.6	20.0	0.0	0.00	1022	2.40	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Boorley Green
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Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation BS8485 & C665		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	CH_4 GSV	CH_4 Conc.	CO_2 GSV	CO_2 Conc.
BH206	10/10/13	120	0.0	1.7	20.0	0.0	0.00	1022	2.40	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	10/10/13	10	0.0	0.6	20.3	0.0	0.0	1022	1.04	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	10/10/13	20	0.0	0.0	20.3	0.0	0.00	1022	1.04	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	10/10/13	30	0.0	0.0	20.7	0.0	0.00	1022	1.04	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	10/10/13	60	0.0	0.0	20.8	0.0	0.00	1022	1.04	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	10/10/13	120	0.0	0.0	20.8	0.0	0.00	1022	1.04	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	17/10/13	10	0.0	1.0	20.3	0.1	0.0	1015	1.43	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	17/10/13	20	0.0	1.3	19.9	0.1	0.00	1015	1.43	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	17/10/13	30	0.0	2.3	19.4	0.1	0.00	1015	1.43	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	17/10/13	60	0.0	2.3	19.5	0.1	0.00	1015	1.43	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	17/10/13	120	0.0	2.1	19.5	0.1	0.00	1015	1.43	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	17/10/13	10	0.0	1.7	19.3	0.0	0.0	1015	3.80	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	17/10/13	20	0.0	1.8	18.6	0.0	0.00	1015	3.80	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	17/10/13	30	0.0	1.8	18.5	0.0	0.00	1015	3.80	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	17/10/13	60	0.0	1.8	18.4	0.0	0.00	1015	3.80	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH210	17/10/13	120	0.0	1.8	18.4	0.0	0.00	1015	3.80	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	17/10/13	10	0.0	1.0	20.9	0.0	0.0	1015	3.17	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	17/10/13	20	0.0	1.3	20.5	0.0	0.00	1015	3.17	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	17/10/13	30	0.0	1.3	20.4	0.0	0.00	1015	3.17	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	17/10/13	60	0.0	1.3	20.3	0.0	0.00	1015	3.17	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	17/10/13	120	0.0	1.4	20.4	0.0	0.00	1015	3.17	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	17/10/13	10	0.0	0.3	20.2	0.3	0.0	1015	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	17/10/13	20	0.0	0.4	20.3	0.3	0.00	1015	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	17/10/13	30	0.0	0.5	20.0	0.3	0.00	1015	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	17/10/13	60	0.0	0.7	19.8	0.3	0.00	1015	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	17/10/13	120	0.0	0.8	19.7	0.3	0.00	1015	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	17/10/13	10	0.0	3.5	19.0	0.0	0.0	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	17/10/13	20	0.0	2.6	19.0	0.0	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	17/10/13	30	0.0	2.2	19.0	0.0	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	17/10/13	60	0.0	2.2	19.0	0.0	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	17/10/13	120	0.0	2.2	18.9	0.0	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	17/10/13	10	0.0	0.2	9.1	0.1	0.0	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	17/10/13	20	0.0	0.1	7.7	0.1	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	17/10/13	30	0.0	0.2	7.7	0.1	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	17/10/13	60	0.0	0.2	7.8	0.1	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	17/10/13	120	0.0	0.2	8.0	0.1	0.00	1014	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	17/10/13	10	0.0	0.1	20.5	0.1	0.0	1014	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	17/10/13	20	0.0	0.2	20.5	0.1	0.00	1014	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	17/10/13	30	0.0	0.2	20.5	0.1	0.00	1014	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	17/10/13	60	0.0	0.3	20.4	0.1	0.00	1014	1.42	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	17/10/13	120	0.0	0.5	20.3	0.1	0.00	1014	1.42	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	17/10/13	10	0.0	1.0	19.8	0.0	0.0	1014	2.70	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	17/10/13	20	0.0	1.1	19.5	0.0	0.00	1014	2.70	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	17/10/13	30	0.0	1.1	19.5	0.0	0.00	1014	2.70	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	17/10/13	60	0.0	1.1	19.5	0.0	0.00	1014	2.70	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	17/10/13	120	0.0	1.1	19.6	0.0	0.00	1014	2.70	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	17/10/13	10	0.0	0.9	19.8	0.2	0.0	1014	0.74	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	17/10/13	20	0.0	1.0	20.1	0.2	0.00	1014	0.74	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Boorley Green
Ref: GE9523
Client: MA Botley Ltd

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation BS8485 & C665		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	CH_4 GSV	CH_4 Conc.	CO_2 GSV	CO_2 Conc.
BH203	17/10/13	30	0.0	0.8	20.2	0.2	0.00	1014	0.74	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	17/10/13	60	0.0	0.6	20.3	0.2	0.00	1014	0.74	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	17/10/13	120	0.0	0.3	20.5	0.2	0.00	1014	0.74	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	17/10/13	10	0.0	1.1	19.9	0.3	0.0	1014	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	17/10/13	20	0.0	1.2	19.8	0.3	0.00	1014	Dry	0.000	0.004	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	17/10/13	30	0.0	1.2	19.7	0.3	0.00	1014	Dry	0.000	0.004	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	17/10/13	60	0.0	1.1	19.7	0.3	0.00	1014	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	17/10/13	120	0.0	1.2	19.7	0.3	0.00	1014	Dry	0.000	0.004	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	17/10/13	10	0.0	3.4	19.2	0.0	0.0	1014	3.56	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	17/10/13	20	0.0	3.6	18.8	0.0	0.00	1014	3.56	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	17/10/13	30	0.0	3.7	18.8	0.0	0.00	1014	3.56	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	17/10/13	60	0.0	3.7	18.7	0.0	0.00	1014	3.56	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	17/10/13	120	0.0	3.7	18.8	0.0	0.00	1014	3.56	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	17/10/13	10	0.0	1.7	19.7	0.0	0.0	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	17/10/13	20	0.0	2.0	19.5	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	17/10/13	30	0.0	2.0	19.4	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	17/10/13	60	0.0	1.8	19.6	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	17/10/13	120	0.0	1.8	19.6	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	17/10/13	10	0.0	1.1	20.6	0.0	0.0	1014	2.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	17/10/13	20	0.0	1.6	20.0	0.0	0.00	1014	2.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	17/10/13	30	0.0	1.6	19.8	0.0	0.00	1014	2.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	17/10/13	60	0.0	1.6	19.8	0.0	0.00	1014	2.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	17/10/13	120	0.0	1.7	19.8	0.0	0.00	1014	2.19	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	17/10/13	10	0.0	0.0	20.2	0.0	0.0	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	17/10/13	20	0.0	0.0	20.6	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	17/10/13	30	0.0	0.0	20.6	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	17/10/13	60	0.0	0.0	20.6	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	17/10/13	120	0.0	0.0	20.6	0.0	0.00	1014	1.09	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	24/10/13	10	0.0	1.1	19.0	0.0	0.0	1013	1.36	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	24/10/13	20	0.0	2.1	20.7	0.0	0.00	1013	1.36	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	24/10/13	30	0.0	2.3	19.1	0.0	0.00	1013	1.36	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	24/10/13	60	0.0	2.6	19.0	0.0	0.00	1013	1.36	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS348	24/10/13	120	0.0	3.0	18.8	0.0	0.00	1013	1.36	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	24/10/13	10	0.0	1.3	20.0	0.1	0.0	1013	3.15	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	24/10/13	20	0.0	2.0	18.5	0.1	0.00	1013	3.15	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	24/10/13	30	0.0	2.3	17.9	0.1	0.00	1013	3.15	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	24/10/13	60	0.0	2.7	17.3	0.1	0.00	1013	3.15	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS333	24/10/13	120	0.0	2.7	17.2	0.1	0.00	1013	3.15	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	24/10/13	10	0.0	0.6	20.2	0.2	0.0	1013	Dry	0.000	0.001	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	24/10/13	20	0.0	0.8	19.7	0.2	0.00	1013	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	24/10/13	30	0.0	0.8	19.6	0.2	0.00	1013	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	24/10/13	60	0.0	0.8	19.6	0.2	0.00	1013	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH208	24/10/13	120	0.0	0.8	19.6	0.2	0.00	1013	Dry	0.000	0.002	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	24/10/13	10	0.0	0.8	19.9	0.0	0.0	1013	3.13	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	24/10/13	20	0.0	1.1	19.9	0.0	0.00	1013	3.13	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	24/10/13	30	0.0	1.2	19.9	0.0	0.00	1013	3.13	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	24/10/13	60	0.0	1.2	19.9	0.0	0.00	1013	3.13	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH207	24/10/13	120	0.0	1.3	19.9	0.0	0.00	1013	3.13	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Boorley Green
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Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
BH209	24/10/13	10	0.0	2.2	19.4	0.0	0.0	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	24/10/13	20	0.0	2.9	18.5	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	24/10/13	30	0.0	2.9	18.5	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	24/10/13	60	0.0	2.9	18.4	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH209	24/10/13	120	0.0	3.0	18.4	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	24/10/13	10	0.0	0.2	20.4	0.0	0.0	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	24/10/13	20	0.0	0.2	20.4	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	24/10/13	30	0.0	0.2	20.4	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	24/10/13	60	0.0	0.2	20.4	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH205	24/10/13	120	0.0	0.2	20.4	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	24/10/13	10	0.0	0.0	20.5	0.0	0.0	1013	1.35	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	24/10/13	20	0.0	0.1	20.5	0.0	0.00	1013	1.35	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	24/10/13	30	0.0	0.1	20.5	0.0	0.00	1013	1.35	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	24/10/13	60	0.0	0.1	20.5	0.0	0.00	1013	1.35	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS293	24/10/13	120	0.0	0.1	20.5	0.0	0.00	1013	1.35	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	24/10/13	10	0.0	0.6	20.0	0.0	0.0	1013	2.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	24/10/13	20	0.0	1.1	19.5	0.0	0.00	1013	2.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	24/10/13	30	0.0	1.2	19.4	0.0	0.00	1013	2.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	24/10/13	60	0.0	1.3	19.2	0.0	0.00	1013	2.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH204	24/10/13	120	0.0	1.3	19.2	0.0	0.00	1013	2.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	24/10/13	10	0.0	0.8	19.3	0.0	0.0	1013	0.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	24/10/13	20	0.0	0.2	20.1	0.0	0.00	1013	0.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	24/10/13	30	0.0	0.1	20.2	0.0	0.00	1013	0.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	24/10/13	60	0.0	0.1	20.3	0.0	0.00	1013	0.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH203	24/10/13	120	0.0	0.1	20.3	0.0	0.00	1013	0.64	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	24/10/13	10	0.0	0.6	20.0	0.5	0.0	1013	Dry	0.000	0.003	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	24/10/13	20	0.0	1.4	19.3	0.5	0.00	1013	Dry	0.000	0.007	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	24/10/13	30	0.0	1.4	19.3	0.5	0.00	1013	Dry	0.000	0.007	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	24/10/13	60	0.0	1.4	19.3	0.5	0.00	1013	Dry	0.000	0.007	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH202	24/10/13	120	0.0	1.5	19.3	0.5	0.00	1013	Dry	0.000	0.008	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	24/10/13	10	0.0	1.6	19.4	0.0	0.0	1013	3.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	24/10/13	20	0.0	3.5	18.6	0.0	0.00	1013	3.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	24/10/13	30	0.0	3.8	18.2	0.0	0.00	1013	3.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	24/10/13	60	0.0	3.8	18.1	0.0	0.00	1013	3.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH201	24/10/13	120	0.0	3.9	18.1	0.0	0.00	1013	3.60	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	24/10/13	10	0.0	2.8	18.0	0.0	0.0	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	24/10/13	20	0.0	3.0	17.7	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	24/10/13	30	0.0	3.5	17.0	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	24/10/13	60	0.0	4.3	16.1	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS205	24/10/13	120	0.0	4.2	16.1	0.0	0.00	1013	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	24/10/13	10	0.0	0.7	20.4	0.0	0.0	1013	2.07	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	24/10/13	20	0.0	1.5	19.6	0.0	0.00	1013	2.07	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	24/10/13	30	0.0	1.5	19.5	0.0	0.00	1013	2.07	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	24/10/13	60	0.0	1.5	19.5	0.0	0.00	1013	2.07	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH206	24/10/13	120	0.0	1.5	19.5	0.0	0.00	1013	2.07	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	24/10/13	10	0.0	0.1	19.2	0.0	0.0	1013	1.05	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	24/10/13	20	0.0	0.0	20.4	0.0	0.00	1013	1.05	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	24/10/13	30	0.0	0.0	20.6	0.0	0.00	1013	1.05	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Boorley Green
Ref: GE9523
Client: MA Botley Ltd

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
WS365	24/10/13	60	0.0	0.0	20.6	0.0	0.00	1013	1.05	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS365	24/10/13	120	0.0	0.0	20.7	0.0	0.00	1013	1.05	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
		10								0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
-	-	20								0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Date and Time	CH4	CO2	O2	H2S	CO	Borehole	Atmospheric	Temperature
10/10/2013 09:44	0	0.5	21.1	0	0	1018	1018	16.2
10/10/2013 10:44	0	1	20.3	0	0	1019	1018	15
10/10/2013 11:44	0	1	20.2	0	0	1019	1018	14.6
10/10/2013 12:44	0	1	20.4	0	0	1019	1018	14.5
10/10/2013 13:44	0	1	20.1	0	0	1019	1018	14.4
10/10/2013 14:44	0	1	20.1	0	0	1019	1018	14.4
10/10/2013 15:44	0	1	20.1	0	0	1019	1018	14.3
10/10/2013 16:44	0	1	20.1	0	0	1018	1018	14.3
10/10/2013 17:44	0	1	20.1	0	0	1019	1018	14.2
10/10/2013 18:44	0	1	20.1	0	0	1019	1018	14.1
10/10/2013 19:44	0	1	20.1	0	0	1019	1018	14.1
10/10/2013 20:44	0	1	20.1	0	0	1019	1018	14.1
10/10/2013 21:44	0	1	20.1	0	0	1019	1018	14.1
10/10/2013 22:44	0	1	20.1	0	0	1019	1018	14
10/10/2013 23:44	0	1	20.1	0	0	1018	1017	14
11/10/2013 00:44	0	1	20	0	0	1018	1017	13.9
11/10/2013 01:44	0	1	20.1	0	0	1017	1016	13.9
11/10/2013 02:44	0	1	19.9	0	0	1016	1015	13.9
11/10/2013 03:44	0	1	19.8	0	0	1015	1014	13.9
11/10/2013 04:44	0	1	19.9	0	0	1014	1013	13.8
11/10/2013 05:44	0	1	20	0	0	1014	1013	13.8
11/10/2013 06:44	0	1	20	0	0	1014	1013	13.8
11/10/2013 07:44	0	1	19.9	0	0	1015	1014	13.8
11/10/2013 08:44	0	1	19.9	0	0	1016	1015	13.7
11/10/2013 09:44	0	1	20.1	0	0	1017	1016	13.7
11/10/2013 10:44	0	1	20.1	0	0	1018	1017	13.6
11/10/2013 11:44	0	1	20	0	0	1018	1017	13.6
11/10/2013 12:44	0	1	20.1	0	0	1018	1017	13.6
11/10/2013 13:44	0	1	20.1	0	1	1017	1016	13.6
11/10/2013 14:44	0	1	19.8	0	1	1016	1015	13.5
11/10/2013 15:44	0	1	19.8	0	0	1015	1014	13.5
11/10/2013 16:44	0	1	19.8	0	0	1015	1014	13.5
11/10/2013 17:44	0	1	19.8	0	0	1015	1014	13.4
11/10/2013 18:44	0	1	19.8	0	0	1015	1014	13.4
11/10/2013 19:44	0	1	19.8	0	0	1016	1014	13.4
11/10/2013 20:44	0	1	19.8	0	0	1015	1014	13.4
11/10/2013 21:44	0	1	20	0	0	1015	1014	13.4
11/10/2013 22:44	0	1	20.1	0	0	1015	1014	13.4
11/10/2013 23:44	0	1	19.8	0	0	1015	1014	13.4
12/10/2013 00:44	0	1	19.8	0	0	1015	1014	13.4
12/10/2013 01:44	0	1	19.8	0	0	1015	1014	13.4
12/10/2013 02:44	0	1	19.8	0	0	1014	1013	13.4
12/10/2013 03:44	0	1	19.8	0	0	1013	1012	13.4
12/10/2013 04:44	0	1	19.7	0	0	1013	1012	13.4
12/10/2013 05:44	0	1	19.7	0	0	1013	1012	13.4
12/10/2013 06:44	0	1	19.9	0	0	1014	1013	13.4
12/10/2013 07:44	0	1	19.8	0	0	1015	1014	13.4
12/10/2013 08:44	0	1	20	0	0	1016	1015	13.4
12/10/2013 09:44	0	1	20.1	0	0	1017	1016	13.4
12/10/2013 10:44	0	1	20.1	0	0	1018	1016	13.4
12/10/2013 11:44	0	1	20.1	0	0	1018	1017	13.4
12/10/2013 12:44	0	1	19.9	0	0	1018	1017	13.4
12/10/2013 13:44	0	1	20	0	1	1018	1017	13.4
12/10/2013 14:44	0	1	20	0	0	1018	1017	13.4
12/10/2013 15:44	0	1	19.9	0	0	1017	1016	13.4
12/10/2013 16:44	0	1	19.8	0	0	1017	1016	13.4
12/10/2013 17:44	0	1	19.8	0	0	1017	1016	13.4
12/10/2013 18:44	0	1	19.8	0	0	1017	1016	13.4
12/10/2013 19:44	0	1	19.8	0	0	1017	1015	13.4
12/10/2013 20:44	0	1	19.8	0	0	1016	1015	13.4
12/10/2013 21:44	0	1	19.8	0	0	1016	1015	13.4

12/10/2013 22:44	0	1	19.8	0	0	1016	1015	13.4
12/10/2013 23:44	0	1	19.8	0	0	1016	1015	13.4
13/10/2013 00:44	0	1	19.9	0	0	1015	1014	13.4
13/10/2013 01:44	0	1	19.7	0	0	1015	1014	13.4
13/10/2013 02:44	0	1	19.7	0	0	1014	1013	13.4
13/10/2013 03:44	0	1	19.7	0	0	1013	1012	13.4
13/10/2013 04:44	0	1	19.7	0	0	1013	1012	13.4
13/10/2013 05:44	0	1	19.7	0	0	1012	1011	13.4
13/10/2013 06:44	0	1	19.7	0	0	1011	1010	13.4
13/10/2013 07:44	0	1	19.7	0	0	1011	1010	13.4
13/10/2013 08:44	0	1	19.7	0	0	1011	1010	13.4
13/10/2013 09:44	0	1	19.7	0	0	1010	1009	13.4
13/10/2013 10:44	0	1	19.7	0	0	1010	1009	13.3
13/10/2013 11:44	0	1	19.7	0	0	1010	1009	13.3
13/10/2013 12:44	0	1	19.7	0	0	1009	1008	13.3
13/10/2013 13:44	0	1	19.7	0	0	1009	1008	13.3
13/10/2013 14:44	0	1	19.7	0	0	1009	1008	13.3
13/10/2013 15:44	0	1	19.7	0	0	1009	1007	13.3
13/10/2013 16:44	0	1	19.7	0	0	1008	1007	13.2
13/10/2013 17:44	0	1	19.7	0	0	1008	1007	13.2
13/10/2013 18:44	0	1	19.7	0	0	1008	1007	13.2
13/10/2013 19:44	0	1	19.7	0	0	1009	1007	13.2
13/10/2013 20:44	0	1	19.7	0	0	1009	1007	13.2
13/10/2013 21:44	0	1	19.7	0	0	1009	1007	13.2
13/10/2013 22:44	0	1	19.7	0	0	1009	1007	13.2
13/10/2013 23:44	0	1	19.7	0	0	1008	1007	13.2
14/10/2013 00:44	0	1	19.7	0	0	1008	1007	13.2
14/10/2013 01:44	0	1	19.7	0	0	1008	1007	13.2
14/10/2013 02:44	0	1	19.7	0	0	1008	1007	13.2
14/10/2013 03:44	0	1	19.7	0	0	1007	1006	13.2
14/10/2013 04:44	0	1	19.7	0	0	1007	1006	13.2
14/10/2013 05:44	0	1	19.7	0	0	1007	1006	13.1
14/10/2013 06:44	0	1	19.7	0	0	1007	1006	13.1
14/10/2013 07:44	0	1	19.7	0	0	1007	1006	13.1
14/10/2013 08:44	0	1	19.7	0	0	1007	1006	13.1
14/10/2013 09:44	0	1	19.7	0	0	1007	1006	13.1
14/10/2013 10:44	0	1	19.7	0	0	1007	1006	13.1
14/10/2013 11:44	0	1	19.7	0	0	1007	1006	13.1
14/10/2013 12:44	0	1	19.7	0	0	1007	1006	13
14/10/2013 13:44	0	1	19.7	0	0	1007	1005	13
14/10/2013 14:44	0	1	19.7	0	0	1006	1005	12.9
14/10/2013 15:44	0	1	19.7	0	0	1005	1004	12.9
14/10/2013 16:44	0	1	19.7	0	0	1005	1004	12.9
14/10/2013 17:44	0	1	19.7	0	0	1006	1004	12.9
14/10/2013 18:44	0	1	19.7	0	0	1006	1005	12.9
14/10/2013 19:44	0	1	19.7	0	0	1006	1005	12.9
14/10/2013 20:44	0	1	19.7	0	0	1006	1005	12.9
14/10/2013 21:44	0	1	19.7	0	0	1007	1005	12.9
14/10/2013 22:44	0	1	19.7	0	0	1007	1006	12.9
14/10/2013 23:44	0	1	19.7	0	0	1007	1006	12.9
15/10/2013 00:44	0	1	19.7	0	0	1008	1006	12.9
15/10/2013 01:44	0	1	19.7	0	0	1008	1007	12.9
15/10/2013 02:44	0	1	19.7	0	0	1008	1007	12.9
15/10/2013 03:44	0	1	19.7	0	0	1008	1007	12.9
15/10/2013 04:44	0	1	19.7	0	0	1008	1007	12.9
15/10/2013 05:44	0	1	19.7	0	0	1008	1007	12.8
15/10/2013 06:44	0	1	19.7	0	0	1008	1007	12.8
15/10/2013 07:44	0	1	19.7	0	0	1008	1007	12.8
15/10/2013 08:44	0	1	19.7	0	0	1008	1007	12.8
15/10/2013 09:44	0	1	19.7	0	0	1008	1007	12.8
15/10/2013 10:44	0	1	19.9	0	0	1009	1008	12.8
15/10/2013 11:44	0	1	19.9	0	0	1009	1008	12.8

15/10/2013 12:44	0	1	19.9	0	0	1009	1008	12.8
15/10/2013 13:44	0	1	19.9	0	0	1009	1008	12.7
15/10/2013 14:44	0	1	19.9	0	0	1008	1007	12.7
15/10/2013 15:44	0	1	19.9	0	0	1009	1008	12.7
15/10/2013 16:44	0	1	19.9	0	0	1009	1008	12.6
15/10/2013 17:44	0	1	19.8	0	0	1010	1008	12.6
15/10/2013 18:44	0	1	19.9	0	0	1010	1009	12.6
15/10/2013 19:44	0	1	19.8	0	0	1011	1010	12.6
15/10/2013 20:44	0	1	19.8	0	0	1011	1010	12.6
15/10/2013 21:44	0	1	20	0	0	1012	1011	12.6
15/10/2013 22:44	0	1	19.8	0	0	1012	1011	12.6
15/10/2013 23:44	0	1	20	0	0	1013	1012	12.6
16/10/2013 00:44	0	1	19.8	0	0	1013	1012	12.5
16/10/2013 01:44	0	1	20	0	0	1013	1012	12.5
16/10/2013 02:44	0	1	20	0	0	1012	1011	12.5
16/10/2013 03:44	0	1	19.8	0	0	1012	1010	12.5
16/10/2013 04:44	0	1	19.8	0	0	1011	1010	12.5
16/10/2013 05:44	0	1	19.8	0	0	1011	1009	12.4
16/10/2013 06:44	0	1	19.9	0	0	1010	1008	12.4
16/10/2013 07:44	0	1	19.7	0	0	1009	1008	12.4
16/10/2013 08:44	0	1	19.7	0	0	1008	1007	12.4
16/10/2013 09:44	0	1	19.7	0	0	1007	1006	12.4
16/10/2013 10:44	0	1	19.7	0	0	1006	1005	12.3
16/10/2013 11:44	0	1	19.7	0	0	1005	1003	12.3
16/10/2013 12:44	0	1	19.7	0	0	1004	1003	12.2
16/10/2013 13:44	0	1	19.6	0	0	1004	1003	12.1
16/10/2013 14:44	0	1	19.7	0	0	1004	1003	12.1
16/10/2013 15:44	0	1	19.7	0	0	1005	1004	12.1
16/10/2013 16:44	0	1	19.7	0	0	1006	1004	12.1
16/10/2013 17:44	0	1	19.7	0	0	1006	1005	12.1
16/10/2013 18:44	0	1	19.7	0	0	1007	1006	12.1
16/10/2013 19:44	0	1	19.7	0	0	1008	1007	12.1
16/10/2013 20:44	0	1	19.9	0	0	1008	1007	12.1
16/10/2013 21:44	0	1	19.9	0	0	1009	1007	12.1
16/10/2013 22:44	0	1	19.8	0	0	1009	1008	12.1
16/10/2013 23:44	0	1	19.8	0	0	1009	1008	12.2
17/10/2013 00:44	0	1	19.8	0	0	1010	1008	12.2
17/10/2013 01:44	0	1	19.8	0	0	1010	1009	12.2
17/10/2013 02:44	0	1	19.8	0	0	1010	1009	12.2
17/10/2013 03:44	0	1	19.8	0	0	1010	1009	12.2
17/10/2013 04:44	0	1	19.8	0	0	1010	1009	12.3
17/10/2013 05:44	0	1	19.8	0	0	1010	1009	12.3
17/10/2013 06:44	0	1	19.8	0	0	1011	1009	12.3
17/10/2013 07:44	0	1	19.8	0	0	1011	1010	12.3
17/10/2013 08:44	0	1	19.8	0	0	1011	1010	12.3
17/10/2013 09:44	0	1	20	0	0	1012	1011	12.3
17/10/2013 10:44	0	1	20	0	0	1013	1011	12.3
17/10/2013 11:44	0	1	19.8	0	0	1013	1011	12.3

Date and Time	CH4	CO2	O2	H2S	CO	Atmospheric	Temperature
18/10/2013 09:02	0	0.5	19.7	0	0	1012	14.9
18/10/2013 10:02	0	0.5	19.2	0	0	1012	14.6
18/10/2013 11:02	0	0.5	18.7	0	0	1012	14.3
18/10/2013 12:02	0	1	18.4	0	0	1011	14.2
18/10/2013 13:02	0	1	18.2	0	0	1010	14.2
18/10/2013 14:02	0	1	18.1	0	0	1010	14.1
18/10/2013 15:02	0	1	18	0	0	1009	14.1
18/10/2013 16:02	0	1	18	0	0	1008	14.1
18/10/2013 17:02	0	1.6	17.9	0	0	1008	14.1
18/10/2013 18:02	0	1.6	17.8	0	0	1007	14.1
18/10/2013 19:02	0	1.6	17.8	0	0	1006	14.1
18/10/2013 20:02	0	1.6	17.7	0	0	1006	14.1
18/10/2013 21:02	0	1.6	17.7	0	0	1006	14.1
18/10/2013 22:02	0	1.6	17.7	0	0	1006	14.2
18/10/2013 23:02	0	1.6	17.7	0	0	1005	14.2
19/10/2013 00:02	0	1.6	17.6	0	0	1004	14.2
19/10/2013 01:02	0	1.6	17.6	0	0	1003	14.2
19/10/2013 02:02	0	1.6	17.6	0	0	1003	14.2
19/10/2013 03:02	0	1.6	17.5	0	0	1003	14.2
19/10/2013 04:02	0	1.6	17.5	0	0	1002	14.2
19/10/2013 05:02	0	1.6	17.5	0	0	1002	14.3
19/10/2013 06:02	0	1.6	17.4	0	0	1001	14.3
19/10/2013 07:02	0	1.6	17.4	0	0	1001	14.3
19/10/2013 08:02	0	1.6	17.4	0	0	1002	14.3
19/10/2013 09:02	0	1.6	17.4	0	0	1002	14.3
19/10/2013 10:02	0	1.6	17.4	0	0	1002	14.3
19/10/2013 11:02	0	1.6	17.4	0	0	1002	14.3
19/10/2013 12:02	0	1.6	17.4	0	0	1002	14.3
19/10/2013 13:02	0	1.6	17.3	0	0	1002	14.3
19/10/2013 14:02	0	1.6	17.3	0	0	1002	14.3
19/10/2013 15:02	0	1.6	17.3	0	0	1001	14.3
19/10/2013 16:02	0	1.6	17.3	0	0	1001	14.3
19/10/2013 17:02	0	1.6	17.3	0	0	1002	14.3
19/10/2013 18:02	0	1.6	17.3	0	0	1002	14.3
19/10/2013 19:02	0	1.6	17.3	0	0	1003	14.4
19/10/2013 20:02	0	1.6	17.3	0	0	1003	14.4
19/10/2013 21:02	0	1.6	17.3	0	0	1003	14.4
19/10/2013 22:02	0	1.6	17.3	0	0	1003	14.4
19/10/2013 23:02	0	1.6	17.3	0	0	1003	14.4
20/10/2013 00:02	0	1.6	17.2	0	0	1003	14.4
20/10/2013 01:02	0	1.6	17.2	0	0	1002	14.4
20/10/2013 02:02	0	1.6	17.2	0	0	1002	14.4
20/10/2013 03:02	0	1.6	17.2	0	0	1002	14.4
20/10/2013 04:02	0	1.6	17.2	0	0	1002	14.5
20/10/2013 05:02	0	1.6	17.2	0	0	1001	14.5
20/10/2013 06:02	0	1.6	17.2	0	0	1001	14.5
20/10/2013 07:02	0	1.6	17.2	0	0	1001	14.5
20/10/2013 08:02	0	1.6	17.2	0	0	1002	14.5
20/10/2013 09:02	0	1.6	17.2	0	0	1002	14.5
20/10/2013 10:02	0	1.6	17.1	0	0	1002	14.5
20/10/2013 11:02	0	1.6	17.1	0	0	1003	14.5
20/10/2013 12:02	0	1.6	17.1	0	0	1002	14.5
20/10/2013 13:02	0	1.6	17.1	0	0	1002	14.5
20/10/2013 14:02	0	1.6	17.1	0	0	1002	14.5
20/10/2013 15:02	0	1.6	17.1	0	0	1001	14.5
20/10/2013 16:02	0	1.6	17	0	0	1002	14.5

20/10/2013 17:02	0	1.6	17	0	0	1003	14.5
20/10/2013 18:02	0	1.6	17	0	0	1003	14.5
20/10/2013 19:02	0	1.6	16.9	0	0	1003	14.5
20/10/2013 20:02	0	1.6	16.9	0	0	1004	14.6
20/10/2013 21:02	0	1.6	16.9	0	0	1004	14.6
20/10/2013 22:02	0	1.6	16.9	0	0	1004	14.6
20/10/2013 23:02	0	1.6	17	0	0	1005	14.6
21/10/2013 00:02	0	1.6	17	0	0	1005	14.6
21/10/2013 01:02	0	1.6	17	0	0	1005	14.6
21/10/2013 02:02	0	1.6	17	0	0	1005	14.6
21/10/2013 03:02	0	1.6	17	0	0	1005	14.6
21/10/2013 04:02	0	1.6	17	0	0	1004	14.6
21/10/2013 05:02	0	1.6	16.9	0	0	1004	14.6
21/10/2013 06:02	0	1.6	16.9	0	0	1004	14.6
21/10/2013 07:02	0	1.6	16.8	0	0	1004	14.6
21/10/2013 08:02	0	1.6	16.8	0	0	1003	14.6
21/10/2013 09:02	0	1.6	16.7	0	0	1003	14.6
21/10/2013 10:02	0	2.1	16.7	0	0	1003	14.6
21/10/2013 11:02	0	1.6	16.7	0	0	1003	14.6
21/10/2013 12:02	0	2.1	16.7	0	0	1003	14.6
21/10/2013 13:02	0	1.6	16.7	0	0	1003	14.6
21/10/2013 14:02	0	1.6	16.7	0	0	1003	14.6
21/10/2013 15:02	0	1.6	16.7	0	0	1002	14.6
21/10/2013 16:02	0	1.6	16.7	0	0	1002	14.6
21/10/2013 17:02	0	1.6	16.7	0	0	1002	14.6
21/10/2013 18:02	0	1.6	16.7	0	0	1002	14.6
21/10/2013 19:02	0	1.6	16.7	0	0	1001	14.6
21/10/2013 20:02	0	2.1	16.6	0	0	1001	14.6
21/10/2013 21:02	0	2.1	16.5	0	0	1001	14.6
21/10/2013 22:02	0	2.1	16.5	0	0	1000	14.6
21/10/2013 23:02	0	2.1	16.4	0	0	1000	14.6
22/10/2013 00:02	0	2.1	16.3	0	0	999	14.7
22/10/2013 01:02	0	2.1	16.3	0	0	999	14.7
22/10/2013 02:02	0	2.1	16.2	0	0	998	14.7
22/10/2013 03:02	0	2.1	16.1	0	0	997	14.7
22/10/2013 04:02	0	2.1	16.1	0	0	997	14.7
22/10/2013 05:02	0	2.1	16	0	0	996	14.8
22/10/2013 06:02	0	2.1	16	0	0	995	14.8
22/10/2013 07:02	0	2.1	15.9	0	0	995	14.8
22/10/2013 08:02	0	2.1	15.9	0	0	994	14.8
22/10/2013 09:02	0	2.1	15.8	0	0	994	14.8
22/10/2013 10:02	0	2.1	15.8	0	0	994	14.8
22/10/2013 11:02	0	2.1	15.7	0	0	994	14.8
22/10/2013 12:02	0	2.1	15.7	0	0	994	14.8
22/10/2013 13:02	0	2.1	15.7	0	0	993	14.8
22/10/2013 14:02	0	2.1	15.6	0	0	993	14.8
22/10/2013 15:02	0	2.1	15.6	0	0	993	14.8
22/10/2013 16:02	0	2.1	15.6	0	0	993	14.8
22/10/2013 17:02	0	2.1	15.6	0	0	992	14.8
22/10/2013 18:02	0	2.1	15.6	0	0	991	14.8
22/10/2013 19:02	0	2.1	15.5	0	0	991	14.9
22/10/2013 20:02	0	2.6	15.4	0	0	992	14.9
22/10/2013 21:02	0	2.6	15.3	0	0	992	15
22/10/2013 22:02	0	2.6	15.2	0	0	991	14.9
22/10/2013 23:02	0	2.6	15.2	0	0	991	14.9
23/10/2013 00:02	0	2.6	15.2	0	0	990	14.9
23/10/2013 01:02	0	2.6	15.3	0	0	989	14.9

23/10/2013 02:02	0	2.6	15.3	0	1	989	15
23/10/2013 03:02	0	2.1	15.3	0	0	989	15
23/10/2013 04:02	0	2.1	15.3	0	0	989	15
23/10/2013 05:02	0	2.1	15.4	0	0	989	15
23/10/2013 06:02	0	2.1	15.4	0	0	989	15
23/10/2013 07:02	0	2.1	15.4	0	0	990	15
23/10/2013 08:02	0	2.1	15.4	0	0	991	15
23/10/2013 09:02	0	2.1	15.5	0	0	992	15
23/10/2013 10:02	0	2.1	15.5	0	0	994	15
23/10/2013 11:02	0	2.1	15.6	0	0	996	15
23/10/2013 12:02	0	2.1	15.6	0	0	997	15
23/10/2013 13:02	0	2.1	15.7	0	0	998	15
23/10/2013 14:02	0	2.1	15.7	0	0	999	15
23/10/2013 15:02	0	2.1	15.7	0	0	1000	15
23/10/2013 16:02	0	2.1	15.7	0	0	1001	15
23/10/2013 17:02	0	2.1	15.8	0	0	1002	15
23/10/2013 18:02	0	2.1	15.8	0	0	1003	15
23/10/2013 19:02	0	2.1	15.8	0	0	1005	15
23/10/2013 20:02	0	2.1	15.8	0	0	1006	15
23/10/2013 21:02	0	2.1	15.9	0	0	1007	15
23/10/2013 22:02	0	2.1	15.9	0	0	1008	15.1
23/10/2013 23:02	0	2.1	15.9	0	0	1008	15
24/10/2013 00:02	0	2.1	15.9	0	0	1009	15.1
24/10/2013 01:02	0	2.1	16	0	1	1010	15.1
24/10/2013 02:02	0	2.1	16	0	0	1010	15.1
24/10/2013 03:02	0	2.1	16	0	1	1010	15
24/10/2013 04:02	0	2.1	16	0	0	1010	15
24/10/2013 05:02	0	2.1	16	0	0	1010	15
24/10/2013 06:02	0	2.1	16	0	0	1011	15
24/10/2013 07:02	0	2.1	16	0	0	1011	14.9
24/10/2013 08:02	0	2.1	16	0	0	1011	14.9
24/10/2013 09:02	0	2.1	16	0	0	1012	14.9
24/10/2013 10:02	0	2.1	16	0	0	1012	14.9
24/10/2013 11:02	0	2.1	16	0	0	1011	14.9
24/10/2013 12:02	0	2.1	16	0	0	1012	14.8
24/10/2013 13:02	0	2.1	16	0	0	1011	14.8
24/10/2013 14:02	0	2.1	16	0	0	1010	14.8
24/10/2013 15:02	0	2.1	16	0	0	1010	14.8
24/10/2013 16:02	0	2.1	16	0	0	1010	14.7

APPENDIX F

Geochemical Laboratory Results

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone (01424) 718618
Facsimile (01424) 729911

2683

THE ENVIRONMENTAL LABORATORY LTD

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Reporting Date: 25 September 2013

ANALYTICAL REPORT No. AR50641

Samples Received By: Laboratory Courier
Sample Receipt Date: 10/09/13
Your Job No: GE9523
Your Order No: ---
Site Location: Boorley Green
ELAB Invoice Number: SO230
No Samples Received: 23
Date of Sampling: ---

This report was written by: N. Williams

Authorised By;

[redacted]

Steve Knight
Reporting Manager

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

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50641

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils

	Characteristic	Chalk	Silt loam	Silty clay loam	Chalk	Silt loam	Silt loam	Sandy silt loam	Silt loam	Sandy silt loam	Silt loam
	Date Sampled	---	---	---	---	---	---	---	---	---	---
	TP/BH	WS212	WS212	WS212	WS213	WS213	WS213	WS214	WS215	WS215	WS219
	Depth (m)	0.20	1.00	4.00	0.20	1.50	3.50	1.00	0.20	0.50	0.20
	Our ref	83268	83269	83270	83271	83272	83273	83274	83275	83276	83278
Stone Content	(%)	11	19	<1	17	3	41	34	21	53	18
Arsenic**	(mg/kg)	<5	7.2	14.0	<5	<5	<5	5.3	7.5	<5	7.0
Cadmium**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium**	(mg/kg)	10	24	48	13	7	11	14	23	10	19
Lead**	(mg/kg)	17	114	24	29	24	13	528	106	59	30
Mercury**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel**	(mg/kg)	6	11	9	7	6	6	8	11	7	5
Copper**	(mg/kg)	6	12	12	9	11	6	6	19	11	10
Zinc**	(mg/kg)	33	98	49	44	30	29	32	108	129	43
Selenium**	(mg/kg)	1.6	3.3	2.7	1.4	1.6	1.3	1.8	2.7	1.0	2.1
Hexavalent Chromium	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water Soluble Boron	(mg/kg)	<0.5	0.7	0.8	0.7	1.8	1.0	1.1	0.6	1.0	0.9
Barium*	(mg/kg)	33	54	37	40	32	33	49	73	35	23
Beryllium*	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vanadium**	(mg/kg)	17	37	69	21	12	18	20	35	15	31
pH Value**	(Units)	8.2	8.1	7.2	8.2	8.0	7.6	10.4	7.6	8.9	6.3
Total Sulphate	(% as SO_4)	0.06	0.15	0.23	0.13	0.23	0.13	0.36	0.21	0.11	0.14
Water Soluble Sulphate**	(mg/l as SO_4)	<20	44	<20	<20	298	74	664	24	52	<20
Water Soluble Sulphate	(mg/kg as SO_4)	<40	88	<40	<40	596	148	1328	48	103	<40
Water Soluble Chloride	(mg/l)	<20	<20	<20	<20	<20	<20	21	<20	<20	20
Water Soluble Chloride	(mg/kg)	<40	<40	<40	<40	<40	<40	41	<40	<40	40
Total Cyanide	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sulphide	(mg/kg)	<2	<2	<2	<2	<2	4.0	<2	<2	<2	<2
Elemental Sulphur**	(mg/kg)	<10	<10	<10	<10	<10	186	<10	<10	<10	<10
Total Monohydric Phenols***	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Organic Carbon	(%)	0.5	0.6	0.5	0.7	0.3	0.7	0.3	1.4	0.5	1.0
TPH (> C_8 - < C_{40})**	(mg/kg)	9	n/t	<5	<5	<5	7	n/t	7	44	<5

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

*** - Sum of Phenol, 2, 3, 5,-Trimethylphenol, 2, 3,-Dimethylphenol, 3, 4-Dimethylphenol, Resorcinol/Catechol, o-Cresol, m, p-Cresol & Napthol

N. Williams

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50641

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils

	Characteristic	Silt loam	Silt loam	Silt loam	Loamy sand	Silt loam	Sand	Loamy sand	Silt loam	Silt loam
	Date Sampled	---	---	---	---	---	---	---	---	---
	TP/BH	WS222	WS224	WS227	WS228	WS228	WS231	WS242	WS244	WS248
	Depth (m)	0.20	0.20	0.20	0.20	0.50	0.20	0.20	0.20	0.20
	Our ref	83280	83281	83283	83284	83285	83286	83288	83289	83291
Stone Content	(%)	16	<1	24	<1	<1	<1	<1	7	<1
Arsenic**	(mg/kg)	62.7	9.0	7.4	6.4	11.2	<5	<5	7.4	9.9
Cadmium**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium**	(mg/kg)	19	25	20	14	35	14	13	19	33
Lead**	(mg/kg)	55	43	12	13	12	11	8	104	37
Mercury**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel**	(mg/kg)	7	9	9	5	9	2	2	7	10
Copper**	(mg/kg)	14	14	8	6	10	5	5	19	14
Zinc**	(mg/kg)	45	44	31	32	53	27	18	36	52
Selenium**	(mg/kg)	3.0	2.9	2.0	1.7	2.4	1.4	0.6	2.7	2.4
Hexavalent Chromium	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water Soluble Boron	(mg/kg)	<0.5	0.6	0.5	0.5	<0.5	<0.5	<0.5	<0.5	0.7
Barium*	(mg/kg)	28	31	18	20	24	12	19	29	38
Beryllium*	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vanadium**	(mg/kg)	32	40	29	22	51	21	18	29	33
pH Value**	(Units)	6.1	5.8	5.5	5.8	6.1	5.7	5.8	5.3	5.9
Total Sulphate	(% as SO_4)	0.17	0.19	0.17	0.15	0.24	0.16	0.18	0.18	0.15
Water Soluble Sulphate**	(mg/l as SO_4)	<20	<20	<20	<20	24	<20	<20	<20	<20
Water Soluble Sulphate	(mg/kg as SO_4)	<40	<40	<40	<40	47	<40	<40	<40	<40
Water Soluble Chloride	(mg/l)	<20	<20	<20	<20	<20	<20	<20	<20	<20
Water Soluble Chloride	(mg/kg)	<40	<40	<40	<40	<40	<40	<40	<40	<40
Total Cyanide	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sulphide	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2
Elemental Sulphur**	(mg/kg)	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Monohydric Phenols***	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Organic Carbon	(%)	0.9	1.1	0.7	0.5	0.3	0.4	0.3	1.5	0.6
TPH (> C_8 - < C_{40})**	(mg/kg)	<5	<5	<5	<5	<5	n/t	<5	n/t	<5

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

*** - Sum of Phenol, 2, 3, 5,-Trimethylphenol, 2, 3,-Dimethylphenol, 3, 4-Dimethylphenol, Resorcinol/Catechol, o-Cresol, m, p-Cresol & Napthol

N. Williams

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50641

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils

	Characteristic	Chalk	Silt loam	Silty clay loam	Chalk	Silt loam	Silt loam	Sandy silt loam	Silt loam	Sandy silt loam	Silt loam
	Date Sampled	---	---	---	---	---	---	---	---	---	---
	TP/BH	WS212	WS212	WS212	WS213	WS213	WS213	WS214	WS215	WS215	WS219
	Depth (m)	0.20	1.00	4.00	0.20	1.50	3.50	1.00	0.20	0.50	0.20
	Our ref	83268	83269	83270	83271	83272	83273	83274	83275	83276	83278
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.8	0.2	<0.1
Anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.9	0.6	<0.1
Pyrene**	(mg/kg)	<0.1	<0.1	0.2	0.1	<0.1	<0.1	<0.1	0.7	0.4	<0.1
Benz(a)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.4	<0.1
Chrysene**	(mg/kg)	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.5	0.4	<0.1
Benzo(b)fluoranthene**	(mg/kg)	0.2	<0.1	0.1	0.2	<0.1	0.3	0.1	0.3	0.5	0.2
Benzo(k)fluoranthene**	(mg/kg)	0.4	<0.1	0.3	0.4	<0.1	0.4	0.2	0.5	0.6	0.3
Benzo(a)pyrene**	(mg/kg)	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.3	0.4	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	0.2	<0.1	0.2	<0.1	<0.1	0.1	0.1	0.4	0.4	0.3
Dibenz(ah)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1
Benzo(ghi)perylene**	(mg/kg)	0.1	<0.1	<0.1	0.1	<0.1	0.4	0.4	0.2	0.3	0.3
Total PAH**	(mg/kg)	1.0	<0.1	0.8	1.1	<0.1	1.3	0.8	5.5	4.4	1.0

All results expressed on dry weight basis

** - MCERTS accredited test

N. Williams

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50641

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils	Characteristic	Silt loam	Silt loam	Silt loam	Loamy sand	Silt loam	Sand	Loamy sand	Silt loam	Silt loam
	Date Sampled	---	---	---	---	---	---	---	---	---
	TP/BH	WS222	WS224	WS227	WS228	WS228	WS231	WS242	WS244	WS248
	Depth (m)	0.20	0.20	0.20	0.20	0.50	0.20	0.20	0.20	0.20
	Our ref	83280	83281	83283	83284	83285	83286	83288	83289	83291
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**	(mg/kg)	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene**	(mg/kg)	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene**	(mg/kg)	0.2	0.2	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene**	(mg/kg)	0.5	0.3	0.2	0.1	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a)pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	0.2	0.4	0.2	0.1	<0.1	<0.1	0.2	<0.1	<0.1
Dibenz(ah)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Total PAH**	(mg/kg)	1.1	1.2	0.5	0.3	<0.1	<0.1	0.5	<0.1	<0.1

All results expressed on dry weight basis

** - MCERTS accredited test

N. Williams

THE ENVIRONMENTAL LABORATORY Limited

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50641

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

TPH CWG - Soil

	Characteristic	Silt loam	Sandy silt loam	Sand	Silt loam
	Date Sampled	---	---	---	---
	TP/BH	WS212	WS214	WS231	WS244
	Depth (m)	1.00	1.00	0.20	0.20
	Our ref	83269	83274	83286	83289
Aromatic					
>EC_5-EC_7	(mg/kg)	<0.01	<0.01	<0.01	<0.01
>EC_7-EC_8	(mg/kg)	<0.01	<0.01	<0.01	<0.01
>EC_8-EC_{10}	(mg/kg)	<0.1	<0.1	<0.1	<0.1
>EC_{10}-EC_{12}	(mg/kg)	<0.1	<0.1	<0.1	<0.1
>EC_{12}-EC_{16}	(mg/kg)	<0.1	<0.1	<0.1	<0.1
>EC_{16}-EC_{21}	(mg/kg)	<0.1	<0.1	<0.1	<0.1
>EC_{21}-EC_{35}	(mg/kg)	0.9	3.7	0.4	0.3
Aliphatic					
>EC_5-EC_7	(mg/kg)	<0.01	<0.01	<0.01	<0.01
>EC_7-EC_8	(mg/kg)	<0.01	<0.01	<0.01	<0.01
>EC_8-EC_{10}	(mg/kg)	<0.1	<0.1	<0.1	<0.1
>EC_{10}-EC_{12}	(mg/kg)	<0.1	<0.1	<0.1	<0.1
>EC_{12}-EC_{16}	(mg/kg)	0.2	<0.1	<0.1	<0.1
>EC_{16}-EC_{21}	(mg/kg)	0.3	<0.1	<0.1	<0.1
>EC_{21}-EC_{35}	(mg/kg)	0.3	0.8	<0.1	<0.1
TPH (C_5 - C_{35})	(mg/kg)	1.7	4.6	0.4	0.3

All results expressed on dry weight basis

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ANALYTICAL REPORT No. AR50641

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

Asbestos Identification

Sample ref:	WS212
Depth (m)	0.20
Our ref:	83268
#Description of Sample Matrix:	Chalk
Result	No asbestos identified

Sample ref:	WS212
Depth (m)	1.00
Our ref:	83269
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS212
Depth (m)	4.00
Our ref:	83270
#Description of Sample Matrix:	Silty clay loam
Result	No asbestos identified

Sample ref:	WS213
Depth (m)	0.20
Our ref:	83271
#Description of Sample Matrix:	Chalk
Result	No asbestos identified

Sample ref:	WS213
Depth (m)	1.50
Our ref:	83272
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

*= UKAS accredited

Analytical result only applies to the sample as submitted by the client

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

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ANALYTICAL REPORT No. AR50641

Location: Boorley Green

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Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

Asbestos Identification

Sample ref:	WS213
Depth (m)	3.50
Our ref:	83273
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS214
Depth (m)	1.00
Our ref:	83274
#Description of Sample Matrix:	Sandy silt loam
Result	No asbestos identified

Sample ref:	WS215
Depth (m)	0.20
Our ref:	83275
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS215
Depth (m)	0.50
Our ref:	83276
#Description of Sample Matrix:	Sandy silt loam
Result	No asbestos identified

Sample ref:	WS219
Depth (m)	0.20
Our ref:	83278
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

*= UKAS accredited

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ANALYTICAL REPORT No. AR50641

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

Asbestos Identification

Sample ref:	WS222
Depth (m)	0.20
Our ref:	83280
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS224
Depth (m)	0.20
Our ref:	83281
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS227
Depth (m)	0.20
Our ref:	83283
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS228
Depth (m)	0.50
Our ref:	83285
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

*= UKAS accredited

Analytical result only applies to the sample as submitted by the client

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Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

UKAS TESTING 2683

ANALYTICAL REPORT No. AR50641

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 24/09/13

Asbestos Identification

Sample ref:	WS231
Depth (m)	0.20
Our ref:	83286
#Description of Sample Matrix:	Sand
Result	No asbestos identified

Sample ref:	WS242
Depth (m)	0.20
Our ref:	83288
#Description of Sample Matrix:	Loamy sand
Result	No asbestos identified

Sample ref:	WS244
Depth (m)	0.20
Our ref:	83289
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS248
Depth (m)	0.20
Our ref:	83291
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

*= UKAS accredited

Analytical result only applies to the sample as submitted by the client

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

N. Williams

2683

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards On Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50641

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: #######

Organo-Chlorine Pesticides

Date Sampled		---	---	---	---
TP/BH		WS216	WS221	WS225	WS245
Depth (m)		0.20	0.20	0.20	0.20
Our ref		83277	83279	83282	83290
Alpha BHC**	(µg/kg)	<10	<10	<10	<10
Beta BHC**	(µg/kg)	<10	<10	<10	<10
Gamma BHC**	(µg/kg)	<10	<10	<10	<10
Delta BHC**	(µg/kg)	<10	<10	<10	<10
Heptachlor	(µg/kg)	<10	<10	<10	<10
Aldrin**	(µg/kg)	<10	<10	<10	<10
Heptachlor epoxide	(µg/kg)	<10	<10	<10	<10
Chlordane	(µg/kg)	<10	<10	<10	<10
Endosulfan I	(µg/kg)	<10	<10	<10	<10
cis-Chlordane	(µg/kg)	<10	<10	<10	<10
pp-DDE**	(µg/kg)	<10	<10	<10	<10
Dieldrin**	(µg/kg)	<10	<10	<10	<10
Endrin	(µg/kg)	<10	<10	<10	<10
pp-DDD**	(µg/kg)	<10	<10	<10	<10
Endrin Aldehyde	(µg/kg)	<10	<10	<10	<10
pp DDT**	(µg/kg)	<10	<10	<10	<10
Endosulfan II	(µg/kg)	<10	<10	<10	<10
Endrin Ketone	(µg/kg)	<10	<10	<10	<10
pp-Methoxychlor	(µg/kg)	<10	<10	<10	<10

All results expressed on dry weight basis

** - MCERTS accredited test

N. Williams

Unit A2
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THE ENVIRONMENTAL LABORATORY LTD

SAMPLE RECEIPT AND TEST DATES

Our Analytical Report Number	AR50641
Your Job No:	GE9523
Sample Receipt Date:	10/09/13
Reporting Date:	24/09/13
Registered:	10/09/13
Prepared:	11/09/13
Analysis complete:	24/09/13

TEST METHOD SUMMARY

PARAMETER	Analysis Undertaken on	Date Tested	Method Number	Technique
Arsenic**	Air dried sample	12/09/13	118	ICPMS
Cadmium**	Air dried sample	12/09/13	118	ICPMS
Chromium**	Air dried sample	12/09/13	118	ICPMS
Lead**	Air dried sample	12/09/13	118	ICPMS
Mercury**	Air dried sample	12/09/13	118	ICPMS
Nickel**	Air dried sample	12/09/13	118	ICPMS
Copper**	Air dried sample	12/09/13	118	ICPMS
Zinc**	Air dried sample	12/09/13	118	ICPMS
Selenium**	Air dried sample	12/09/13	118	ICPMS
Hexavalent Chromium	As submitted sample	12/09/13	110	Colorimetry
Water Soluble Boron	Air dried sample	12/09/13	202	Colorimetry
Barium*	Air dried sample	12/09/13	118	ICPMS
Beryllium*	Air dried sample	12/09/13	118	ICPMS
Vanadium**	Air dried sample	12/09/13	118	ICPMS
pH Value**	Air dried sample	12/09/13	113	Probe
Total Sulphate	Air dried sample	12/09/13	208	Colorimetry
Water Soluble Sulphate**	Air dried sample	11/09/13	172	Ion Chromatography
Water Soluble Chloride	Air dried sample	11/09/13	172	Ion Chromatography
Total Cyanide	As submitted sample	12/09/13	204	Colorimetry
Sulphide	As submitted sample	19/09/13	109	Colorimetry
Elemental Sulphur**	Air dried sample	11/09/13	122	HPLC
Total Monohydric Phenols	As submitted sample	12/09/13	121	HPLC
Total Organic Carbon	Air dried sample	24/09/13	210	Automated IR Adsorption
TPH (> C8 - < C40)**	As submitted sample	11/09/13	117	Gas chromatography
Speciated PAH**	As submitted sample	11/09/13	133	Gas Chromatography
Carbon Banding (TPH)	As submitted sample	11/09/13	214	Gas chromatography
Asbestos*	As submitted sample	20/09/13	179	see note
Organo Chlorine Pesticides**	As submitted sample	11/09/13	173	GCMS

Asbestos analysis qualitative only
Note:- Documented In-house procedure based on HSG 248 2005
* = UKAS Accredited test
** - MCERTS Accredited test
Determinands not marked with * or ** are not accredited
MCERTS accreditation covers samples which are predominantly sand, clay, loam or combinations of these three soil types
All results have been expressed on a dry weight basis and where appropriate have been corrected for moisture and stone content accordingly

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

Unit A2
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2683

THE ENVIRONMENTAL LABORATORY LTD

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Reporting Date: 01 October 2013

ANALYTICAL REPORT No. AR50739

Samples Received By: Laboratory Courier
Sample Receipt Date: 16/09/13
Your Job No: GE9523
Your Order No: ---
Site Location: Boorley Green
ELAB Invoice Number: 302
No Samples Received: 37
Date of Sampling: ---

This report was written by: G Rouse

Authorised By;

[redacted]

Steve Knight
Reporting Manager

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

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils		Characteristic	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
		Date Sampled	---	---	---	---	---	---	---	---	---	---
		TP/BH	WS201	WS203	WS205	WS207	WS209	WS269	WS271	WS274	WS275	WS277
		Depth (m)	0.50	0.20	0.50	0.20	0.20	0.50	0.20	0.20	0.20	0.20
		Our ref	84087	84089	84090	84091	84092	84094	84095	84097	84098	84099
Stone Content		(%)	5	19	21	9	13	<1	12	27	28	<1
Arsenic**		(mg/kg)	9.3	7.4	6.5	10.0	10.6	8.4	9.3	10.0	8.5	9.0
Cadmium**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium**		(mg/kg)	33	24	22	25	32	30	25	26	26	26
Lead**		(mg/kg)	37	142	15	42	48	25	27	42	22	31
Mercury**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel**		(mg/kg)	7	11	6	6	7	9	5	7	7	7
Copper**		(mg/kg)	16	26	7	21	19	9	13	15	15	11
Zinc**		(mg/kg)	56	89	36	55	56	67	40	44	45	45
Selenium**		(mg/kg)	0.8	1.0	<0.5	0.7	0.7	0.7	<0.5	0.6	0.7	<0.5
Hexavalent Chromium		(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water Soluble Boron		(mg/kg)	0.7	0.8	<0.5	0.9	0.6	<0.5	0.7	0.8	0.8	0.6
Barium*		(mg/kg)	47	94	30	47	40	41	29	38	42	29
Beryllium*		(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vanadium**		(mg/kg)	45	39	32	39	46	43	38	38	39	42
pH Value**		(Units)	6.9	7.5	6.1	5.8	6.4	6.8	5.4	5.5	8.0	5.7
Total Sulphate		(% as SO_4)	0.20	0.28	0.26	0.24	0.22	0.30	0.25	0.20	0.22	0.23
Water Soluble Sulphate**		(mg/l as SO_4)	16	25	13	13	14	16	21	15	59	12
Water Soluble Chloride		(mg/l)	8	10	7	9	7	16	10	11	17	8
Total Cyanide**		(mg/kg)	1.3	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sulphide		(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Elemental Sulphur**		(mg/kg)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Monohydric Phenols**		(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Organic Carbon		(%)	1.1	2.3	0.3	2.1	1.7	0.6	1.3	2.2	2.0	1.4
TPH (> C_8 - < C_{40})**		(mg/kg)	<5	24	n/t	<5	<5	<5	n/t	<5	n/t	<5

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

G Rouse

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

2683

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils		Characteristic	Silt Loam	Silty clay loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
		Date Sampled	---	---	---	---	---	---	---	---	---	---
		TP/BH	WS288	WS290	WS292	WS295	WS296	WS298	WS300	WS301	WS303	WS304
		Depth (m)	0.20	0.50	0.20	0.20	0.20	0.50	0.20	0.20	0.50	0.20
		Our ref	84100	84101	84102	84103	84104	84105	84106	84107	84108	84109
	Stone Content	(%)	<1	<1	<1	37	<1	26	<1	18	<1	<1
	Arsenic**	(mg/kg)	<5	7.1	14.1	5.2	9.3	<5	6.5	6.7	8.6	8.6
	Cadmium**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chromium**	(mg/kg)	14	37	44	25	25	16	21	19	26	21
	Lead**	(mg/kg)	21	32	52	14	21	10	22	36	14	47
	Mercury**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Nickel**	(mg/kg)	3	9	8	5	5	3	5	5	9	9
	Copper**	(mg/kg)	7	12	15	6	10	5	8	11	9	17
	Zinc**	(mg/kg)	24	42	60	36	69	22	34	36	39	51
	Selenium**	(mg/kg)	<0.5	0.8	1.0	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	1.0
	Hexavalent Chromium	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Water Soluble Boron	(mg/kg)	0.7	0.6	0.9	0.5	0.9	<0.5	0.5	0.6	<0.5	<0.5
	Barium*	(mg/kg)	21	53	60	33	20	20	34	31	32	38
	Beryllium*	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vanadium**	(mg/kg)	21	54	70	25	32	23	34	30	39	33
	pH Value**	(Units)	5.2	5.9	6.0	6.1	5.4	6.6	5.2	5.4	5.9	5.4
	Total Sulphate	(% as SO_4)	0.25	0.30	0.32	0.19	0.31	0.19	0.27	0.27	0.30	0.18
	Water Soluble Sulphate**	(mg/l as SO_4)	<10	23	20	12	13	<10	14	<10	12	<10
	Water Soluble Chloride	(mg/l)	5	21	13	9	12	7	14	8	9	7
	Total Cyanide**	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	1.2	<1
	Sulphide	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Elemental Sulphur**	(mg/kg)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total Monohydric Phenols**	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Total Organic Carbon	(%)	0.8	1.6	2.0	0.6	2.0	0.6	0.9	1.2	0.4	1.1
	TPH (> C_8 - < C_{40})**	(mg/kg)	n/t	<5	<5	<5	n/t	<5	<5	n/t	n/t	<5

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

G Rouse

2683

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils		Characteristic	Silty clay loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
		Date Sampled	---	---	---	---	---	---	---	---	---	---
		TP/BH	WS306	WS307	WS309	WS310	WS313	WS318	WS319	WS320	WS323	WS328
		Depth (m)	0.20	0.50	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
		Our ref	84110	84111	84112	84113	84114	84115	84116	84117	84118	84119
Stone Content		(%)	<1	11	24	10	40	4	<1	5	18	4
Arsenic**		(mg/kg)	10.0	8.7	6.2	7.7	<5	7.7	5.4	5.9	5.1	7.8
Cadmium**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium**		(mg/kg)	31	28	14	18	14	23	16	18	12	18
Lead**		(mg/kg)	12	11	18	98	22	14	18	18	13	44
Mercury**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel**		(mg/kg)	13	6	3	4	4	7	7	7	3	4
Copper**		(mg/kg)	12	8	8	11	7	7	8	9	7	8
Zinc**		(mg/kg)	50	27	26	31	26	33	36	40	23	37
Selenium**		(mg/kg)	0.7	0.7	<0.5	0.6	0.6	0.5	0.5	0.7	<0.5	0.6
Hexavalent Chromium		(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water Soluble Boron		(mg/kg)	<0.5	<0.5	0.9	0.6	<0.5	<0.5	<0.5	<0.5	0.5	<0.5
Barium*		(mg/kg)	27	20	23	38	25	29	29	32	21	20
Beryllium*		(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vanadium**		(mg/kg)	45	43	25	33	17	34	27	30	22	29
pH Value**		(Units)	5.3	5.3	5.4	5.6	5.6	5.5	5.4	5.2	5.3	5.3
Total Sulphate		(% as SO_4)	0.27	0.27	0.22	0.28	0.15	0.25	0.27	0.21	0.17	0.21
Water Soluble Sulphate**		(mg/l as SO_4)	15	17	11	11	10	<10	<10	<10	14	12
Water Soluble Chloride		(mg/l)	8	11	8	9	12	9	7	7	7	9
Total Cyanide**		(mg/kg)	<1	<1	<1	<1	<1	<1	1.3	<1	<1	<1
Sulphide		(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Elemental Sulphur**		(mg/kg)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Monohydric Phenols**		(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Organic Carbon		(%)	0.3	0.3	1.0	1.5	0.5	0.5	0.9	0.9	0.5	0.4
TPH (> C_8 - < C_{40})**		(mg/kg)	<5	<5	n/t	<5	n/t	<5	n/t	<5	<5	n/t

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

G Rouse

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THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

Soil			Characteristic	Silt Loam
			Date Sampled	---
			TP/BH	WS329
			Depth (m)	0.20
			Our ref	84120
	Stone Content	(%)		15
	Arsenic**	(mg/kg)		7.4
	Cadmium**	(mg/kg)		<0.5
	Chromium**	(mg/kg)		28
	Lead**	(mg/kg)		29
	Mercury**	(mg/kg)		<0.5
	Nickel**	(mg/kg)		4
	Copper**	(mg/kg)		8
	Zinc**	(mg/kg)		31
	Selenium**	(mg/kg)		0.5
	Hexavalent Chromium	(mg/kg)		<2
	Water Soluble Boron	(mg/kg)		<0.5
	Barium*	(mg/kg)		25
	Beryllium*	(mg/kg)		<1
	Vanadium**	(mg/kg)		28
	pH Value**	(Units)		5.4
	Total Sulphate	(% as SO_4)		0.16
	Water Soluble Sulphate**	(mg/l as SO_4)		14
	Water Soluble Chloride	(mg/l)		11
	Total Cyanide**	(mg/kg)		<1
	Sulphide	(mg/kg)		<2
	Elemental Sulphur**	(mg/kg)		<10
	Total Monohydric Phenols**	(mg/kg)		<1
	Total Organic Carbon	(%)		0.7
	TPH (> C_8 - < C_{40})**	(mg/kg)		<5

All results expressed on dry weight basis

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Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils

	Characteristic	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
	Date Sampled	---	---	---	---	---	---	---	---	---	---
	TP/BH	WS201	WS203	WS205	WS207	WS209	WS269	WS271	WS274	WS275	WS277
	Depth (m)	0.50	0.20	0.50	0.20	0.20	0.50	0.20	0.20	0.20	0.20
	Our ref	84087	84089	84090	84091	84092	84094	84095	84097	84098	84099
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**	(mg/kg)	<0.1	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3
Pyrene**	(mg/kg)	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**	(mg/kg)	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene**	(mg/kg)	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene**	(mg/kg)	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(k)fluoranthene**	(mg/kg)	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)pyrene**	(mg/kg)	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7
Dibenz(ah)anthracene**	(mg/kg)	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**	(mg/kg)	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4
Total PAH**	(mg/kg)	<0.1	6.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.8

All results expressed on dry weight basis

** - MCERTS accredited test

G Rouse

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils	Characteristic	Silt Loam	Silty clay loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
	Date Sampled	---	---	---	---	---	---	---	---	---	---
	TP/BH	WS288	WS290	WS292	WS295	WS296	WS298	WS300	WS301	WS303	WS304
	Depth (m)	0.20	0.50	0.20	0.20	0.20	0.50	0.20	0.20	0.50	0.20
	Our ref	84100	84101	84102	84103	84104	84105	84106	84107	84108	84109
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

All results expressed on dry weight basis

** - MCERTS accredited test

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THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils	Characteristic	Silty clay loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
	Date Sampled	---	---	---	---	---	---	---	---	---	---
	TP/BH	WS306	WS307	WS309	WS310	WS313	WS318	WS319	WS320	WS323	WS328
	Depth (m)	0.20	0.50	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
	Our ref	84110	84111	84112	84113	84114	84115	84116	84117	84118	84119
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	<0.1	<0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**	(mg/kg)	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH**	(mg/kg)	<0.1	<0.1	0.3	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1

All results expressed on dry weight basis

** - MCERTS accredited test

G Rouse

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THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soil		Characteristic	Silt Loam
		Date Sampled	---
		TP/BH	WS329
		Depth (m)	0.20
		Our ref	84120
Naphthalene**	(mg/kg)		<0.1
Acenaphthylene**	(mg/kg)		<0.1
Acenaphthene**	(mg/kg)		<0.1
Fluorene**	(mg/kg)		<0.1
Phenanthrene**	(mg/kg)		<0.1
Anthracene**	(mg/kg)		<0.1
Fluoranthene**	(mg/kg)		<0.1
Pyrene**	(mg/kg)		<0.1
Benz(a)anthracene**	(mg/kg)		<0.1
Chrysene**	(mg/kg)		<0.1
Benzo(b)fluoranthene**	(mg/kg)		<0.1
Benzo(k)fluoranthene**	(mg/kg)		<0.1
Benzo(a)pyrene**	(mg/kg)		<0.1
Indeno(123-cd)pyrene**	(mg/kg)		<0.1
Dibenz(ah)anthracene**	(mg/kg)		<0.1
Benzo(ghi)perylene**	(mg/kg)		<0.1
Total PAH**	(mg/kg)		<0.1

All results expressed on dry weight basis

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ANALYTICAL REPORT No. AR50739

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

TPH CWG - Soil		Characteristic	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
		Date Sampled	---	---	---	---	---	---	---	---	---	---
		TP/BH	WS205	WS271	WS275	WS288	WS296	WS301	WS303	WS309	WS313	WS319
		Depth (m)	0.50	0.20	0.20	0.20	0.20	0.20	0.50	0.20	0.20	0.20
		Our ref	84090	84095	84098	84100	84104	84107	84108	84112	84114	84116
	Aromatic											
	$>EC_5$-EC_7	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	$>EC_7$-EC_8	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	$>EC_8$-EC_{10}	(mg/kg)	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1
	$>EC_{10}$-EC_{12}	(mg/kg)	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.2	0.2	<0.1	<0.1
	$>EC_{12}$-EC_{16}	(mg/kg)	0.2	0.2	1.7	0.3	0.4	0.4	0.4	0.4	0.3	0.2
	$>EC_{16}$-EC_{21}	(mg/kg)	0.1	0.2	1.0	0.2	0.3	0.2	0.2	0.3	0.2	0.2
	$>EC_{21}$-EC_{35}	(mg/kg)	0.2	1.0	1.6	0.2	0.6	0.3	0.3	1.0	0.8	0.3
	Aliphatic											
	$>EC_5$-EC_7	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	$>EC_7$-EC_8	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	$>EC_8$-EC_{10}	(mg/kg)	<0.1	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3
	$>EC_{10}$-EC_{12}	(mg/kg)	<0.1	0.2	0.2	0.2	0.2	0.2	<0.1	0.2	<0.1	<0.1
	$>EC_{12}$-EC_{16}	(mg/kg)	0.3	<0.1	1.4	0.1	0.2	0.3	0.2	0.2	<0.1	<0.1
	$>EC_{16}$-EC_{21}	(mg/kg)	0.2	0.1	0.6	0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1
	$>EC_{21}$-EC_{35}	(mg/kg)	<0.1	<0.1	<0.1	0.2	<0.1	0.3	0.4	0.3	0.4	0.6
	TPH (C_5 - C_{35})	(mg/kg)	1.0	2.0	6.6	1.5	2.5	2.4	1.9	2.8	1.9	1.6

All results expressed on dry weight basis

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THE ENVIRONMENTAL LABORATORY Limited

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

		Characteristic	Silt Loam
		Date Sampled	---
		TP/BH	WS328
		Depth (m)	0.20
		Our ref	84119
Aromatic			
>EC_5-EC_7	(mg/kg)		<0.01
>EC_7-EC_8	(mg/kg)		<0.01
>EC_8-EC_{10}	(mg/kg)		<0.1
>EC_{10}-EC_{12}	(mg/kg)		<0.1
>EC_{12}-EC_{16}	(mg/kg)		0.2
>EC_{16}-EC_{21}	(mg/kg)		0.1
>EC_{21}-EC_{35}	(mg/kg)		0.3
Aliphatic			
>EC_5-EC_7	(mg/kg)		<0.01
>EC_7-EC_8	(mg/kg)		<0.01
>EC_8-EC_{10}	(mg/kg)		<0.1
>EC_{10}-EC_{12}	(mg/kg)		<0.1
>EC_{12}-EC_{16}	(mg/kg)		0.2
>EC_{16}-EC_{21}	(mg/kg)		0.1
>EC_{21}-EC_{35}	(mg/kg)		<0.1
TPH (C_5 - C_{35})	(mg/kg)		0.9

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ANALYTICAL REPORT No. AR50739

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

Asbestos Identification

Sample ref:	WS201
Depth (m)	0.50
Our ref:	84087
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS203
Depth (m)	0.20
Our ref:	84089
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS205
Depth (m)	0.50
Our ref:	84090
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS207
Depth (m)	0.20
Our ref:	84091
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS209
Depth (m)	0.20
Our ref:	84092
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

*= UKAS accredited
Analytical result only applies to the sample as submitted by the client
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ANALYTICAL REPORT No. AR50739

Location: Boorley Green

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28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

Asbestos Identification

Sample ref:	WS269
Depth (m)	0.50
Our ref:	84094
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS271
Depth (m)	0.20
Our ref:	84095
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS274
Depth (m)	0.20
Our ref:	84097
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS275
Depth (m)	0.20
Our ref:	84098
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS277
Depth (m)	0.20
Our ref:	84099
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

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Reporting Date: 01/10/13

Asbestos Identification

Sample ref:	WS288
Depth (m)	0.20
Our ref:	84100
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS290
Depth (m)	0.50
Our ref:	84101
#Description of Sample Matrix:	Silty clay loam
Result	No asbestos identified

Sample ref:	WS292
Depth (m)	0.20
Our ref:	84102
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS295
Depth (m)	0.20
Our ref:	84103
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS296
Depth (m)	0.20
Our ref:	84104
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

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Your Order No: ---
Reporting Date: 01/10/13

Asbestos Identification

Sample ref:	WS298
Depth (m)	0.50
Our ref:	84105
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS300
Depth (m)	0.20
Our ref:	84106
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS301
Depth (m)	0.20
Our ref:	84107
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS303
Depth (m)	0.50
Our ref:	84108
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS304
Depth (m)	0.20
Our ref:	84109
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

*= UKAS accredited

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ANALYTICAL REPORT No. AR50739

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BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

Asbestos Identification

Sample ref:	WS306
Depth (m)	0.20
Our ref:	84110
#Description of Sample Matrix:	
Result	No asbestos identified

Sample ref:	WS307
Depth (m)	0.50
Our ref:	84111
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS309
Depth (m)	0.20
Our ref:	84112
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS310
Depth (m)	0.20
Our ref:	84113
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS313
Depth (m)	0.20
Our ref:	84114
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

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

G Rouse

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THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

Asbestos Identification

Sample ref:	WS318
Depth (m)	0.20
Our ref:	84115
#Description of Sample Matrix:	
Result	No asbestos identified

Sample ref:	WS319
Depth (m)	0.20
Our ref:	84116
#Description of Sample Matrix:	
Result	No asbestos identified

Sample ref:	WS320
Depth (m)	0.20
Our ref:	84117
#Description of Sample Matrix:	
Result	No asbestos identified

Sample ref:	WS323
Depth (m)	0.20
Our ref:	84118
#Description of Sample Matrix:	
Result	No asbestos identified

Sample ref:	WS328
Depth (m)	0.20
Our ref:	84119
#Description of Sample Matrix:	
Result	No asbestos identified

*= UKAS accredited

Analytical result only applies to the sample as submitted by the client

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Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50739

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 01/10/13

Asbestos Identification

Sample ref:	WS329
Depth (m)	0.20
Our ref:	84120
#Description of Sample Matrix:	
Result	No asbestos identified

*= UKAS accredited

Analytical result only applies to the sample as submitted by the client

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Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards On Sea, East Sussex, TN38 9BY

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ANALYTICAL REPORT No. AR50739

Location: Boorley Green

2683

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: #########

Organo-Chlorine Pesticides

	Characteristic	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
	Date Sampled	---	---	---	---	---	---
	TP/BH	WS202	WS283	WS299	WS302	WS312	WS322
	Depth (m)	0.20	0.20	0.20	0.20	0.20	0.20
	Our ref	84088	84121	84122	84123	84124	84125
Alpha BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Beta BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Gamma BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Delta BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Heptachlor	(µg/kg)	<10	<10	<10	<10	<10	<10
Aldrin**	(µg/kg)	<10	<10	<10	<10	<10	<10
Heptachlor epoxide	(µg/kg)	<10	<10	<10	<10	<10	<10
Chlordane	(µg/kg)	<10	<10	<10	<10	<10	<10
Endosulfan I	(µg/kg)	<10	<10	<10	<10	<10	<10
cis-Chlordane	(µg/kg)	<10	<10	<10	<10	<10	<10
pp-DDE**	(µg/kg)	<10	<10	<10	<10	<10	<10
Dieldrin**	(µg/kg)	<10	<10	<10	<10	<10	<10
Endrin	(µg/kg)	<10	<10	<10	<10	<10	<10
pp-DDD**	(µg/kg)	<10	<10	<10	<10	<10	<10
Endrin Aldehyde	(µg/kg)	<10	<10	<10	<10	<10	<10
pp DDT**	(µg/kg)	<10	<10	<10	<10	<10	<10
Endosulfan II	(µg/kg)	<10	<10	<10	<10	<10	<10
Endrin Ketone	(µg/kg)	<10	<10	<10	<10	<10	<10
pp-Methoxychlor	(µg/kg)	<10	<10	<10	<10	<10	<10

All results expressed on dry weight basis

** - MCERTS accredited test

G Rouse

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THE ENVIRONMENTAL LABORATORY LTD

SAMPLE RECEIPT AND TEST DATES

Our Analytical Report Number	AR50739
Your Job No:	GE9523
Sample Receipt Date:	16/09/13
Reporting Date:	01/10/13
Registered:	16/09/13
Prepared:	17/09/13
Analysis complete:	01/10/13

TEST METHOD SUMMARY

PARAMETER	Analysis Undertaken on	Date Tested	Method Number	Technique
Arsenic**	Air dried sample	20/09/13	118	ICPMS
Cadmium**	Air dried sample	20/09/13	118	ICPMS
Chromium**	Air dried sample	20/09/13	118	ICPMS
Lead**	Air dried sample	20/09/13	118	ICPMS
Mercury**	Air dried sample	20/09/13	118	ICPMS
Nickel**	Air dried sample	20/09/13	118	ICPMS
Copper**	Air dried sample	20/09/13	118	ICPMS
Zinc**	Air dried sample	20/09/13	118	ICPMS
Selenium**	Air dried sample	20/09/13	118	ICPMS
Hexavalent Chromium	As submitted sample	17/09/13	110	Colorimetry
Water Soluble Boron	Air dried sample	19/09/13	202	Colorimetry
Barium*	Air dried sample	20/09/13	118	ICPMS
Beryllium*	Air dried sample	20/09/13	118	ICPMS
Vanadium**	Air dried sample	20/09/13	118	ICPMS
pH Value**	Air dried sample	19/09/13	113	Probe
Total Sulphate	Air dried sample	25/09/13	208	Colorimetry
Water Soluble Sulphate**	Air dried sample	21/09/13	172	Ion Chromatography
Water Soluble Chloride	Air dried sample	21/09/13	172	Ion Chromatography
Total Cyanide**	As submitted sample	27/09/13	204	Colorimetry
Sulphide	As submitted sample	27/09/13	109	Colorimetry
Elemental Sulphur**	Air dried sample	23/09/13	122	HPLC
Total Monohydric Phenols**	As submitted sample	19/09/13	121	HPLC
Total Organic Carbon	Air dried sample	18/09/13	210	Automated IR Adsorption
TPH (> C8 - < C40)**	As submitted sample	26/09/13	117	Gas chromatography
Speciated PAH**	As submitted sample	26/09/13	133	Gas Chromatography
Carbon Banding (TPH)	As submitted sample	26/09/13	214	Gas chromatography
Asbestos*	As submitted sample	25/09/13	179	see note
Organo Chlorine Pesticides**	As submitted sample	25/09/13	173	GCMS

Asbestos analysis qualitative only
Note:- Documented In-house procedure based on HSG 248 2005
* = UKAS Accredited test
** - MCERTS Accredited test
Determinands not marked with * or ** are not accredited
MCERTS accreditation covers samples which are predominantly sand, clay, loam or combinations of these three soil types
All results have been expressed on a dry weight basis and where appropriate have been corrected for moisture and stone content accordingly

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

Unit A2
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THE ENVIRONMENTAL LABORATORY LTD

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Reporting Date: 30 September 2013

ANALYTICAL REPORT No. AR50743

Samples Received By: Laboratory Courier
Sample Receipt Date: 16/09/13
Your Job No: GE9523
Your Order No: ---
Site Location: Boorley Green
ELAB Invoice Number: 322
No Samples Received: 24
Date of Sampling: ---

This report was written by: G Rouse

Authorised By;

[redacted]

Steve Knight
Reporting Manager

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THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils		Characteristic	Silt Loam	Silt Loam	Sandy silt loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
		Date Sampled	---	---	---	---	---	---	---	---	---	---
		TP/BH	WS233	WS233	WS235	WS217	WS237	WS239	WS241	WS246	WS250	WS251
		Depth (m)	0.20	0.50	0.50	0.20	0.20	0.20	0.50	0.20	0.20	0.50
		Our ref	83287	83341	83344	83319	83349	83354	83359	54133	83368	83372
Stone Content		(%)	25	28	15	<1	4	2	49	<1	17	<1
Arsenic**		(mg/kg)	7.6	13.0	10.9	10.0	7.6	<5	9.3	8.0	7.8	5.3
Cadmium**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium**		(mg/kg)	19	23	31	37	19	16	17	23	20	20
Lead**		(mg/kg)	32	21	10	40	42	11	8	18	34	22
Mercury**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel**		(mg/kg)	5	7	9	7	4	2	5	10	6	3
Copper**		(mg/kg)	10	8	7	15	16	5	5	10	13	7
Zinc**		(mg/kg)	39	40	41	58	46	22	23	45	51	33
Selenium**		(mg/kg)	5.7	6.8	9.4	6.2	6.5	1.4	4.0	10.6	7.0	<0.5
Hexavalent Chromium		(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water Soluble Boron		(mg/kg)	0.5	<0.5	<0.5	1.1	0.7	0.5	<0.5	<0.5	0.7	0.8
Barium*		(mg/kg)	52	32	28	42	24	14	14	40	18	21
Beryllium*		(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vanadium**		(mg/kg)	30	34	48	59	32	25	28	36	25	30
pH Value**		(Units)	7.0	6.8	6.8	5.9	5.7	6.1	6.5	5.8	7.3	6.1
Total Sulphate		(% as SO_4)	0.05	0.10	0.11	0.18	0.14	0.15	0.08	0.14	0.13	0.16
Water Soluble Sulphate**		(mg/l as SO_4)	13	10	12	13	14	<10	13	11	<10	13
Water Soluble Chloride		(mg/l)	8	6	9	10	9	7	8	8	7	12
Total Cyanide**		(mg/kg)	7.7	2.9	2.3	2.5	1.1	1.5	2.0	2.0	3.3	1.2
Sulphide		(mg/kg)	4.0	2.1	2.5	3.3	3.3	2.5	2.3	2.2	2.2	2.3
Elemental Sulphur**		(mg/kg)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Monohydric Phenols**		(mg/kg)	<1	<1	1.2	3.1	1.7	1.3	<1	<1	<1	<1
Total Organic Carbon		(%)	0.6	0.5	0.3	2.8	2.3	0.5	0.2	0.7	1.1	0.8
TPH (> C_8 - < C_{40})**		(mg/kg)	<5	<5	<5	<5	<5	<5	<5	<5	<5	n/t

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

G Rouse

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

2683

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils		Characteristic	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silty clay loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
		Date Sampled	---	---	---	---	---	---	---	---	---	---
		TP/BH	WS253	WS255	WS257	WS258	WS261	WS262	WS264	WS279	WS280	WS282
		Depth (m)	0.50	0.20	0.20	0.20	0.20	0.50	0.20	0.20	0.20	0.20
		Our ref	83377	84134	84135	84136	84137	84138	84139	84142	84143	84144
Stone Content		(%)	17	12	<1	7	13	<1	<1	10	19	5
Arsenic**		(mg/kg)	8.3	8.1	7.2	<5	<5	14.4	6.9	11.8	<5	7.4
Cadmium**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium**		(mg/kg)	36	33	22	11	14	51	23	36	19	24
Lead**		(mg/kg)	9	46	29	16	24	16	20	26	37	29
Mercury**		(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel**		(mg/kg)	6	5	6	2	5	6	7	6	10	6
Copper**		(mg/kg)	4	14	13	7	7	13	8	15	34	12
Zinc**		(mg/kg)	37	45	40	21	35	42	39	40	5	37
Selenium**		(mg/kg)	7.6	3.9	5.9	3.8	4.9	6.2	5.2	6.1	<0.5	4.4
Hexavalent Chromium		(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water Soluble Boron		(mg/kg)	<0.5	0.7	0.6	0.6	0.5	<0.5	0.5	0.6	0.9	0.7
Barium*		(mg/kg)	15	33	33	14	18	35	37	37	25	28
Beryllium*		(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vanadium**		(mg/kg)	61	46	34	19	23	68	34	53	31	39
pH Value**		(Units)	6.7	5.9	6.0	5.6	5.5	6.2	6.3	6.0	6.1	5.5
Total Sulphate		(% as SO_4)	0.12	0.14	0.14	0.14	0.13	0.13	0.11	0.13	0.11	0.06
Water Soluble Sulphate**		(mg/l as SO_4)	12	11	12	<10	<10	24	11	28	<10	<10
Water Soluble Chloride		(mg/l)	13	10	10	5	7	14	9	9	7	7
Total Cyanide**		(mg/kg)	3.2	1.8	2.2	2.1	2.0	3.4	2.7	3.1	5.2	6.4
Sulphide		(mg/kg)	2.2	<2	<2	<2	<2	3.3	4.9	<2	<2	<2
Elemental Sulphur**		(mg/kg)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Monohydric Phenols**		(mg/kg)	1.1	2.3	1.5	<1	<1	1.2	<1	7.6	2.3	<1
Total Organic Carbon		(%)	0.2	2.0	0.8	0.8	0.7	0.4	0.6	1.2	1.7	1.2
TPH (> C_8 - < C_{40})**		(mg/kg)	n/t	<5	<5	<5	<5	<5	<5	<5	<5	<5

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

G Rouse

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils		Characteristic	Silt Loam	Silt Loam	Sandy silt loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
		Date Sampled	---	---	---	---	---	---	---	---	---	---
		TP/BH	WS233	WS233	WS235	WS217	WS237	WS239	WS241	WS246	WS250	WS251
		Depth (m)	0.20	0.50	0.50	0.20	0.20	0.20	0.50	0.20	0.20	0.50
		Our ref	83287	83341	83344	83319	83349	83354	83359	54133	83368	83372
Naphthalene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH**		(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

All results expressed on dry weight basis

** - MCERTS accredited test

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Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils	Characteristic	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silty clay loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
	Date Sampled	---	---	---	---	---	---	---	---	---	---
	TP/BH	WS253	WS255	WS257	WS258	WS261	WS262	WS264	WS279	WS280	WS282
	Depth (m)	0.50	0.20	0.20	0.20	0.20	0.50	0.20	0.20	0.20	0.20
	Our ref	83377	84134	84135	84136	84137	84138	84139	84142	84143	84144
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6
Pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3
Chrysene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(b)fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5
Benzo(k)fluoranthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3
Benzo(a)pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
Dibenz(ah)anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Total PAH**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.3

All results expressed on dry weight basis

** - MCERTS accredited test

G Rouse

THE ENVIRONMENTAL LABORATORY Limited

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

TPH CWG - Soil

		Characteristic	Silt Loam	Silt Loam
		Date Sampled	---	---
		TP/BH	WS251	WS253
		Depth (m)	0.50	0.50
		Our ref	83372	83377
Aromatic				
$>EC_5-EC_7$	(mg/kg)		<0.01	<0.01
$>EC_7-EC_8$	(mg/kg)		<0.01	<0.01
$>EC_8-EC_{10}$	(mg/kg)		<0.1	<0.1
$>EC_{10}-EC_{12}$	(mg/kg)		0.2	<0.1
$>EC_{12}-EC_{16}$	(mg/kg)		0.3	0.3
$>EC_{16}-EC_{21}$	(mg/kg)		0.2	0.2
$>EC_{21}-EC_{35}$	(mg/kg)		1.0	0.3
Aliphatic				
$>EC_5-EC_7$	(mg/kg)		<0.01	<0.01
$>EC_7-EC_8$	(mg/kg)		<0.01	<0.01
$>EC_8-EC_{10}$	(mg/kg)		<0.1	<0.1
$>EC_{10}-EC_{12}$	(mg/kg)		<0.1	<0.1
$>EC_{12}-EC_{16}$	(mg/kg)		<0.1	0.2
$>EC_{16}-EC_{21}$	(mg/kg)		0.1	0.1
$>EC_{21}-EC_{35}$	(mg/kg)		0.2	<0.1
TPH (C_5 - C_{35})	(mg/kg)		2.0	1.1

All results expressed on dry weight basis

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Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY

Tel: 01424 718618 Fax: 01424 729911

UKAS TESTING 2683

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

Asbestos Identification

Sample ref:	WS233
Depth (m)	0.20
Our ref:	83287
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS233
Depth (m)	0.50
Our ref:	83341
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS235
Depth (m)	0.50
Our ref:	83344
#Description of Sample Matrix:	Sandy silt loam
Result	No asbestos identified

Sample ref:	WS217
Depth (m)	0.20
Our ref:	83319
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS237
Depth (m)	0.20
Our ref:	83349
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

*= UKAS accredited

Analytical result only applies to the sample as submitted by the client

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UKAS TESTING 2683

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

Asbestos Identification

Sample ref:	WS239
Depth (m)	0.20
Our ref:	83354
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS241
Depth (m)	0.50
Our ref:	83359
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS246
Depth (m)	0.20
Our ref:	54133
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS250
Depth (m)	0.20
Our ref:	83368
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS251
Depth (m)	0.50
Our ref:	83372
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

*= UKAS accredited

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UKAS TESTING 2683

ANALYTICAL REPORT No. AR50743

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

Asbestos Identification

Sample ref:	WS253
Depth (m)	0.50
Our ref:	83377
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS255
Depth (m)	0.20
Our ref:	84134
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS257
Depth (m)	0.20
Our ref:	84135
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS258
Depth (m)	0.20
Our ref:	84136
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS261
Depth (m)	0.20
Our ref:	84137
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

*= UKAS accredited

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ANALYTICAL REPORT No. AR50743

Location: Boorley Green

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/09/13

Asbestos Identification

Sample ref:	WS262
Depth (m)	0.50
Our ref:	84138
#Description of Sample Matrix:	Silty clay loam
Result	No asbestos identified

Sample ref:	WS264
Depth (m)	0.20
Our ref:	84139
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS279
Depth (m)	0.20
Our ref:	84142
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS280
Depth (m)	0.20
Our ref:	84143
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

Sample ref:	WS282
Depth (m)	0.20
Our ref:	84144
#Description of Sample Matrix:	Silt Loam
Result	No asbestos identified

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ANALYTICAL REPORT No. AR50743

Location: Boorley Green

2683

F.A.O. Glyn Evans
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: ---
Reporting Date: 30/9/13

Organo-Chlorine Pesticides

Characteristic		Silt Loam	Silt Loam	Silt Loam	Silt Loam
Date Sampled		---	---	---	---
TP/BH		WS240	WS252	WS263	WS269
Depth (m)		0.20	0.20	0.20	0.20
Our ref		83356	83374	84140	84141
Alpha BHC**	(µg/kg)	<10	<10	<10	<10
Beta BHC**	(µg/kg)	<10	<10	<10	<10
Gamma BHC**	(µg/kg)	<10	<10	<10	<10
Delta BHC**	(µg/kg)	<10	<10	<10	<10
Heptachlor	(µg/kg)	<10	<10	<10	<10
Aldrin**	(µg/kg)	<10	<10	<10	<10
Heptachlor epoxide	(µg/kg)	<10	<10	<10	<10
Chlordane	(µg/kg)	<10	<10	<10	<10
Endosulfan I	(µg/kg)	<10	<10	<10	<10
cis-Chlordane	(µg/kg)	<10	<10	<10	<10
pp-DDE**	(µg/kg)	<10	<10	<10	<10
Dieldrin**	(µg/kg)	<10	<10	<10	<10
Endrin	(µg/kg)	<10	<10	<10	<10
pp-DDD**	(µg/kg)	<10	<10	<10	<10
Endrin Aldehyde	(µg/kg)	<10	<10	<10	<10
pp DDT**	(µg/kg)	<10	<10	<10	<10
Endosulfan II	(µg/kg)	<10	<10	<10	<10
Endrin Ketone	(µg/kg)	<10	<10	<10	<10
pp-Methoxychlor	(µg/kg)	<10	<10	<10	<10

All results expressed on dry weight basis

** - MCERTS accredited test

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THE ENVIRONMENTAL LABORATORY LTD

SAMPLE RECEIPT AND TEST DATES

Our Analytical Report Number	AR50743
Your Job No:	GE9523
Sample Receipt Date:	16/09/13
Reporting Date:	30/09/13
Registered:	16/09/13
Prepared:	17/09/13
Analysis complete:	30/09/13

TEST METHOD SUMMARY

PARAMETER	Analysis Undertaken on	Date Tested	Method Number	Technique
Arsenic**	Air dried sample	23/09/13	118	ICPMS
Cadmium**	Air dried sample	23/09/13	118	ICPMS
Chromium**	Air dried sample	23/09/13	118	ICPMS
Lead**	Air dried sample	23/09/13	118	ICPMS
Mercury**	Air dried sample	23/09/13	118	ICPMS
Nickel**	Air dried sample	23/09/13	118	ICPMS
Copper**	Air dried sample	23/09/13	118	ICPMS
Zinc**	Air dried sample	23/09/13	118	ICPMS
Selenium**	Air dried sample	23/09/13	118	ICPMS
Hexavalent Chromium	As submitted sample	18/09/13	110	Colorimetry
Water Soluble Boron	Air dried sample	20/09/13	202	Colorimetry
Barium*	Air dried sample	23/09/13	118	ICPMS
Beryllium*	Air dried sample	23/09/13	118	ICPMS
Vanadium**	Air dried sample	23/09/13	118	ICPMS
pH Value**	Air dried sample	20/09/13	113	Probe
Total Sulphate	Air dried sample	23/09/13	208	Colorimetry
Water Soluble Sulphate**	Air dried sample	21/09/13	172	Ion Chromatography
Water Soluble Chloride	Air dried sample	21/09/13	172	Ion Chromatography
Total Cyanide**	As submitted sample	27/09/13	204	Colorimetry
Sulphide	As submitted sample	26/09/13	109	Colorimetry
Elemental Sulphur**	Air dried sample	24/09/13	122	HPLC
Total Monohydric Phenols**	As submitted sample	26/09/13	121	HPLC
Total Organic Carbon	Air dried sample	19/09/13	210	Automated IR Adsorption
TPH (> C8 - < C40)**	As submitted sample	26/09/13	117	Gas chromatography
Speciated PAH**	As submitted sample	26/09/13	133	Gas Chromatography
Carbon Banding (TPH)	As submitted sample	26/09/13	214	Gas chromatography
Asbestos*	As submitted sample	27/09/13	179	see note
Organo Chlorine Pesticides**	As submitted sample	25/09/13	173	GCMS

Asbestos analysis qualitative only

Note:- Documented In-house procedure based on HSG 248 2005

* = UKAS Accredited test

** - MCERTS Accredited test

Determinands not marked with * or ** are not accredited

MCERTS accreditation covers samples which are predominantly sand, clay, loam or combinations of these three soil types

All results have been expressed on a dry weight basis and where appropriate have been corrected for moisture and stone content accordingly

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

Unit A2
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Ponswood Industrial Estate
St Leonards on Sea
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TN38 9BY
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2683

THE ENVIRONMENTAL LABORATORY LTD

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Reporting Date: 08 October 2013

ANALYTICAL REPORT No. AR50901

Samples Received By: Laboratory Courier
Sample Receipt Date: 24/09/13
Your Job No: GE9523
Your Order No: PO1901
Site Location: Boorley Green
ELAB Sales Order:
No Samples Received: 32
Date of Sampling: 23/09/13

This report was written by: Stuart Ballard

Authorised By;

[redacted]

Steve Knight
Reporting Manager

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THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

		Characteristic	Sandy Silt loam	Silt loam	Sandy Silt loam	Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Silt loam	Silt loam
		Date Sampled	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
		TP/BH	WS266	WS266	WS365	WS365	WS325	WS347	WS359	WS356	WS342	WS331
		Depth (m)	0.20	1.00	0.20	0.40	0.20	0.20	0.20	0.50	0.20	0.50
	Soils	Our ref	84933	84934	84935	84936	84937	84938	84939	84940	84941	84942
	Arsenic**	(mg/kg)	6.4	<5	6.4	7.1	5.6	7.3	<5	8.0	6.0	8.1
	Cadmium**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chromium**	(mg/kg)	15	9	10	15	15	23	15	26	20	14
	Lead**	(mg/kg)	80	52	68	43	22	18	16	10	29	6
	Mercury**	(mg/kg)	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Nickel**	(mg/kg)	10	6	6	6	5	7	3	10	6	9
	Copper**	(mg/kg)	59	14	9	12	8	6	8	7	11	6
	Zinc**	(mg/kg)	80	44	75	64	26	28	23	36	38	23
	Selenium**	(mg/kg)	0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5
	Hexavalent Chromium	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Water Soluble Boron	(mg/kg)	0.7	0.6	0.6	0.9	0.6	<0.5	0.7	<0.5	0.9	<0.5
	Barium*	(mg/kg)	75	38	369	53	29	36	24	29	39	24
	Beryllium*	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vanadium**	(mg/kg)	24	15	15	24	25	35	22	40	34	23
	pH Value**	(Units)	8.2	8.2	8.2	7.9	7.1	6.8	6.1	6.7	5.5	6.4
	Total Sulphate	(% as SO_4)	0.15	0.15	0.10	0.16	0.16	0.16	0.12	0.10	0.15	0.07
	Water Soluble Sulphate	(mg/l as SO_4)	42	28	24	100	<20	<20	32	33	22	30
	Water Soluble Chloride	(mg/l)	<20	<20	25	40	<20	<20	21	22	<20	<20
	Water Soluble Sulphate**	(mg/kg as SO_4)	85	56	49	201	<40	<40	64	66	44	60
	Water Soluble Chloride**	(mg/kg)	<40	<40	51	79	<40	<40	43	45	<40	<40
	Total Cyanide**	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Sulphide	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Elemental Sulphur**	(mg/kg)	<10	<10	<10	16	<10	<10	<10	<10	<10	<10
	Total Monohydric Phenols**	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Total Organic Carbon	(%)	1.1	0.5	0.5	1.0	1.1	0.6	0.9	0.2	1.5	0.1
n/t = Not Tested	TPH (> C_8 - < C_{40})**	(mg/kg)	n/t	<5	n/t	n/t	<5	<5	n/t	<5	n/t	n/t

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

Stuart Ballard

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

		Characteristic	Silty Clay loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam
		Date Sampled	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
		TP/BH	WS366	WS368	WS370	WS324	WS349	WS355	WS354	WS364	WS373	WS374
		Depth (m)	0.50	0.50	0.20	0.50	0.20	0.20	0.20	0.20	0.50	0.20
	Soils	Our ref	84943	84944	84945	84946	84947	84948	84949	84950	84957	84958
	Arsenic**	(mg/kg)	8.1	9.3	5.7	6.1	8.1	<5	6.1	6.9	9.1	6.0
	Cadmium**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chromium**	(mg/kg)	22	23	18	20	17	15	19	24	30	18
	Lead**	(mg/kg)	36	45	26	14	10	16	34	70	13	20
	Mercury**	(mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Nickel**	(mg/kg)	8	7	5	5	5	4	6	6	13	8
	Copper**	(mg/kg)	12	9	16	6	4	7	11	14	9	10
	Zinc**	(mg/kg)	101	37	32	25	31	27	41	47	49	48
	Selenium**	(mg/kg)	0.9	0.9	<0.5	0.6	<0.5	<0.5	<0.5	0.6	<0.5	0.6
	Hexavalent Chromium	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Water Soluble Boron	(mg/kg)	3.4	<0.5	<0.5	<0.5	<0.5	0.6	0.6	0.7	<0.5	0.5
	Barium*	(mg/kg)	37	49	19	27	23	22	31	37	37	35
	Beryllium*	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vanadium**	(mg/kg)	30	37	28	29	28	22	30	38	45	29
	pH Value**	(Units)	7.8	7.7	6.3	6.3	7.5	6.1	6.0	6.0	6.0	5.8
	Total Sulphate	(% as SO_4)	0.25	0.23	0.23	0.23	0.19	0.20	0.25	0.27	0.28	0.26
	Water Soluble Sulphate	(mg/l as SO_4)	297	28	40	40	36	<20	23	33	36	23
	Water Soluble Chloride	(mg/l)	203	<20	28	29	22	<20	<20	26	24	21
	Water Soluble Sulphate**	(mg/kg as SO_4)	594	55	80	80	73	<40	45	67	73	45
	Water Soluble Chloride**	(mg/kg)	406	<40	55	57	44	<40	<40	51	48	43
	Total Cyanide**	(mg/kg)	<1	<1	<1	<1	4.4	<1	<1	<1	<1	<1
	Sulphide	(mg/kg)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Elemental Sulphur**	(mg/kg)	148	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total Monohydric Phenols**	(mg/kg)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Total Organic Carbon	(%)	2.7	0.6	1.0	0.5	0.2	0.5	0.9	1.5	0.4	0.9
n/t = Not Tested	TPH (> C_8 - < C_{40})**	(mg/kg)	n/t	n/t	<5	n/t	n/t	<5	n/t	n/t	n/t	n/t

All results expressed on dry weight basis

** - MCERTS accredited test

* = UKAS accredited test

Stuart Ballard

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

2683

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

		Characteristic	Sandy Silt loam
		Date Sampled	23/09/13
		TP/BH	WS375
		Depth (m)	0.50
	Soils	Our ref	84959
Arsenic**	(mg/kg)		6.4
Cadmium**	(mg/kg)		<0.5
Chromium**	(mg/kg)		18
Lead**	(mg/kg)		57
Mercury**	(mg/kg)		<0.5
Nickel**	(mg/kg)		9
Copper**	(mg/kg)		14
Zinc**	(mg/kg)		66
Selenium**	(mg/kg)		<0.5
Hexavalent Chromium	(mg/kg)		<2
Water Soluble Boron	(mg/kg)		0.7
Barium*	(mg/kg)		60
Beryllium*	(mg/kg)		<1
Vanadium**	(mg/kg)		26
pH Value**	(Units)		8.1
Total Sulphate	(% as SO_4)		0.17
Water Soluble Sulphate	(mg/l as SO_4)		42
Water Soluble Chloride	(mg/l)		<20
Water Soluble Sulphate**	(mg/kg as SO_4)		83
Water Soluble Chloride**	(mg/kg)		<40
Total Cyanide**	(mg/kg)		<1
Sulphide	(mg/kg)		<2
Elemental Sulphur**	(mg/kg)		<10
Total Monohydric Phenols**	(mg/kg)		<1
Total Organic Carbon	(%)		1.1
TPH (C_6-C_{40})**	(mg/kg)		n/t

n/t = Not Tested

All results expressed on dry weight basis

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ANALYTICAL REPORT No. AR50901

Location: Boorley Green

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Your Job No: GE9523
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Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils

	Characteristic	Sandy Silt loam	Silt loam	Sandy Silt loam	Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Silt loam	Silt loam
	Date Sampled	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
	TP/BH	WS266	WS266	WS365	WS365	WS325	WS347	WS359	WS356	WS342	WS331
	Depth (m)	0.20	1.00	0.20	0.40	0.20	0.20	0.20	0.50	0.20	0.50
	Our ref	84933	84934	84935	84936	84937	84938	84939	84940	84941	84942
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	0.5	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**	(mg/kg)	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**	(mg/kg)	1.0	1.4	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene**	(mg/kg)	0.9	1.2	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**	(mg/kg)	0.7	0.8	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene**	(mg/kg)	0.8	0.9	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene**	(mg/kg)	0.8	0.8	0.4	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene**	(mg/kg)	0.6	0.7	0.2	0.3	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(a)pyrene**	(mg/kg)	0.7	0.8	0.3	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	0.7	0.6	0.5	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene**	(mg/kg)	0.2	0.2	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**	(mg/kg)	0.5	0.6	0.4	0.4	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Total PAH**	(mg/kg)	7.7	9.1	2.7	2.4	<0.1	<0.1	0.4	<0.1	<0.1	<0.1

All results expressed on dry weight basis

** - MCERTS accredited test

Stuart Ballard

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Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils	Characteristic	Silty Clay loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam
	Date Sampled	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
	TP/BH	WS366	WS368	WS370	WS324	WS349	WS355	WS354	WS364	WS373	WS374
	Depth (m)	0.50	0.50	0.20	0.50	0.20	0.20	0.20	0.20	0.50	0.20
	Our ref	84943	84944	84945	84946	84947	84948	84949	84950	84957	84958
Naphthalene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene**	(mg/kg)	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene**	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene**	(mg/kg)	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene**	(mg/kg)	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene**	(mg/kg)	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene**	(mg/kg)	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene**	(mg/kg)	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene**	(mg/kg)	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene**	(mg/kg)	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene**	(mg/kg)	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene**	(mg/kg)	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene**	(mg/kg)	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH**	(mg/kg)	3.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

All results expressed on dry weight basis

** - MCERTS accredited test

Stuart Ballard

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Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils		Characteristic	Sandy Silt loam
		Date Sampled	23/09/13
		TP/BH	WS375
		Depth (m)	0.50
		Our ref	84959
Naphthalene**	(mg/kg)		3.6
Acenaphthylene**	(mg/kg)		1.6
Acenaphthene**	(mg/kg)		4.3
Fluorene**	(mg/kg)		3.1
Phenanthrene**	(mg/kg)		22.1
Anthracene**	(mg/kg)		7.9
Fluoranthene**	(mg/kg)		35.3
Pyrene**	(mg/kg)		29.1
Benz(a)anthracene**	(mg/kg)		18.8
Chrysene**	(mg/kg)		19.0
Benzo(b)fluoranthene**	(mg/kg)		16.7
Benzo(k)fluoranthene**	(mg/kg)		16.0
Benzo(a)pyrene**	(mg/kg)		18.9
Indeno(123-cd)pyrene**	(mg/kg)		14.1
Dibenz(ah)anthracene**	(mg/kg)		3.4
Benzo(ghi)perylene**	(mg/kg)		13.4
Total PAH**	(mg/kg)		227.4

All results expressed on dry weight basis

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ANALYTICAL REPORT No. AR50901

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Your Job No: GE9523
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Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

TPH CWG - Soil

	Characteristic	Sandy Silt loam	Sandy Silt loam	Silt loam	Sandy Silt loam	Silt loam	Silt loam	Silty Clay loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam
	Date Sampled	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
	TP/BH	WS266	WS365	WS365	WS359	WS342	WS331	WS366	WS368	WS324	WS349
	Depth (m)	0.20	0.20	0.40	0.20	0.20	0.50	0.50	0.50	0.50	0.20
	Our ref	84933	84935	84936	84939	84941	84942	84943	84944	84946	84947
Aromatic											
>EC_5-EC_7	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>EC_7-EC_8	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>EC_8-EC_{10}	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
>EC_{10}-EC_{12}	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
>EC_{12}-EC_{16}	(mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
>EC_{16}-EC_{21}	(mg/kg)	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
>EC_{21}-EC_{35}	(mg/kg)	14.2	9.8	2.3	0.2	<0.1	<0.1	1.2	0.8	0.1	<0.1
Aliphatic											
>EC_5-EC_7	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>EC_7-EC_8	(mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>EC_8-EC_{10}	(mg/kg)	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3
>EC_{10}-EC_{12}	(mg/kg)	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
>EC_{12}-EC_{16}	(mg/kg)	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4
>EC_{16}-EC_{21}	(mg/kg)	0.3	0.5	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.1
>EC_{21}-EC_{35}	(mg/kg)	5.3	8.6	1.8	<0.1	<0.1	<0.1	1.4	<0.1	<0.1	8.1
TPH (C_5 - C_{35})	(mg/kg)	20.9	19.0	5.5	0.2	<0.1	<0.1	2.6	0.8	0.1	10.2

All results expressed on dry weight basis

Stuart Ballard

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ANALYTICAL REPORT No. AR50901

Location: Boorley Green

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

TPH CWG - Soil

		Characteristic	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam
		Date Sampled	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
		TP/BH	WS354	WS364	WS373	WS374	WS375
		Depth (m)	0.20	0.20	0.50	0.20	0.50
		Our ref	84949	84950	84957	84958	84959
Aromatic							
$>EC_5-EC_7$	(mg/kg)		<0.01	<0.01	<0.01	<0.01	<0.01
$>EC_7-EC_8$	(mg/kg)		<0.01	<0.01	<0.01	<0.01	<0.01
$>EC_8-EC_{10}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	<0.1
$>EC_{10}-EC_{12}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	0.6
$>EC_{12}-EC_{16}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	40.7
$>EC_{16}-EC_{21}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	126.4
$>EC_{21}-EC_{35}$	(mg/kg)		0.1	0.5	0.1	0.2	334.6
Aliphatic							
$>EC_5-EC_7$	(mg/kg)		<0.01	<0.01	<0.01	<0.01	<0.01
$>EC_7-EC_8$	(mg/kg)		<0.01	<0.01	<0.01	<0.01	<0.01
$>EC_8-EC_{10}$	(mg/kg)		0.2	0.2	<0.1	0.1	0.2
$>EC_{10}-EC_{12}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	1.5
$>EC_{12}-EC_{16}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	11.9
$>EC_{16}-EC_{21}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	14.9
$>EC_{21}-EC_{35}$	(mg/kg)		<0.1	<0.1	<0.1	<0.1	49.8
TPH (C_5 - C_{35})	(mg/kg)		0.3	0.7	0.1	0.3	580.5

All results expressed on dry weight basis

Stuart Ballard

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ANALYTICAL REPORT No. AR50901

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: #######

Organo-Chlorine Pesticides

	Characteristic	Sandy Silt loam	Silt loam	Sandy Silt loam	Silt loam	Sandy Silt loam	Sandy Silt loam
	Date Sampled	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
	TP/BH	WS345	WS348	WS353	WS363	WS337	WS340
	Depth (m)	0.20	0.20	0.20	0.20	0.20	0.20
	Our ref	84951	84952	84953	84954	84955	84956
Alpha BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Beta BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Gamma BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Delta BHC**	(µg/kg)	<10	<10	<10	<10	<10	<10
Heptachlor	(µg/kg)	<10	<10	<10	<10	<10	<10
Aldrin**	(µg/kg)	<10	<10	<10	<10	<10	<10
Heptachlor epoxide	(µg/kg)	<10	<10	<10	<10	<10	<10
Chlordane	(µg/kg)	<10	<10	<10	<10	<10	<10
Endosulfan I	(µg/kg)	<10	<10	<10	<10	<10	<10
cis-Chlordane	(µg/kg)	<10	<10	<10	<10	<10	<10
pp-DDE**	(µg/kg)	<10	<10	<10	<10	<10	<10
Dieldrin**	(µg/kg)	<10	<10	<10	<10	<10	<10
Endrin	(µg/kg)	<10	<10	<10	<10	<10	<10
pp-DDD**	(µg/kg)	<10	<10	<10	<10	<10	<10
Endrin Aldehyde	(µg/kg)	<10	<10	<10	<10	<10	<10
pp DDT**	(µg/kg)	<10	<10	<10	<10	<10	<10
Endosulfan II	(µg/kg)	<10	<10	<10	<10	<10	<10
Endrin Ketone	(µg/kg)	<10	<10	<10	<10	<10	<10
pp-Methoxychlor	(µg/kg)	<10	<10	<10	<10	<10	<10

All results expressed on dry weight basis

** - MCERTS accredited test

Stuart Ballard

2683

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards On Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Soils

Characteristic		Silt loam	Sandy Silt loam	Sandy Silt loam	Sandy Silt loam	Silt loam
Date Sampled		23/09/13	23/09/13	23/09/13	23/09/13	23/09/13
TP/BH		WS326	WS327	WS346	WS350	WS352
Depth (m)		0.20	0.20	0.20	0.20	0.20
Our ref		84960	84961	84962	84963	84964
Clay Content [1]	(%)	11.5	14.7	13.8	11.0	18.0
Silt Content [1]	(%)	25.0	24.4	27.6	24.4	30.3
Sand Content [1]	(%)	58.8	57.7	55.7	54.4	45.8
Maximum Coarse Fragment Content [1]						
>2mm	(%)	5.0	3.0	3.0	10.0	6.0
>20mm	(%)	<0.1	<0.1	<0.1	<0.1	<0.1
>50mm	(%)	<0.1	<0.1	<0.1	<0.1	<0.1
pH Value**	(Units)	6.8	5.8	6.0	6.2	7.6
Electrical Conductivity**	(µS/cm)	189	54	66	72	186
Carbonate	(% as $CaCO_3$)	4.9	6.6	<0.1	<0.1	3.3
Soil Organic Matter*	(%)	3.40	3.19	2.40	1.05	2.12
Ammonium	(mg/kg)	<5	<5	<5	<5	<5
Nitrogen	(%)	0.1	0.2	0.2	0.2	0.2
Extractable Phosphorus	(mg/l)	13.6	19.7	21.5	12.3	10.6
Extractable Potassium	(mg/l)	47.7	42.4	41.7	28.9	64.6
Extractable Magnesium	(mg/l)	76.6	75.8	67.7	43.6	83.1
Carbon:Nitrogen Ratio		21.9	20.5	15.5	6.8	13.6
Nickel**	(mg/kg)	6	5	8	4	5
Copper**	(mg/kg)	8	9	8	5	6
Zinc**	(mg/kg)	28	33	41	20	23

[1] - Subcontracted analysis

All results expressed on dry weight basis

** - MCERTS accredited test

Stuart Ballard

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Tel: 01424 718618 Fax: 01424 729911

UKAS TESTING 2683

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

Asbestos Identification

Sample ref:	WS266
Depth (m)	0.20
Our ref:	84933
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS266
Depth (m)	1.00
Our ref:	84934
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS365
Depth (m)	0.20
Our ref:	84935
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS365
Depth (m)	0.40
Our ref:	84936
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS325
Depth (m)	0.20
Our ref:	84937
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

*= UKAS accredited

Analytical result only applies to the sample as submitted by the client

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

Stuart Ballard

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UKAS TESTING 2683

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

Asbestos Identification

Sample ref:	WS347
Depth (m)	0.20
Our ref:	84938
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS359
Depth (m)	0.20
Our ref:	84939
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS356
Depth (m)	0.50
Our ref:	84940
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS342
Depth (m)	0.20
Our ref:	84941
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

Sample ref:	WS331
Depth (m)	0.50
Our ref:	84942
#Description of Sample Matrix:	Silt loam
Result	No asbestos identified

*= UKAS accredited

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UKAS TESTING 2683

ANALYTICAL REPORT No. AR50901

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

Asbestos Identification

Sample ref:	WS366
Depth (m)	0.50
Our ref:	84943
#Description of Sample Matrix:	Silty Clay loam
Result	No asbestos identified

Sample ref:	WS368
Depth (m)	0.50
Our ref:	84944
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS370
Depth (m)	0.20
Our ref:	84945
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS324
Depth (m)	0.50
Our ref:	84946
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS349
Depth (m)	0.20
Our ref:	84947
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

*= UKAS accredited

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ANALYTICAL REPORT No. AR50901

Location: Boorley Green

F.A.O. Jonathan Tingley
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BN2 3RP

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

Asbestos Identification

Sample ref:	WS355
Depth (m)	0.20
Our ref:	84948
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS354
Depth (m)	0.20
Our ref:	84949
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS364
Depth (m)	0.20
Our ref:	84950
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS373
Depth (m)	0.50
Our ref:	84957
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

Sample ref:	WS374
Depth (m)	0.20
Our ref:	84958
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

*= UKAS accredited
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ANALYTICAL REPORT No. AR50901

Location: Boorley Green

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
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BN2 3RP

Your Job No: GE9523
Your Order No: PO1901
Reporting Date: 08/10/13

Asbestos Identification

Sample ref:	WS375
Depth (m)	0.50
Our ref:	84959
#Description of Sample Matrix:	Sandy Silt loam
Result	No asbestos identified

*= UKAS accredited

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THE ENVIRONMENTAL LABORATORY LTD

SAMPLE RECEIPT AND TEST DATES

Our Analytical Report Number	AR50901
Your Job No:	GE9523
Sample Receipt Date:	24/09/13
Reporting Date:	08/10/13
Registered:	24/09/13
Prepared:	25/09/13
Analysis complete:	08/10/13

TEST METHOD SUMMARY

PARAMETER	Analysis Undertaken on	Date Tested	Method Number	Technique
Arsenic**	Air dried sample	01/10/13	118	ICPMS
Cadmium**	Air dried sample	01/10/13	118	ICPMS
Chromium**	Air dried sample	01/10/13	118	ICPMS
Lead**	Air dried sample	01/10/13	118	ICPMS
Mercury**	Air dried sample	01/10/13	118	ICPMS
Nickel**	Air dried sample	01/10/13	118	ICPMS
Copper**	Air dried sample	01/10/13	118	ICPMS
Zinc**	Air dried sample	01/10/13	118	ICPMS
Selenium**	Air dried sample	01/10/13	118	ICPMS
Hexavalent Chromium	As submitted sample	27/09/13	110	Colorimetry
Water Soluble Boron	Air dried sample	01/10/13	202	Colorimetry
Barium*	Air dried sample	01/10/13	118	ICPMS
Beryllium*	Air dried sample	01/10/13	118	ICPMS
Vanadium**	Air dried sample	01/10/13	118	ICPMS
pH Value**	Air dried sample	02/10/13	113	Probe
Total Sulphate	Air dried sample	01/10/13	208	Colorimetry
Water Soluble Sulphate	Air dried sample	30/09/13	172	Ion Chromatography
Water Soluble Chloride	Air dried sample	30/09/13	172	Ion Chromatography
Total Cyanide**	As submitted sample	27/09/13	204	Colorimetry
Sulphide	As submitted sample	03/10/13	109	Colorimetry
Elemental Sulphur**	Air dried sample	01/10/13	122	HPLC
Total Monohydric Phenols**	As submitted sample	27/09/13	121	HPLC
Total Organic Carbon	Air dried sample	03/10/13	210	Automated IR Adsorption
TPH (> C8 - < C40)**	As submitted sample	27/09/13	117	Gas chromatography
Speciated PAH**	As submitted sample	27/09/13	133	Gas Chromatography
Carbon Banding (TPH)	As submitted sample	27/09/13	117	Gas chromatography
Asbestos*	As submitted sample	02/10/13	179	see note

Asbestos analysis qualitative only
Note:- Documented In-house procedure based on HSG 248 2005
* = UKAS Accredited test
** - MCERTS Accredited test
Determinands not marked with * or ** are not accredited
MCERTS accreditation covers samples which are predominantly sand, clay, loam or combinations of these three soil types
All results have been expressed on a dry weight basis and where appropriate have been corrected for moisture and stone content accordingly

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

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THE ENVIRONMENTAL LABORATORY LTD

SAMPLE RECEIPT AND TEST DATES

Our Analytical Report Number	AR50901
Your Job No:	GE9523
Sample Receipt Date:	24/09/13
Reporting Date:	08/10/13
Registered:	24/09/13
Prepared:	25/09/13
Analysis complete:	08/10/13

TEST METHOD SUMMARY

PARAMETER	Analysis Undertaken on	Date Tested	Method Number	Technique
Clay Content (1)	As submitted sample	---	---	Subcontracted Analysis
Silt Content (1)	As submitted sample	---	---	Subcontracted Analysis
Sand Content (1)	As submitted sample	---	---	Subcontracted Analysis
>2mm	As submitted sample	---	---	Subcontracted Analysis
>20mm	As submitted sample	---	---	Subcontracted Analysis
>50mm	As submitted sample	---	---	Subcontracted Analysis
pH Value**	Air dried sample	02/10/13	113	Probe
Electrical Conductivity**	Air dried sample	02/10/13	136	Probe
Carbonate	Air dried sample	02/10/13	100	BS 1377: Part 3 : 1990
Soil Organic Matter*	Air dried sample	02/10/13	111	Titration
Ammonium	As submitted sample	30/09/13	138	Colorimetry
Nitrogen	Air dried sample	30/09/13	151	Colorimetry
Extractable Phosphorus	Air dried sample	01/10/13	140	ICPMS
Extractable Potassium	Air dried sample	01/10/13	141	ICPMS
Extractable Magnesium	Air dried sample	01/10/13	141	ICPMS
Carbon:Nitrogen Ratio	Air dried sample	02/10/13	---	Calculation
Nickel**	Air dried sample	01/10/13	118	ICPMS
Copper**	Air dried sample	01/10/13	118	ICPMS
Zinc**	Air dried sample	01/10/13	118	ICPMS

** - MCERTS Accredited test

MCERTS accreditation covers samples which are predominantly sand, clay, loam or combinations of these three soil types

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THE ENVIRONMENTAL LABORATORY LTD

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Reporting Date: 21 October 2013

ANALYTICAL REPORT No. AR51092

Samples Received By: Laboratory Courier
Sample Receipt Date: 07/10/13
Your Job No: GE9523
Your Order No: F200
Site Location: Boorley Green
No Samples Received: 7
Date of Sampling: 03/10/13

This report was written by: Stuart Ballard

Authorised By:

[redacted]

Steve Knight
Reporting Manager

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

THE ENVIRONMENTAL LABORATORY LTD

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Tel: 01424 718618 Fax: 01424 729911

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ANALYTICAL REPORT No. AR51092

Location: Boorley Green

Your Job No: GE9523
Your Order No: F200
Reporting Date: 21/10/2013

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Waters

	Date Sampled	03/10/13	03/10/13	03/10/13	03/10/13	03/10/13	03/10/13	03/10/13
	TP/BH	WS365	WS295	BH207	BH201	BH203	BH204	BH210
	Depth	2.75	1.00	3.75	3.90	2.00	3.00	3.75
	Our ref	86399	86400	86401	86402	86403	86404	86405
Arsenic*	(µg/l)	<5	<5	<5	<5	<5	<5	<5
Cadmium*	(µg/l)	<1	<1	<1	<1	<1	<1	<1
Chromium*	(µg/l)	<5	<5	<5	<5	<5	<5	<5
Lead*	(µg/l)	<1	<1	<1	<1	<1	<1	<1
Nickel*	(µg/l)	10	2	3	9	4	1	6
Copper*	(µg/l)	10	<5	<5	<5	5	<5	<5
Zinc*	(µg/l)	15	14	8	39	12	6	13
Mercury*	(µg/l)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium*	(µg/l)	95	<5	<5	<5	<5	<5	<5
Boron	(µg/l)	468	515	438	397	366	413	188
Barium*	(µg/l)	82	7	8	16	17	12	9
Beryllium*	(µg/l)	<5	<5	<5	<5	<5	<5	<5
Vanadium	(µg/l)	<5	<5	<5	<5	<5	<5	<5
pH Value*	(Units)	6.7	3.8	5.8	5.1	6.5	5.8	5.7
Sulphate*	(mg/l)	208	41	26	119	76	28	30
Chloride*	(mg/l)	71	14	15	51	29	13	29
Total Cyanide	(µg/l)	<20	<20	<20	<20	<20	<20	<20
Sulphide	(mg/l)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phenols	(µg/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hexavalent Chromium	(µg/l)	<100	<100	<100	<100	<100	<100	<100
TOC (In filtered samples)*	(mg/l)	30.6	5.3	7.1	4.7	8.8	12.7	9.0
Elemental Sulphur	(mg/l)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH (> C_9 - < C_{40})*	(µg/l)	130	269	1047	243	158	182	2106

* = UKAS Accredited test

Stuart Ballard

THE ENVIRONMENTAL LABORATORY LTD

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards On Sea, East Sussex, TN38 9BY
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR51092

Location: Boorley Green

Your Job No: GE9523

Reporting Date: 21/10/2013

F.A.O. Jonathan Tingley
Geo-Environmental Services Limited
28 Crescent Road
Brighton, East Sussex
BN2 3RP

Waters									
		Date Sampled	03/10/13	03/10/13	03/10/13	03/10/13	03/10/13	03/10/13	03/10/13
		TP/BH	WS365	WS295	BH207	BH201	BH203	BH204	BH210
		Depth	2.75	1.00	3.75	3.90	2.00	3.00	3.75
		Our ref	86399	86400	86401	86402	86403	86404	86405
Naphthalene		(µg/l)	0.27	0.19	0.14	0.14	0.15	0.12	0.13
Acenaphthylene		(µg/l)	0.04	0.02	0.02	0.02	0.02	0.01	0.02
Acenaphthene		(µg/l)	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Fluorene		(µg/l)	0.06	0.04	0.04	0.04	0.04	0.03	0.04
Phenanthrene		(µg/l)	0.22	0.14	0.13	0.13	0.14	0.10	0.14
Anthracene		(µg/l)	0.10	0.06	0.04	0.06	0.06	0.04	0.05
Fluoranthene		(µg/l)	0.13	0.06	0.08	0.06	0.07	0.06	0.09
Pyrene		(µg/l)	0.09	0.04	0.07	0.05	0.04	0.04	0.08
Benz(a)anthracene		(µg/l)	0.04	0.02	0.03	<0.01	<0.01	<0.01	0.03
Chrysene		(µg/l)	0.06	0.01	0.02	<0.01	<0.01	<0.01	0.02
Benzo(b)fluoranthene		(µg/l)	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
Benzo(k)fluoranthene		(µg/l)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benzo(a)pyrene		(µg/l)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(123-cd)pyrene		(µg/l)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenz(ah)anthracene		(µg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene		(µg/l)	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total PAH		(µg/l)	1.20	0.59	0.58	0.51	0.53	0.41	0.65

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THE ENVIRONMENTAL LABORATORY LTD

WATER SAMPLE RECEIPT AND TEST DATES

Our Analytical Report Number	AR51092
Your Ref No:	GE9523
Sample Receipt Date:	07/10/13
Reporting Date:	21/10/13
Registered:	07/10/13
Prepared:	08/10/13
Analysis complete:	21/10/13

WATER TEST METHOD SUMMARY

PARAMETER	Method Number	Technique
Arsenic*	101	ICPMS
Cadmium*	101	ICPMS
Chromium*	101	ICPMS
Lead*	101	ICPMS
Nickel*	101	ICPMS
Copper*	101	ICPMS
Zinc*	101	ICPMS
Mercury*	101	ICPMS
Selenium*	101	ICPMS
Boron	203	Colorimetry
Barium*	101	ICPMS
Beryllium*	101	ICPMS
Vanadium	101	ICPMS
pH Value*	113	Electrometric
Sulphate*	131	Ion Chromatography
Chloride*	131	Ion Chromatography
Total Cyanide	130	Colorimetry
Sulphide	134	Colorimetry
Total Phenols	121	HPLC
Hexavalent Chromium	110	Colorimetry
TOC (In filtered samples)*	102	TOC Analyser
Elemental Sulphur	122	HPLC
TPH (> C9 - < C40)*	178	Gas chromatography
Speciated PAH	135	GCMS

* = UKAS Accredited test

Determinands not marked with * are non accredited

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APPENDIX G

Geotechnical Laboratory Results

Client :	Geo-Environmental Services Ltd	Our Job/report no:	15279	Samples Rec :	10/09/2013	Testing Started:	26/09/2013
Project name:	Boorley Green (Southampton)	Project No:	GE9523-1904	Project Started:	12/09/2013	Date reported:	15/10/2013

BH / TP No	Sample no / ref	Sample depth (m)	Description	Moisture content (%)	Bulk Density (Mg/m3)	Dry density (Mg/m3)	Cell Pressure (kPa)	Strain at failure (%)	Max Deviator Stress (kPa)	Mode of failure	Shear Strength (kPa)	Phi (deg)
BH201	U1	1.00	Medium strength orange brown, brown and pale blue grey mottled silty CLAY with numerous orange brown sandy partings	29	1.85	1.43	20	5.0	119	Brittle	59	NA
BH201	U2	3.00	Medium strength pale grey brown mottled orange brown and purple grey silty CLAY	35	1.80	1.34	60	5.5	94	Brittle	47	NA
BH201	U3	5.00	Low strength blue grey mottled greenish grey silty CLAY	30	1.94	1.49	100	2.0	78	Brittle	39	NA
BH201	U4	8.00	Medium strength fissured dark grey silty CLAY	31	1.89	1.45	160	7.0	133	Brittle	66	NA
BH201	U5	11.00	Medium strength fissured dark brown, blue grey and rusty brown silty CLAY	33	1.90	1.42	220	4.5	111	Brittle	56	NA
BH201	U6	14.00	Medium strength fissured dark grey brown silty CLAY	34	1.87	1.40	280	1.5	147	Brittle	73	NA
BH202	U1	1.00	Medium strength pale grey brown mottled rusty orange brown slightly sandy silty CLAY	28	1.93	1.51	20	2.5	126	Brittle	63	NA
BH202	U2	3.00	Medium strength pale grey brown, orange brown, yellow brown mottled silty CLAY with fine sandy patches	32	1.81	1.37	60	7.0	134	Brittle	67	NA
BH203	U	2.00	Medium strength dark blue grey silty fine sandy CLAY	25	1.89	1.51	40	12	102	Brittle	51	NA
BH203	U	4.00	Medium strength dark grey silty CLAY	30	1.91	1.48	80	12	128	Brittle	64	NA
BH203	U	6.50	High strength dark grey slightly fine sandy CLAY with black stains	25	1.99	1.58	130	12	202	Brittle	101	NA
BH203	U	9.50	Medium strength grey mottled grey brown silty fine sandy CLAY	22	1.99	1.63	190	12	144	Brittle	72	NA
BH203	U	12.50	Very high strength dark grey silty fine sandy CLAY with pale grey silty fine sandy pockets	22	2.02	1.66	250	19	382	Brittle	191	NA

K4 SOILS

Summary of Undrained Triaxial Compression Testing

BS 1377 : Part 7 : Clause 8 : 1990

UKAS TESTING

2519

Checked and approved

Initials kp

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Client :	Geo-Environmental Services Ltd	Our Job/report no:	15279	Samples Rec :	10/09/2013	Testing Started:	26/09/2013
Project name:	Boorley Green (Southampton)	Project No:	GE9523-1904	Project Started:	12/09/2013	Date reported:	15/10/2013

BH / TP No	Sample no / ref	Sample depth (m)	Description	Moisture content (%)	Bulk Density (Mg/m3)	Dry density (Mg/m3)	Cell Pressure (kPa)	Strain at failure (%)	Max Deviator Stress (kPa)	Mode of failure	Shear Strength (kPa)	Phi (deg)
BH204	U	5.00	High strength dark grey and dark blue grey silty fine sandy CLAY	34	1.91	1.43	100	20	176	Brittle	88	NA
BH204	U	8.00	High strength dark grey slightly silty slightly sandy CLAY with one medium sized pyrites nodules	25	2.01	1.61	160	15	218	Brittle	109	NA
BH204	U	11.00	High strength slightly fissured dark grey CLAY with occasional fine sand partings	29	2.02	1.57	220	15	231	Brittle	116	NA
BH204	U	14.10	Very high strength fissured dark grey CLAY with occasional fine sand partings	25	2.00	1.60	282	15	382	Brittle	191	NA
BH205	U	1.00	Very high strength reddish brown and blue grey mottled slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular to angular)	21	2.09	1.73	20	5.7	312	Brittle	156	NA
BH205	U	3.00	Medium strength light brown and light orange brown mottled sandy CLAY	27	1.82	1.44	60	11	137	Brittle	68	NA
BH206	U	1.00	Medium strength light brown slightly mottled orange brown and blue grey sandy CLAY	27	1.94	1.53	20	10	147	Brittle	74	NA
BH206	U	3.00	Medium strength brown and blue mottled sandy CLAY	27	1.98	1.56	60	20	123	Brittle	61	NA
BH206	U	5.00	High strength brown, light brown and grey CLAY	28	1.96	1.53	100	4.5	157	Brittle	79	NA
BH206	U	8.00	Medium strength fissured dark grey CLAY	31	1.89	1.44	160	12	120	Brittle	60	NA
BH206	U	14.00	High strength fissured dark grey CLAY	31	1.92	1.47	280	16	152	Brittle	76	NA
BH207	U	1.00	High strength brown slightly blue grey and orange mottled slightly gravelly slightly sandy CLAY (gravel is fm and angular)	17	2.11	1.80	20	16	193	Brittle	97	NA
BH208	U	1.00	High strength brown and dark brown sandy CLAY	18	2.02	1.71	20	4.5	279	Brittle	140	NA

K4 SOILS

Summary of Undrained Triaxial Compression Testing

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Client :	Geo-Environmental Services Ltd	Our Job/report no:	15279	Samples Rec :	10/09/2013	Testing Started:	26/09/2013
Project name:	Boorley Green (Southampton)	Project No:	GE9523-1904	Project Started:	12/09/2013	Date reported:	15/10/2013

BH / TP No	Sample no / ref	Sample depth (m)	Description	Moisture content (%)	Bulk Density (Mg/m3)	Dry density (Mg/m3)	Cell Pressure (kPa)	Strain at failure (%)	Max Deviator Stress (kPa)	Mode of failure	Shear Strength (kPa)	Phi (deg)
BH209	U	1.00	High strength slightly fissured dark brown, light brown slightly orange and blue grey mottled CLAY with occasional fine rootlets	35	1.70	1.26	20	4.0	161	Brittle	81	NA
BH209	U	3.00	Medium strength light brown and light orange sandy CLAY	27	1.79	1.42	60	6.1	100	Brittle	50	NA

K4 SOILS

Summary of Undrained Triaxial Compression Testing

BS 1377 : Part 7 : Clause 8 : 1990

UKAS TESTING 2519

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH201	**Sample no:**	U1	**Depth (m):**	1.00

Soil Description: Medium strength orange brown, brown and pale blue grey mottled silty CLAY with numerous orange brown sandy partings

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	29
Bulk Density	Mg/m³	1.85
Dry Density	Mg/m³	1.43

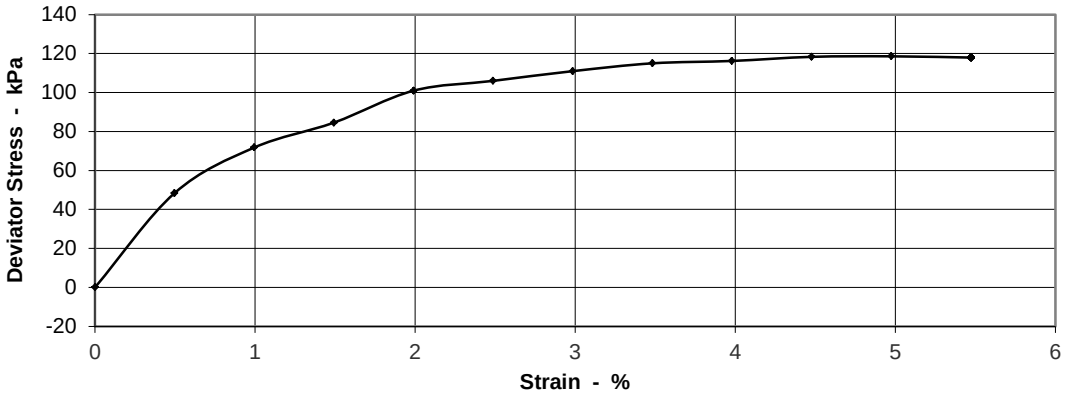
Position and orientation within the original sample

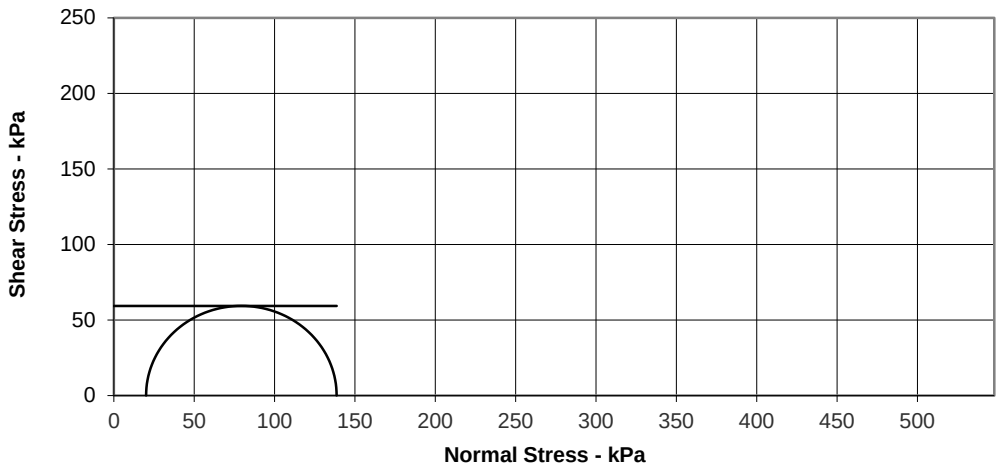
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.25
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	20
Strain at Failure	%	5.0
Maximum Deviator Stress	kPa	119
Shear Strength	kPa	59
Mode of Failure		Brittle

Shear Strength Parameters	
C	59 kPa
Phi	0.0 °

Specimen 1





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J.Phaure(Lab.Mgr)

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Initials: kp
Date: 15/10/2013

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH201	**Sample no:**	U2	**Depth (m):**	3.00

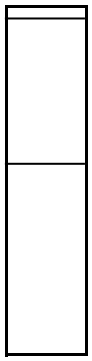
Soil Description: Medium strength pale grey brown mottled orange brown and purple grey silty CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	35
Bulk Density	Mg/m³	1.80
Dry Density	Mg/m³	1.34

Test Details

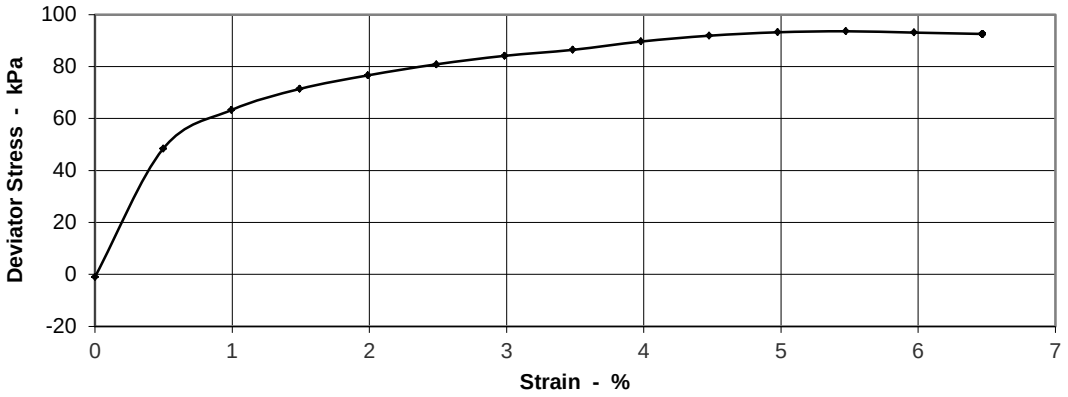
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.27
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	60
Strain at Failure	%	5.5
Maximum Deviator Stress	kPa	94
Shear Strength	kPa	47
Mode of Failure		Brittle

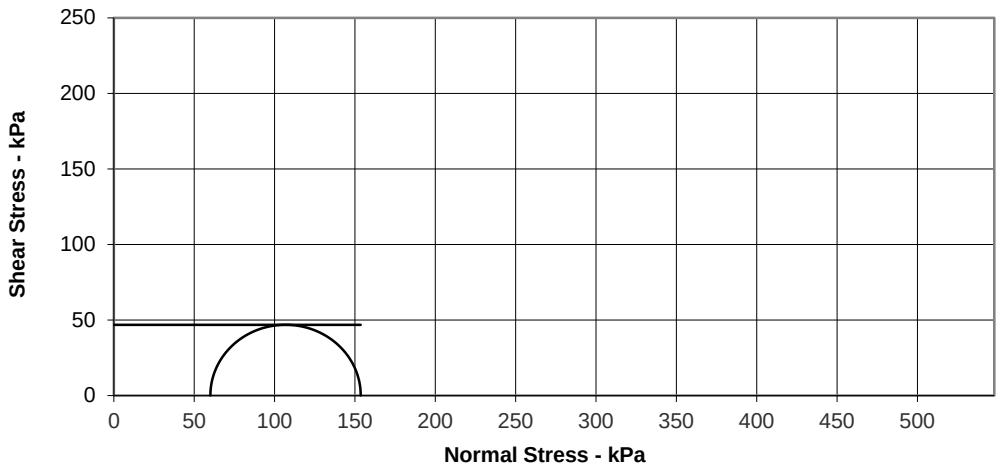
Position and orientation within the original sample



Shear Strength Parameters	
C	47 kPa
Phi	0.0 °

Specimen 1





K4 SOILS LABORATORY
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J.Phaure(Lab.Mgr)

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Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH201	**Sample no:**	U3	**Depth (m):**	5.00

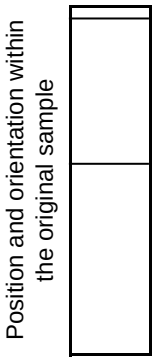
Soil Description: Low strength blue grey mottled greenish grey silty CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	30
Bulk Density	Mg/m³	1.94
Dry Density	Mg/m³	1.49

Test Details

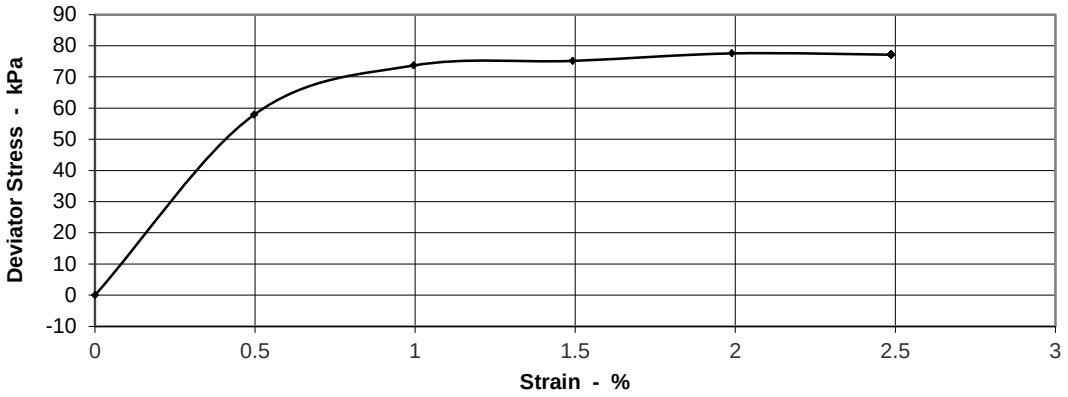
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.11
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	100
Strain at Failure	%	2.0
Maximum Deviator Stress	kPa	78
Shear Strength	kPa	39
Mode of Failure		Brittle

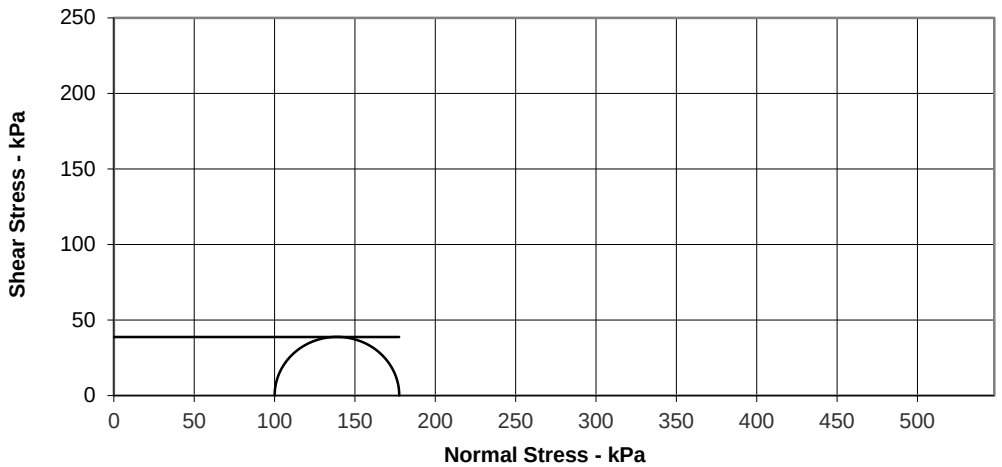
Position and orientation within the original sample



Shear Strength Parameters	
C	39 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

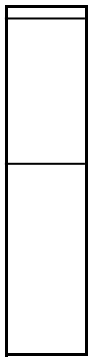
Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH201	**Sample no:**	U4	**Depth (m):**	8.00

Soil Description: Medium strength fissured dark grey silty CLAY

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	31
Bulk Density	Mg/m³	1.89
Dry Density	Mg/m³	1.45

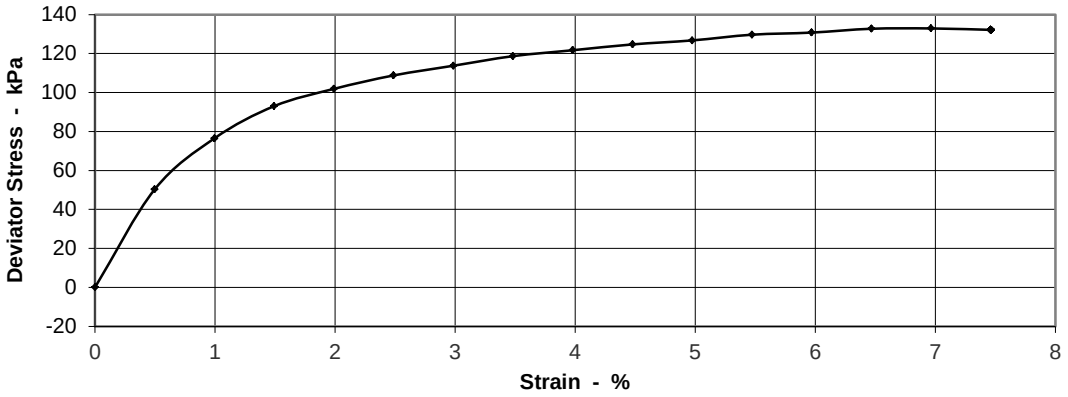
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.33
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	160
Strain at Failure	%	7.0
Maximum Deviator Stress	kPa	133
Shear Strength	kPa	66
Mode of Failure		Brittle

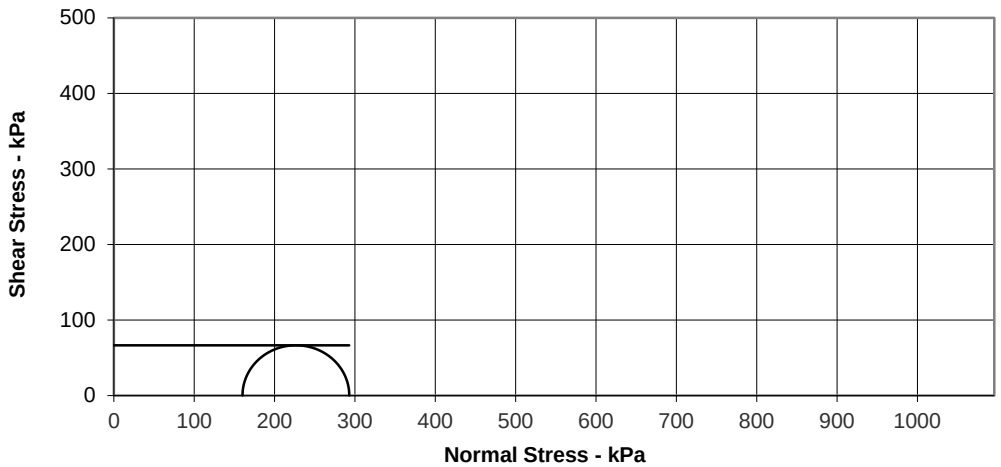
Position and orientation within the original sample



Shear Strength Parameters	
C	66 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH201	**Sample no:**	U5	**Depth (m):**	11.00

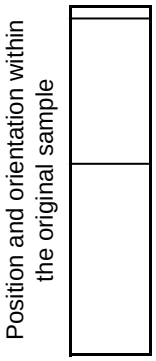
Soil Description: Medium strength fissured dark brown, blue grey and rusty brown silty CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	33
Bulk Density	Mg/m³	1.90
Dry Density	Mg/m³	1.42

Test Details

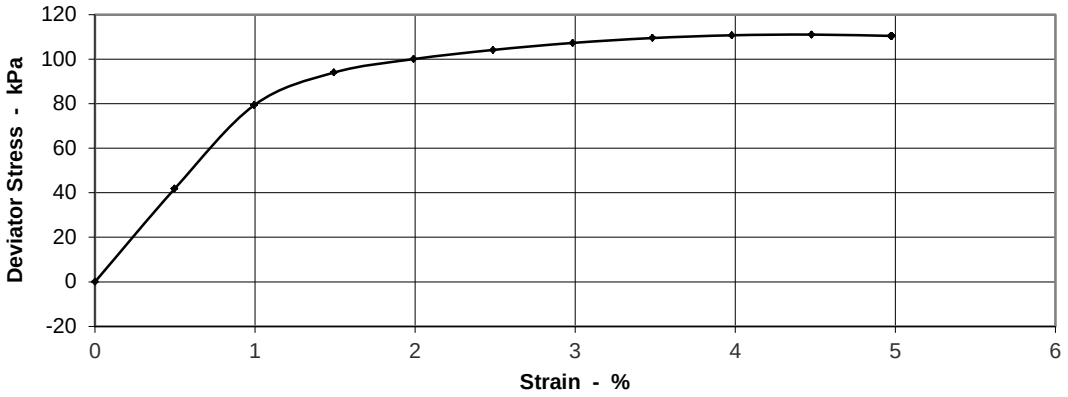
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.23
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	220
Strain at Failure	%	4.5
Maximum Deviator Stress	kPa	111
Shear Strength	kPa	56
Mode of Failure		Brittle

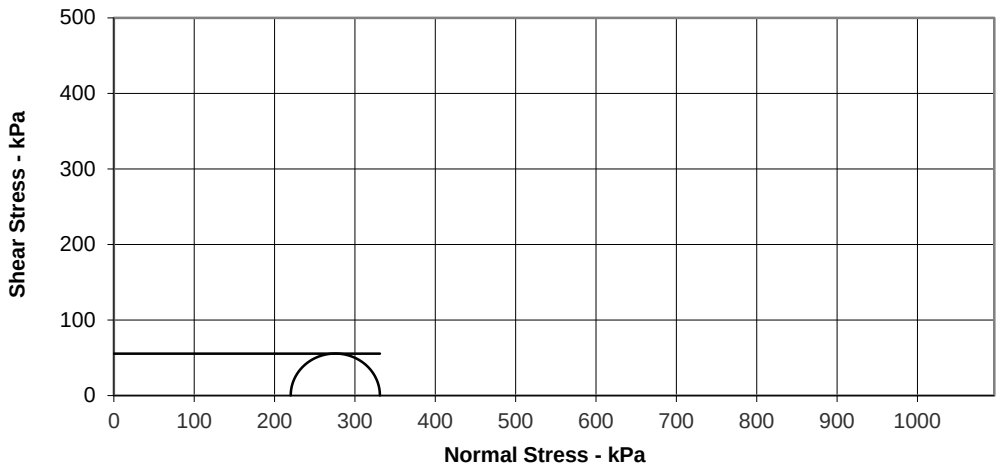
Position and orientation within the original sample



Shear Strength Parameters	
C	56 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH201	**Sample no:**	U6	**Depth (m):**	14.00

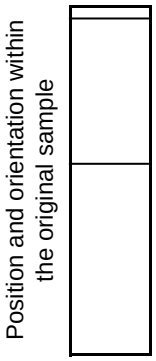
Soil Description: Medium strength fissured dark grey brown silty CLAY - REMARKS - Sample slighlty disturbed

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	34
Bulk Density	Mg/m³	1.87
Dry Density	Mg/m³	1.40

Test Details

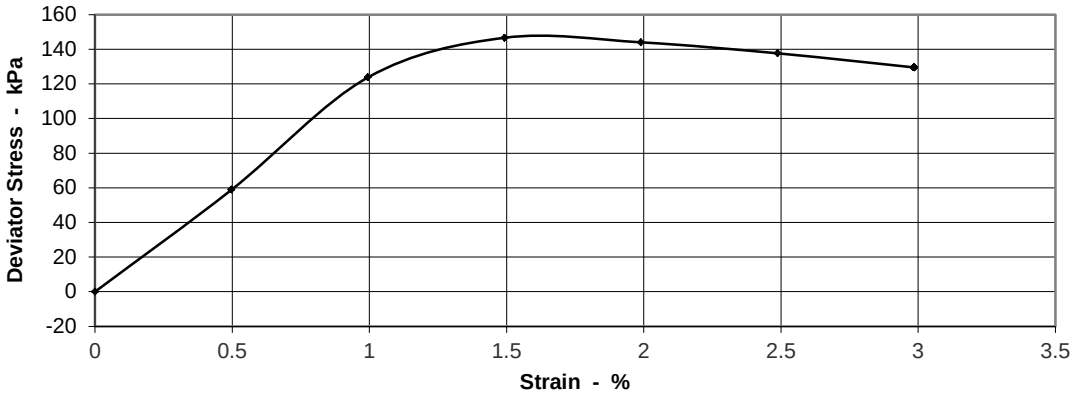
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.08
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	280
Strain at Failure	%	1.5
Maximum Deviator Stress	kPa	147
Shear Strength	kPa	73
Mode of Failure		Brittle

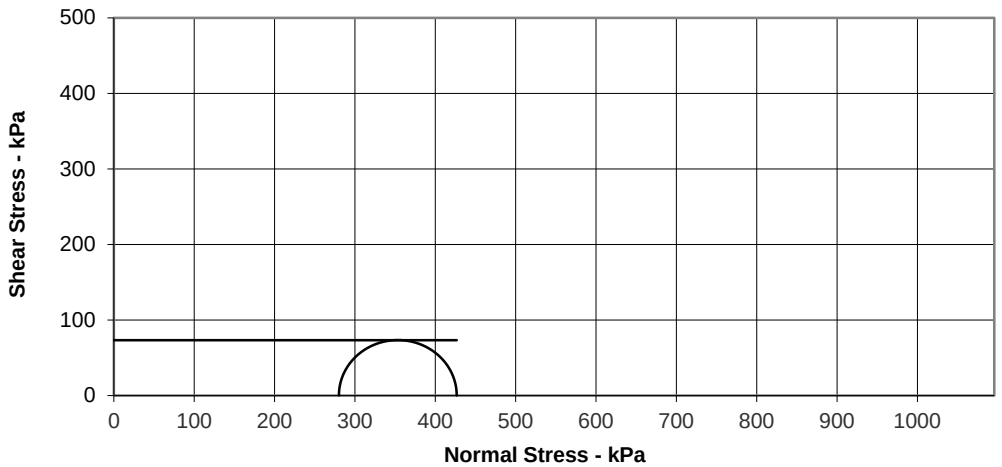
Position and orientation within the original sample



Shear Strength Parameters	
C	73 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

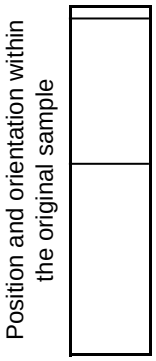
Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH202	**Sample no:**	U1	**Depth (m):**	1.00

Soil Description: Medium strength pale grey brown mottled rusty orange brown slightly sandy silty CLAY

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	28
Bulk Density	Mg/m³	1.93
Dry Density	Mg/m³	1.51

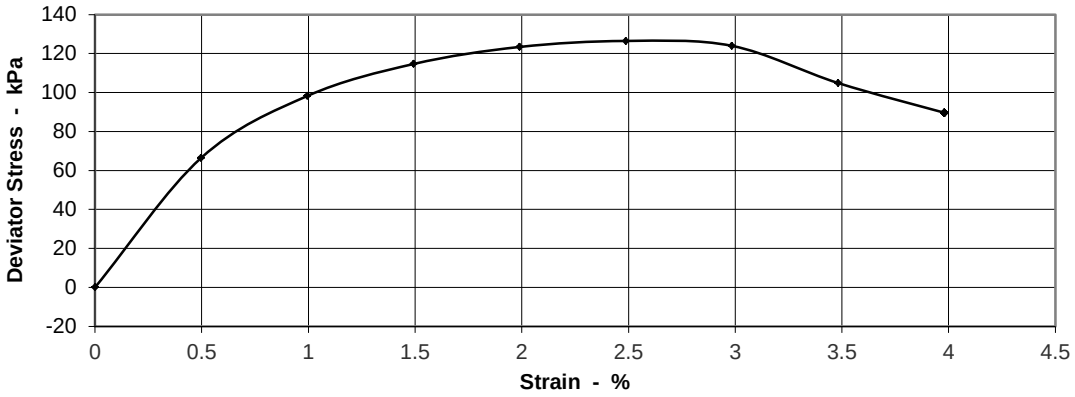
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.14
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	20
Strain at Failure	%	2.5
Maximum Deviator Stress	kPa	126
Shear Strength	kPa	63
Mode of Failure		Brittle

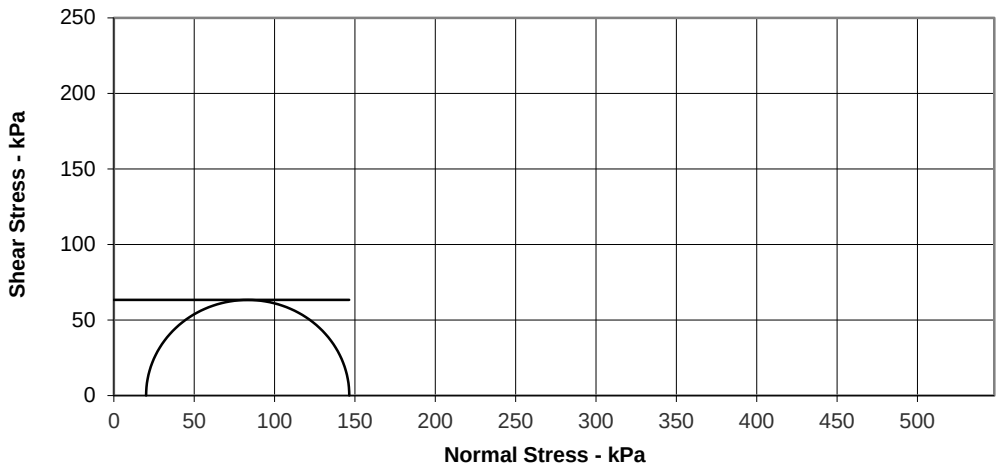
Position and orientation within the original sample



Shear Strength Parameters	
C	63 kPa
Phi	0.0 °

Specimen 1





K4 SOILS LABORATORY
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Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH202	**Sample no:**	U2	**Depth (m):**	3.00

Soil Description: Medium strength pale grey brown, orange brown, yellow brown mottled silty CLAY with fine sandy patches

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	32
Bulk Density	Mg/m³	1.81
Dry Density	Mg/m³	1.37

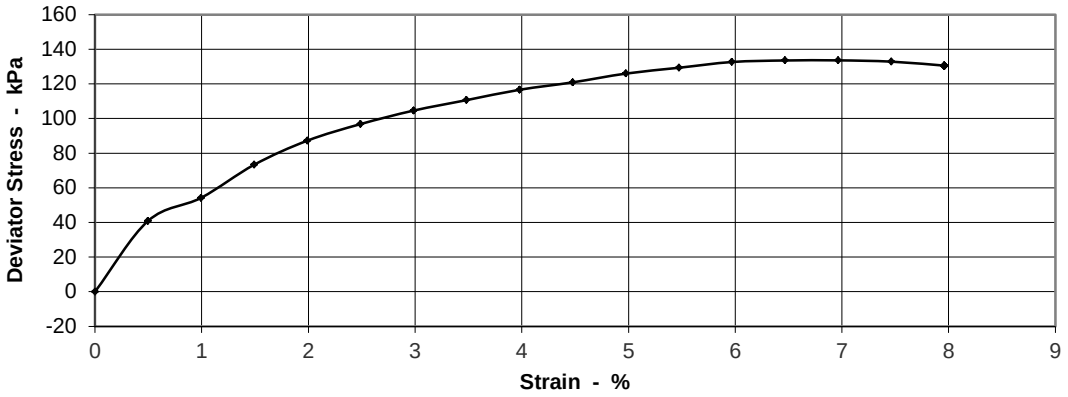
Position and orientation within the original sample

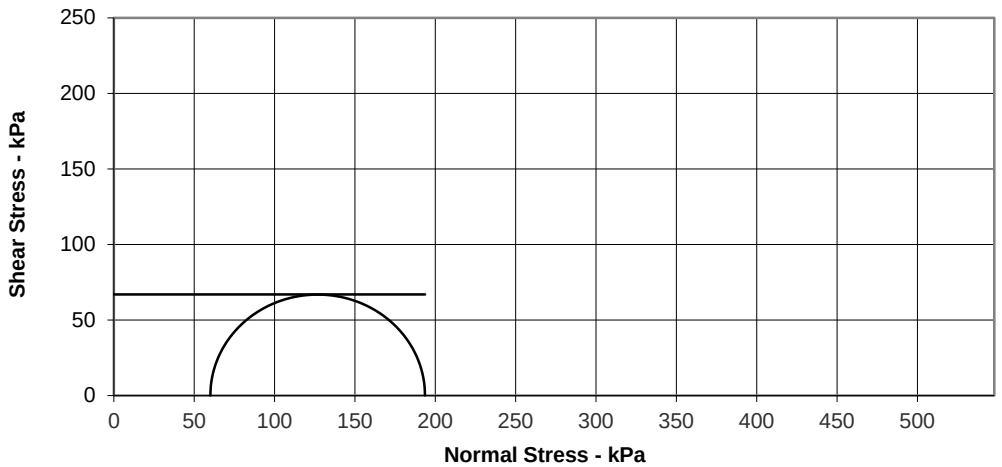
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.33
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	60
Strain at Failure	%	7.0
Maximum Deviator Stress	kPa	134
Shear Strength	kPa	67
Mode of Failure		Brittle

Shear Strength Parameters	
C	67 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH203	**Sample no:**	U	**Depth (m):**	2.00

Soil Description: Medium strength dark blue grey silty fine sandy CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	25
Bulk Density	Mg/m³	1.89
Dry Density	Mg/m³	1.51

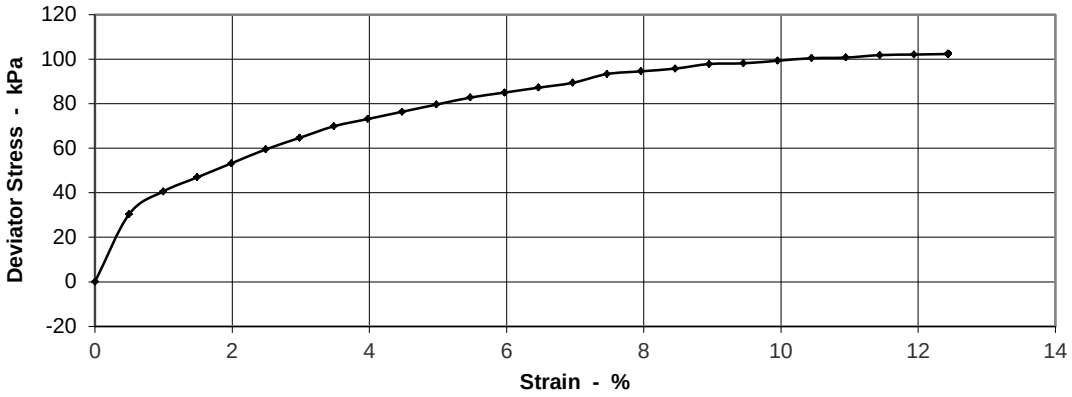
Position and orientation within the original sample

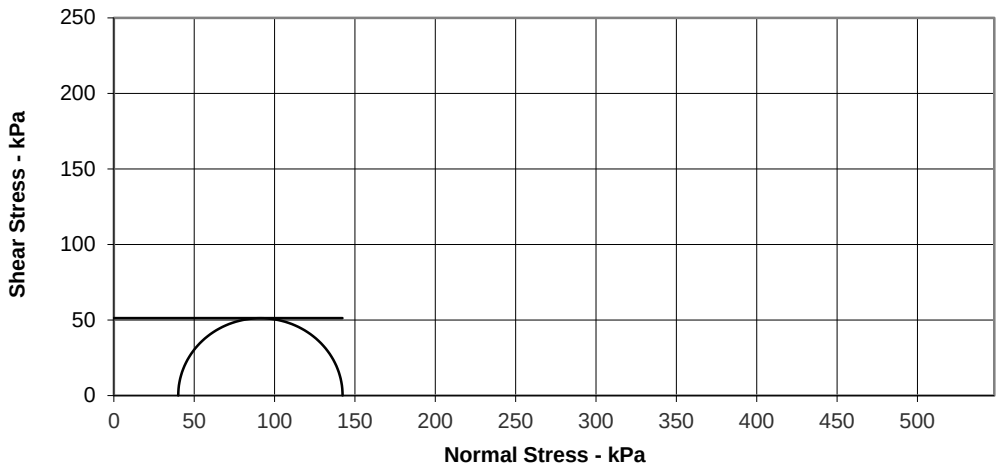
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.52
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	40
Strain at Failure	%	12.4
Maximum Deviator Stress	kPa	102
Shear Strength	kPa	51
Mode of Failure		Brittle

Shear Strength Parameters	
C	51 kPa
Phi	0.0 °

Specimen 1





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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

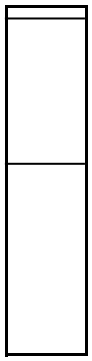
Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH203	**Sample no:**	U	**Depth (m):**	4.00

Soil Description: Medium strength dark grey silty CLAY - Sample slighlty disturbed

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	29
Bulk Density	Mg/m³	1.91
Dry Density	Mg/m³	1.48

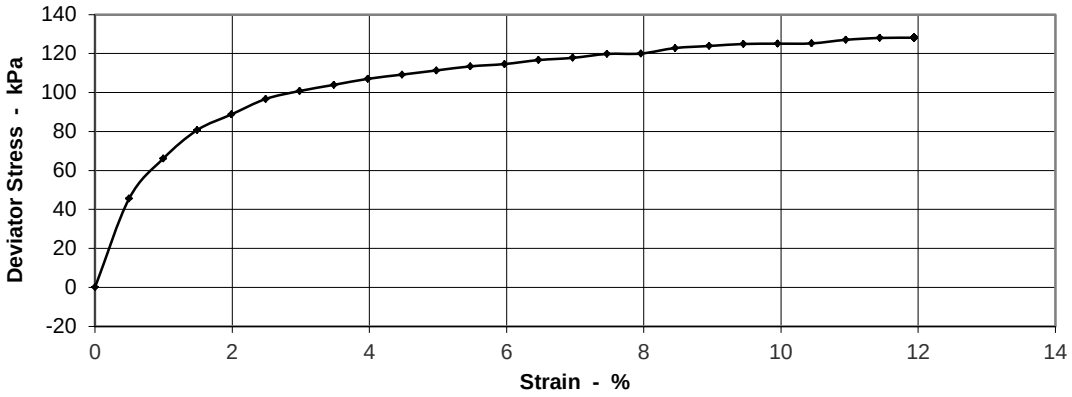
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.51
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	80
Strain at Failure	%	11.9
Maximum Deviator Stress	kPa	128
Shear Strength	kPa	64
Mode of Failure		Brittle

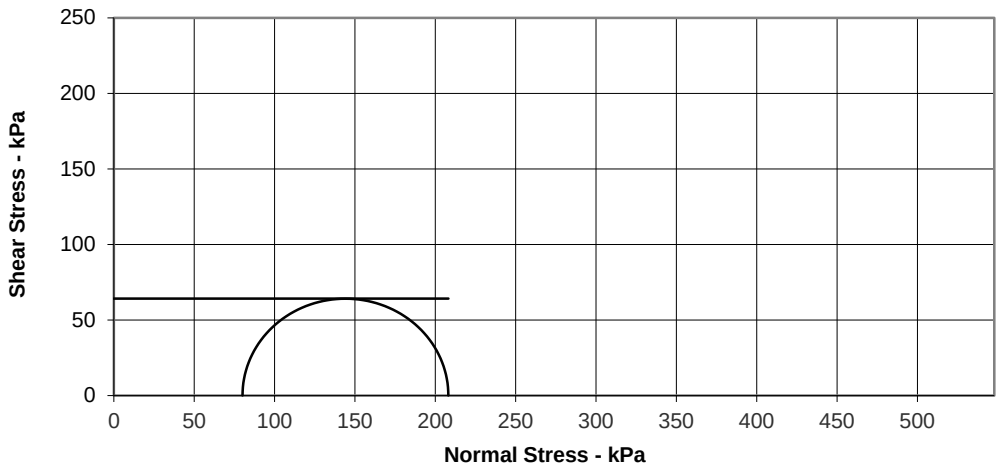
Position and orientation within the original sample



Shear Strength Parameters	
C	64 kPa
Phi	0.0 °

Specimen 1





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Initials: kp
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UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH203	**Sample no:**	U	**Depth (m):**	6.50

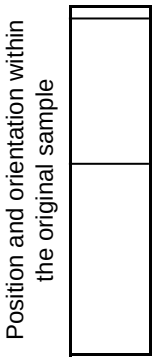
Soil Description: High strength dark grey slightly fine sandy CLAY with black stains

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	25
Bulk Density	Mg/m³	1.99
Dry Density	Mg/m³	1.58

Test Details

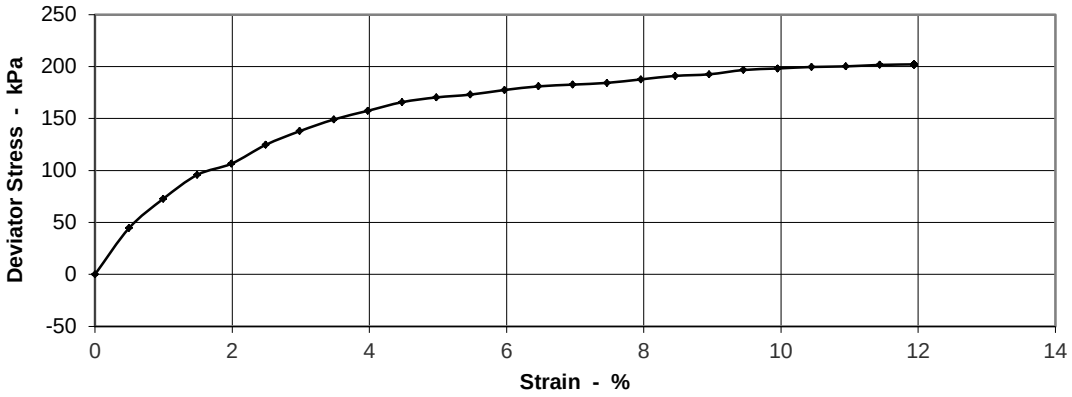
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.51
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	130
Strain at Failure	%	11.9
Maximum Deviator Stress	kPa	202
Shear Strength	kPa	101
Mode of Failure		Brittle

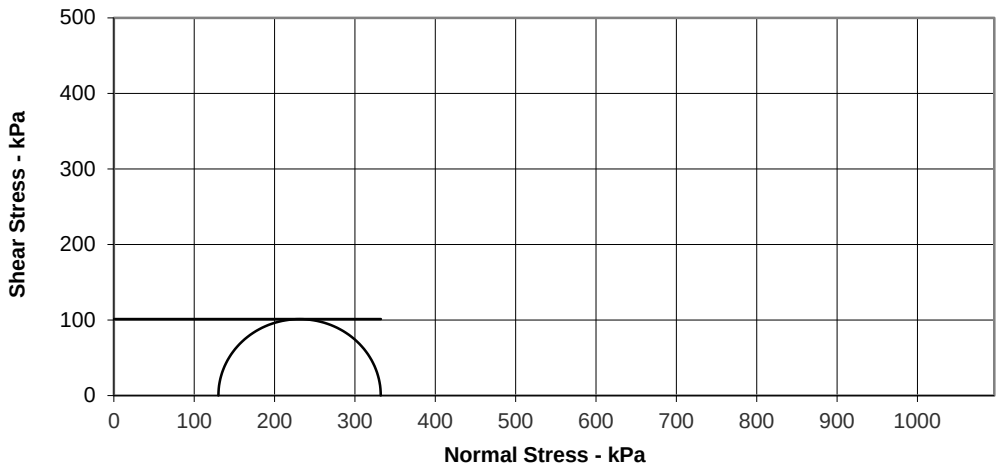
Position and orientation within the original sample



Shear Strength Parameters	
C	101 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH203	**Sample no:**	U	**Depth (m):**	9.50

Soil Description: Medium strength grey mottled grey brown silty fine sandy CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	22
Bulk Density	Mg/m³	1.99
Dry Density	Mg/m³	1.63

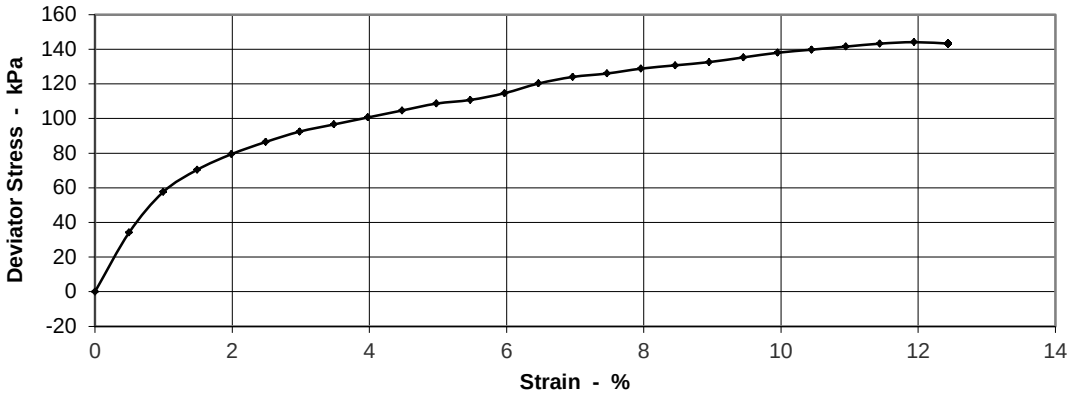
Position and orientation within the original sample

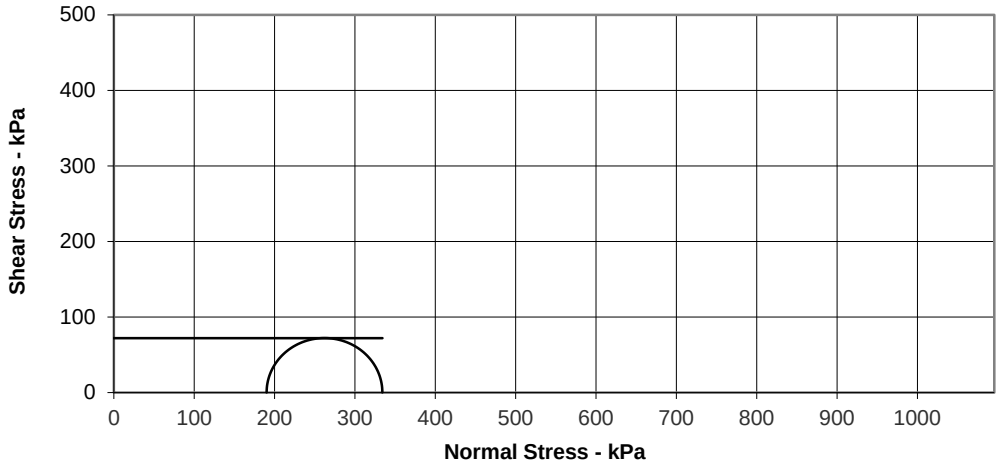
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.51
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	190
Strain at Failure	%	11.9
Maximum Deviator Stress	kPa	144
Shear Strength	kPa	72
Mode of Failure		Brittle

Shear Strength Parameters	
C	72 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH203	**Sample no:**	U	**Depth (m):**	12.50

Soil Description: Very high strength dark grey silty fine sandy CLAY with pale grey silty fine sandy pockets

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	22
Bulk Density	Mg/m³	2.02
Dry Density	Mg/m³	1.66

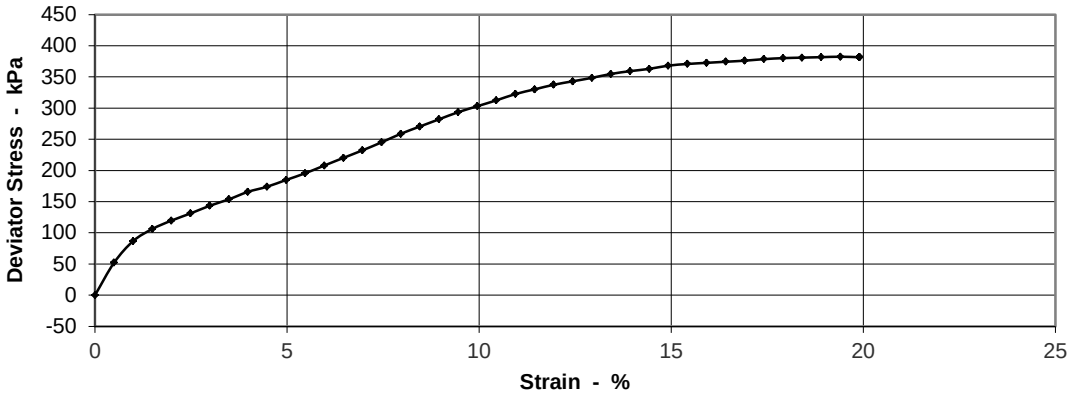
Position and orientation within the original sample

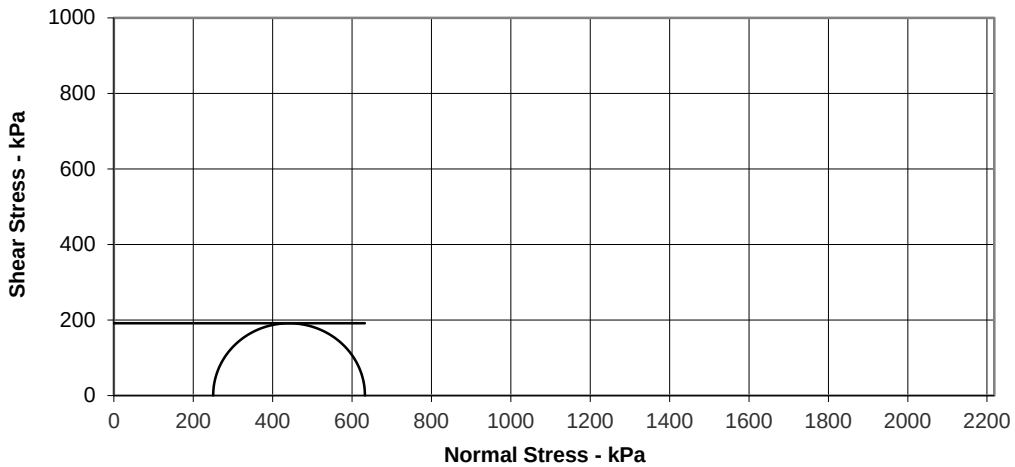
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.73
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	250
Strain at Failure	%	19.4
Maximum Deviator Stress	kPa	382
Shear Strength	kPa	191
Mode of Failure		Brittle

Shear Strength Parameters	
C	191 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH204	**Sample no:**	U	**Depth (m):**	5.00

Soil Description: High strength dark grey and dark blue grey silty fine sandy CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	201.0
Diameter	mm	102.0
Moisture Content	%	34
Bulk Density	Mg/m³	1.91
Dry Density	Mg/m³	1.43

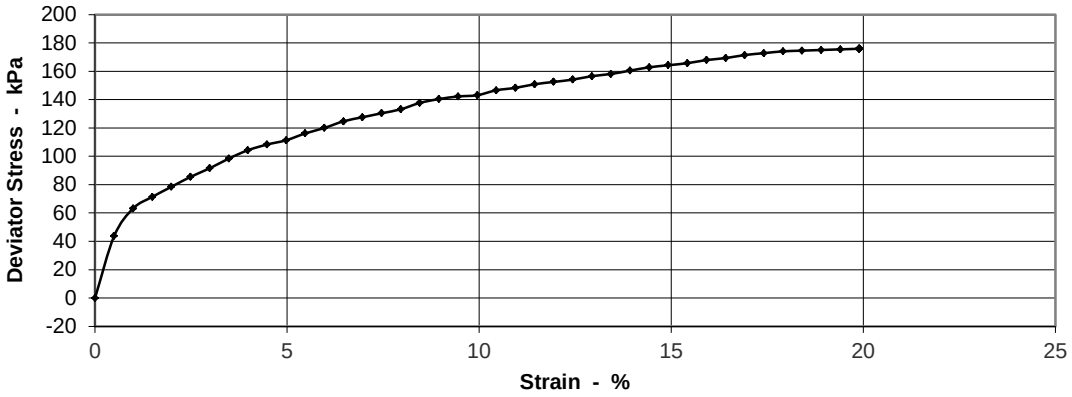
Position and orientation within the original sample

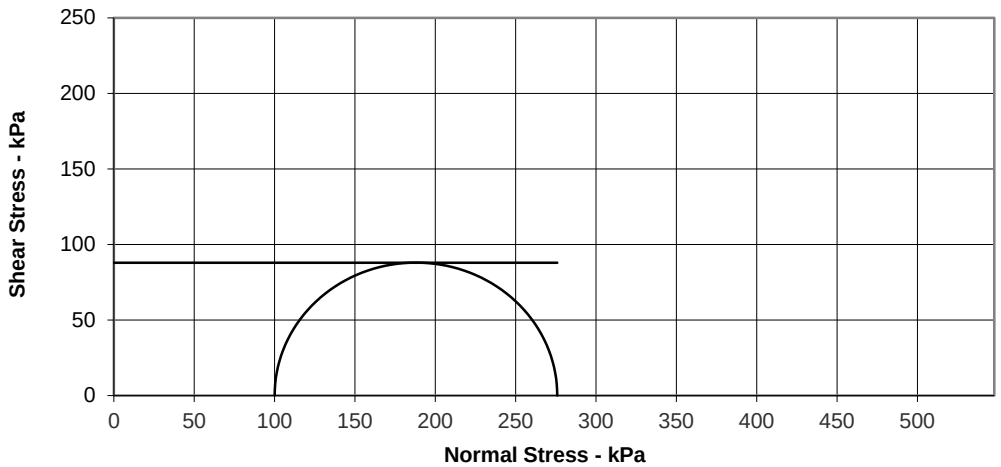
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.74
Rate of Axial Displacement	%/min	1.99
Cell Pressure	kPa	100
Strain at Failure	%	19.9
Maximum Deviator Stress	kPa	176
Shear Strength	kPa	88
Mode of Failure		Brittle

Shear Strength Parameters	
C	88 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH204	**Sample no:**	U	**Depth (m):**	8.00

Soil Description: High strength dark grey slightly silty slightly sandy CLAY with one medium sized pyrites nodules

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	25
Bulk Density	Mg/m³	2.01
Dry Density	Mg/m³	1.61

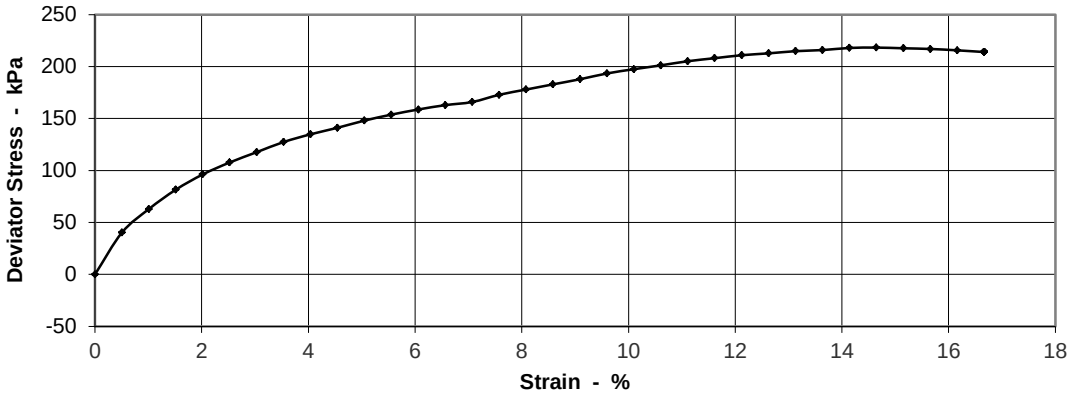
Position and orientation within the original sample

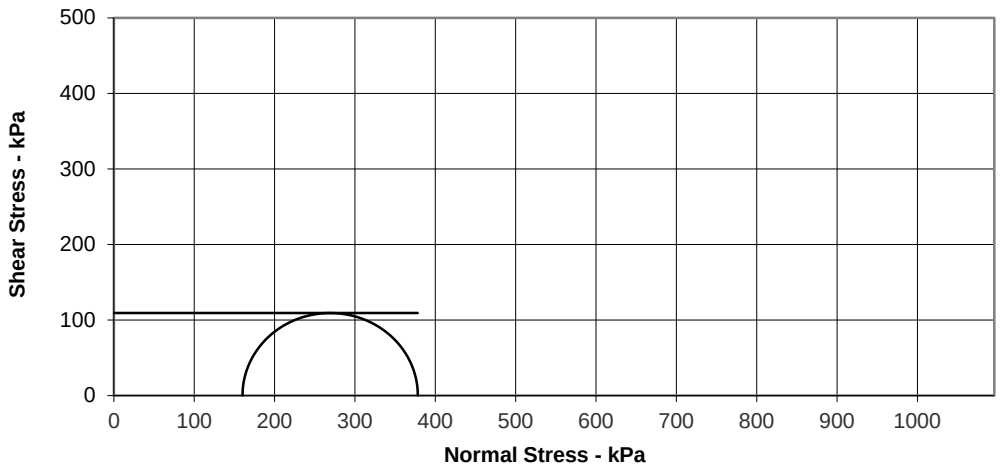
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.59
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	160
Strain at Failure	%	14.6
Maximum Deviator Stress	kPa	218
Shear Strength	kPa	109
Mode of Failure		Brittle

Shear Strength Parameters	
C	109 kPa
Phi	0.0 °

Specimen 1





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K4 SOILS

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BS 1377 : Part 7 : 1990 Clause 8.0

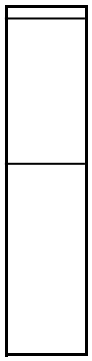
Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	26/09/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH204	**Sample no:**	U	**Depth (m):**	11.00

Soil Description: High strength slightly fissured dark grey CLAY with occasional fine sand partings

Sample Details		**Specimen 1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	29
Bulk Density	Mg/m³	2.02
Dry Density	Mg/m³	1.57

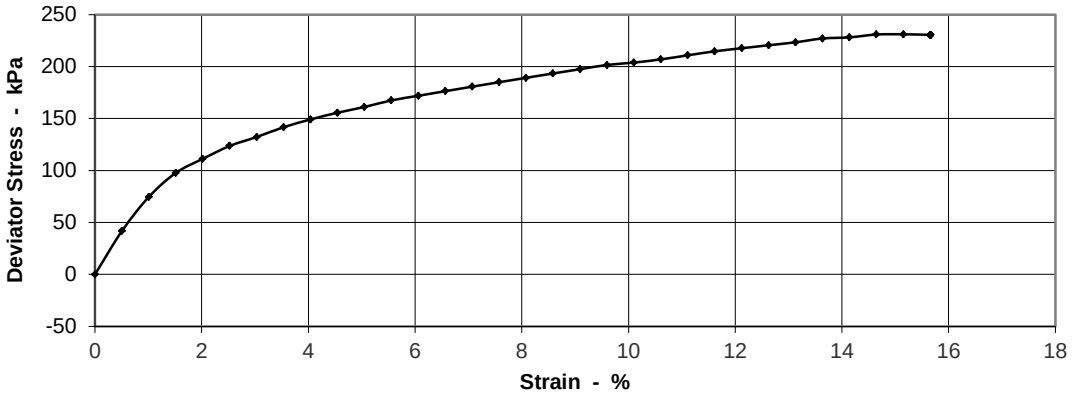
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.61
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	220
Strain at Failure	%	15.2
Maximum Deviator Stress	kPa	231
Shear Strength	kPa	116
Mode of Failure		Brittle

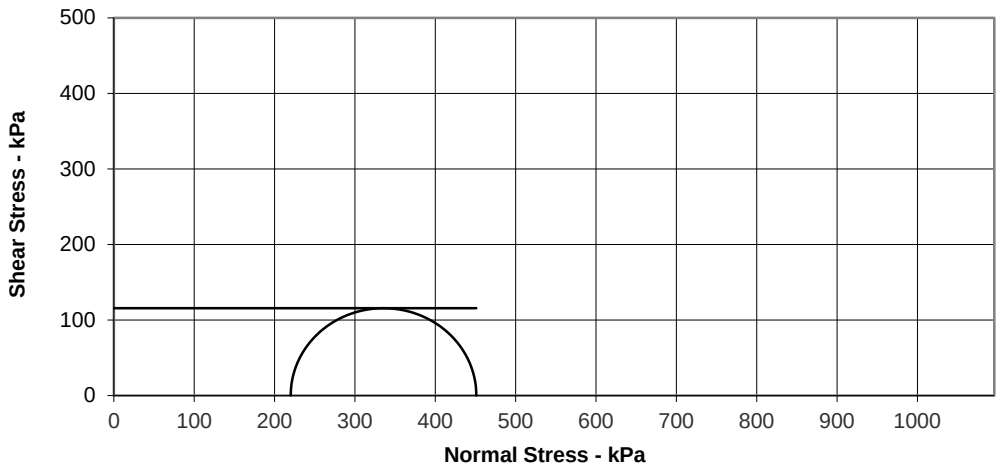
Position and orientation within the original sample



Shear Strength Parameters	
C	116 kPa
Phi	0.0 °

Specimen 1





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Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH204	**Sample no:**	U	**Depth (m):**	14.10

Soil Description: Very high strength fissured dark grey CLAY with occasional fine sand partings

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	25
Bulk Density	Mg/m³	2.00
Dry Density	Mg/m³	1.60

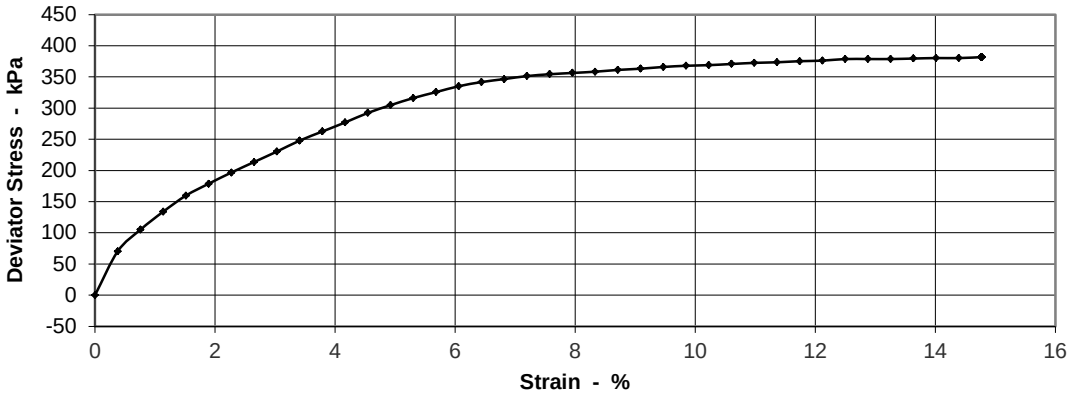
Position and orientation within the original sample

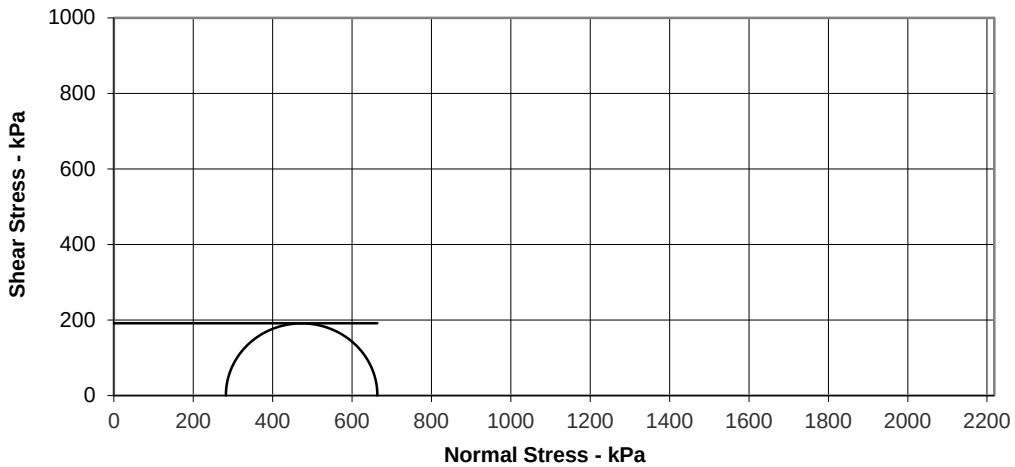
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.60
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	282
Strain at Failure	%	14.8
Maximum Deviator Stress	kPa	382
Shear Strength	kPa	191
Mode of Failure		Brittle

Shear Strength Parameters	
C	191 kPa
Phi	0.0 °

Specimen 1





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

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH205	**Sample no:**	U	**Depth (m):**	1.00

Soil Description: Very high strength reddish brown and blue grey mottled slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular to angular)

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	21
Bulk Density	Mg/m³	2.09
Dry Density	Mg/m³	1.73

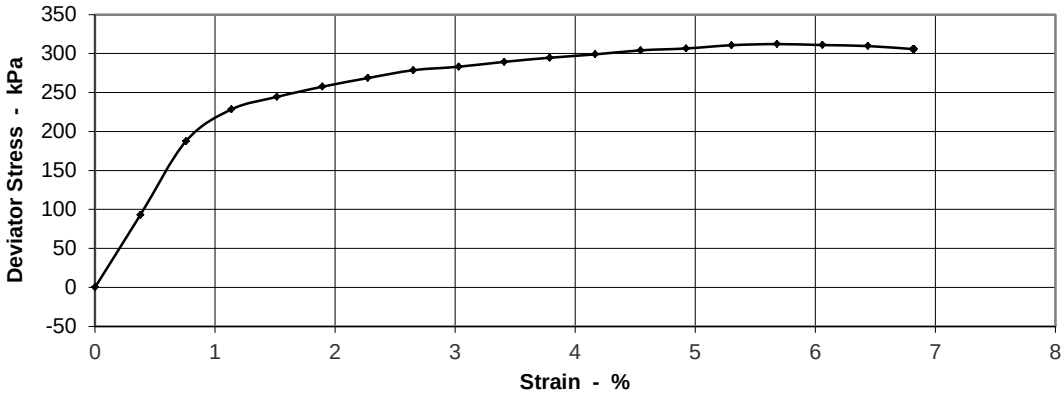
Position and orientation within the original sample

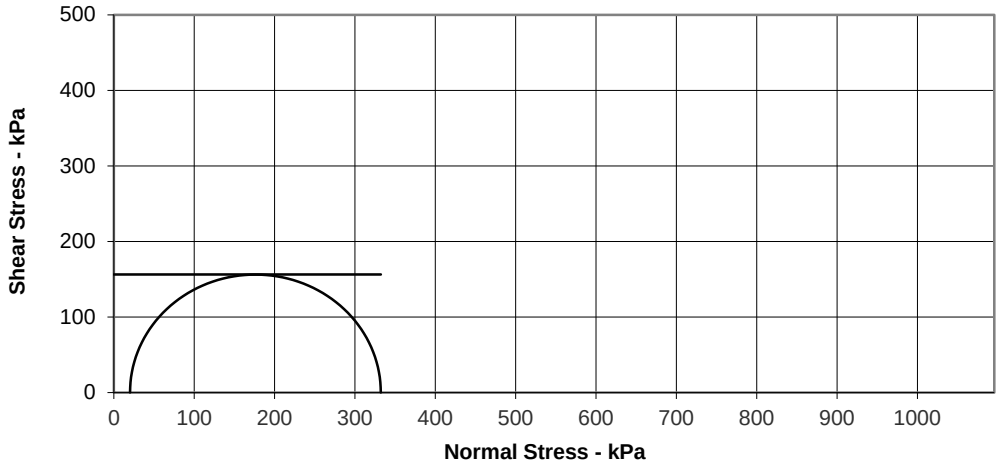
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.28
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	20
Strain at Failure	%	5.7
Maximum Deviator Stress	kPa	312
Shear Strength	kPa	156
Mode of Failure		Brittle

Shear Strength Parameters	
C	156 kPa
Phi	0.0 °

Specimen 1





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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH205	**Sample no:**	U	**Depth (m):**	3.00

Soil Description: Medium strength light brown and light orange brown mottled sandy CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	27
Bulk Density	Mg/m³	1.82
Dry Density	Mg/m³	1.44

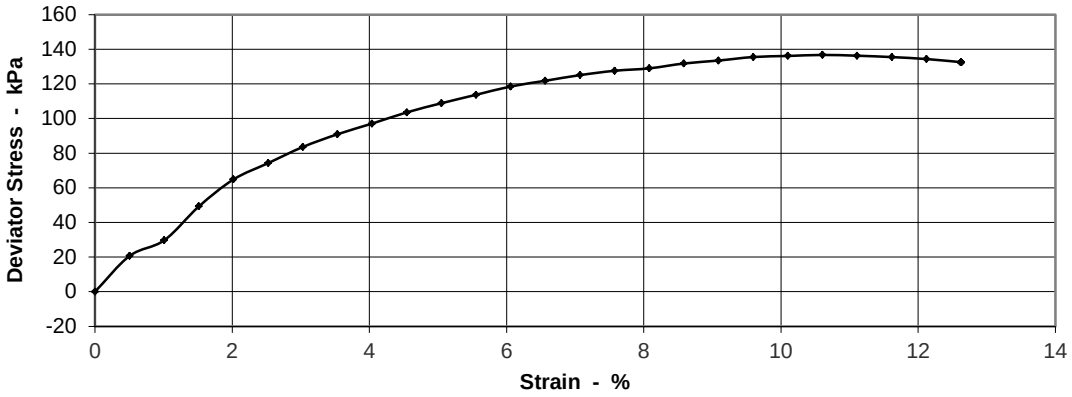
Position and orientation within the original sample

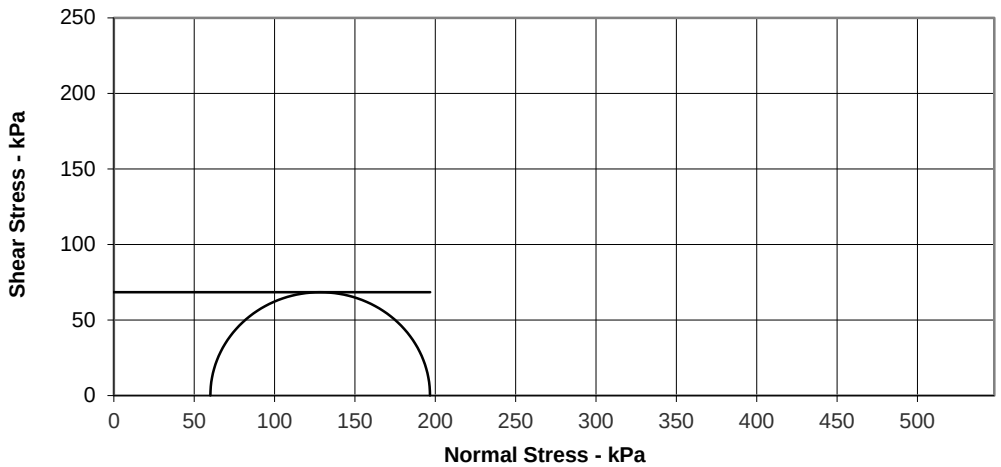
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.46
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	60
Strain at Failure	%	10.6
Maximum Deviator Stress	kPa	137
Shear Strength	kPa	68
Mode of Failure		Brittle

Shear Strength Parameters	
C	68 kPa
Phi	0.0 °

Specimen 1





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K4 SOILS

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BS 1377 : Part 7 : 1990 Clause 8.0

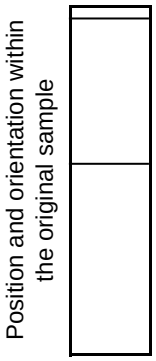
Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH206	**Sample no:**	U	**Depth (m):**	1.00

Soil Description: Medium strength light brown slightly mottled orange brown and blue grey sandy CLAY

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	27
Bulk Density	Mg/m³	1.94
Dry Density	Mg/m³	1.53

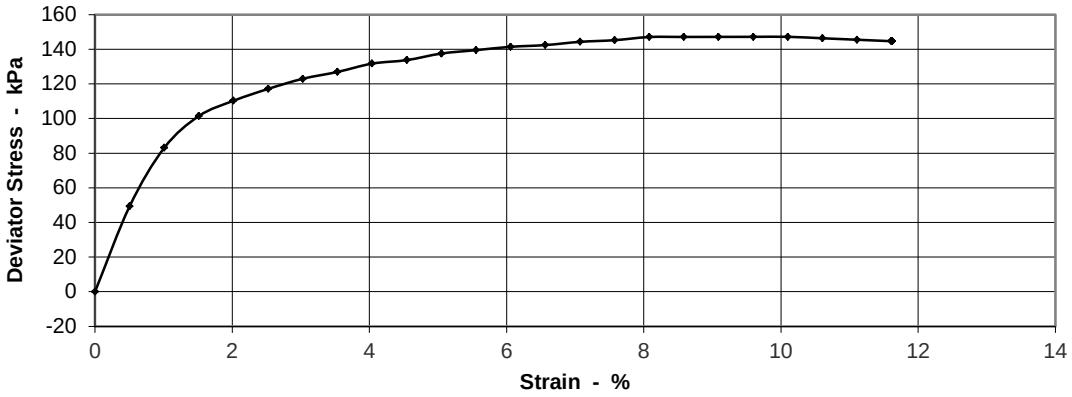
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.45
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	20
Strain at Failure	%	10.1
Maximum Deviator Stress	kPa	147
Shear Strength	kPa	74
Mode of Failure		Brittle

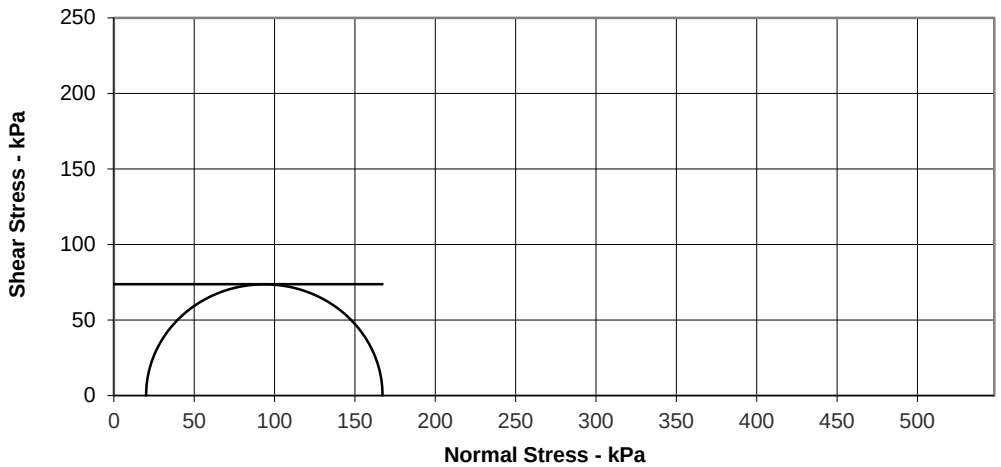
Position and orientation within the original sample



Shear Strength Parameters	
C	74 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

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K4 SOILS

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BS 1377 : Part 7 : 1990 Clause 8.0

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				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH206	**Sample no:**	U	**Depth (m):**	3.00

Soil Description: Medium strength brown and blue mottled sandy CLAY

Sample Details		**Specimen 1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	27
Bulk Density	Mg/m³	1.98
Dry Density	Mg/m³	1.56

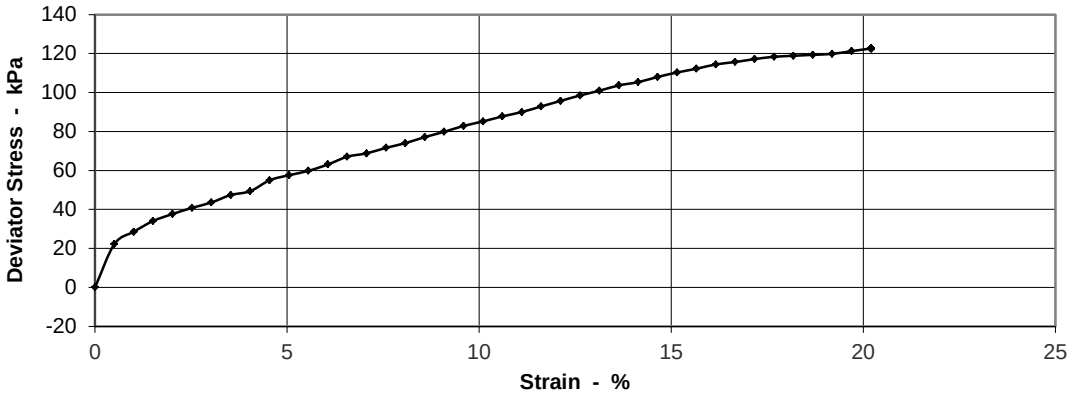
Position and orientation within the original sample

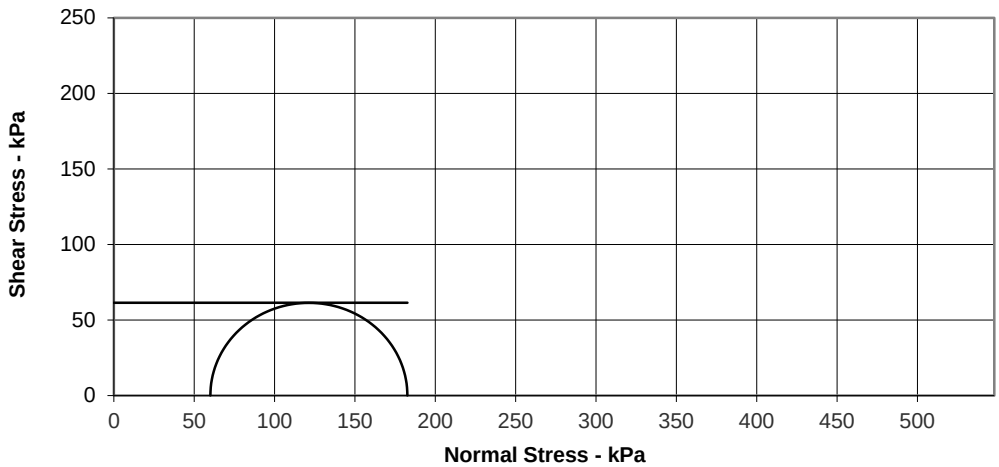
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.75
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	60
Strain at Failure	%	20.2
Maximum Deviator Stress	kPa	123
Shear Strength	kPa	61
Mode of Failure		Brittle

Shear Strength Parameters	
C	61 kPa
Phi	0.0 °

Specimen 1





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K4 SOILS

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BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH206	**Sample no:**	U	**Depth (m):**	5.00

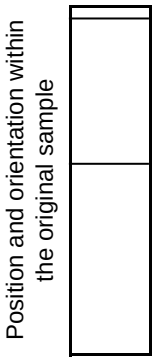
Soil Description: High strength brown, light brown and grey CLAY

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	28
Bulk Density	Mg/m³	1.96
Dry Density	Mg/m³	1.53

Test Details

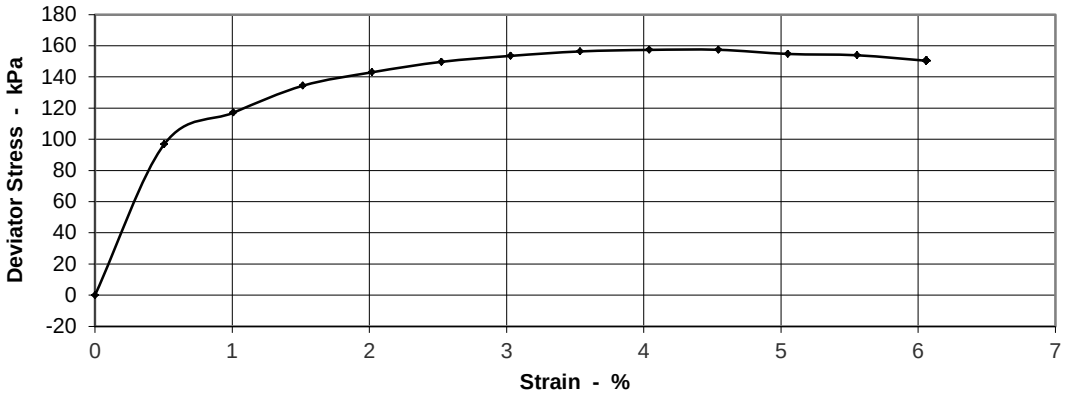
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.23
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	100
Strain at Failure	%	4.5
Maximum Deviator Stress	kPa	157
Shear Strength	kPa	79
Mode of Failure		Brittle

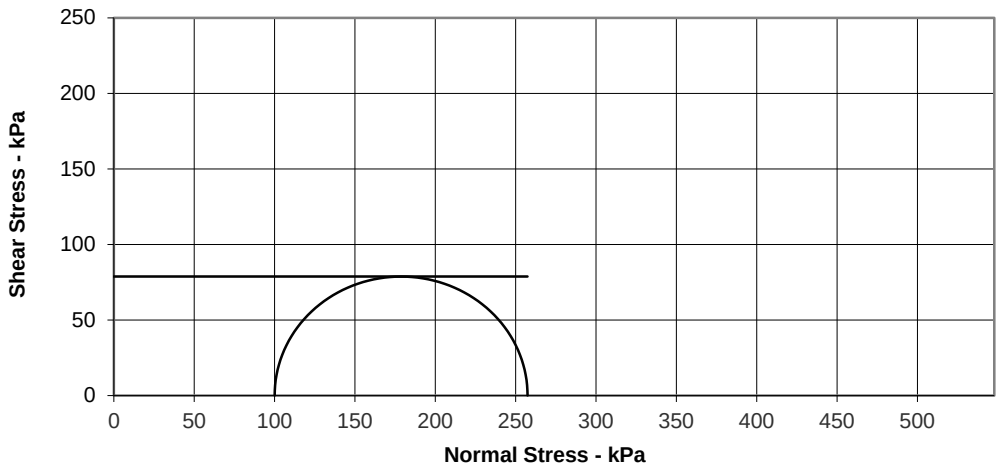
Position and orientation within the original sample



Shear Strength Parameters	
C	79 kPa
Phi	0.0 °

Specimen 1





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Date: 15/10/2013

UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH206	**Sample no:**	U	**Depth (m):**	8.00

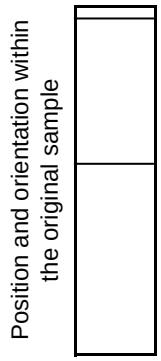
Soil Description: Medium strength fissured dark grey CLAY

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	31
Bulk Density	Mg/m³	1.89
Dry Density	Mg/m³	1.44

Test Details

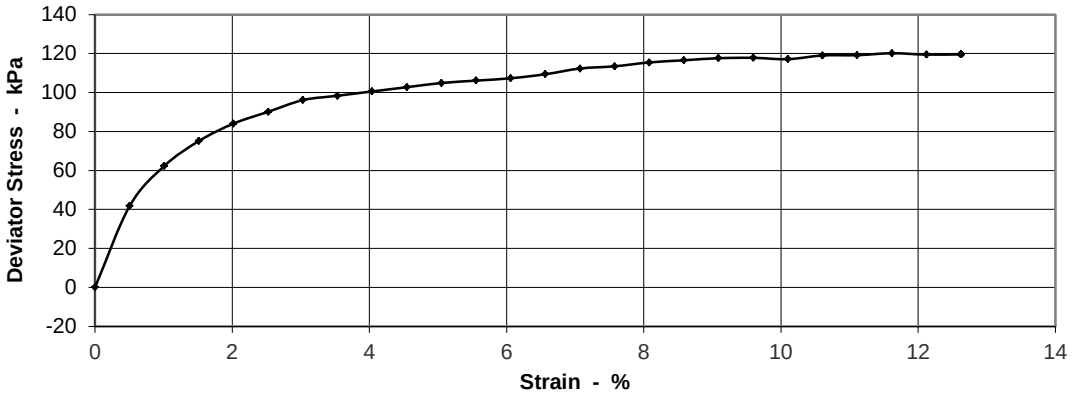
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.50
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	160
Strain at Failure	%	11.6
Maximum Deviator Stress	kPa	120
Shear Strength	kPa	60
Mode of Failure		Brittle

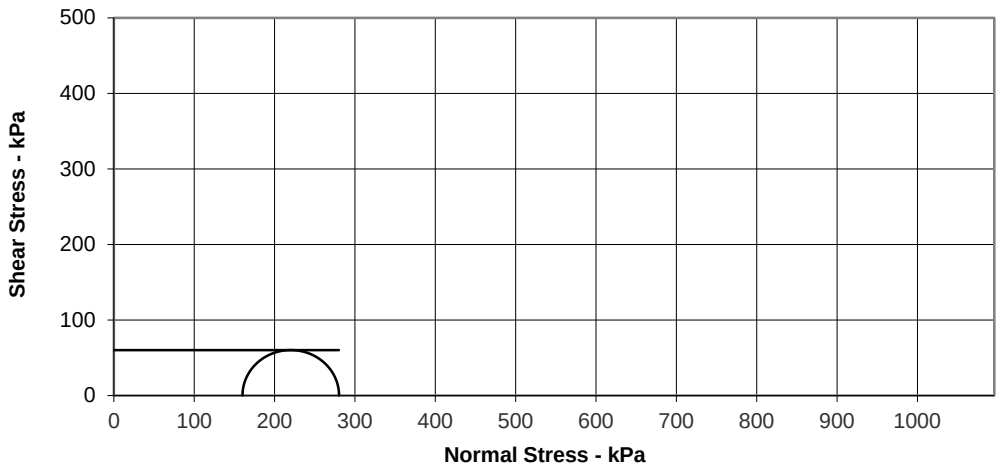
Position and orientation within the original sample



Shear Strength Parameters		
C	60	kPa
Phi	0.0	°

Specimen 1





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UKAS TESTING

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K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

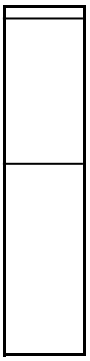
Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH206	**Sample no:**	U	**Depth (m):**	14.00

Soil Description: High strength fissured dark grey CLAY - Sample disturbed

Sample Details		**Specimen 1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	31
Bulk Density	Mg/m³	1.92
Dry Density	Mg/m³	1.47

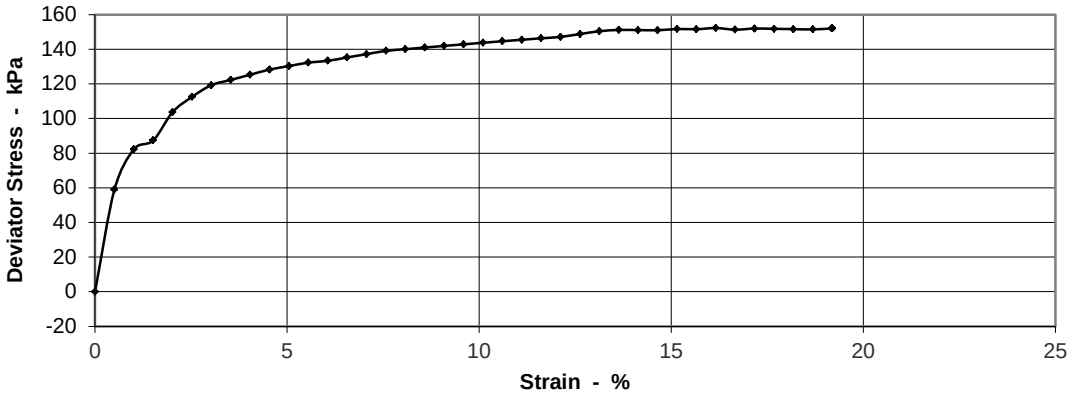
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.64
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	280
Strain at Failure	%	16.2
Maximum Deviator Stress	kPa	152
Shear Strength	kPa	76
Mode of Failure		Brittle

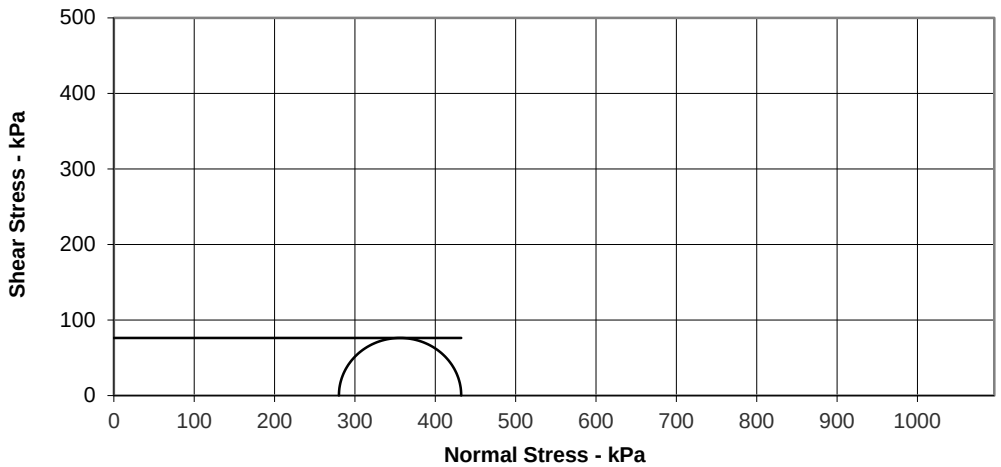
Position and orientation within the original sample



Shear Strength Parameters	
C	76 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH207	**Sample no:**	U	**Depth (m):**	1.00

Soil Description: High strength brown slightly blue grey and orange mottled slightly gravelly slightly sandy CLAY (gravel is fm and angular)

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	17
Bulk Density	Mg/m³	2.11
Dry Density	Mg/m³	1.80

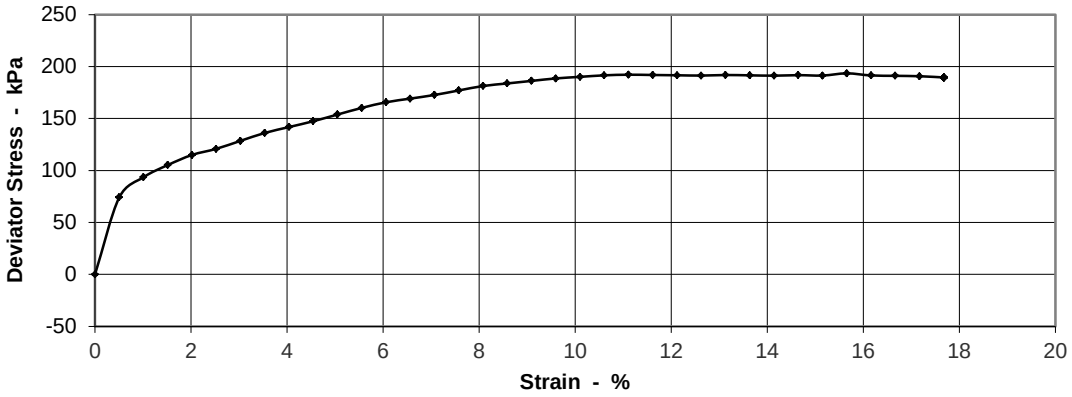
Position and orientation within the original sample

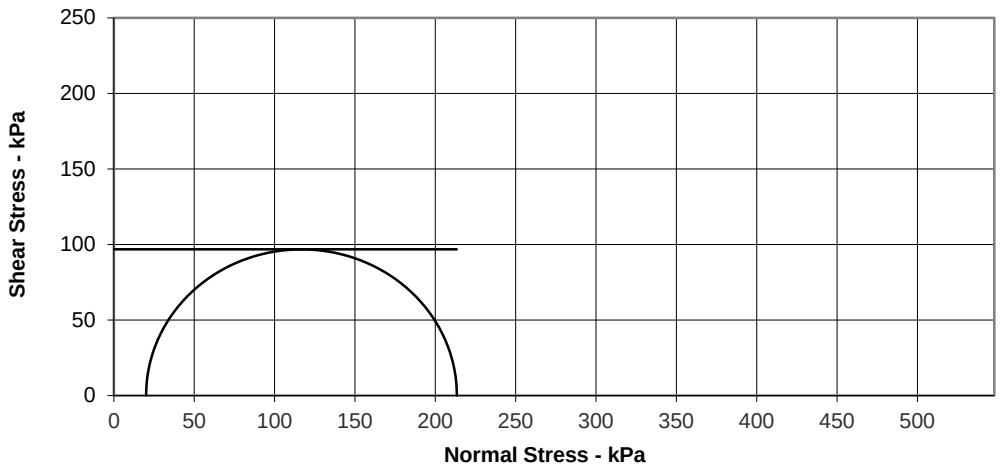
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.62
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	20
Strain at Failure	%	15.7
Maximum Deviator Stress	kPa	193
Shear Strength	kPa	97
Mode of Failure		Brittle

Shear Strength Parameters	
C	97 kPa
Phi	0.0 °

Specimen 1





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K4 SOILS

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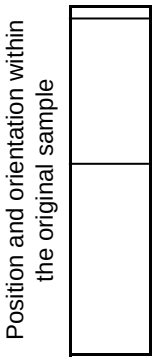
Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH208	**Sample no:**	U	**Depth (m):**	1.00

Soil Description: High strength brown and dark brown sandy CLAY

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	18
Bulk Density	Mg/m³	2.02
Dry Density	Mg/m³	1.71

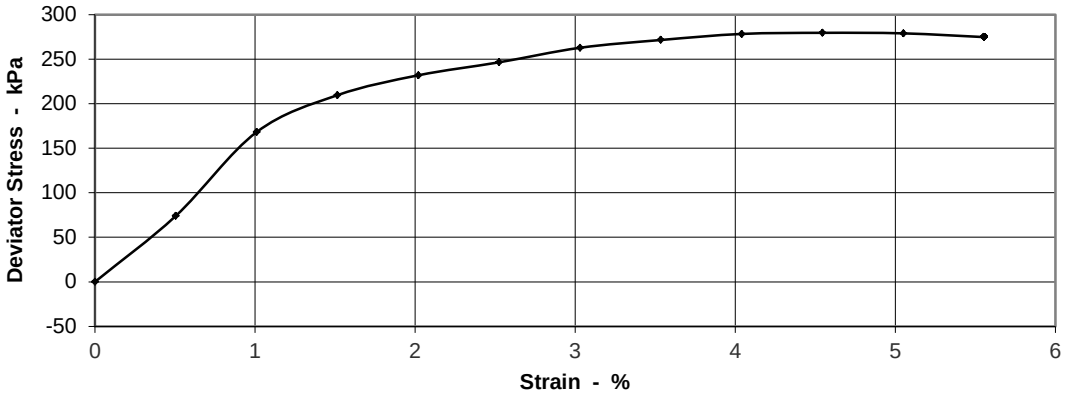
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.23
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	20
Strain at Failure	%	4.5
Maximum Deviator Stress	kPa	279
Shear Strength	kPa	140
Mode of Failure		Brittle

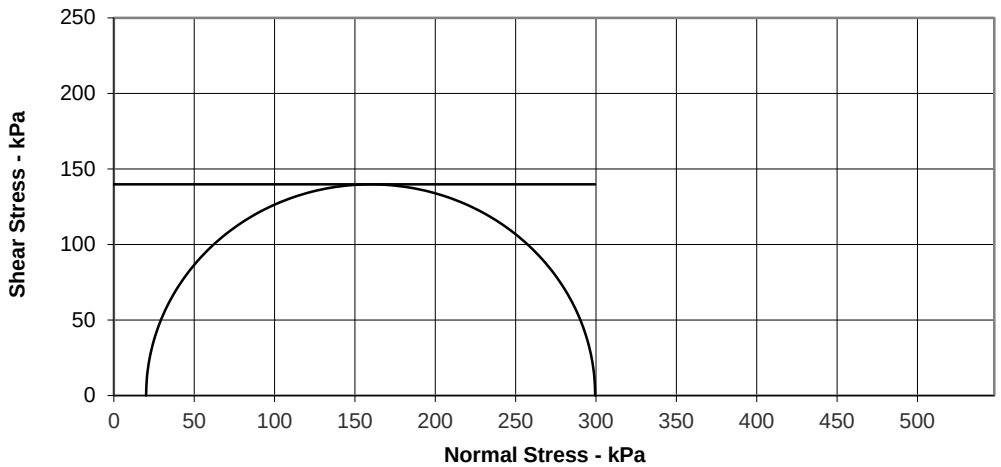
Position and orientation within the original sample



Shear Strength Parameters	
C	140 kPa
Phi	0.0 °

Specimen 1





K4 SOILS LABORATORY
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E-mail: k4soils@aol.com

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

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

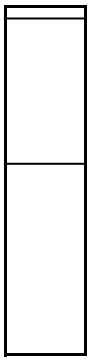
BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH209	**Sample no:**	U	**Depth (m):**	1.00

Soil Description: High strength slightly fissured dark brown, light brown slightly orange and blue grey mottled CLAY with occasional fine rootlets

Sample Details		**Specimen** 1
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	35
Bulk Density	Mg/m³	1.70
Dry Density	Mg/m³	1.26

Position and orientation within the original sample

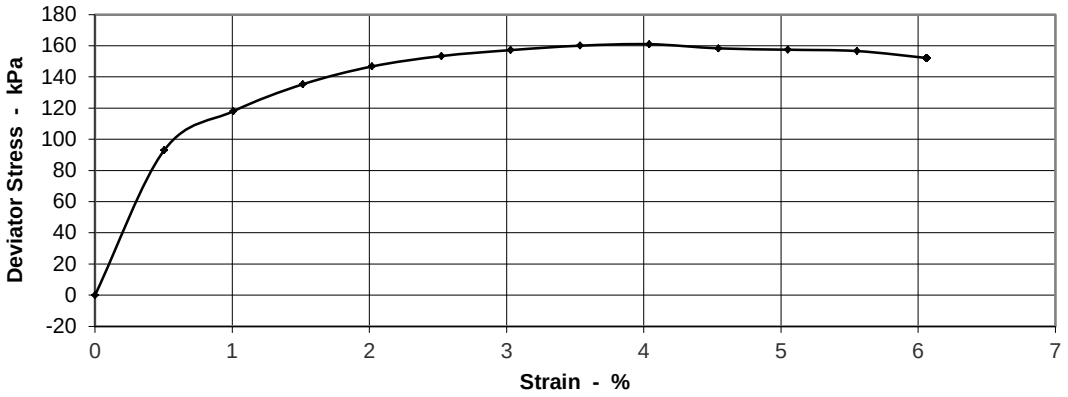


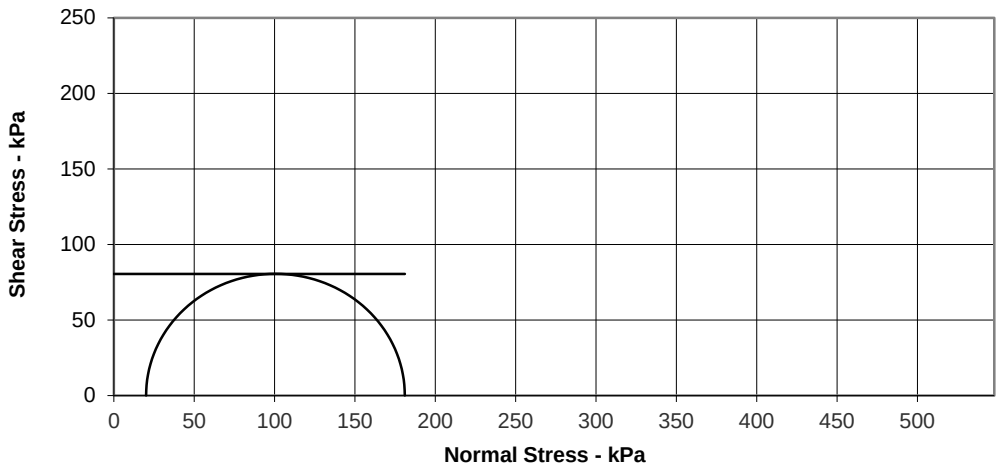
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.21
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	20
Strain at Failure	%	4.0
Maximum Deviator Stress	kPa	161
Shear Strength	kPa	81
Mode of Failure		Brittle

Shear Strength Parameters	
C	81 kPa
Phi	0.0 °

Specimen 1





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

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	07/10/2013
Project no:	GE9523-1904	**Our job /report no:**	15279	**Date Reported:**	15/10/2013
BH / TP no:	BH209	**Sample no:**	U	**Depth (m):**	3.00

Soil Description: Medium strength light brown and light orange sandy CLAY

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	27
Bulk Density	Mg/m³	1.79
Dry Density	Mg/m³	1.42

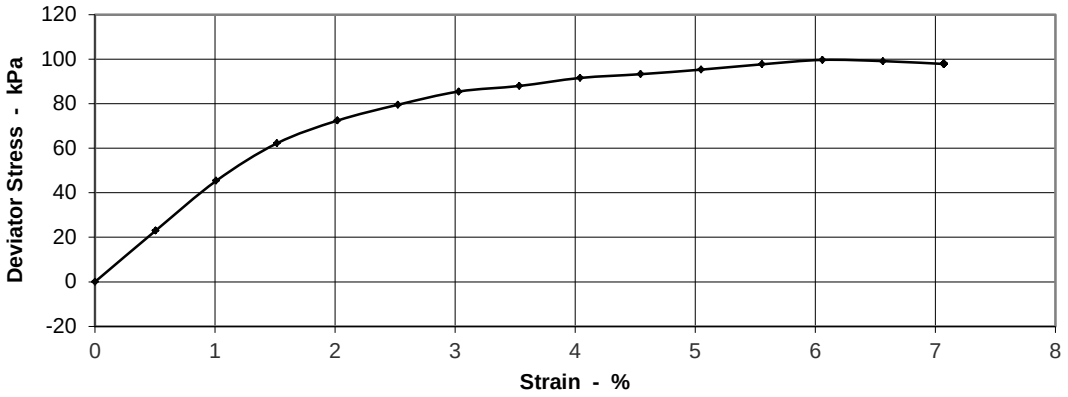
Position and orientation within the original sample

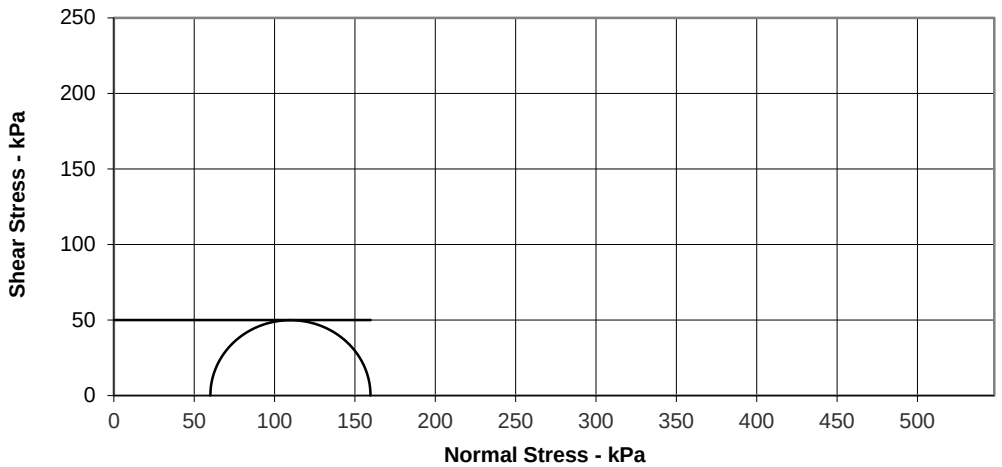
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.30
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	60
Strain at Failure	%	6.1
Maximum Deviator Stress	kPa	100
Shear Strength	kPa	50
Mode of Failure		Brittle

Shear Strength Parameters	
C	50 kPa
Phi	0.0 °

Specimen 1





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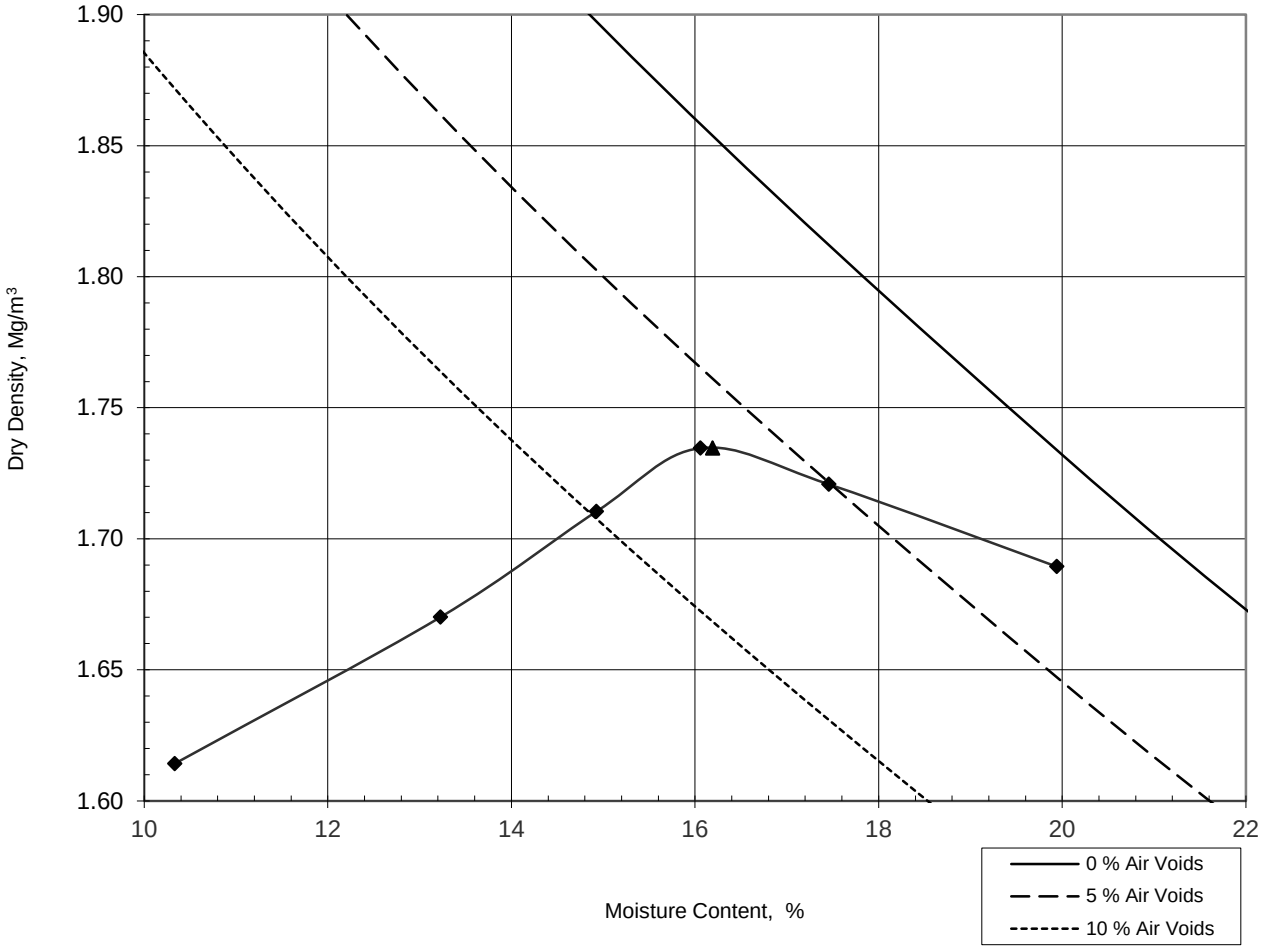
Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

2519

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP101
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	1.00 m
Soil Description	Brownish green silty fine sandy CLAY with traces of rootlets	Sample Type	



Preparation		Air Dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	64
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.73
Optimum Moisture Content	%	16

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Approved Signatories:
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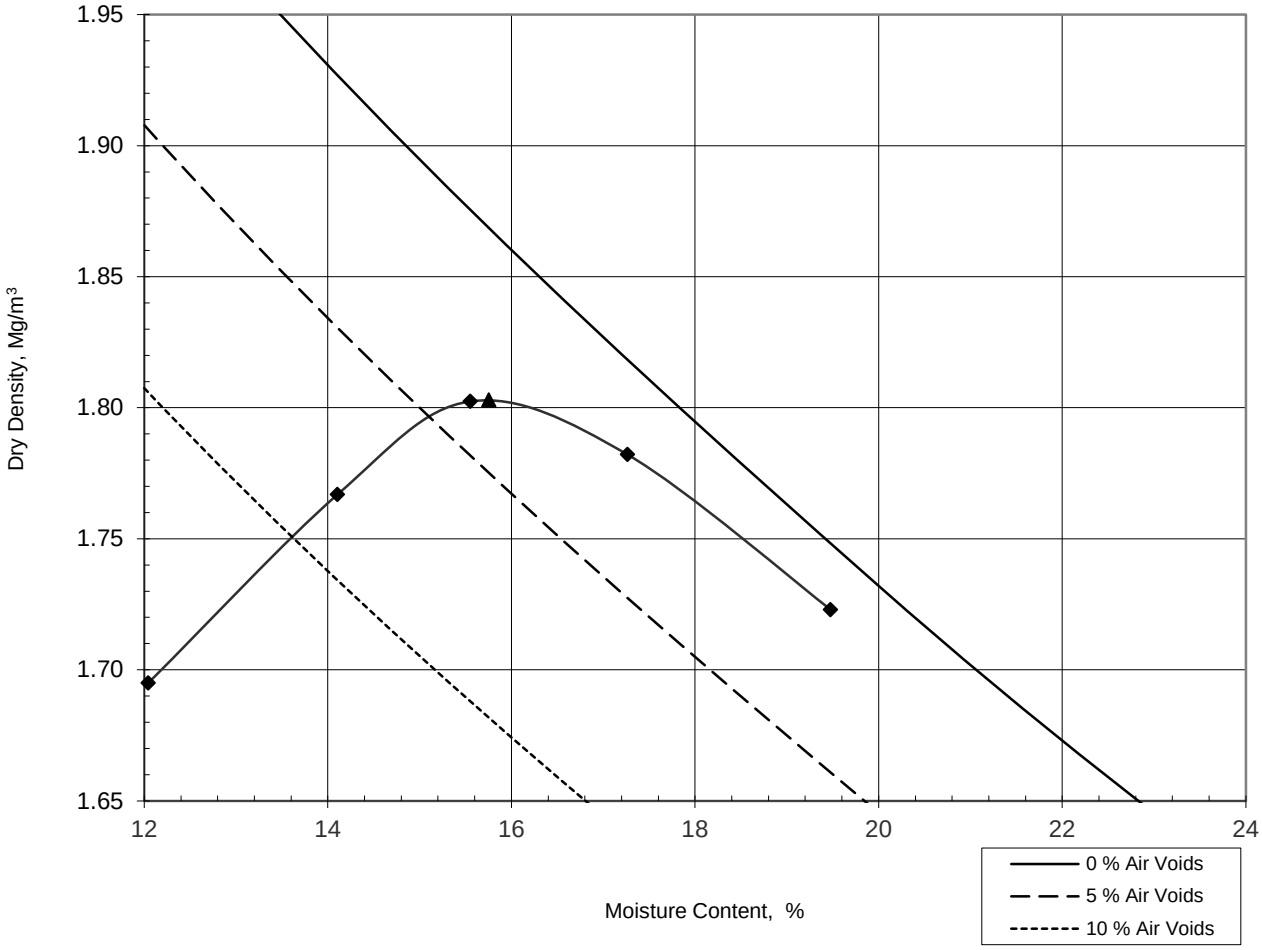
Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

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2519

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP103
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	1.00 m
Soil Description	Pale brown and pale blue grey sandy CLAY with rare fm and sub-angular gravel	Sample Type	



Preparation		Air Dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	1
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.80
Optimum Moisture Content	%	16

K4 SOILS LABORATORY
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Approved Signatories:
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Test results relate only to the sample numbers shown above

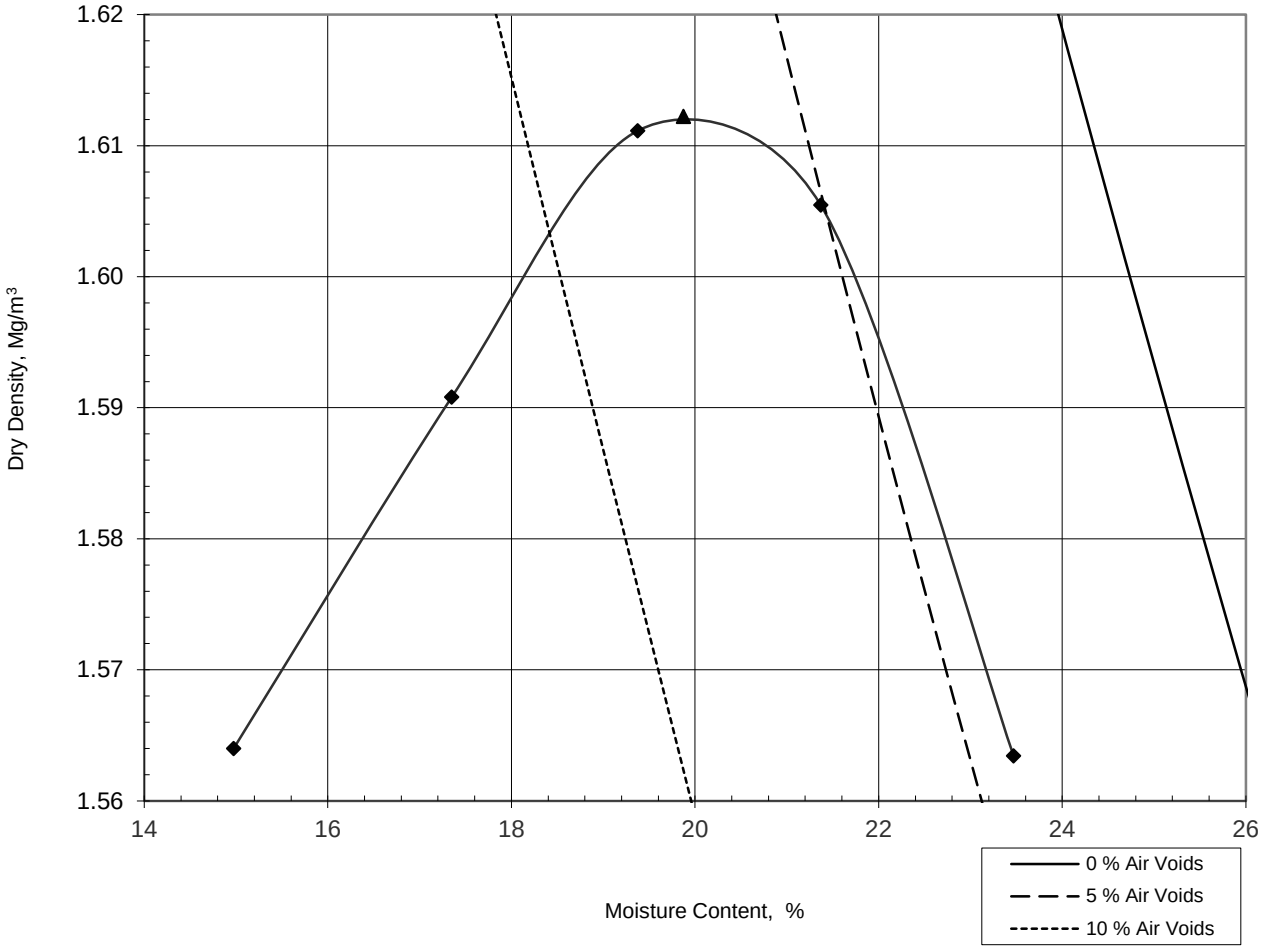
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UKAS TESTING

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2519

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP105
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	1.50 m
Soil Description	Pale brown slightly silty slightly clayey SAND	Sample Type	



Preparation		Air Dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.61
Optimum Moisture Content	%	20

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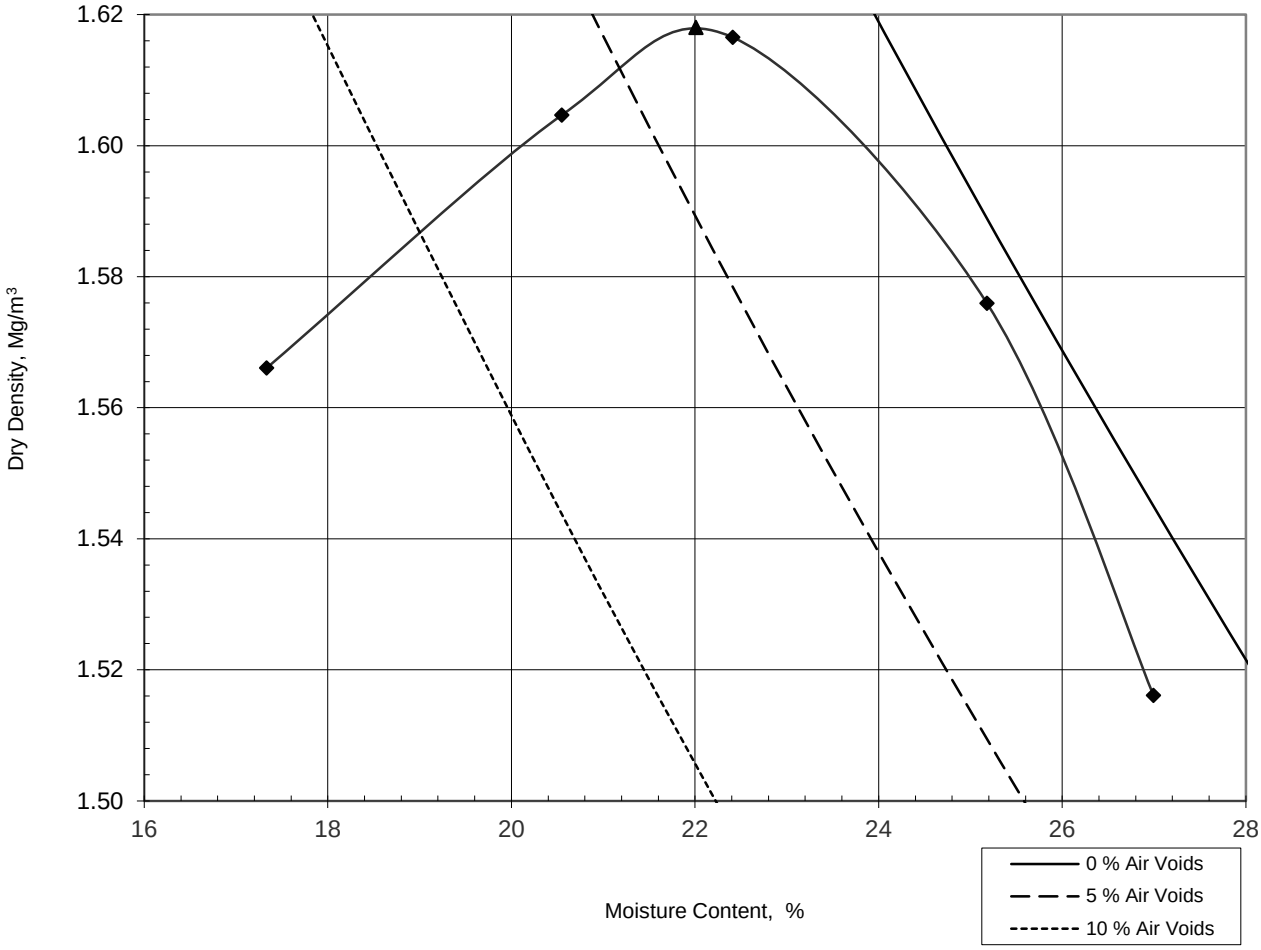
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Initials: kp
Date: 15/10/2013

UKAS TESTING

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2519

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP107
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	1.50 m
Soil Description	Brown and occasional orange brown sandy CLAY with occasional weakly cemented fm mudstone fragments	Sample Type	



Preparation		Air dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	1
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.62
Optimum Moisture Content	%	22

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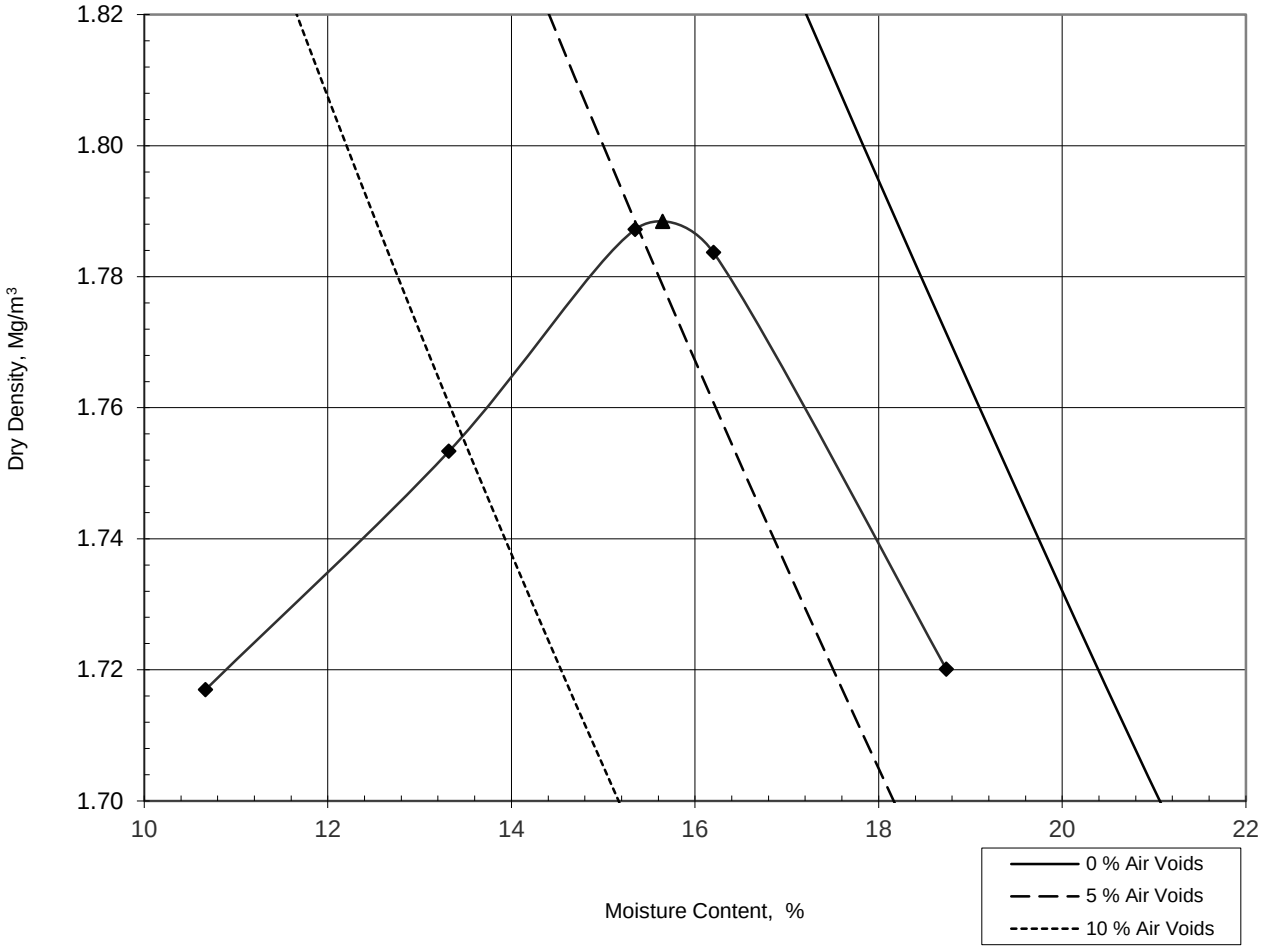
Approved Signatories:
K.Phaure(Tech Mgr) J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP109
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	1.00 m
Soil Description	Brown and orange brown slightly gravelly sandy silty CLAY with occasional rootlets (gravel is fm and sub-angular to angular)	Sample Type	



Preparation		Air Dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	3
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.79
Optimum Moisture Content	%	16

K4 SOILS LABORATORY
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E-mail: k4soils@aol.com

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

Test results relate only to the sample numbers shown above

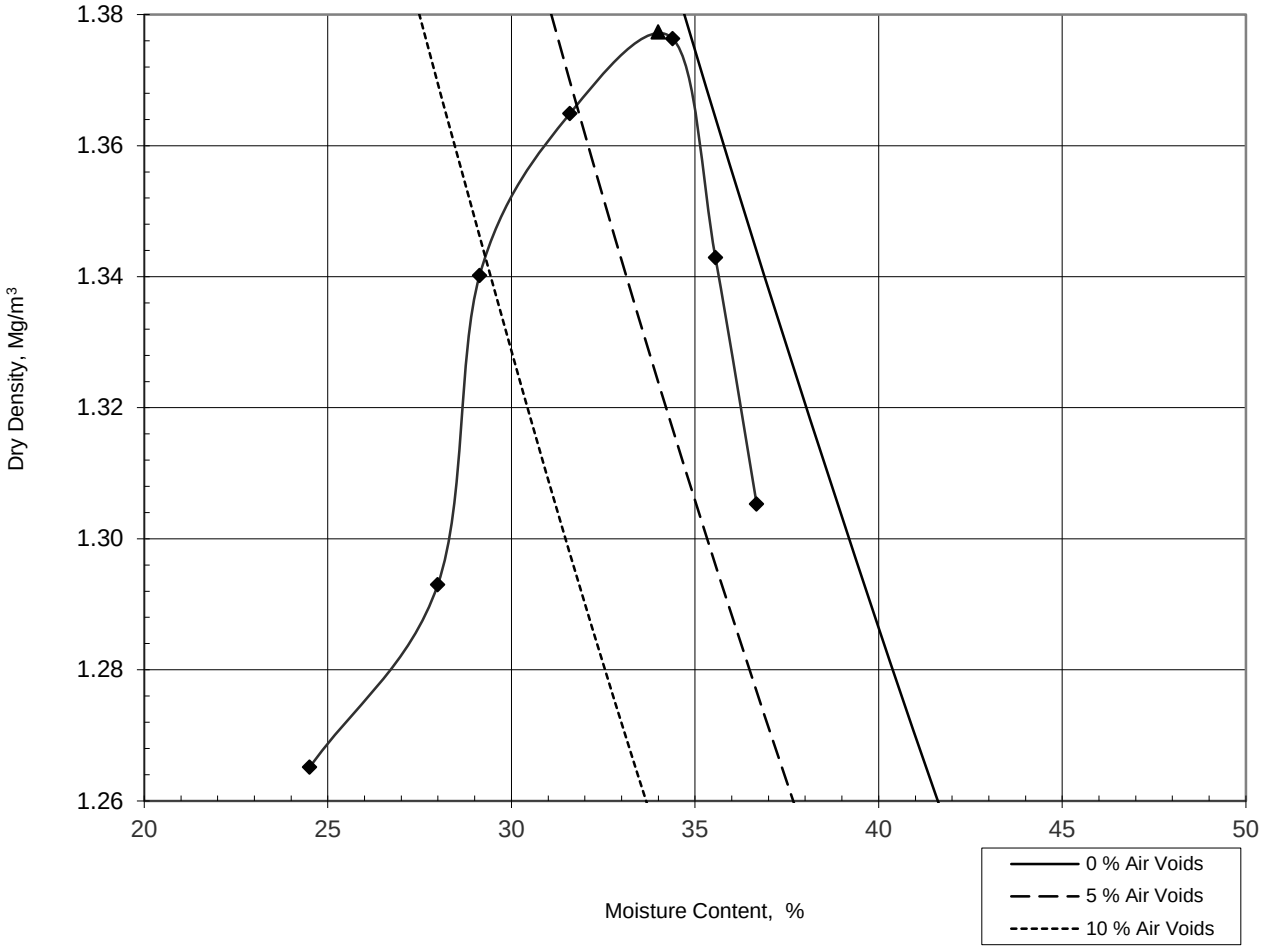
Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

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2519

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP111
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	1.00 m
Soil Description	Pale greyish brown slightly gravelly slightly sandy slightly silty CLAY (gravel is fm and sub-angular)	Sample Type	



Preparation		Air Dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.38
Optimum Moisture Content	%	34

K4 SOILS LABORATORY
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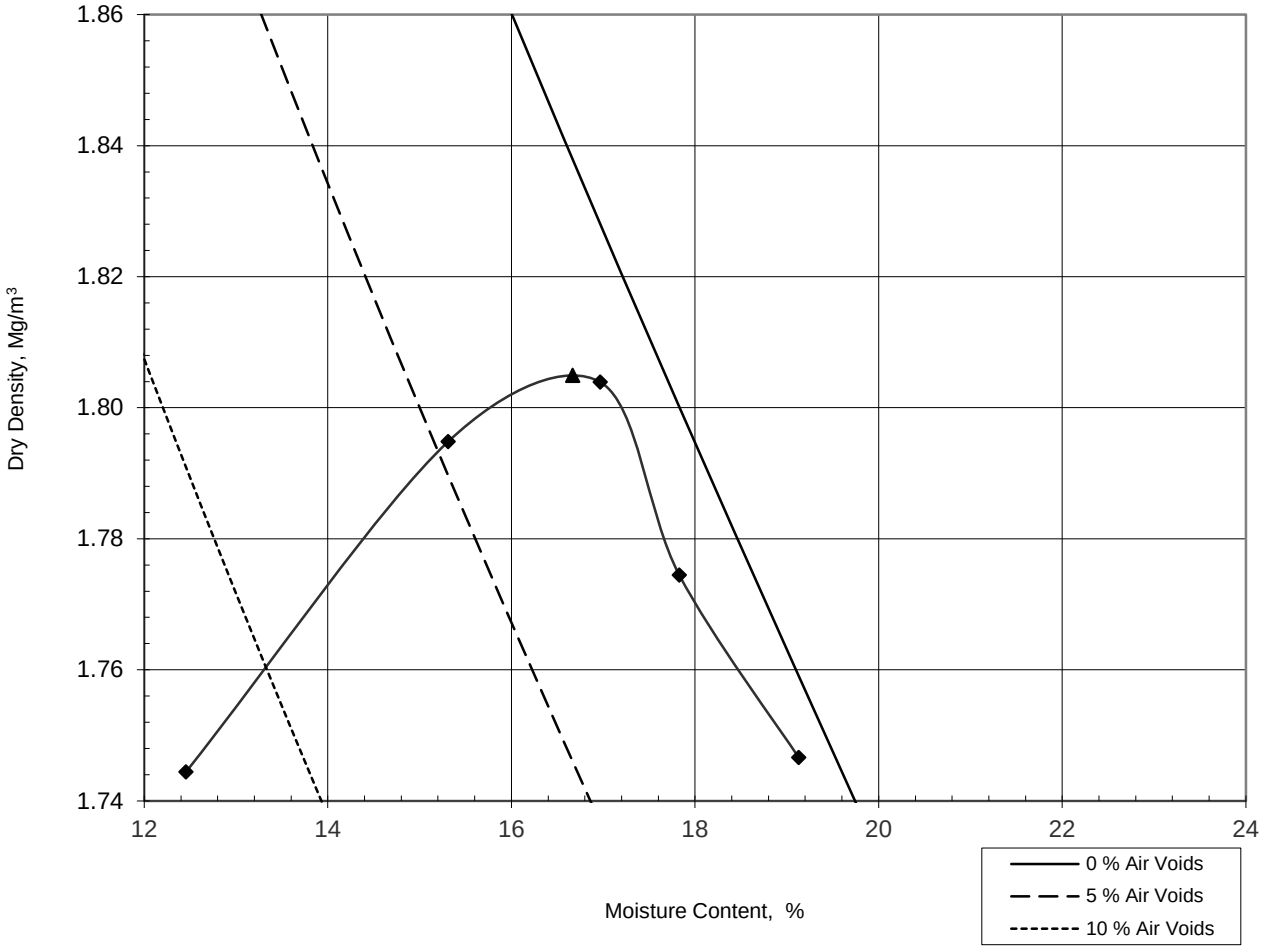
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UKAS TESTING

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2519

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP113
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	2.00 m
Soil Description	Grey and occasional pale brown slightly silty CLAY	Sample Type	



Preparation		Air Dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.80
Optimum Moisture Content	%	17

K4 SOILS LABORATORY
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WD18 9RU.Tel:01923711288 Fax:01923711311.
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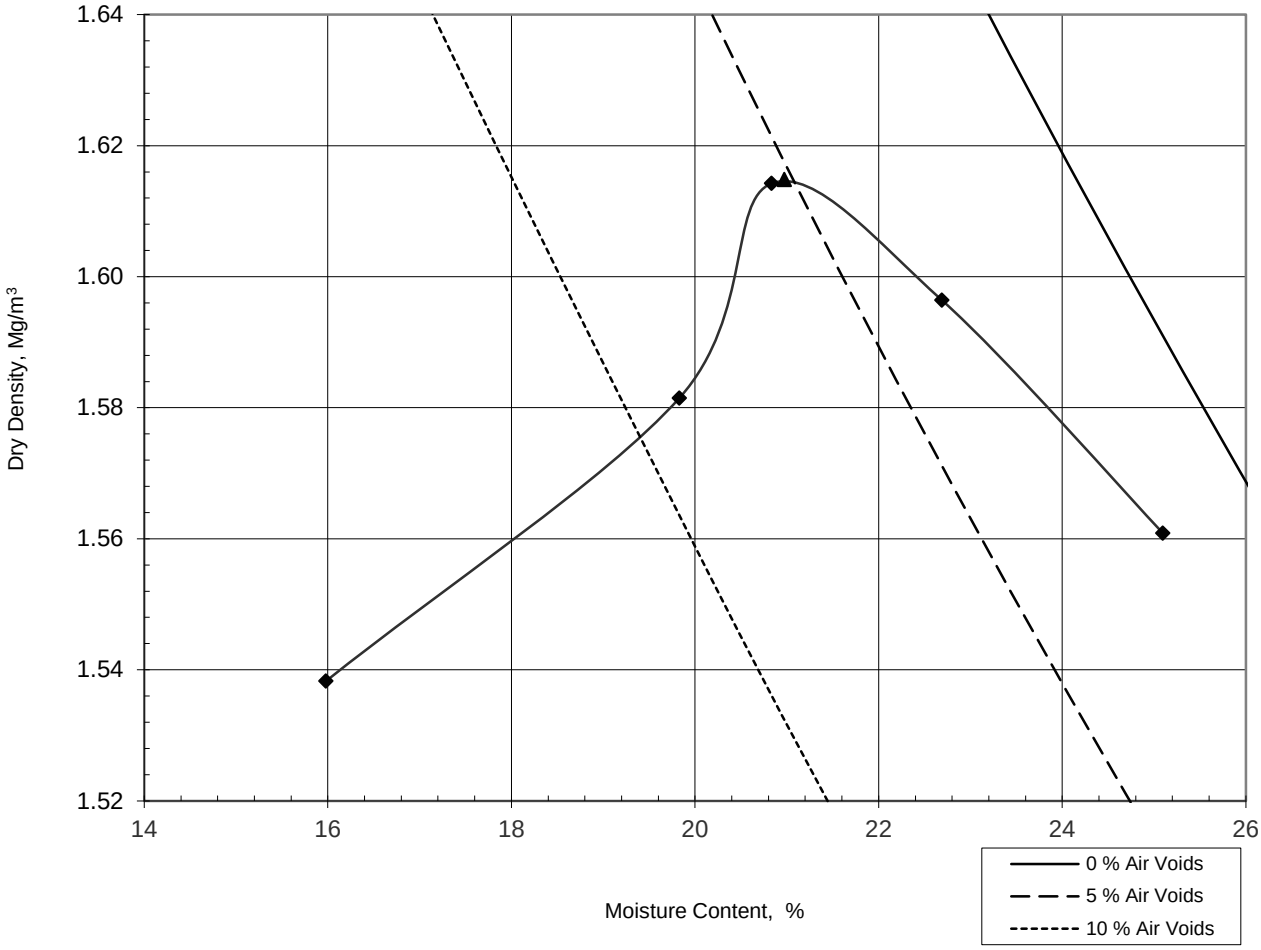
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Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

K4 SOILS	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	GE9523-1904
		Borehole / Pit No	TP115
Site Name	Boorley Green (Southampton)	Sample No	
		Depth	0.50 m
Soil Description	Pale grey and orange brown slightly sandy silty CLAY with occasional rootlets	Sample Type	



Preparation		Air Dried
Test Method		2.5 kg rammer
Mould Type		One litre
Samples Used		Separate Samples
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.61
Optimum Moisture Content	%	21

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

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

Client name & address:			**Samples Received**	10/09/2013	**K4 SOILS**
Geo-Environmental Services Ltd			**Project Started**	12/09/2013	
Project Name:	Boorley Green (Southampton)		**Testing Started**	25/09/2013	
Project No:	GE9523-19 **Our Job / report no:**	15279	**Date Reported:**	15/10/2013	
Sample description:			**Sample no/ type:**	U	**BH no:** BH203
Medium strength grey mottled grey brown silty fine sandy CLAY					**Depth (m):** 9.50

Test details

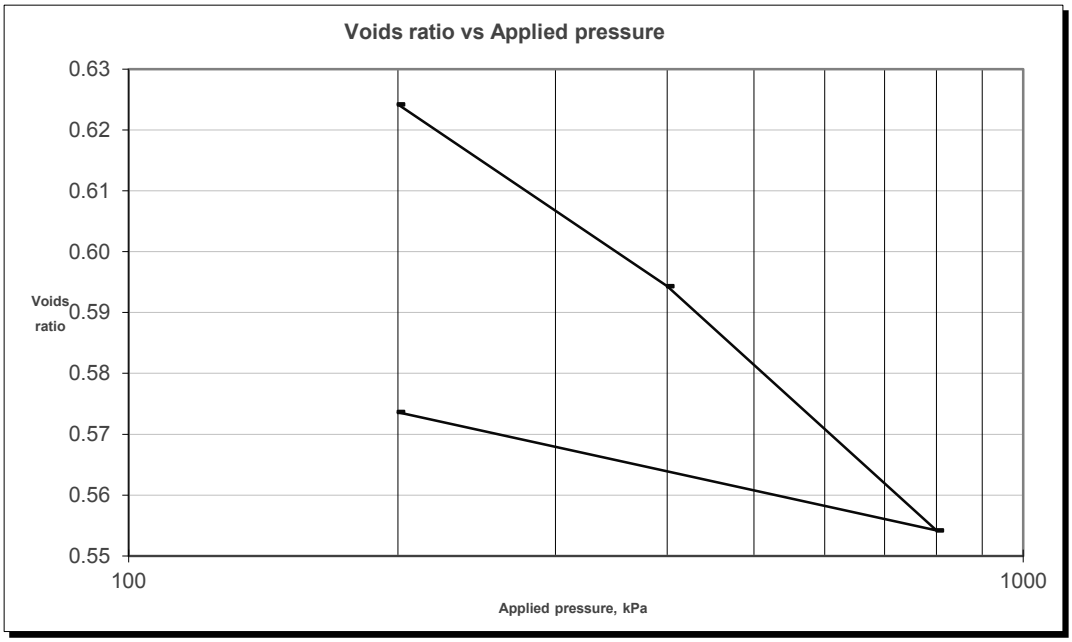
Depth within original sample m : 9.60 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	18.87	17.80
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.03	2.13
Moisture content	% :	24	22
Dry density	Mg/m3 :	1.64	1.74
Voids Ratio	:	0.67	0.57
Degree of saturation	% :	97.1	-
Particle density	Mg/m3 :	2.74	-
Swelling pressure	kPa :	-	-

Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	200	0.6242	2.08	0.133	11				
2	400	0.5943	1.02	0.092	12				
3	800	0.5542	1.66	0.063	13				
4	200	0.5736	1.51	0.021	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 15/10/2013

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
BH201	U1	1.00	Orange brown, brown and pale blue grey mottled silty CLAY with large orange brown sandy partings	25	49	22	27	100	
BH201	U4	8.00	Medium strength fissured dark grey silty CLAY	37	94	32	62	100	
BH202	U1	1.00	Medium strength pale grey brown mottled rusty orange brown slightly sandy silty CLAY	29	69	25	44	100	
BH203	U	4.00	Medium strength dark grey silty CLAY	29	71	25	46	100	
BH203	U	6.50	High strength dark grey slightly fine sandy CLAY with black stains	26	56	22	34	100	
BH204	U	5.00	High strength dark grey and dark blue grey silty fine sandy CLAY	28	58	24	34	100	
BH204	U	8.00	High strength dark grey slightly silty slightly sandy CLAY with one medoum sized pyrites nodules	29	55	23	32	100	
BH205	U	1.00	Very high strength reddish brown, blue grey mottled slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular to angular)	19	56	19	37	97	
BH205	D	1.50	Reddish brown and pale greyish brown slightly gravelly sandy CLAY (gravel is fm and sub-angular to sub-rounded)	22	60	20	40	96	
BH205	U	3.00	Medium strength light brown and light orange brown mottled sandy CLAY	28	52	26	26	100	
BH206	U	1.00	Medium strength light brown slightly orange brown and blue grey mottled sandy CLAY	28	62	25	37	99	
BH206	U	3.00	Medium strength brown and blue mottled sandy CLAY	27	39	24	15	100	
BH207	U	1.00	High strength brown slightly blue grey and orange mottled slightly gravelly slightly sandy CLAY (gravel is fm and angular)	17	35	16	19	99	
BH207	U	2.45	Brown and pale brown slightly sandy slightly silty CLAY with rare fine gravel	17	35	14	21	99	
BH207	B	2.50	Pale brown and pale grey sandy gravelly CLAY (gravel is fmc and angular to rounded)	18	32	15	17	52	
BH208	U	1.00	High strength brown and dark brown sandy CLAY	24	49	18	31	100	
BH208	D	1.50	Orange brown slightly clayey SAND	9.6	-	-	-	-	Non Plastic
BH208	D	9.00	Dark grey silty CLAY	7.3	53	24	29	100	
BH209	U	1.00	High strength slightly fissured dark brown, light brown slightly orange and blue grey mottled CLAY with occasional fine rootlets	36	91	33	58	100	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 15/10/2013

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
BH210	D	0.50 - 1.00	Brown sandy CLAY with rare fm and sub-angular gravel and traces of fine rootlets	12	47	23	24	99	
BH210	D	2.45	Orangey brown and occasional grey sandy CLAY	18	33	15	18	100	
TP115	-	0.50	Pale grey and orange brown slightly sandy silty CLAY with occasional rootlets	14	60	20	40	100	
TP101	-	1.00	Brownish green silty fine sandy CLAY with traces of rootlets	12	42	20	22	100	
TP103	-	1.00	Pale brown and pale blue grey sandy CLAY with rare fm and sub-angular gravel	18	44	16	28	99	
TP113	-	2.00	Grey and occasional pale brown slightly silty CLAY	18	48	14	34	100	
TP109	-	1.00	Brown and orange brown slightly gravelly sandy silty CLAY with occasional rootlets (gravel is fm and sub-angular to angular)	13	45	16	29	98	
TP111	-	1.00	Pale greyish brown slightly gravelly slightly sandy slightly silty CLAY (gravel is fm and sub-angular)	38	84	32	52	98	
WS201	-	1.50	Brown, orange brown and pale grey CLAY	35	75	34	41	100	
WS202	-	2.00	Brown and grey CLAY with sandy patches	32	55	29	26	100	
WS203	-	1.50	Brown and pale grey CLAY with orange brown sandy patches	25	69	30	39	100	
WS204	-	3.00	Brown CLAY with orange brown sandy patches	27	73	31	42	100	
WS205	-	1.50	Pale grey, brown and reddish brown slightly sandy silty CLAY	26	70	27	43	100	
WS206	-	1.50	Brown and pale grey slightly gravelly CLAY with occasional sandy patches (gravel is fmc and sub-angular)	22	55	20	35	90	
WS208	-	2.00	Pale grey CLAY with orange brown sandy patches	35	72	32	40	100	
WS210	-	1.50	Greenish grey, brown and orange brown silty CLAY with occasional sandy parches and a little fine gravel	27	60	23	37	99	
WS211	-	1.50	Pale grey and orange brown CLAY with sandy patches	34	70	27	43	100	
WS211	-	3.50	Pale greyish brown CLAY with yellow brown sandy patches	34	68	36	32	100	
WS214	-	2.50	Greenish grey and orange brown slightly sandy CLAY	29	60	25	35	100	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 15/10/2013

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
WS215	-	2.50	Brown and grey CLAY	35	74	29	45	100	
WS218	-	1.50	Greenish grey and orange brown CLAY with silt patches	45	92	46	46	100	
WS220	-	1.00	Brown and orangey brown slightly sandy very gravelly CLAY with roots (gravel is fmc and angular to rounded)	30	52	18	34	39	
WS221	-	2.00	Brown slightly sandy clayey GRAVEL (gravel is fmc and angular to sub-angular)	15	62	23	39	23	
WS223	-	1.00	Pale brown slightly silty slightly sandy gravelly CLAY with occasional roots and rootlets (gravel is fm and angular to sub-angular)	12	60	19	41	64	
WS224	-	1.50	Brown sandy silty CLAY with rare fmc gravel	19	35	17	18	95	
WS225	-	1.50	Brown and grey slightly sandy silty CLAY with rare fmc gravel	21	49	17	32	95	
WS226	-	2.00	Orangey brown and occasional pale brown sandy gravelly CLAY with patchy sand staining and occasional rootlets (gravel is fmc and angular to sub-angular)	14	38	22	16	45	
WS227	-	2.50	Grey silty CLAY	32	67	24	43	100	
WS235	-	1.50	Orange brown and greenish grey sandy CLAY with rare fine gravel	21	42	19	23	99	
WS236	-	1.50	Brown and greenish grey sandy silty CLAY	18	47	20	27	100	
WS237	-	1.50	Orangey brown and grey sandy CLAY with rare fm and angular gravel	20	41	15	26	99	
WS240	-	3.00	Greyish brown and brown sandy silty CLAY	31	46	19	27	100	
WS241	-	1.00	Grey and orange brown slightly gravelly slightly sandy silty CLAY with occasional pockets of sand (gravel is fmc and sub-angular to angular)	25	50	21	29	95	
WS246	-	1.00	Brown and greyish brown sandy CLAY with rare fine gravel	18	31	18	13	99	
WS246	-	2.50	Orange brown and pale grey sandy CLAY	21	30	17	13	100	
WS247	-	1.00	Brown sandy CLAY	19	35	19	16	100	
WS250	-	1.50	Orangey brown and grey slightly clayey SILT	9.9	-	-	-	-	Non Plastic
WS252	-	1.00	Brown and greenish grey slightly gravelly sandy CLAY (gravel is fmc and sub-angular)	14	46	18	28	97	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 15/10/2013

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
WS252	-	2.50	Brown and pale grey sandy CLAY with rare fine gravel	17	50	21	29	99	
WS254	-	2.00	Greenish grey and orange brown slightly gravelly slightly sandy CLAY (gravel is fmc and sub-angular)	27	58	21	37	97	
WS255	-	1.50	Greyish brown and brown slightly shaley CLAY with occasional sandy patches	39	82	40	42	100	
WS260	-	1.00	Brown sandy silty CLAY with rare fine gravel	22	35	19	16	99	
WS261	-	1.00	Brown sandy CLAY with rare fine gravel	18	27	18	9	99	
WS261	-	2.00	Grey and orange brown slightly clayey SAND	25	-	-	-	-	Non Plastic
WS263	-	1.00	Brown, orangey brown and pale grey slightly gravelly sandy CLAY (gravel is fmc and angular to rounded)	13	46	16	30	67	
WS264	-	2.00	Pale grey CLAY with orange brown sandy patches	41	88	38	50	100	
WS267	-	1.50	Greenish grey and orange brown sandy CLAY with roots	15	40	19	21	100	
WS268	-	1.00	Yellowish brown, orange brown and grey silty CLAY with traces of fine rootlets	37	83	28	55	100	
WS268	-	3.00	Yellowish brown and grey silty CLAY	38	67	34	33	100	
WS269	-	2.00	Orangey brown and grey slightly silty CLAY	35	101	33	68	100	
WS270	-	1.50	Grey and orange brown CLAY with occasional sandy patches	48	104	36	68	100	
WS272	-	1.00	Brown, grey and orange brown slightly sandy silty CLAY with rare fine gravel and fine rootlets	21	71	26	45	99	
WS274	-	1.00	Pale grey and yellow brown slightly sandy silty CLAY with occasional fine rootlets	21	72	26	46	100	
WS275	-	2.50	Reddish brown and grey slightly sandy silty CLAY	41	82	46	36	100	
WS276	-	1.50	Pale brown and orange brown slightly silty CLAY with traces of rootlets	29	97	34	63	100	
WS278	-	2.00	Brown, orange brown and grey mottled silty CLAY	39	70	39	31	100	
WS279	-	1.00	Pale grey silty CLAY with orange brown sandy patches	39	90	45	45	100	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 15/10/2013

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
WS281	-	1.00	Dark orange brown mottled pale grey sandy CLAY with rare fine gravel	14	43	17	26	99	
WS281	-	2.00	Yellowish brown slightly clayey SILT	6.2	-	-	-	-	Non Plastic
WS282	-	1.00	Orangey brown slightly gravelly fine sandy silty CLAY with occasional roots (gravel is fm and sub-angular)	12	35	16	19	97	
WS290	-	1.00	Brown and grey CLAY	39	65	27	38	100	
WS290	-	2.50	Brown and pale grey slightly gravelly CLAY (gravel is fm and sub-angluar)	47	76	26	50	97	
WS291	-	1.50	Orange brown and greenish grey slightly gravelly slightly sandy silty CLAY (gravel is fm and sub-angular)	28	57	23	34	98	
WS292	-	2.00	Pale grey slightly shaley CLAY with orange brown sandy patches	40	89	39	50	100	
WS293	-	1.00	Yellowish brown and grey silty CLAY with traces of decayed rootlets and occasional rootlets	42	78	38	40	100	
WS295	-	1.00	Brown and greenish grey silty CLAY	28	80	33	47	100	
WS297	-	1.50	Orange brown and grey fine sandy CLAY	24	38	21	17	100	
WS298	-	2.00	Pale grey and orange brown slightly silty CLAY	30	93	30	63	100	
WS300	-	1.50	Pale greenish grey, brown and reddish brown slightly silty CLAY with occasional sandy patches	31	86	32	54	100	
WS300	-	3.00	Grey and orange brown slightly sandy silty CLAY	31	58	26	32	100	
WS301	-	1.00	Reddish brown and pale grey mottled slightly sandy gravelly CLAY (gravel is fmc and angular to rounded)	25	66	22	44	60	
WS303	-	1.50	Yellowish brown, pale grey and occasional orange sandy gravelly CLAY with occasional rootlets (gravel is fm and angular to rounded)	13	35	16	19	57	
WS304	-	2.00	Brown, orange brown and pale grey sandy silty CLAY with rare fine gravel	17	34	15	19	99	
WS305	-	1.00	Orange brown and greyish brown slightly gravelly slightly sandy silty CLAY (gravel is fmc and sub-angular to angular)	13	47	17	30	95	
WS305	-	2.50	Orange brown and greenish grey slightly gravelly sandy CLAY (gravel is fmc and sub-angular to angular)	16	30	14	16	90	
WS306	-	1.00	Brown and pale grey slightly sandy silty CLAY with rare fine gravel	14	45	18	27	99	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 15/10/2013

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
WS306	-	2.00	Yellowish brown and grey slightly clayey SILT	9.0	-	-	-	-	Non Plastic
WS307	-	2.00	Pale grey silty CLAY with white silt patches and small pockets of orange brown sand	25	72	28	44	100	
WS308	-	1.50	Pale grey, light grey and occasional orange silty CLAY with traces of rootlets	14	55	20	35	100	
WS309	-	1.00	Grey and brown slightly fine sandy slightly silty CLAY	24	79	22	57	100	
WS309	-	1.50	Orange, pele brown and pale grey sandy CLAY with clay inclusions	18					
WS309	-	2.50	Yellow and pale brown sandy silty CLAY with clay inclusions	26					
WS310	-	1.00	Greenish grey and orange brown CLAY	34	90	30	60	100	
WS310	-	3.00	Greyish brown and brown CLAY	38	74	38	36	100	
WS312	-	1.50	Orange brown and greyish brown slightly sandy CLAY	27	57	21	36	100	
WS313	-	1.00	Orange brown and grey CLAY with rare fine gravel	19	60	21	39	99	
WS314	-	2.00	Grey and orange brown sandy CLAY	26	40	22	18	100	
WS315	-	1.50	Orangey brown and pale grey silty CLAY with traces of roots	36	101	31	70	100	
WS316	-	1.00	Brown and grey CLAY with orange brown sandy patches	31	71	31	40	100	
WS316	-	2.50	Brown sandy silty CLAY	26	48	30	18	100	
WS317	-	1.50	Light grey and occasional orange brown mottled silty CLAY	18	55	20	35	100	
WS318	-	2.00	Grey and brown silty CLAY with rare fine gravel	19	57	18	39	99	
WS319	-	1.50	Brown and grey slightly gravelly slightly sandy silty CLAY (gravel is fmc and sub-angular to angular)	22	48	18	30	90	
WS322	-	1.00	Orangey brown and grey sandy CLAY with traces of rootlets and fine rare gravel	14	40	15	25	99	
WS322	-	3.50	Dark grey and light grey silty CLAY	60	71	27	44	100	

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

UKAS TESTING 2519

Checked and Approved
Initials: K.P
Date: 15/10/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
WS323	-	1.00	Light grey and orangey brown slightly silty CLAYwith fine sandy inclusions	30	71	24	47	100	
WS325	-	1.00	Brown, reddish brown and grey slightly sandy slightly silty slightly gravelly CLAY (gravel is fm and sub-angular to angular)	18	47	17	30	97	
WS325	-	2.50	Brown and light grey silty CLAY	25	68	22	46	100	
WS326	-	1.50	Pale greyish brown very sandy CLAY/clayey SAND with seams of brown clay	28	41	16	25	100	
WS327	-	2.00	Brown and grey slightly clayey SAND	25	27	22	5	100	
WS329	-	1.00	Brown and grey silty CLAY with traces of rootlets	17	60	22	38	100	
WS331	-	1.50	Brown sandy clayey GRAVEL (gravel is fmc and sub-angular to angular)	10	36	17	19	24	
WS332	-	1.00	Brown sandy clayey GRAVEL (gravel is fmc and sub-angular to angular)	14	39	17	22	33	
WS333	-	1.00	Brown sandy clayey GRAVEL (gravel is fmc and angular to rounded)	12	30	15	15	47	
WS334	-	1.50	Brown slightly gravelly slightly sandy silty CLAY (gravel is fmc and sub-angular)	18	39	17	22	90	
WS337	-	1.00	Orange brown and greyish brown slightly gravelly slightly sandy silty CLAY with fine rootlets (gravel is fmc and sub-angular to angular)	14	48	18	30	95	
WS338	-	1.00	Brown and greyish brown sandy silty CLAY with rare fine gravel and fine rootlets	16	45	18	27	99	
WS339	-	1.00	Brown gravelly sandy silty CLAY with fine rootlets (gravel is fmc and sub-angular to angular)	14	37	16	21	85	
WS340	-	1.00	Brown sandy clayey GRAVEL (gravel is fmc and angular to rounded)	12	44	20	24	54	
WS341	-	1.00	Greenish grey and orange brown slightly gravelly slightly sandy silty CLAY with roots (gravel is fmc and sub-angular)	19	60	20	40	90	
WS343	-	1.00	Brown and greyish brown slightly sandy silty CLAY	22	48	18	30	100	
WS345	-	1.50	Brown, reddish brown and greyish brown motttled slightly gravelly CLAY with sandy patches (gravel is fm and sub-angular)	26	53	24	29	95	
WS345	-	2.50	Brown very sandy CLAY/clayey SAND	19	32	17	15	100	
WS349	-	1.50	Orange brown and pale grey sandy silty CLAY with rare fine gravel	20	41	17	24	99	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.

BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.

BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved

Initials: K.P

Date: 15/10/2013

Project Name:	Boorley Green (Southampton)			**Samples Received:**	10/09/2013
				Project Started:	12/09/2013
Client:	Geo-Environmental Services Ltd			**Testing Started:**	20/09/2013
Project No:	GE9523-1904	**Our job/report no:**	15279	**Date Reported:**	15/10/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
WS352	-	1.50	Orangey brown and grey silty CLAY	34	52	24	28	100	
WS353	-	1.00	Brown, orange brown and pale grey sandy gravelly CLAY with occasional rootlets (gravel is fm and angular to rounded)	13	41	18	23	60	
WS354	-	1.00	Brown, grey and orange brown slightly gravelly sandy silty CLAY (gravel is fmc and sub-angular to angular)	15	52	20	32	95	
WS355	-	1.50	Brown and grey slightly silty CLAY with orange brown sandy patches	31	72	28	44	100	
WS356	-	2.00	Orangey brown slightly clayey sandy GRAVEL (gravel is fm and angular to rounded)	14	32	19	13	27	
WS357	-	1.50	Brown sandy silty CLAY	25	45	20	25	100	
WS360	-	2.00	Brown and greenish grey sandy CLAY	36	50	21	29	100	
WS361	-	1.00	Greenish grey and orange brown slightly sandy silty CLAY	22	70	23	47	100	
WS363	-	1.00	Greyish brown and orange brown sandy silty CLAY	19	52	21	31	100	
WS363	-	2.00	Greenish grey and orange brown sandy CLAY	24	44	22	22	100	
WS364	-	1.00	Greenish grey and orange brown slightly sandy silty CLAY	19	58	21	37	100	
WS365	-	1.50	Orangey brown and grey slightly silty CLAY with traces of decayed roots	34	68	23	45	100	
WS366	-	2.50	Pale grey and occasional brown silty CLAY	40	81	32	49	100	
WS369	-	1.00	Brown and greyish brown sandy silty CLAY	16	39	17	22	100	
WS370	-	1.50	Greenish grey and orange brown sandy silty CLAY	22	42	18	24	100	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

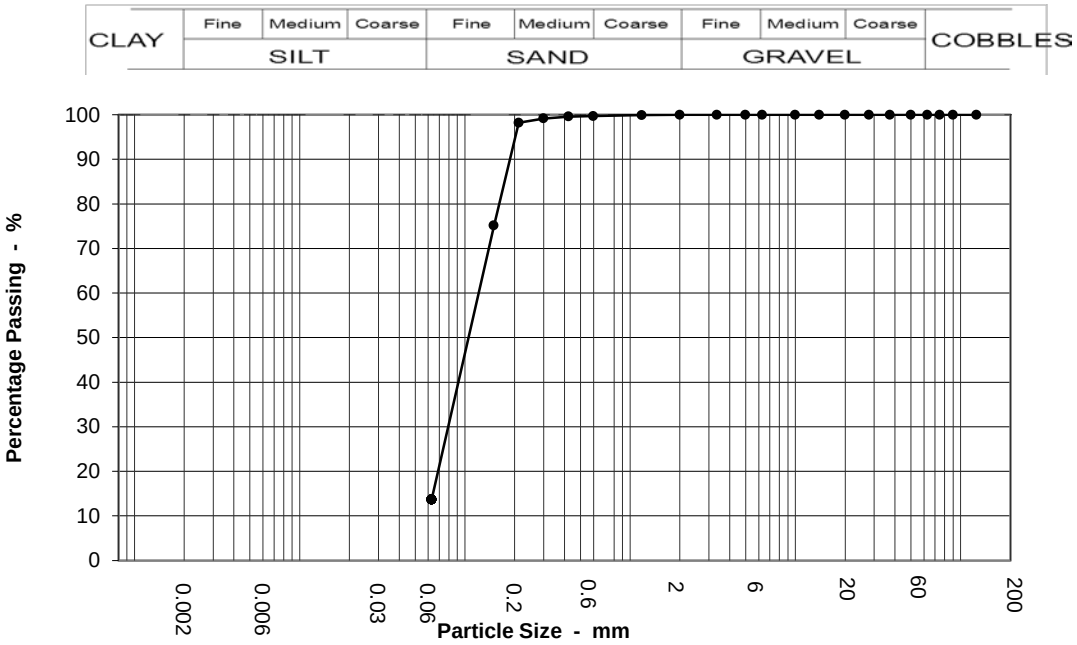
Checked and Approved
Initials: K.P
Date: 15/10/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH202
		Depth	4.45 m
Visual Soil Description	Pale brown slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	98		
0.15	75		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	86.3
Silt & Clay	13.7

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

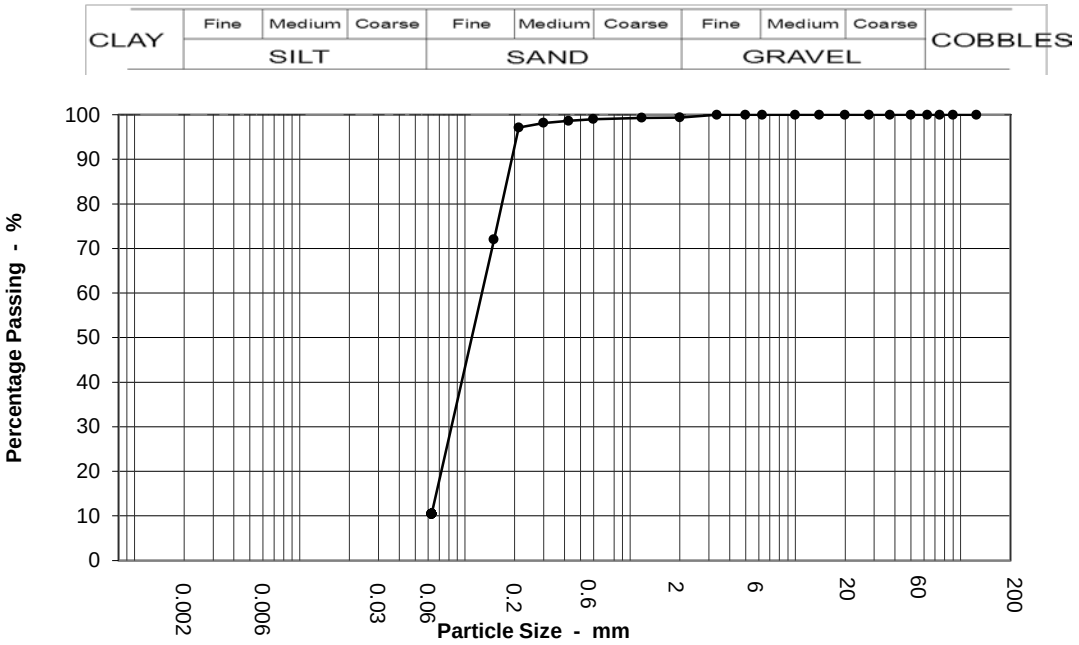
Approved Signatories:
K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH202
		Depth	6.95 m
Visual Soil Description	Pale greyish brown slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	99		
0.425	99		
0.3	98		
0.212	97		
0.15	72		
0.063	10		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.6
Sand	88.9
Silt & Clay	10.5

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
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E-mail: k4soils@aol.com

Approved Signatories:
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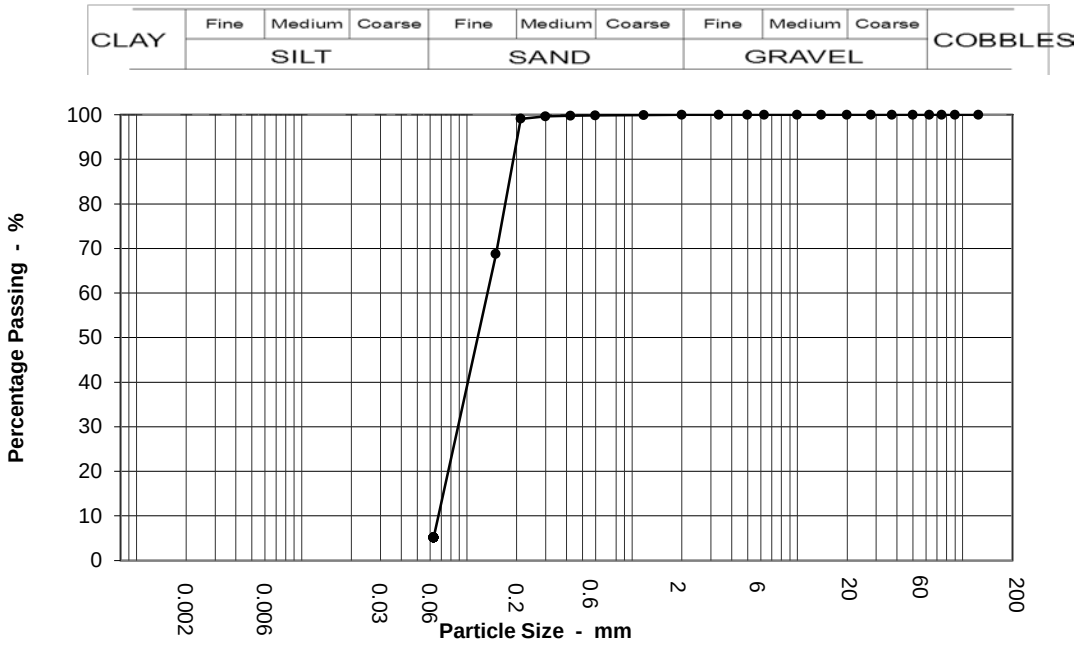
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH202
		Depth	9.00 m
Visual Soil Description	Greyish brown slightly silty SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	69		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	94.9
Silt & Clay	5.1

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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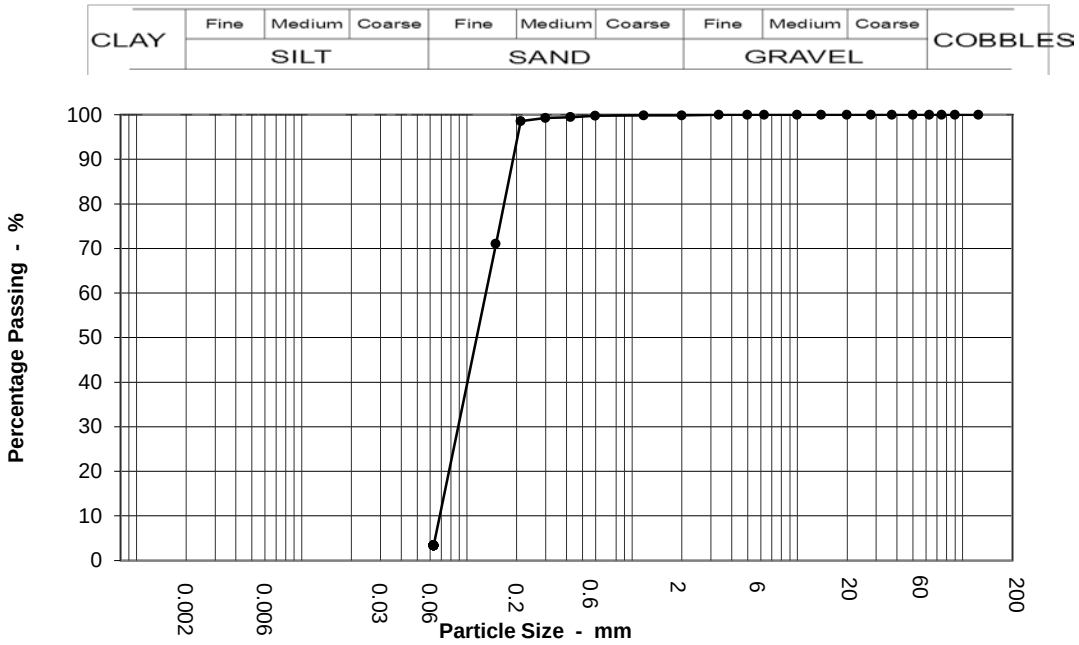
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH202
		Depth	11.45 m
Visual Soil Description	Brownish grey slightly silty SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	99		
0.15	71		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.2
Sand	96.5
Silt & Clay	3.3

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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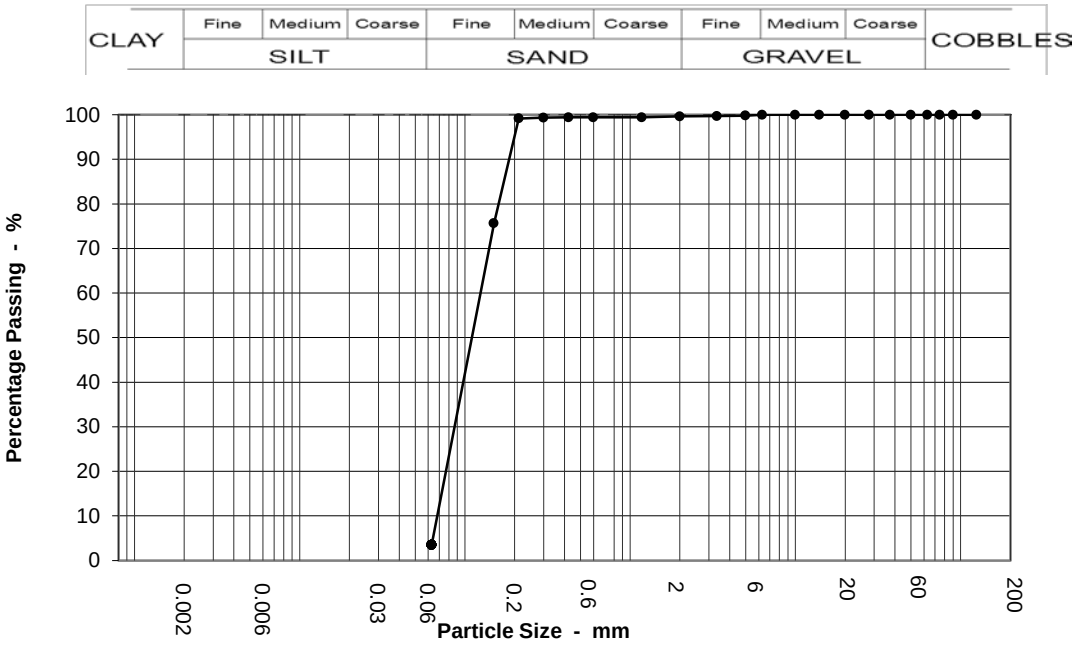
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH202
		Depth	15.00 m
Visual Soil Description	Brown slightly silty SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	99		
0.3	99		
0.212	99		
0.15	76		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.4
Sand	96.1
Silt & Clay	3.5

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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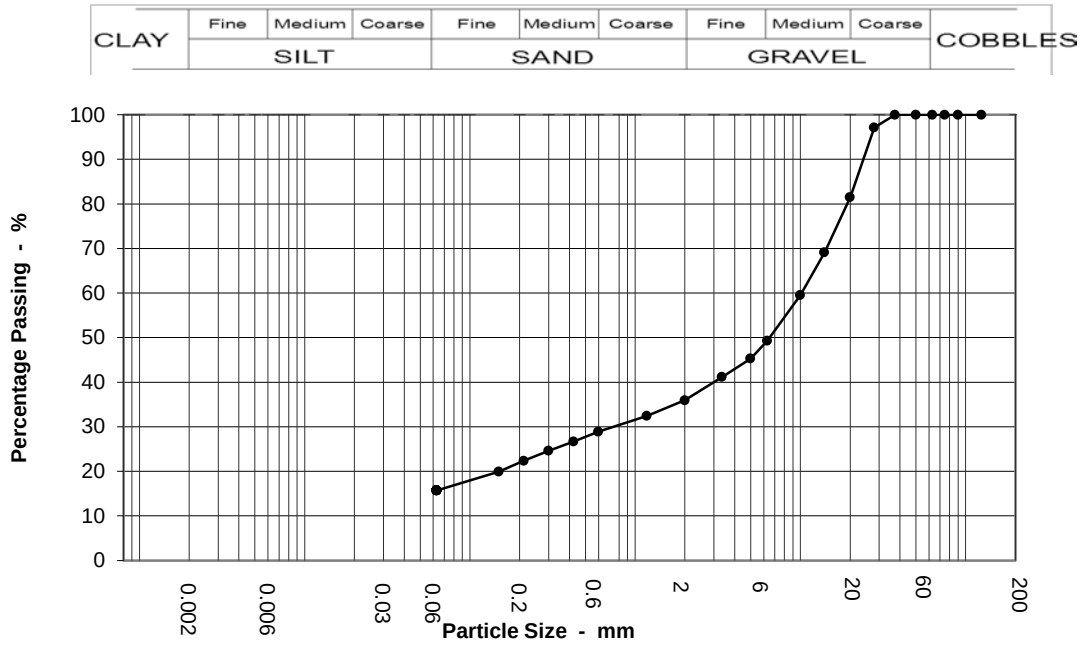
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH203
		Depth	1.00 - 1.45 m
Visual Soil Description	Brown slightly clayey sandy GRAVEL (gravel is fmc and sub-rounded to angular)	Sample Type/No	- B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	82		
14	69		
10	60		
6.3	49		
5	45		
3.35	41		
2	36		
1.18	32		
0.6	29		
0.425	27		
0.3	25		
0.212	22		
0.15	20		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	64.1
Sand	20.2
Silt & Clay	15.7

Grading Analysis	
D100	125.0
D60	10.2
D10	
Uniformity Coefficient	N/A

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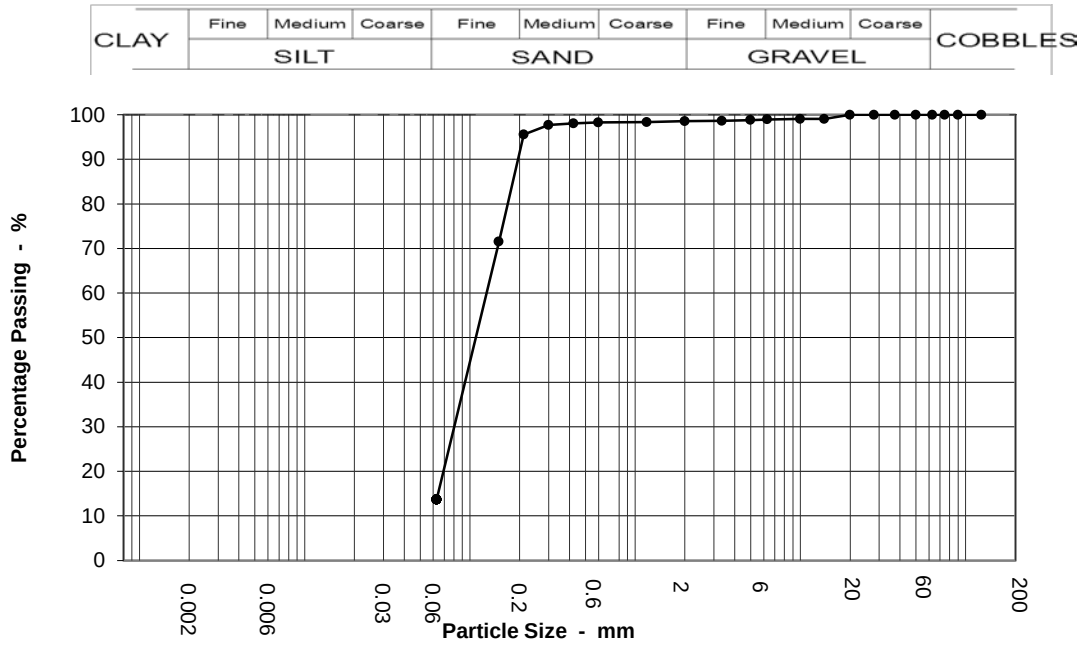
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH204
		Depth	.50 - 1.00 m
Visual Soil Description	Pale grey slightly silty SAND with rare fm gravel	Sample Type/No	- B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	98		
0.6	98		
0.425	98		
0.3	98		
0.212	96		
0.15	72		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	1.4
Sand	84.9
Silt & Clay	13.7

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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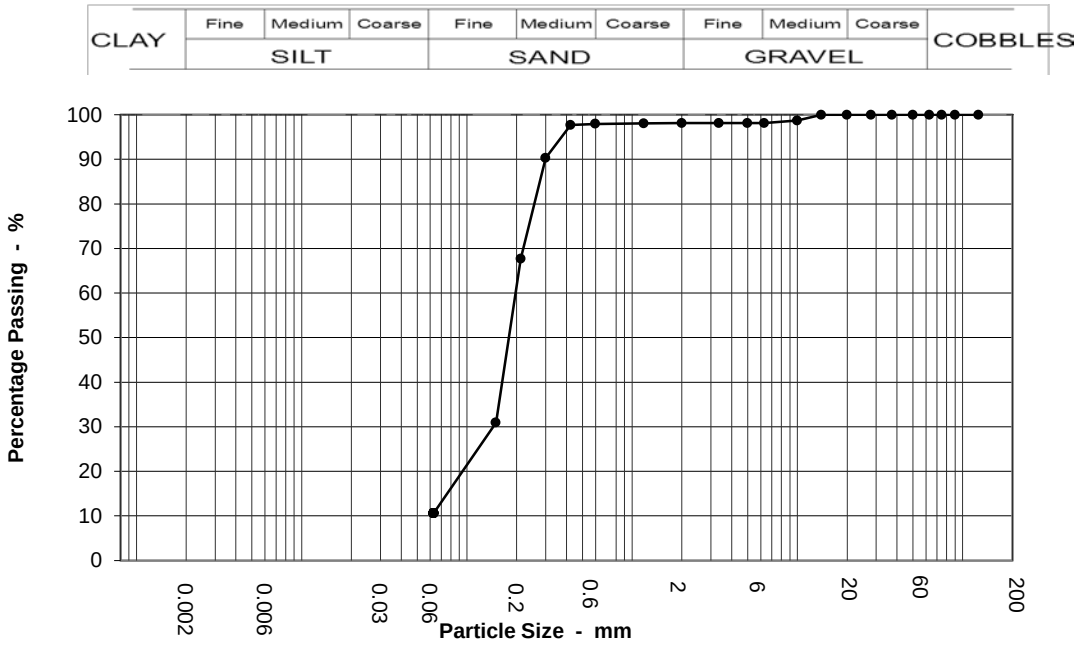
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH204
		Depth	2.45 m
Visual Soil Description	Brown slightly clayey SAND with rare fm gravel	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	98		
5	98		
3.35	98		
2	98		
1.18	98		
0.6	98		
0.425	98		
0.3	90		
0.212	68		
0.15	31		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	1.9
Sand	87.6
Silt & Clay	10.6

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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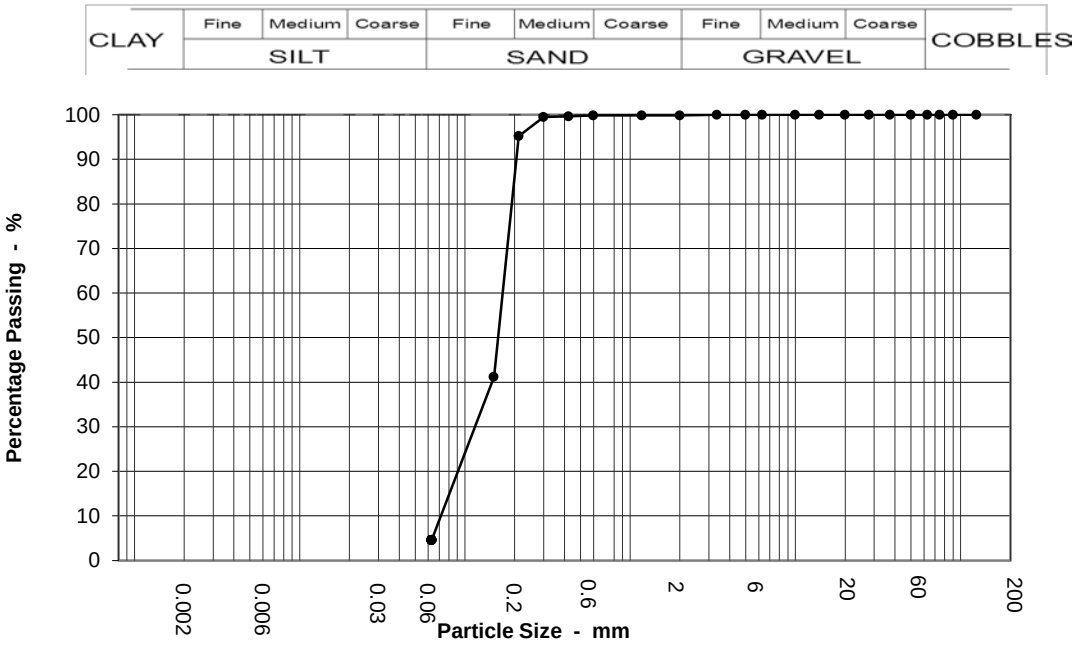
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH204
		Depth	3.45 m
Visual Soil Description	Pale greyish brown slightly silty SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	95		
0.15	41		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	95.3
Silt & Clay	4.6

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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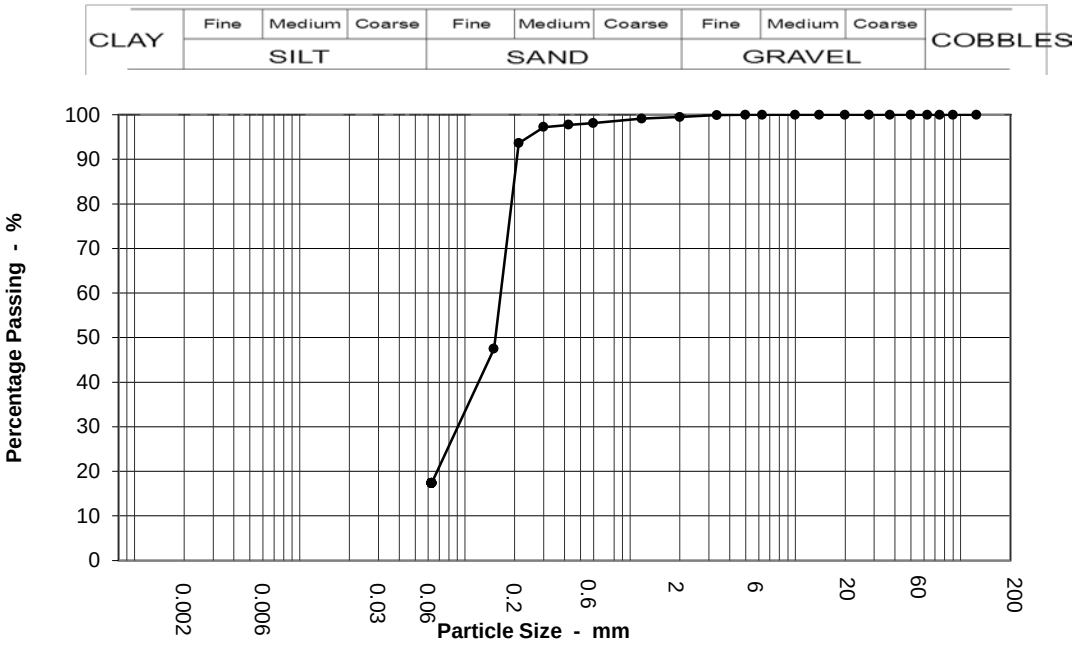
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH205
		Depth	4.45 m
Visual Soil Description	Pale brown slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	98		
0.425	98		
0.3	97		
0.212	94		
0.15	48		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.5
Sand	82.2
Silt & Clay	17.4

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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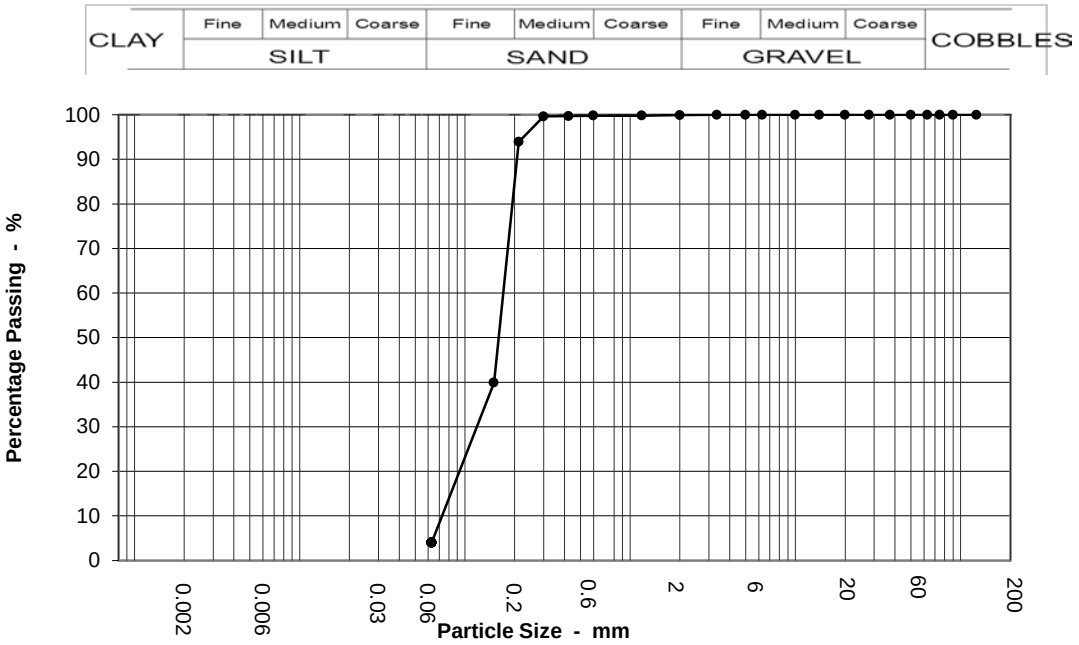
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH205
		Depth	6.00 m
Visual Soil Description	Brown slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	94		
0.15	40		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	95.9
Silt & Clay	4.0

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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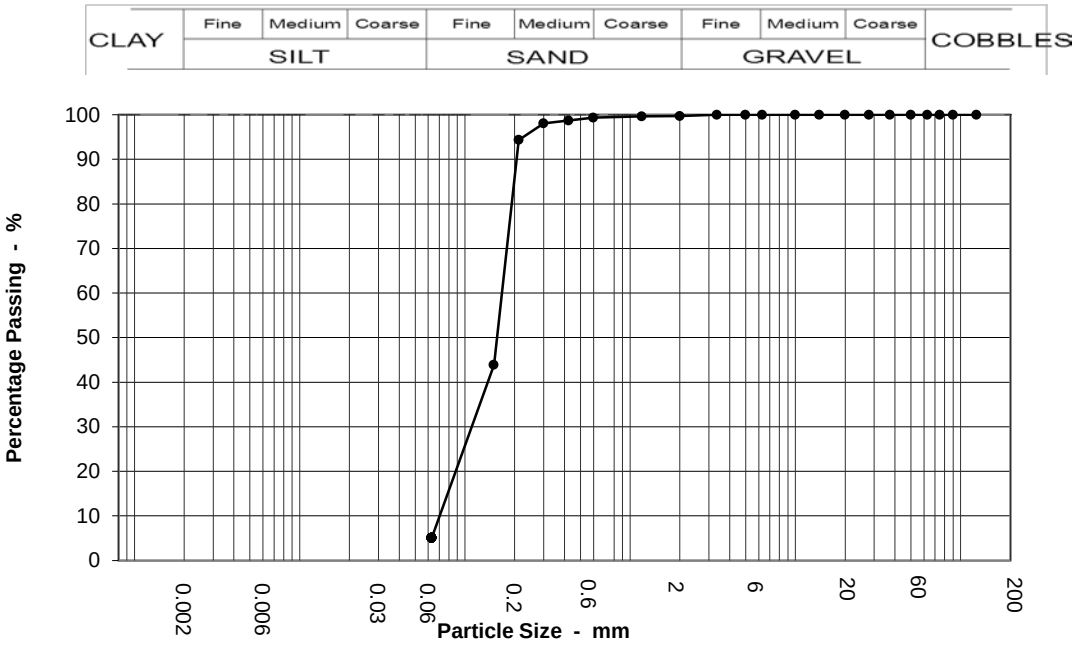
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH205
		Depth	8.45 m
Visual Soil Description	Greyish brown slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	94		
0.15	44		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.3
Sand	94.7
Silt & Clay	5.0

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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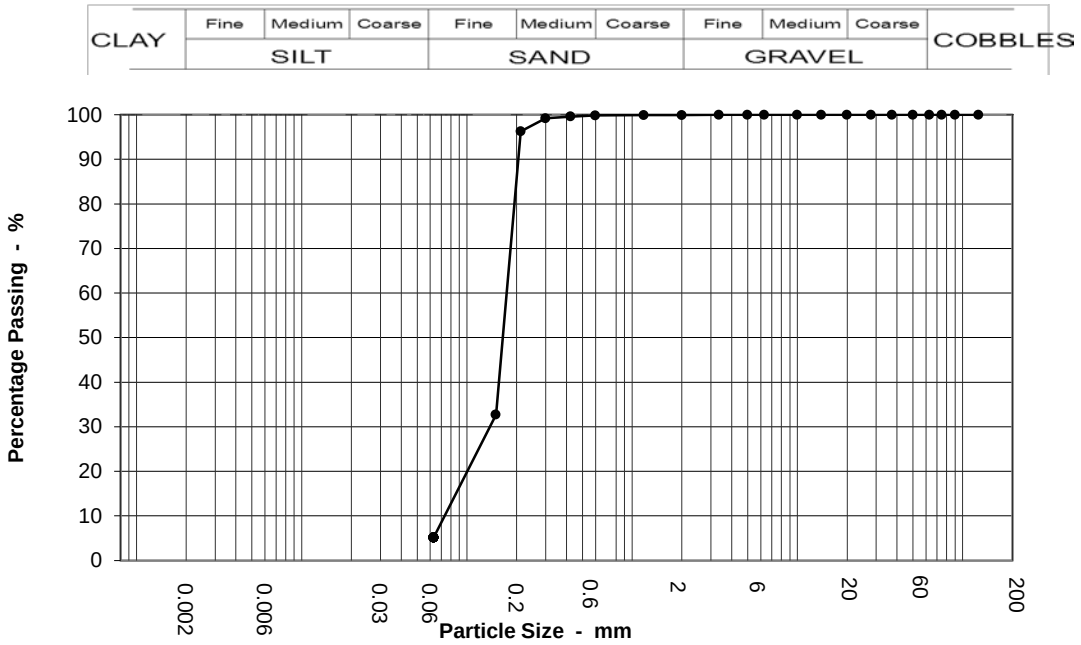
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K4 SOILS	PARTICLE SIZE DISTRIBUTION	Our Report No:	15279
	BS 1377 : Part 2 : 1990 : Clause 9	Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH205
		Depth	10.50 m
Visual Soil Description	Pale brown slightly silty SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	96		
0.15	33		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	94.8
Silt & Clay	5.2

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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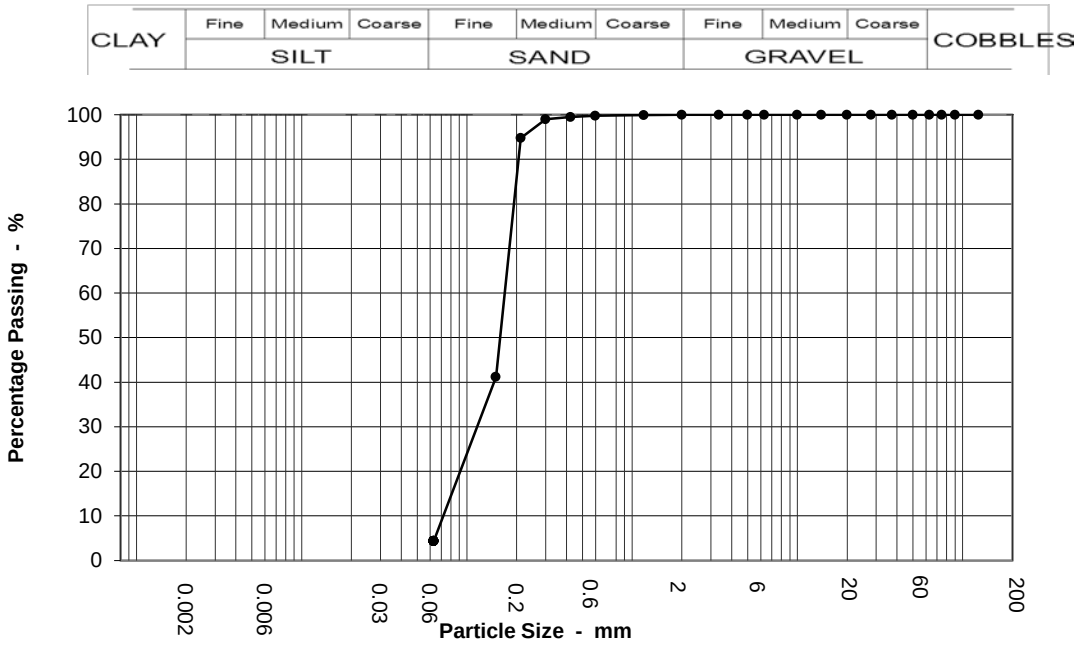
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH205
		Depth	12.95 m
Visual Soil Description	Greyish brown slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	95		
0.15	41		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	95.7
Silt & Clay	4.3

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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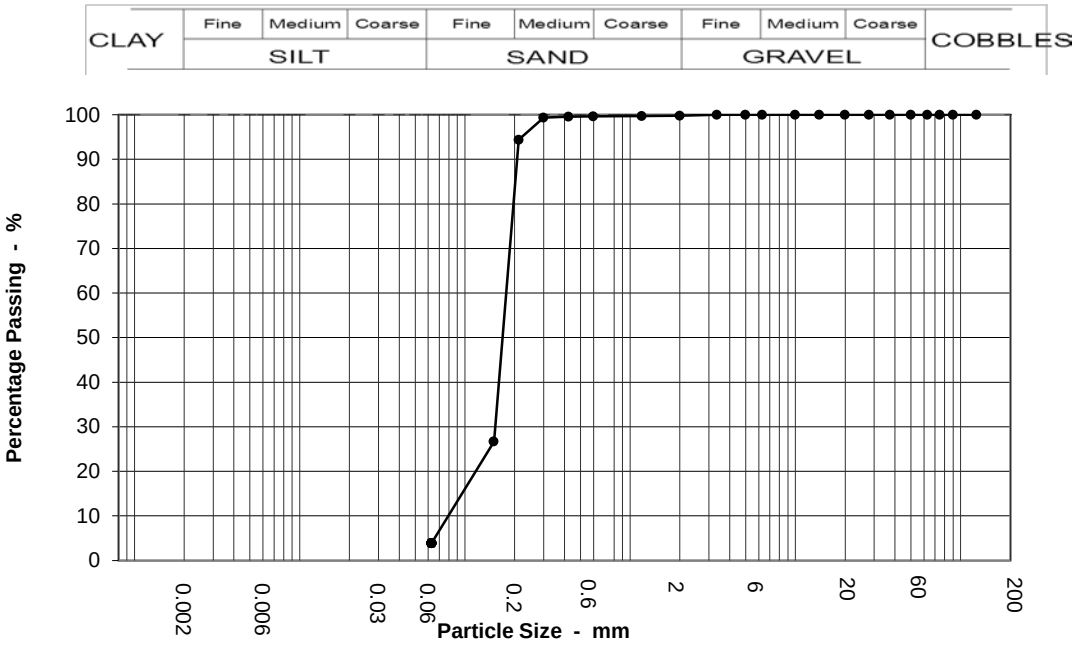
Approved Signatories:
K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

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Date: 15/10/2013

UKAS TESTING

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH205
		Depth	15.00 m
Visual Soil Description	Greish brown slightly silty SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	94		
0.15	27		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.2
Sand	95.9
Silt & Clay	3.9

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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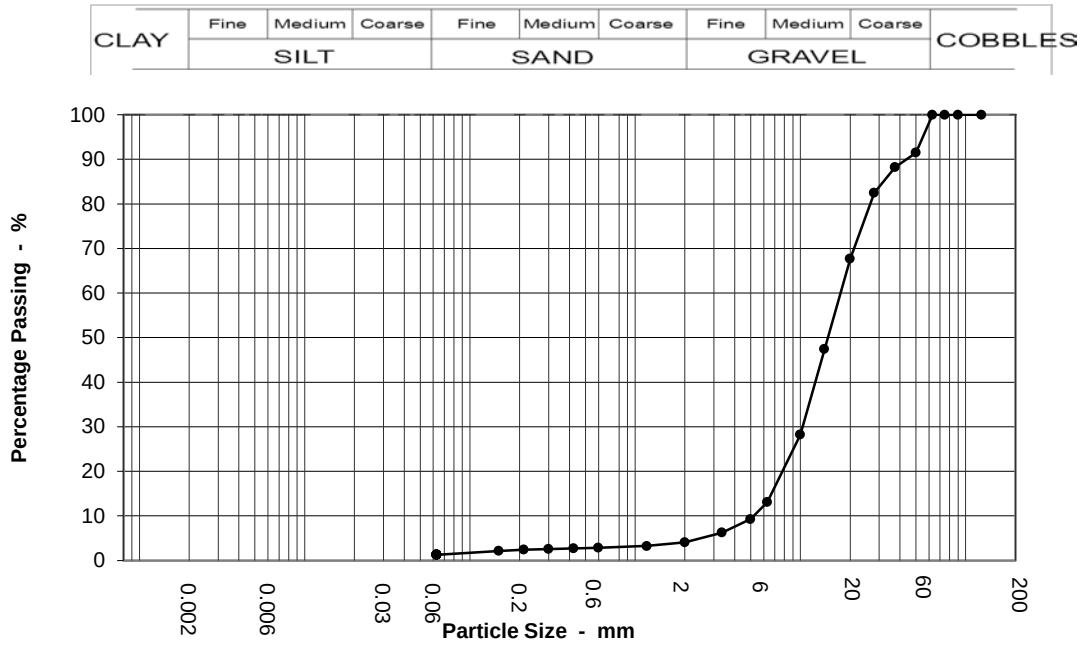
Approved Signatories:
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Date: 15/10/2013

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH207
		Depth	4.00 m
Visual Soil Description	Grey slightly clayey slightly sandy GRAVEL (gravel is fmc and sub-rounded to angular)	Sample Type/No	- B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	91		
37.5	88		
28	82		
20	68		
14	47		
10	28		
6.3	13		
5	9		
3.35	6		
2	4		
1.18	3		
0.6	3		
0.425	3		
0.3	3		
0.212	2		
0.15	2		
0.063	1		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	95.9
Sand	2.8
Silt & Clay	1.3

Grading Analysis	
D100	125.0
D60	17.7
D10	5.2
Uniformity Coefficient	3

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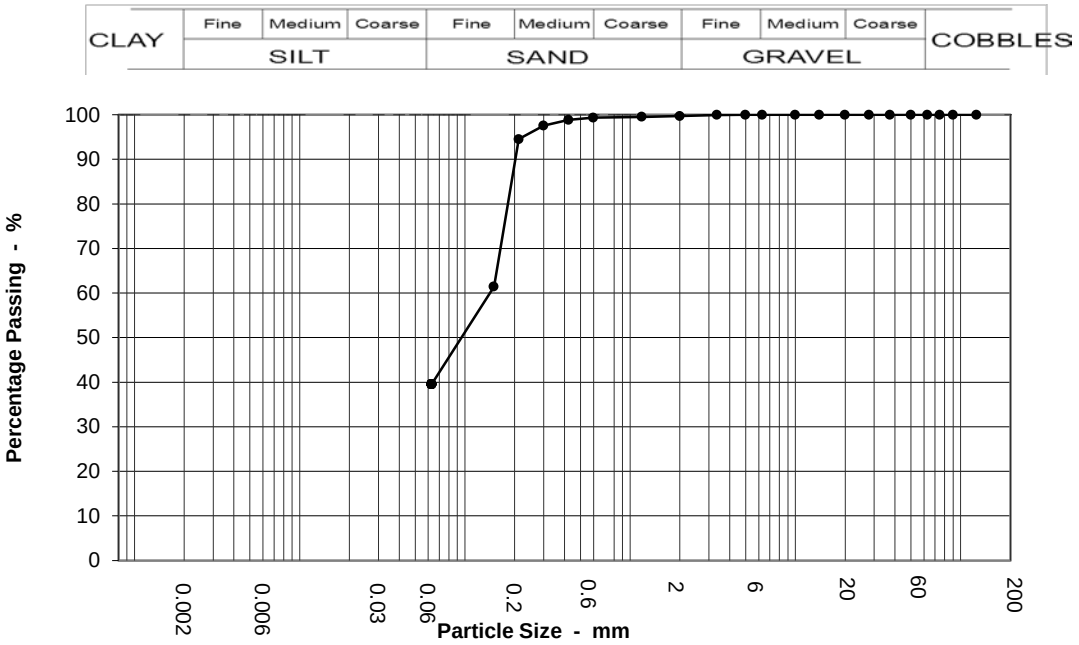
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH207
		Depth	7.50 m
Visual Soil Description	Dark grey slightly silty very sandy CLAY	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	95		
0.15	61		
0.063	40		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.3
Sand	60.2
Silt & Clay	39.5

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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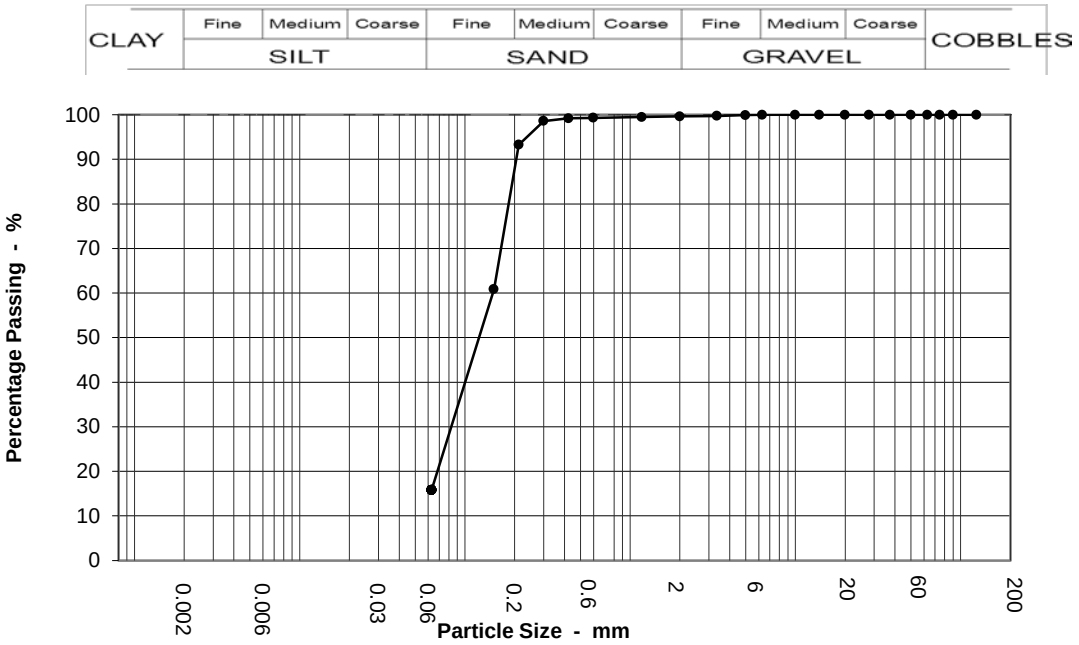
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH207
		Depth	9.95 m
Visual Soil Description	Dark grey slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	99		
0.212	93		
0.15	61		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.4
Sand	83.8
Silt & Clay	15.8

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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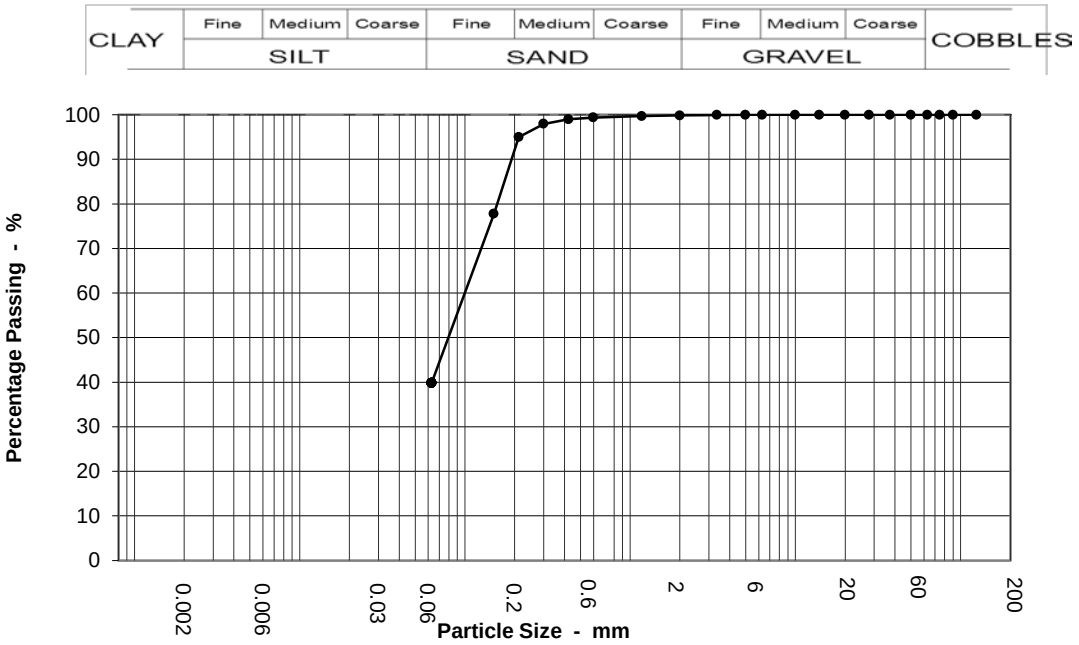
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH207
		Depth	12.00 m
Visual Soil Description	Dark grey slightly silty very sandy CLAY	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	95		
0.15	78		
0.063	40		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	60.1
Silt & Clay	39.8

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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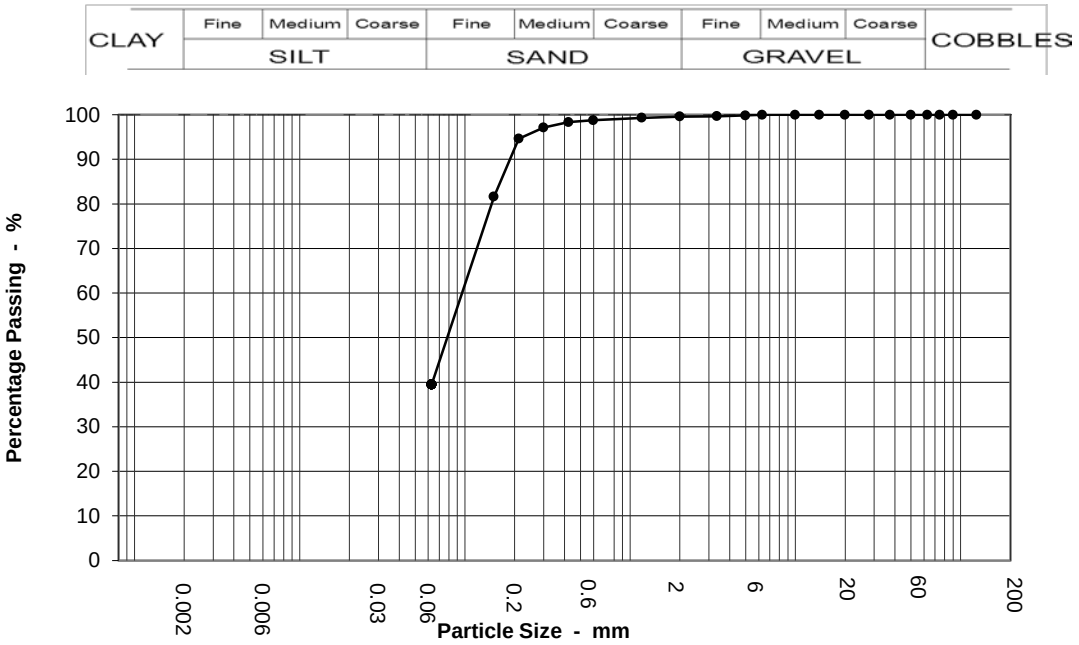
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH207
		Depth	13.50 m
Visual Soil Description	Dark grey slightly silty very sandy CLAY	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	98		
0.3	97		
0.212	95		
0.15	82		
0.063	39		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.4
Sand	60.1
Silt & Clay	39.5

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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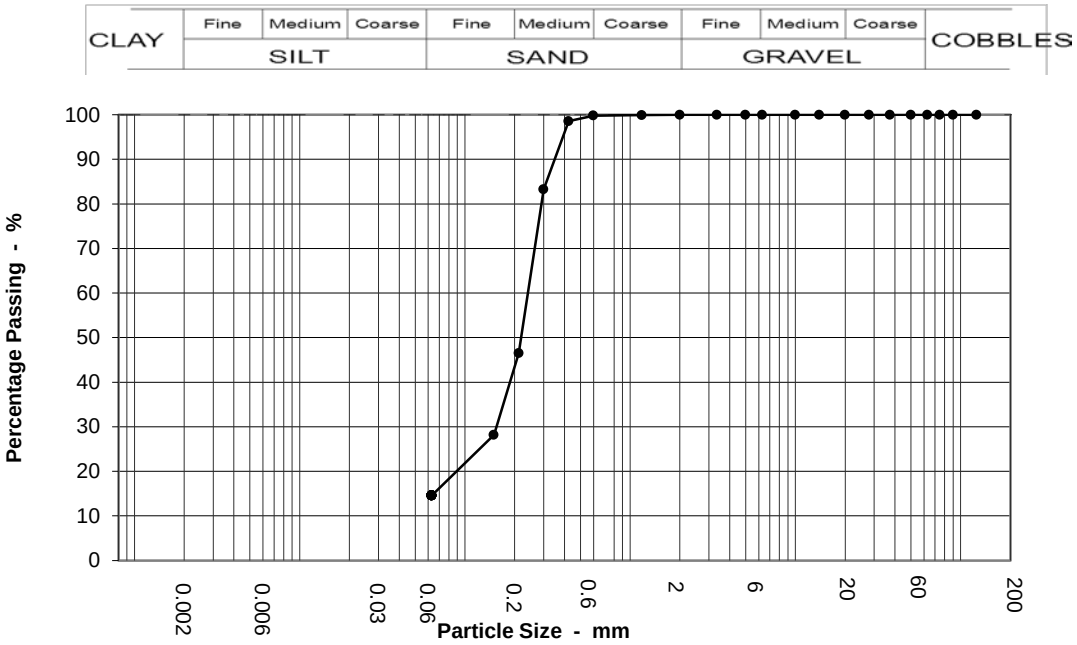
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH208
		Depth	3.45 m
Visual Soil Description	Brown slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	83		
0.212	47		
0.15	28		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	85.4
Silt & Clay	14.6

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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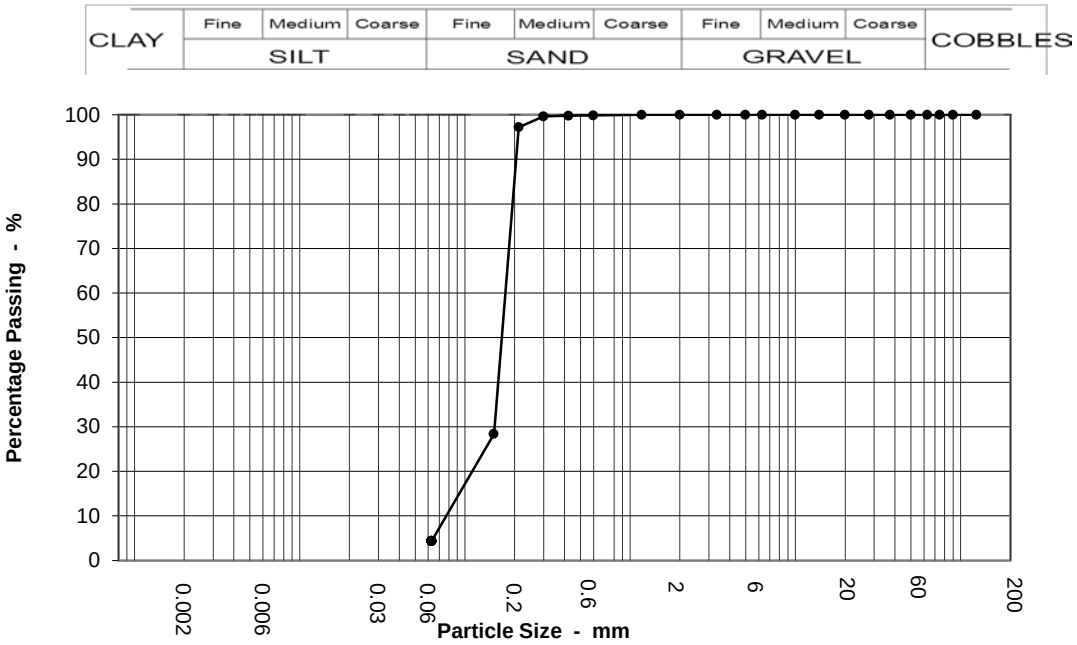
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH208
		Depth	6.95 m
Visual Soil Description	Brownish grey slightly silty SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	97		
0.15	28		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	95.6
Silt & Clay	4.4

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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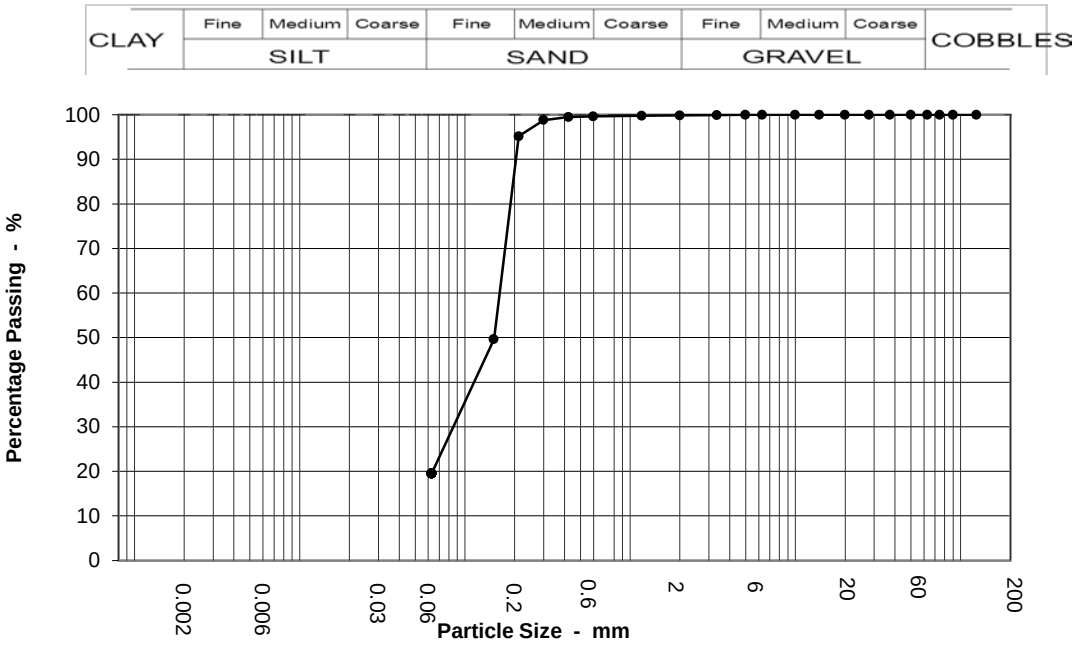
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Date: 15/10/2013

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH208
		Depth	12.00 m
Visual Soil Description	Dark grey slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	95		
0.15	50		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	80.4
Silt & Clay	19.5

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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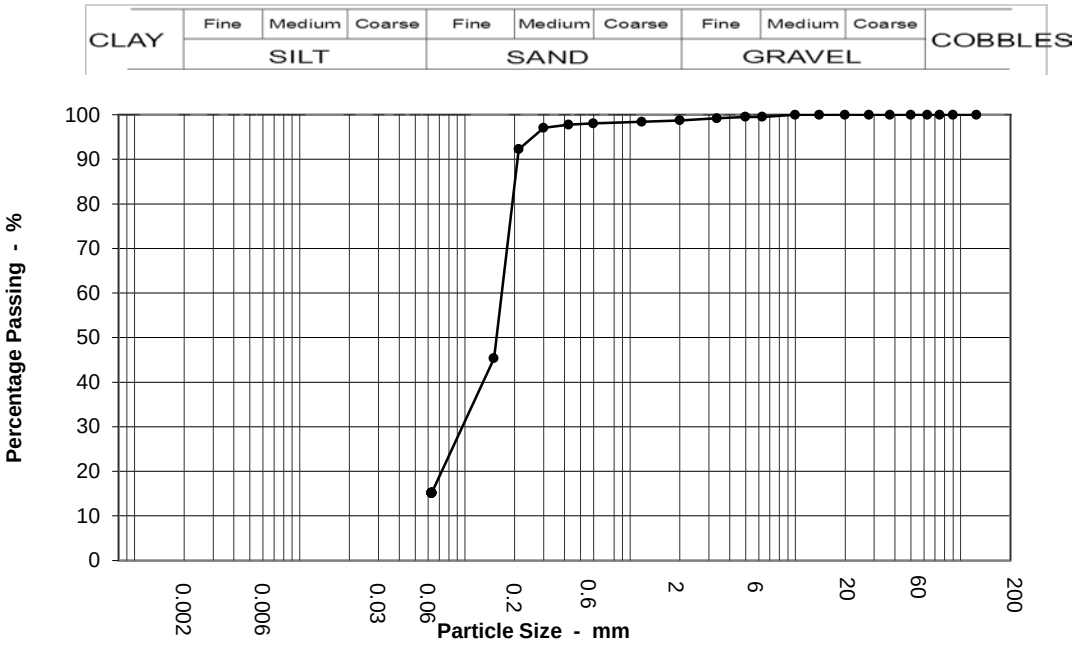
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH208
		Depth	15.00 m
Visual Soil Description	Dark grey slightly silty slightly clayey SAND with rare fine gravel	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	98		
0.6	98		
0.425	98		
0.3	97		
0.212	92		
0.15	45		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	1.3
Sand	83.6
Silt & Clay	15.1

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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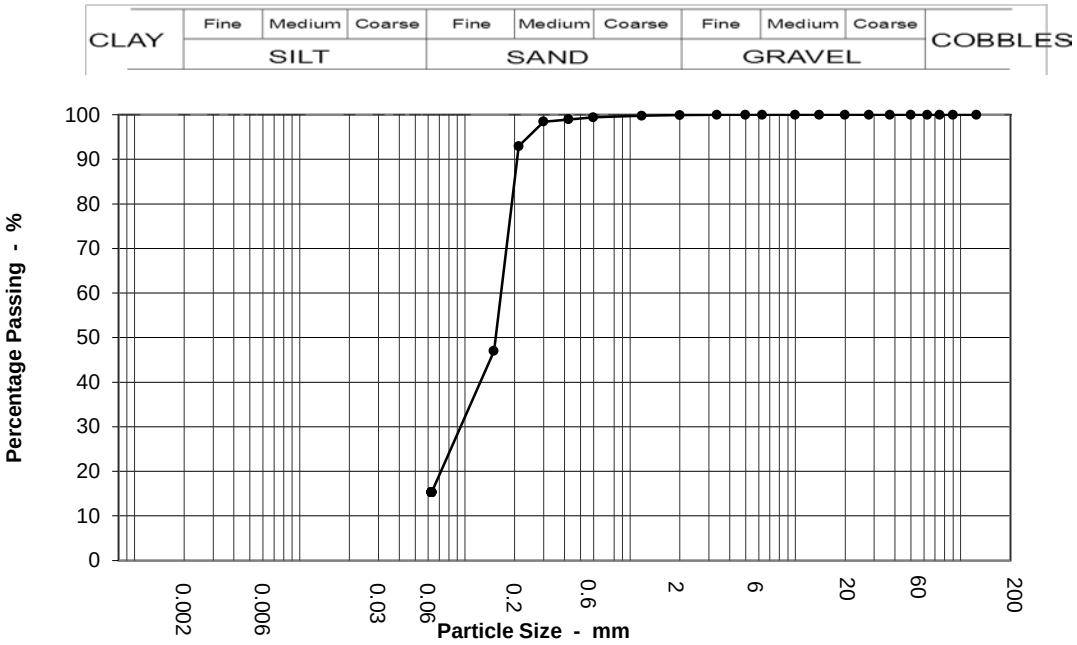
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH209
		Depth	5.45 m
Visual Soil Description	Brownish grey slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	93		
0.15	47		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	84.7
Silt & Clay	15.3

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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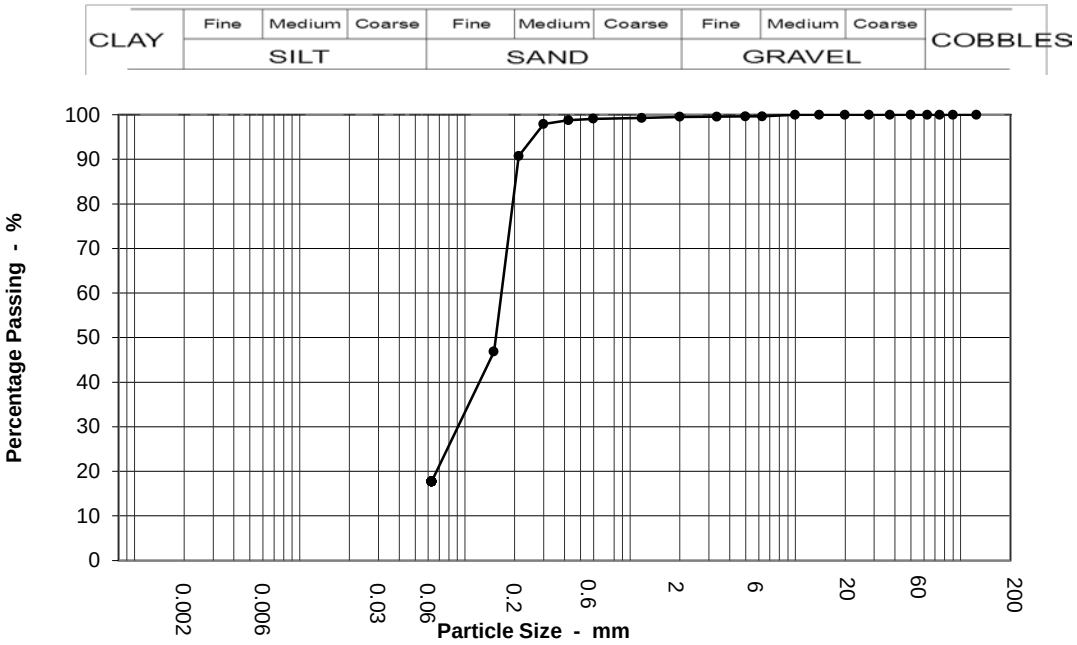
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Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH209
		Depth	11.45 m
Visual Soil Description	Brown slightly silty slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	99		
0.3	98		
0.212	91		
0.15	47		
0.063	18		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.5
Sand	81.8
Silt & Clay	17.7

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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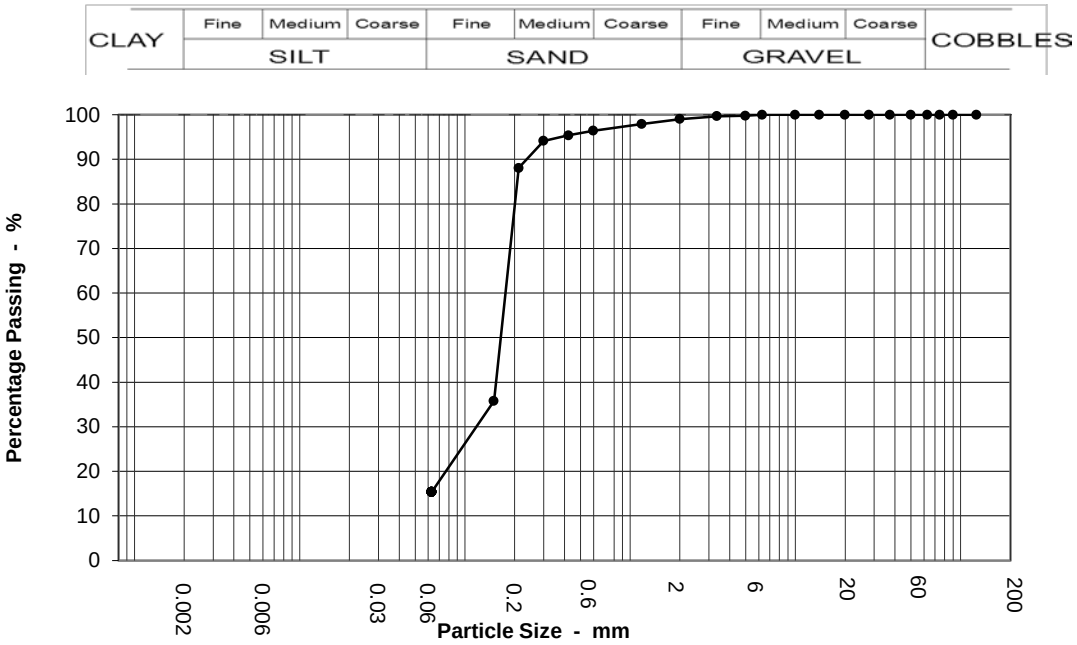
Approved Signatories:
K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH209
		Depth	13.50 m
Visual Soil Description	Brown slightly clayey SAND with rare fine gravel	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	98		
0.6	96		
0.425	95		
0.3	94		
0.212	88		
0.15	36		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	1.0
Sand	83.7
Silt & Clay	15.4

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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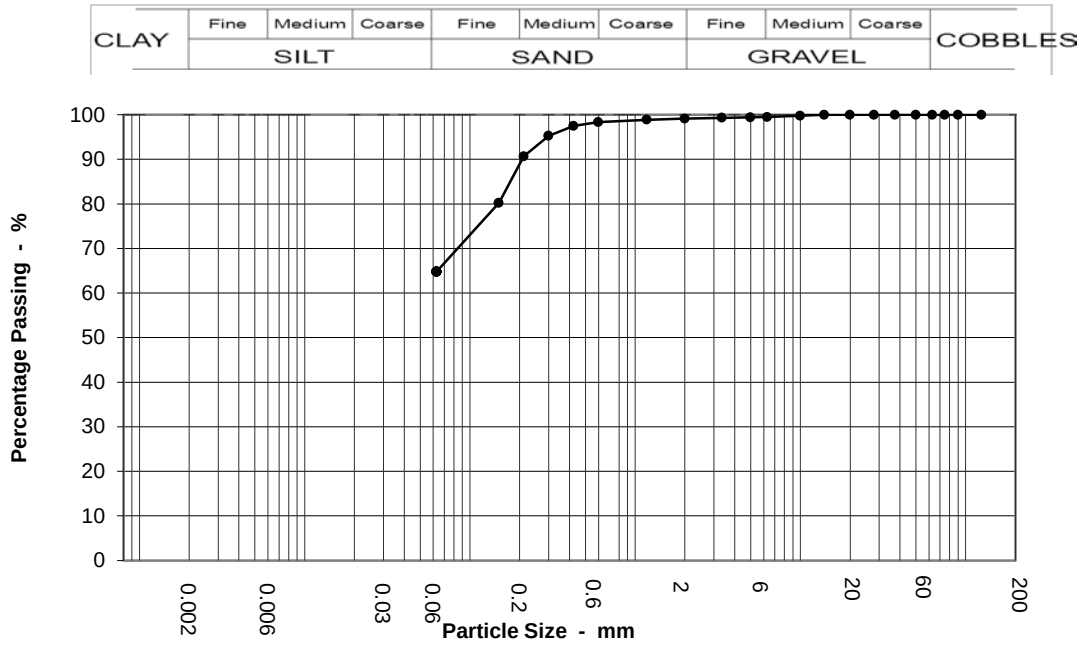
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH210
		Depth	0.50 - 1.00 m
Visual Soil Description	Brown sandy CLAY with rare fm and sub-angular gravel and traces of fine rootlets	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	99		
0.6	98		
0.425	98		
0.3	95		
0.212	91		
0.15	80		
0.063	65		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.9
Sand	34.3
Silt & Clay	64.8

Grading Analysis	
D100	125.0
D60	
D10	
Uniformity Coefficient	N/A

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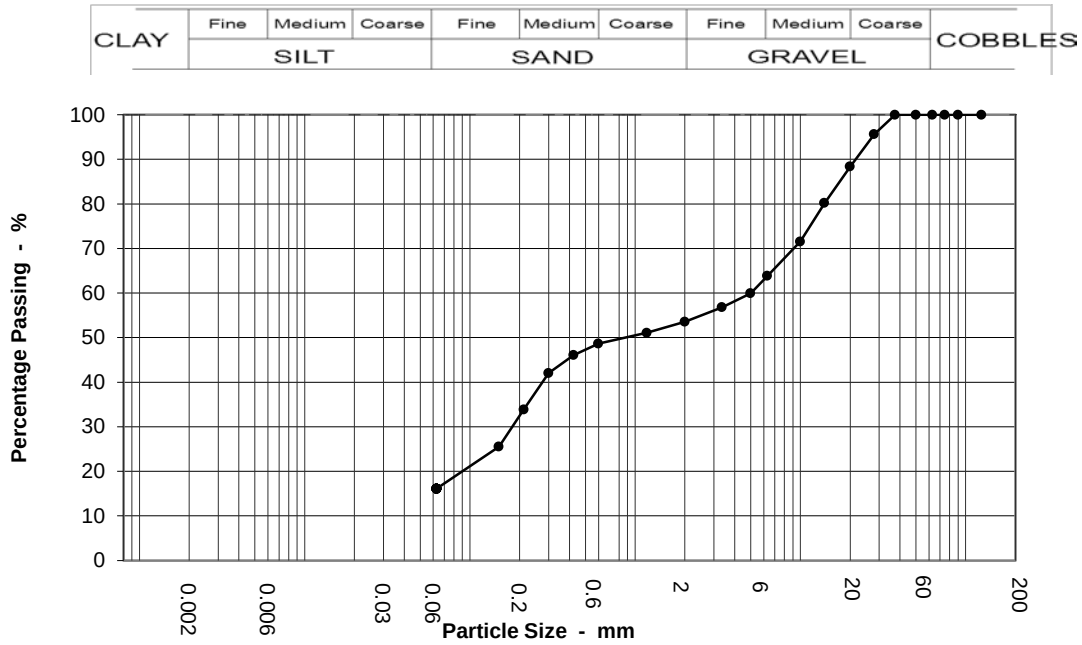
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH210
		Depth	3.00 m
Visual Soil Description	Brown slightly clayey sandy GRAVEL (gravel is fmc and sub-rounded to angular)	Sample Type/No	- B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	88		
14	80		
10	72		
6.3	64		
5	60		
3.35	57		
2	54		
1.18	51		
0.6	49		
0.425	46		
0.3	42		
0.212	34		
0.15	26		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	46.4
Sand	37.5
Silt & Clay	16.1

Grading Analysis	
D100	125.0
D60	5.0
D10	
Uniformity Coefficient	N/A

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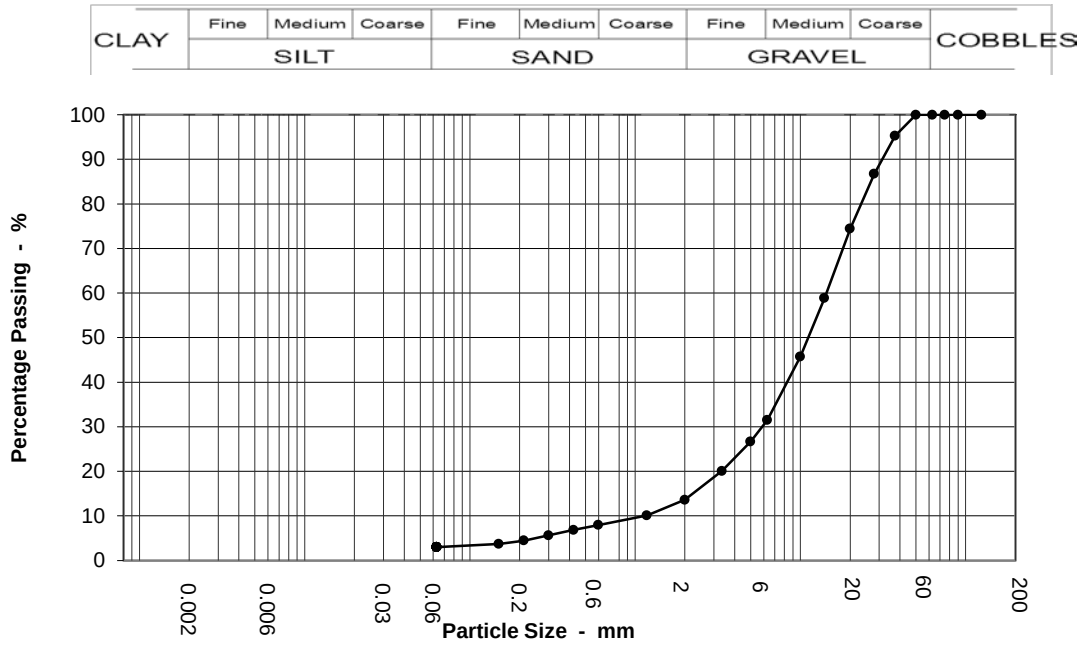
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH210
		Depth	4.00 m
Visual Soil Description	Brown slightly clayey slightly sandy GRAVEL (gravel is fmc and angular to rounded)	Sample Type/No	- B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	87		
20	74		
14	59		
10	46		
6.3	31		
5	27		
3.35	20		
2	14		
1.18	10		
0.6	8		
0.425	7		
0.3	6		
0.212	4		
0.15	4		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	86.4
Sand	10.6
Silt & Clay	3.0

Grading Analysis	
D100	125.0
D60	14.4
D10	1.2
Uniformity Coefficient	12

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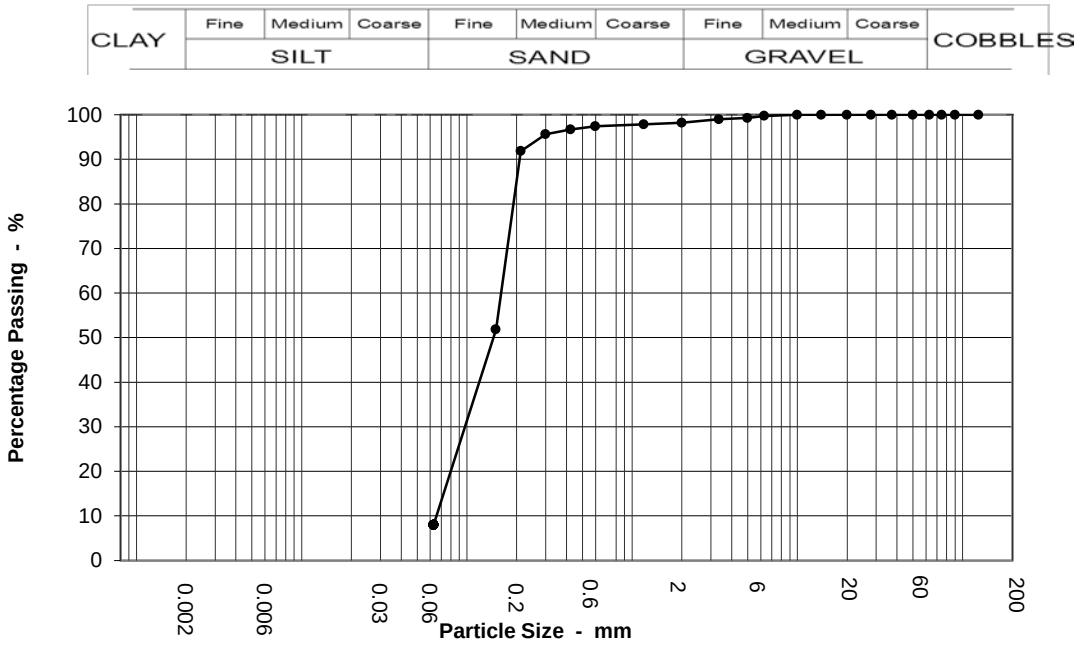
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH210
		Depth	7.50 m
Visual Soil Description	Dark greenish grey slightly silty SAND with rare fine gravel	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	98		
1.18	98		
0.6	97		
0.425	97		
0.3	96		
0.212	92		
0.15	52		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	1.8
Sand	90.2
Silt & Clay	8.0

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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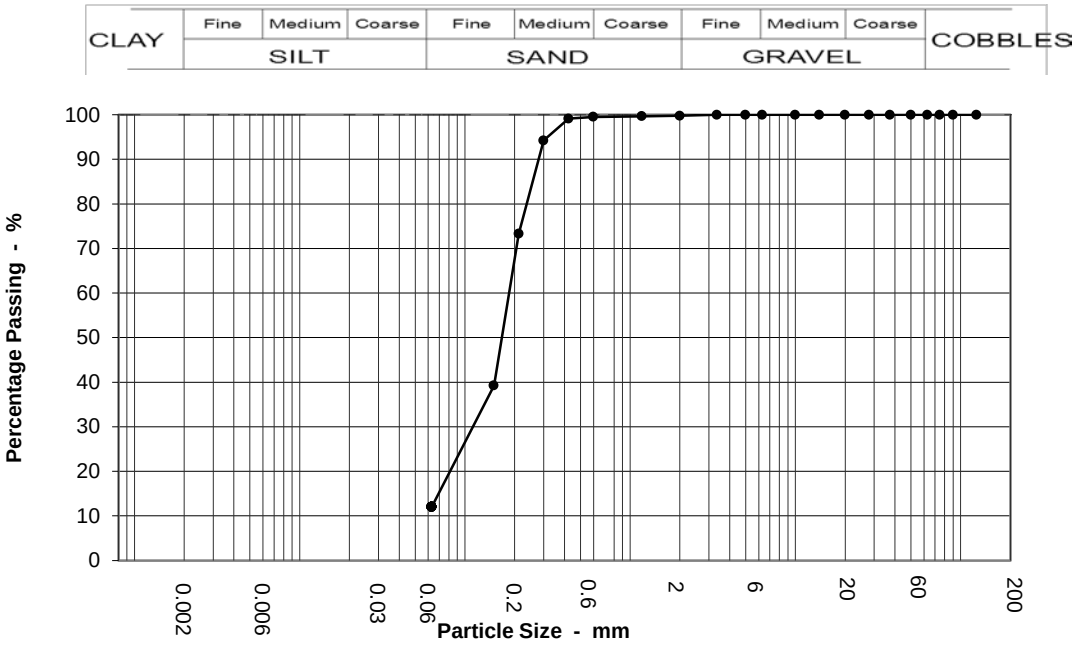
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH210
		Depth	9.95 m
Visual Soil Description	Dark grey slightly clayey SAND	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	94		
0.212	73		
0.15	39		
0.063	12		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.2
Sand	87.8
Silt & Clay	12.0

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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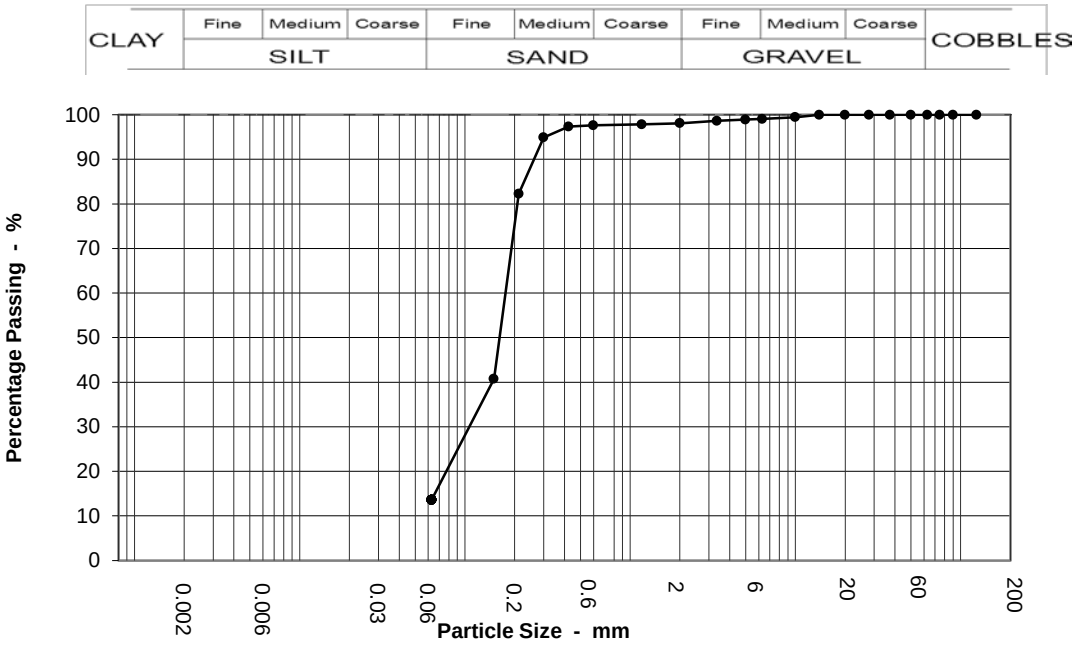
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH210
		Depth	11.45 m
Visual Soil Description	Dark grey slightly clayey SAND with rare fm gravel	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	99		
2	98		
1.18	98		
0.6	98		
0.425	97		
0.3	95		
0.212	82		
0.15	41		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	1.9
Sand	84.5
Silt & Clay	13.6

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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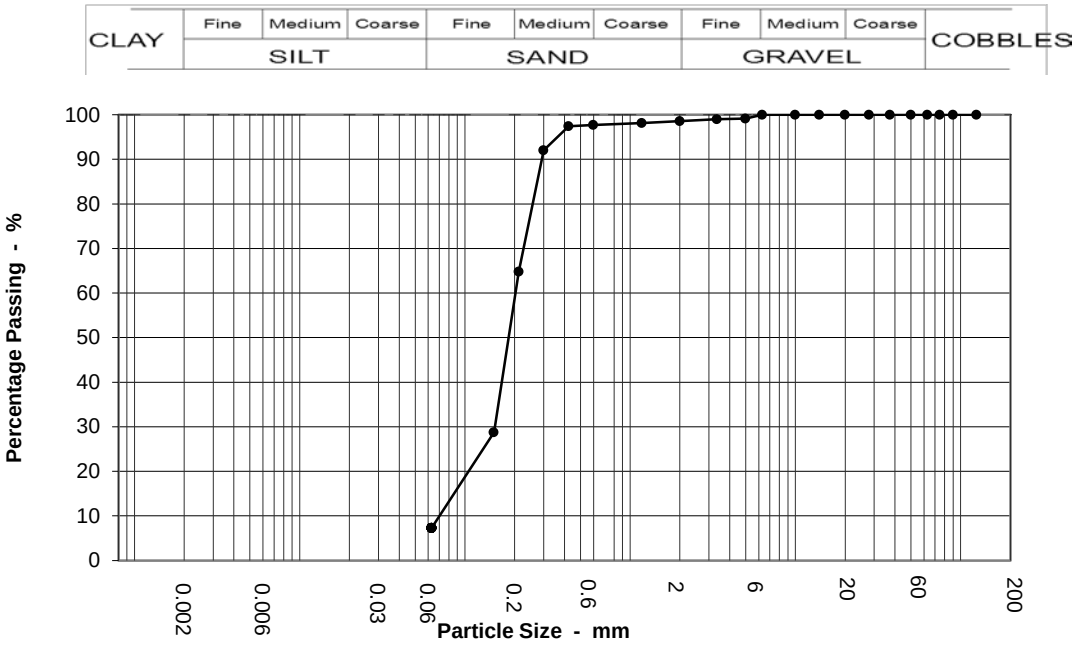
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	BH210
		Depth	15.00 m
Visual Soil Description	Dark grey slightly clayey SAND with rare fine gravel	Sample Type/No	- D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	99		
1.18	98		
0.6	98		
0.425	97		
0.3	92		
0.212	65		
0.15	29		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	1.4
Sand	91.3
Silt & Clay	7.3

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	3

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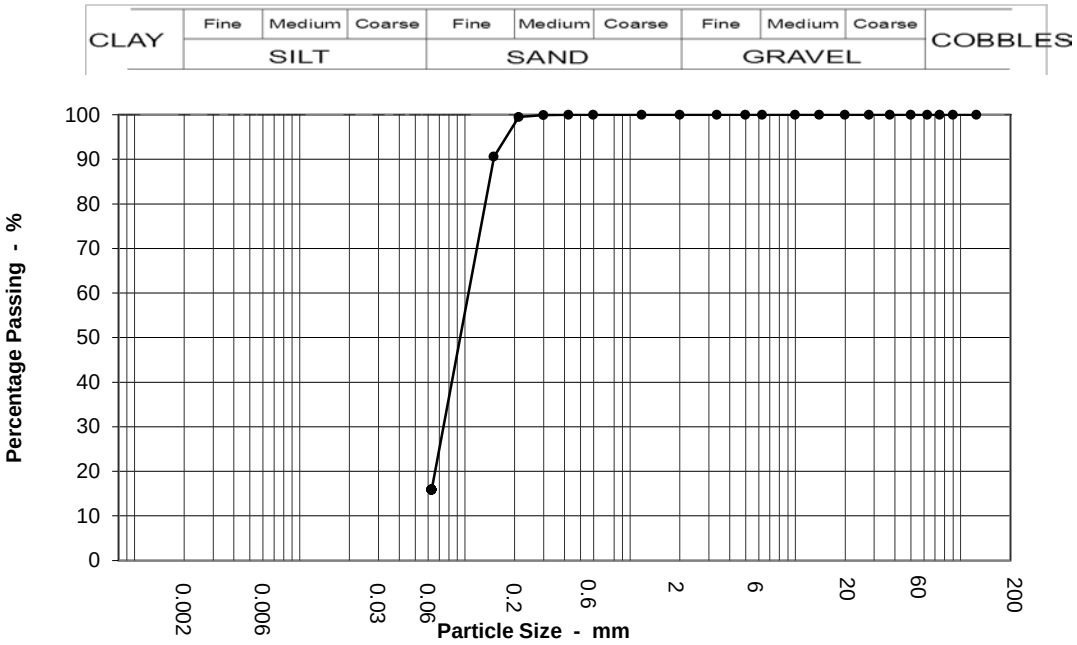
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	TP105
		Depth	1.50 m
Visual Soil Description	Pale brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	91		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	84.1
Silt & Clay	15.9

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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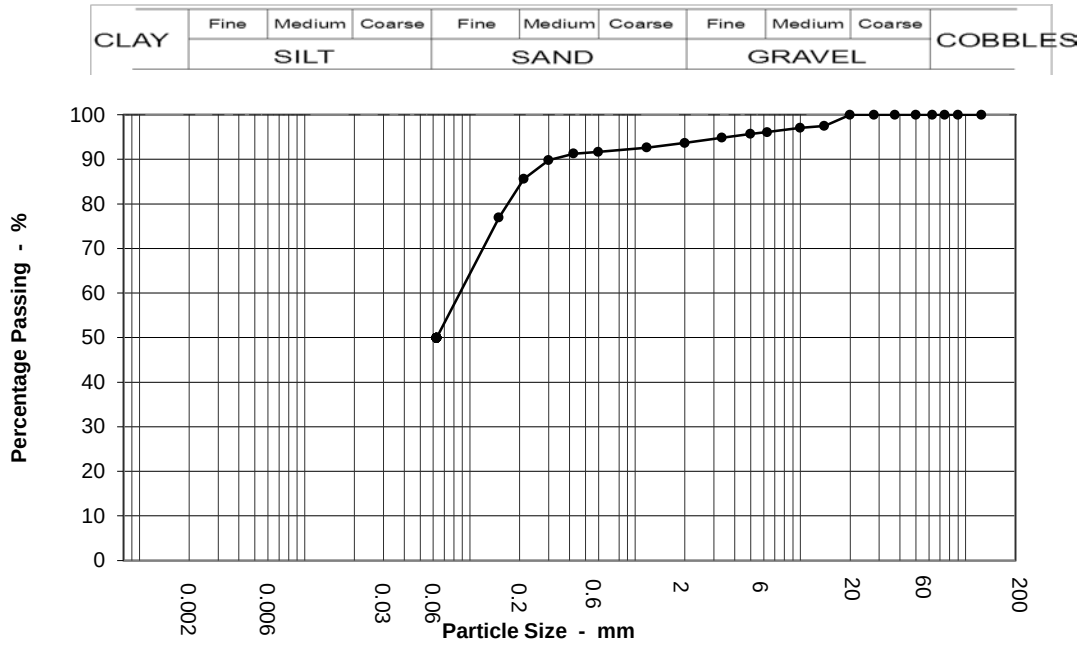
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	TP107
		Depth	1.50 m
Visual Soil Description	Brown and occasional orange brown sandy CLAY with occasional weakly cemented fm mudstone fragments	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	97		
6.3	96		
5	96		
3.35	95		
2	94		
1.18	93		
0.6	92		
0.425	91		
0.3	90		
0.212	86		
0.15	77		
0.063	50		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	6.3
Sand	43.7
Silt & Clay	50.0

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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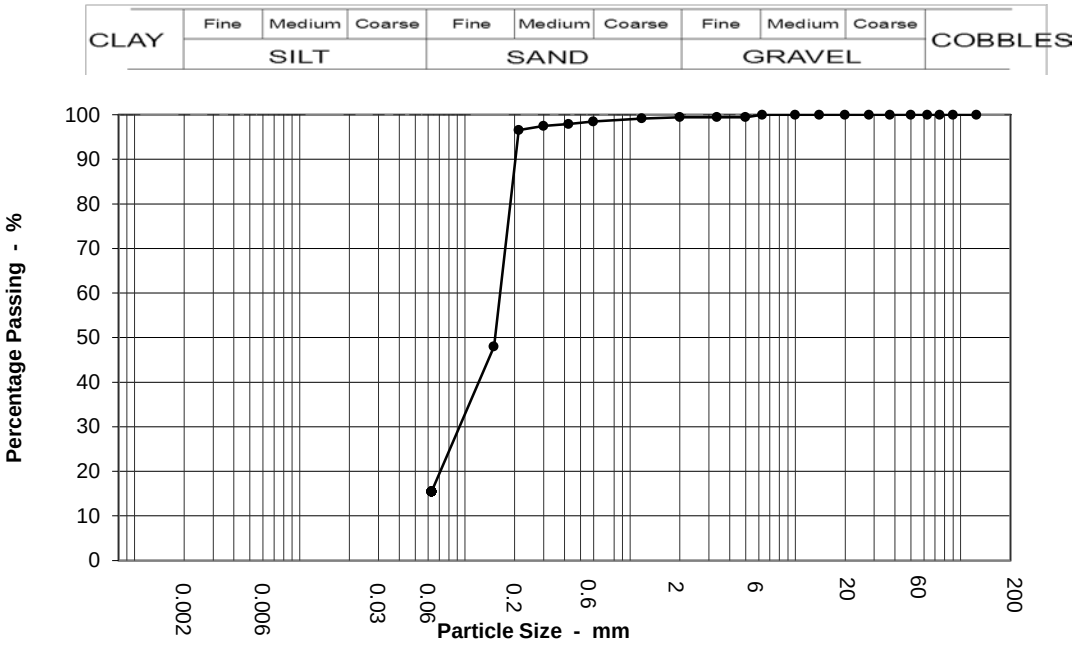
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS216
		Depth	2.50 m
Visual Soil Description	Brownish grey slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	99		
1.18	99		
0.6	99		
0.425	98		
0.3	97		
0.212	97		
0.15	48		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.5
Sand	84.0
Silt & Clay	15.5

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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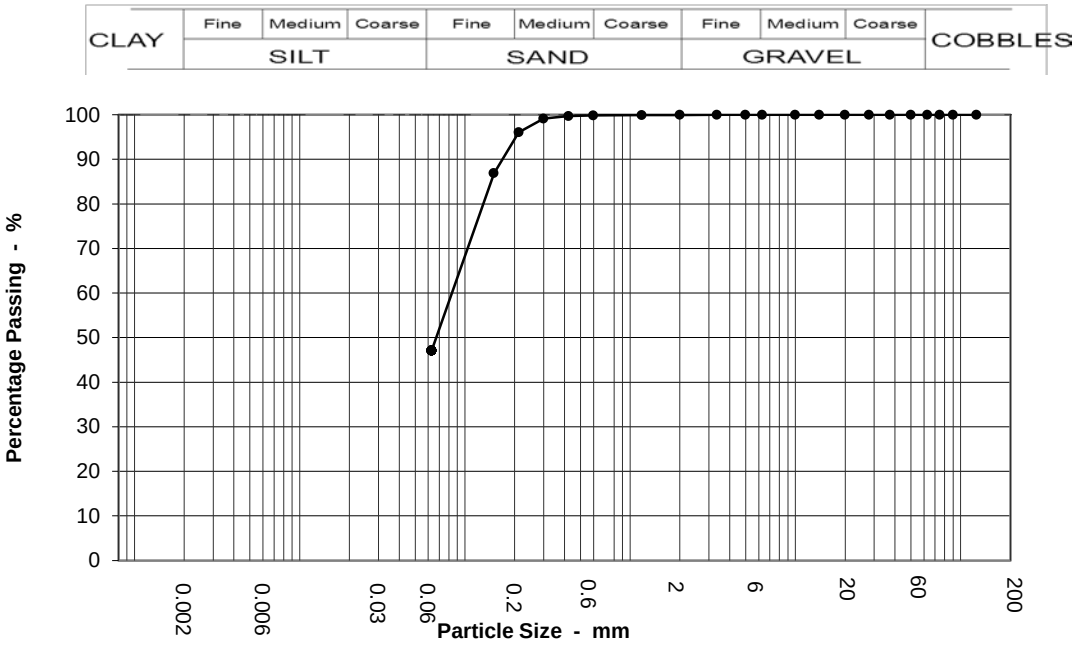
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS217
		Depth	2.00 m
Visual Soil Description	Brown silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	96		
0.15	87		
0.063	47		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	52.9
Silt & Clay	47.1

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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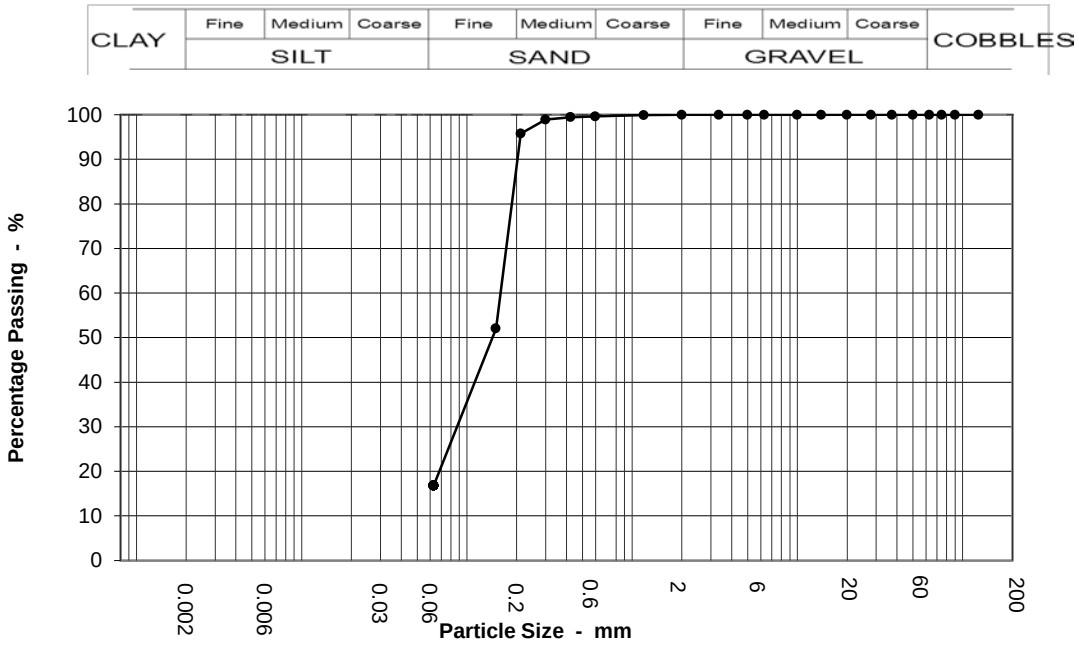
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS219
		Depth	1.50 m
Visual Soil Description	Brown and occasional blue grey slightly silty slightly clayey SAND with traces of fine roots	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	96		
0.15	52		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	83.2
Silt & Clay	16.8

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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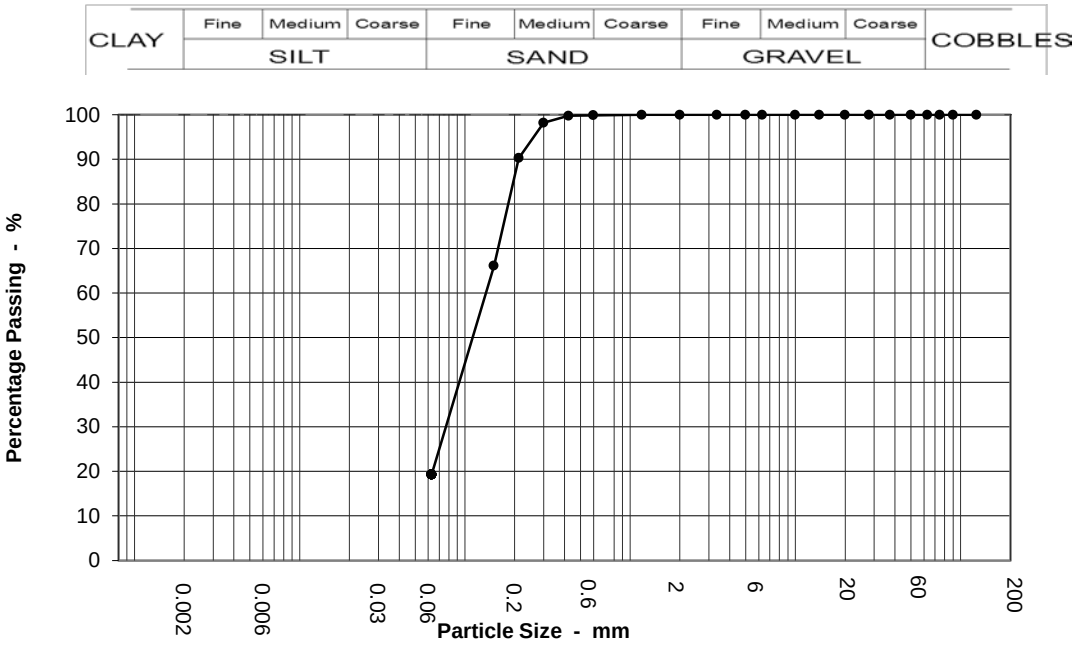
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS219
		Depth	3.00 m
Visual Soil Description	Greyish brown slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	98		
0.212	90		
0.15	66		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	80.7
Silt & Clay	19.3

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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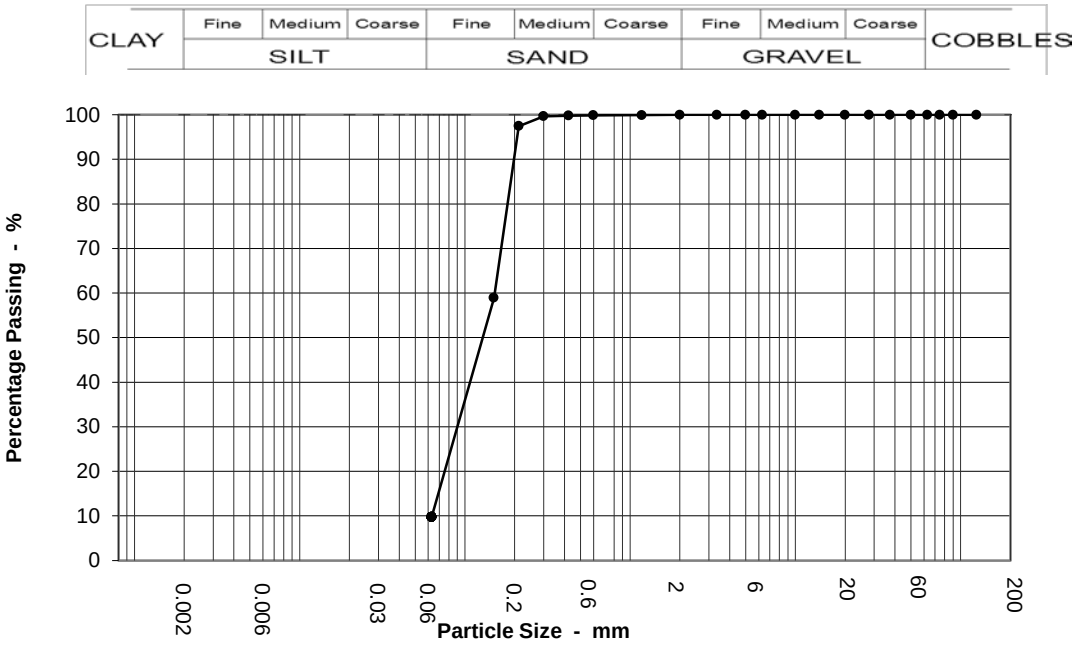
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS222
		Depth	2.00 m
Visual Soil Description	Greyish brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	97		
0.15	59		
0.063	10		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	90.3
Silt & Clay	9.7

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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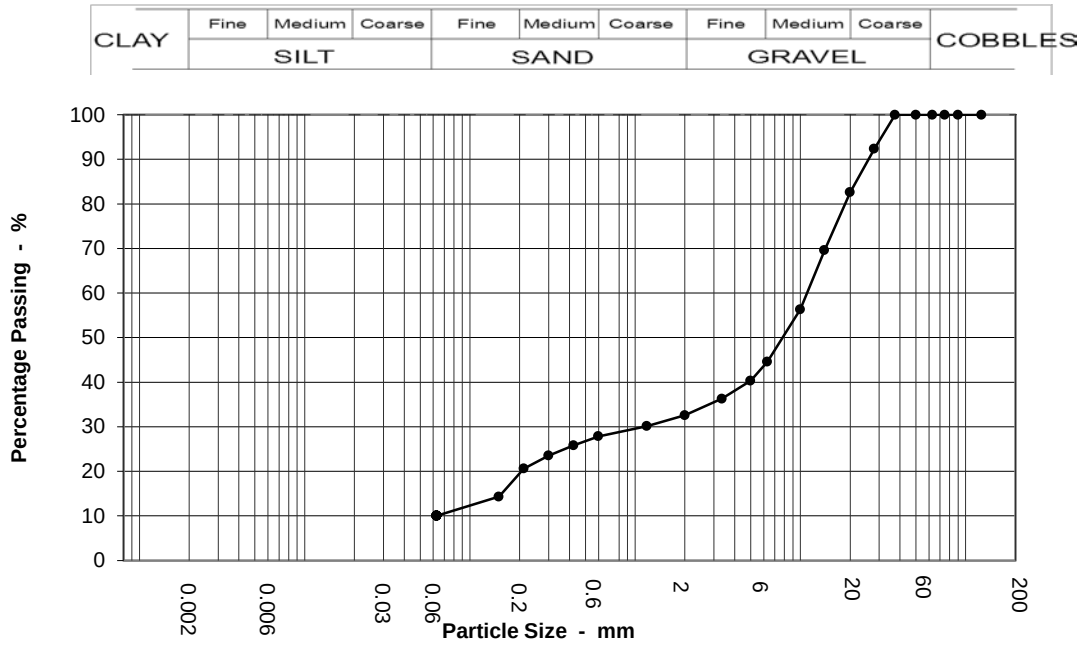
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS223
		Depth	2.50 m
Visual Soil Description	Brown and occasional blue grey slightly clayey sandy GRAVEL (gravel is fmc and sub-rounded to angular)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	83		
14	70		
10	56		
6.3	45		
5	40		
3.35	36		
2	33		
1.18	30		
0.6	28		
0.425	26		
0.3	24		
0.212	21		
0.15	14		
0.063	10		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	67.4
Sand	22.6
Silt & Clay	10.0

Grading Analysis	
D100	125.0
D60	11.1
D10	
Uniformity Coefficient	N/A

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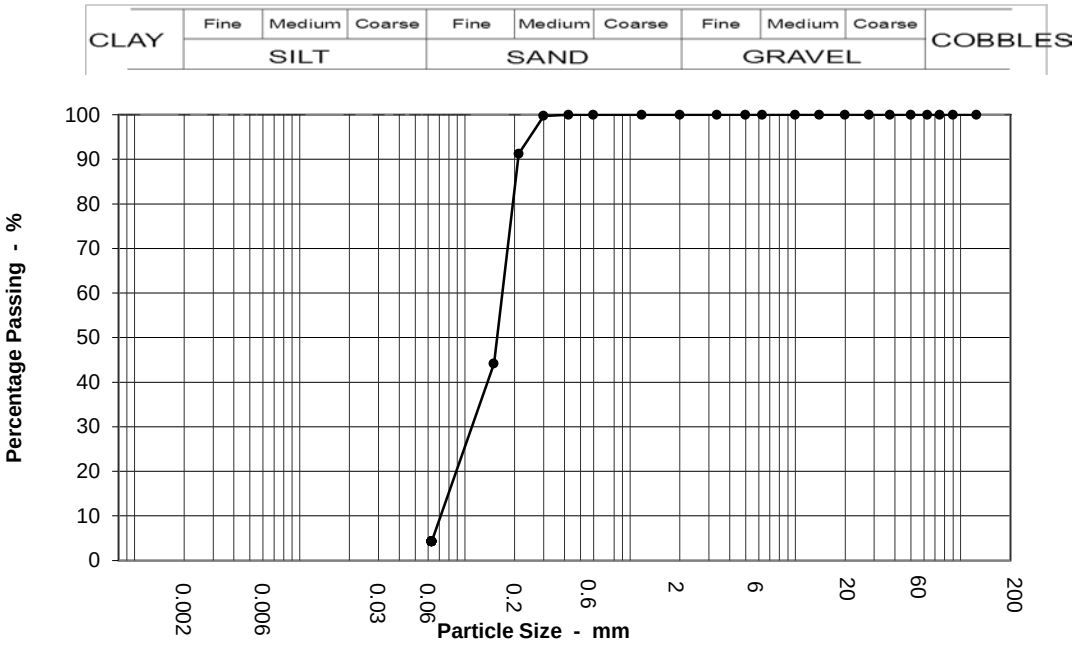
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS228
		Depth	1.50 m
Visual Soil Description	Orange brown slightly silty SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	91		
0.15	44		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	95.8
Silt & Clay	4.2

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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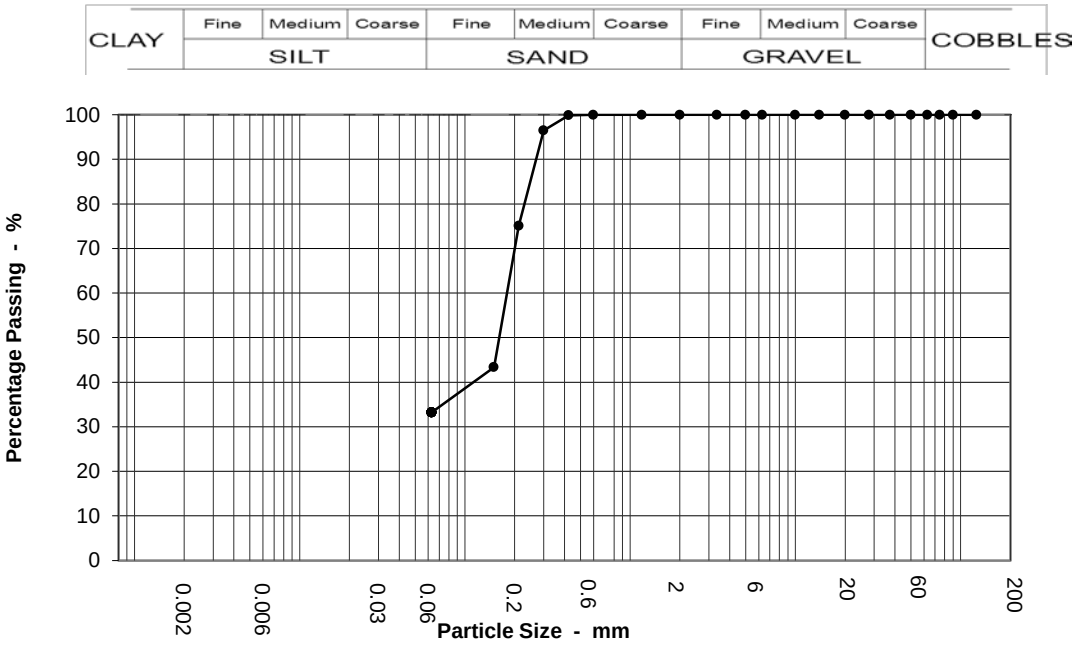
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS230
		Depth	2.00 m
Visual Soil Description	Brown and blue grey clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	96		
0.212	75		
0.15	43		
0.063	33		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	66.8
Silt & Clay	33.2

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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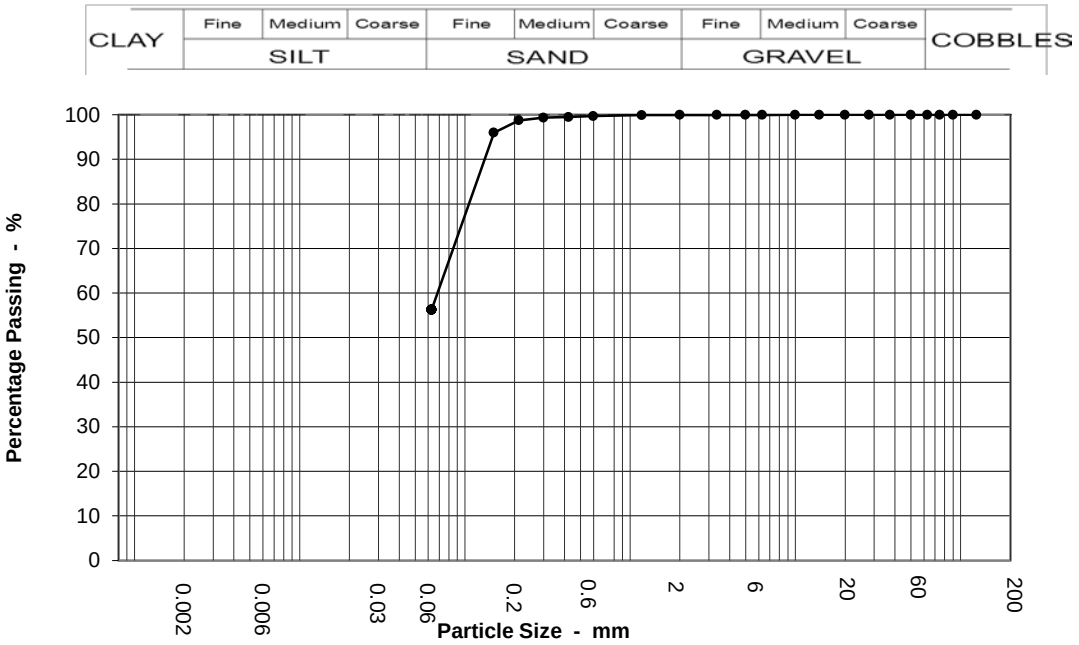
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS232
		Depth	1.50 m
Visual Soil Description	Pale brown, pale grey and orange brown laminated silty sandy CLAY	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	99		
0.15	96		
0.063	56		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	43.7
Silt & Clay	56.2

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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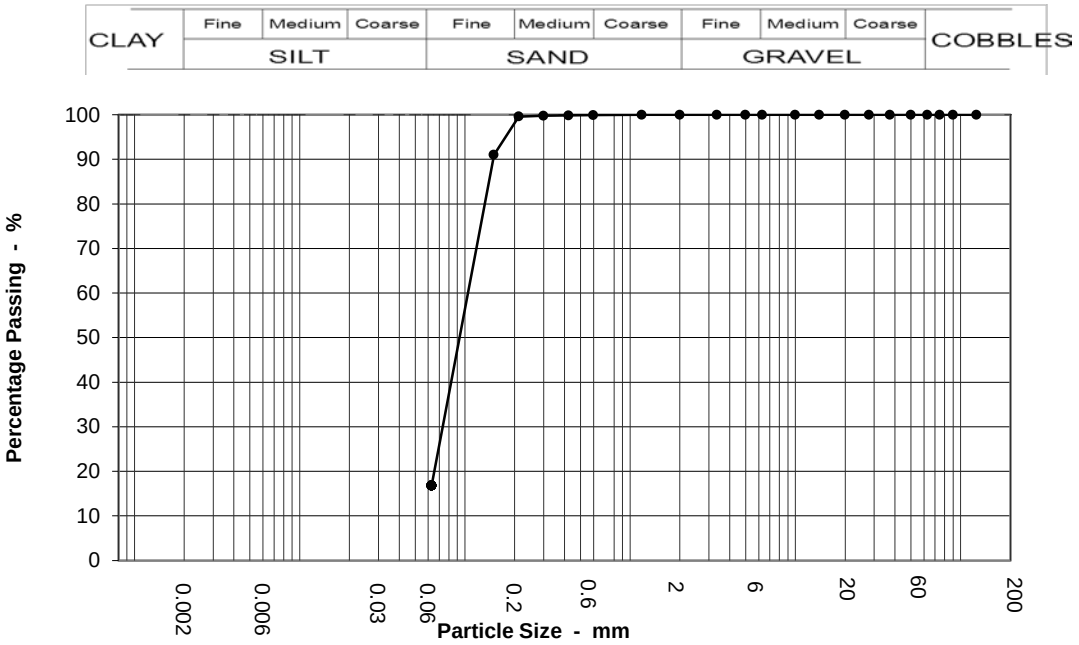
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS233
		Depth	1.50 m
Visual Soil Description	Pale brown slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	91		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	83.2
Silt & Clay	16.8

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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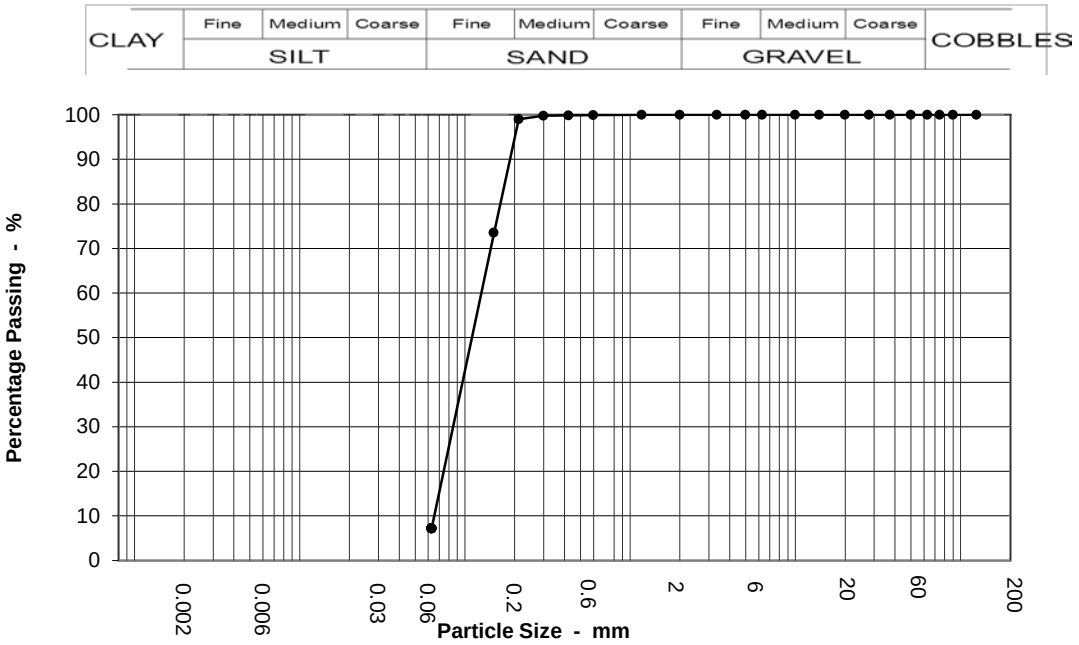
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS239
		Depth	1.00 m
Visual Soil Description	Pale brown slightly clayey slightly silty SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	74		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	92.8
Silt & Clay	7.2

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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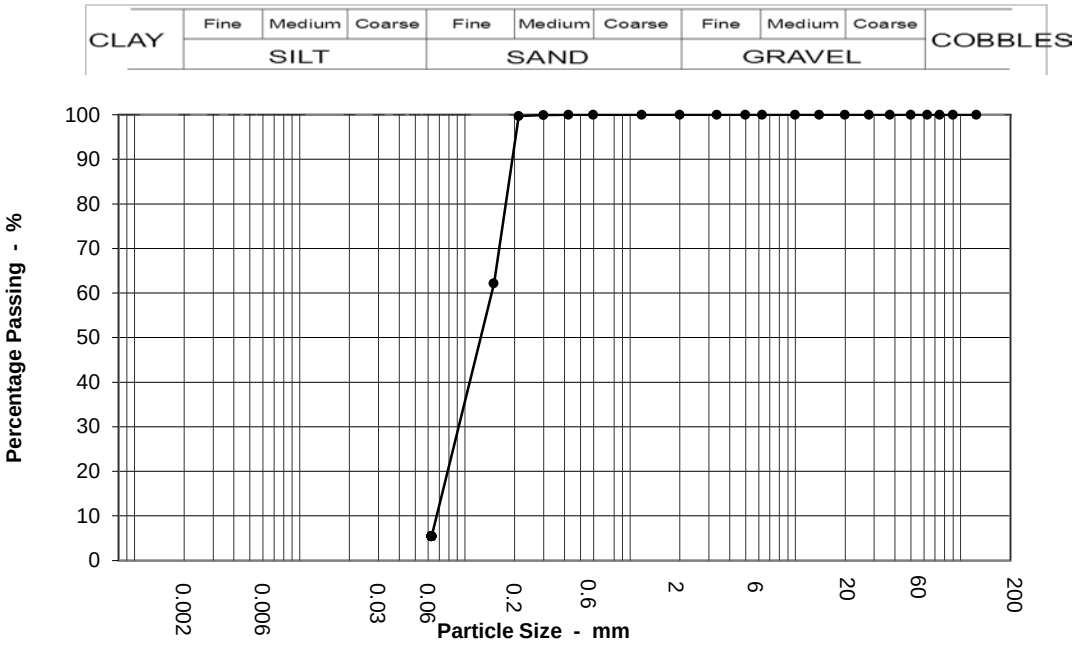
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS239
		Depth	2.50 m
Visual Soil Description	Pale brown slightly silty SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	62		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	94.6
Silt & Clay	5.4

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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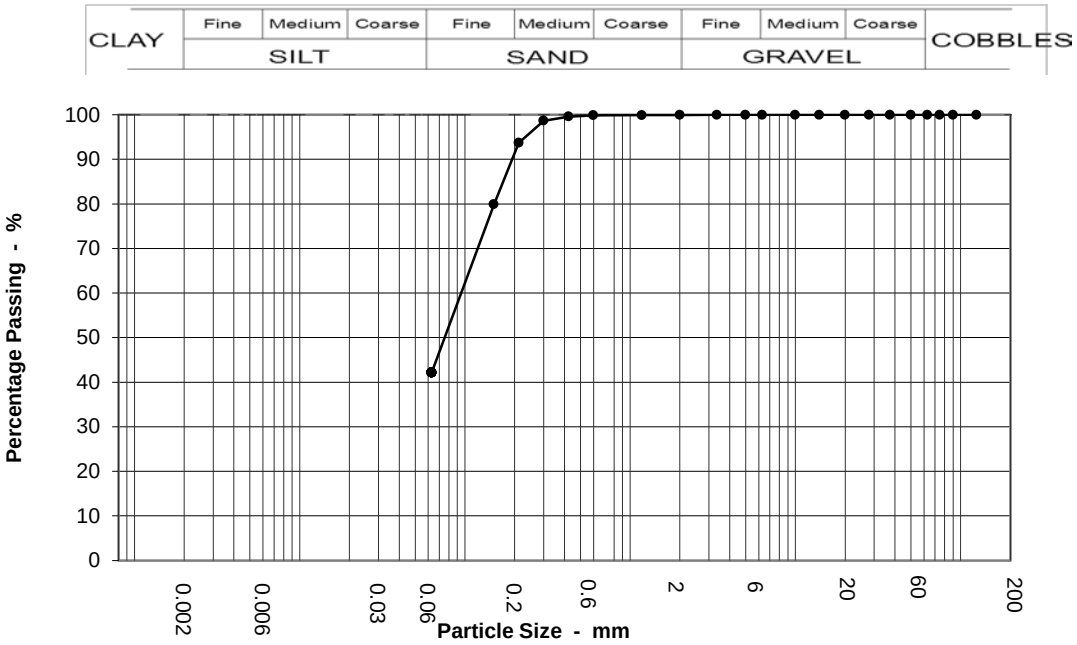
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Date: 15/10/2013

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS243
		Depth	1.50 m
Visual Soil Description	Brown, orange brown and pale grey very sandy CLAY	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	94		
0.15	80		
0.063	42		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	57.8
Silt & Clay	42.2

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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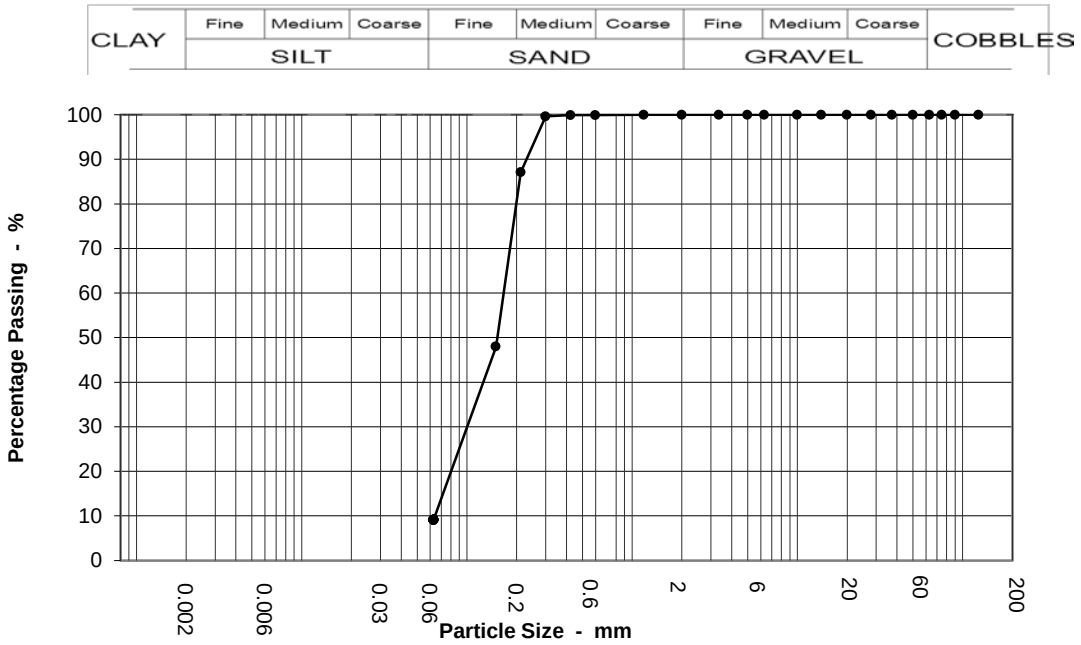
Approved Signatories:
K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

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Initials: kp
Date: 15/10/2013

UKAS TESTING

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS244
		Depth	2.00 m
Visual Soil Description	Brown and greyish brown slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	87		
0.15	48		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	90.9
Silt & Clay	9.1

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	3

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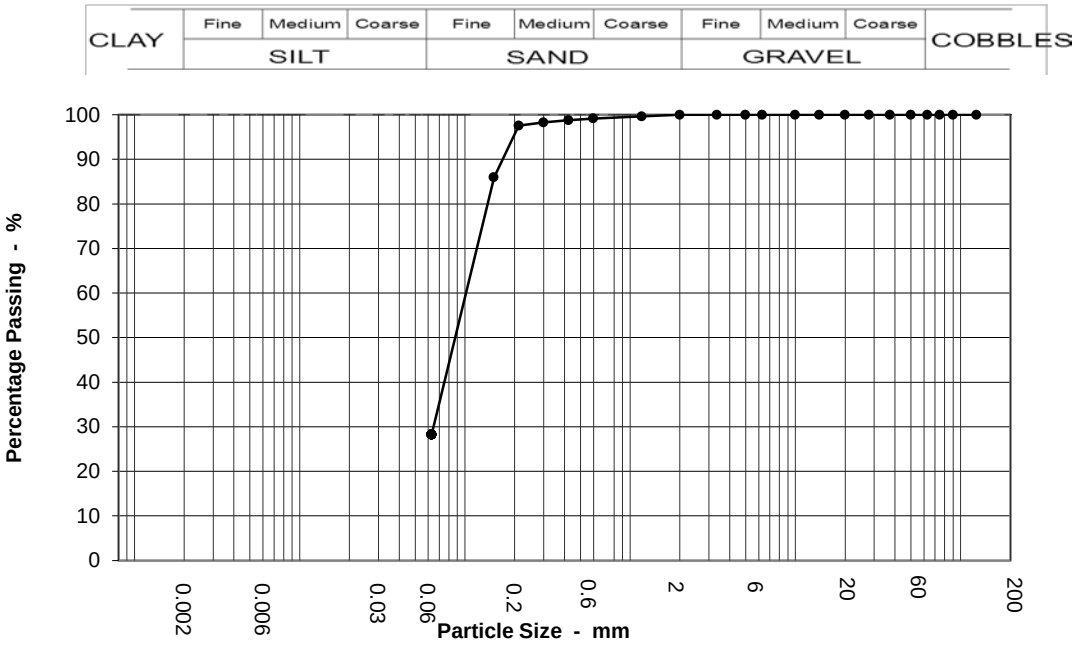
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS245
		Depth	1.50 m
Visual Soil Description	Dark greenish grey clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	98		
0.15	86		
0.063	28		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	71.8
Silt & Clay	28.2

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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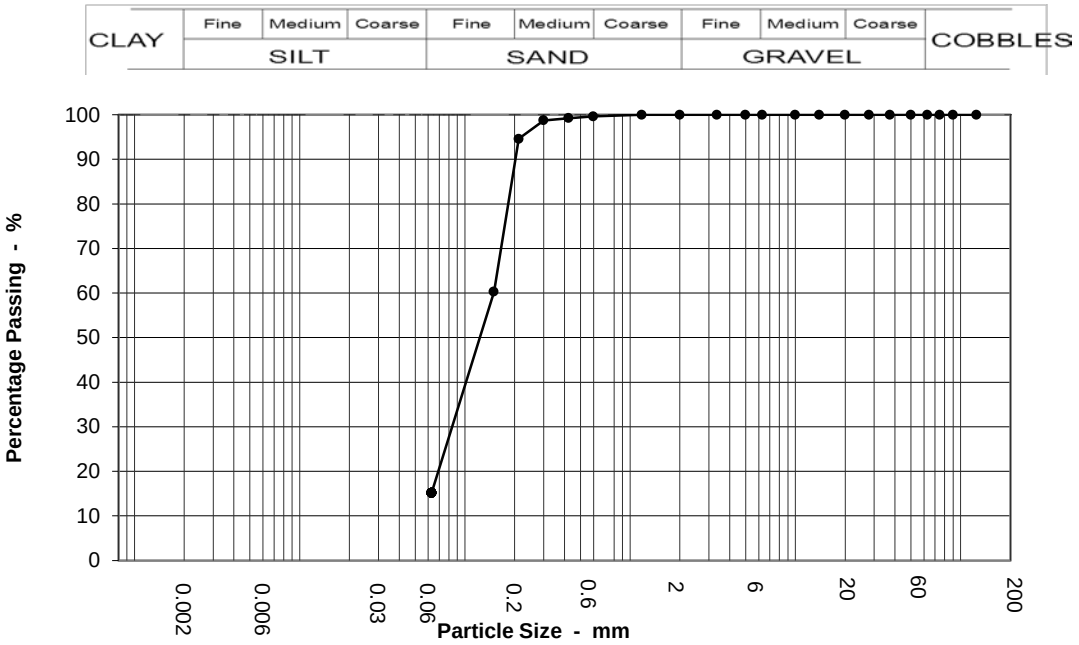
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS247
		Depth	2.00 m
Visual Soil Description	Greenish grey slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	95		
0.15	60		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	84.8
Silt & Clay	15.2

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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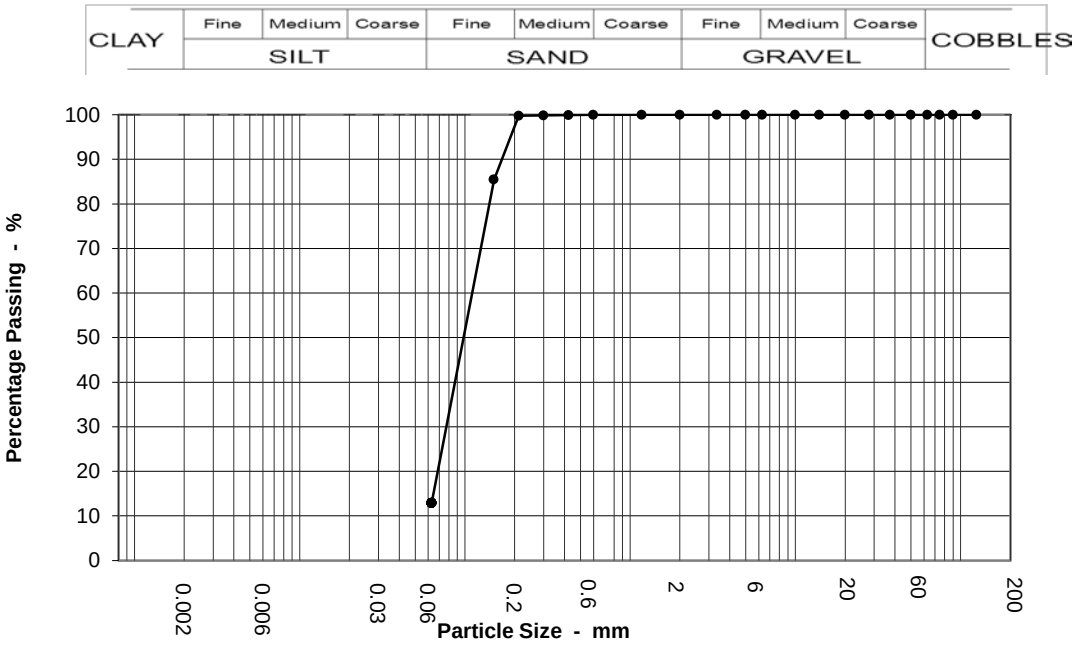
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS248
		Depth	1.50 m
Visual Soil Description	Greenish brown and brown slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	85		
0.063	13		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	87.1
Silt & Clay	12.9

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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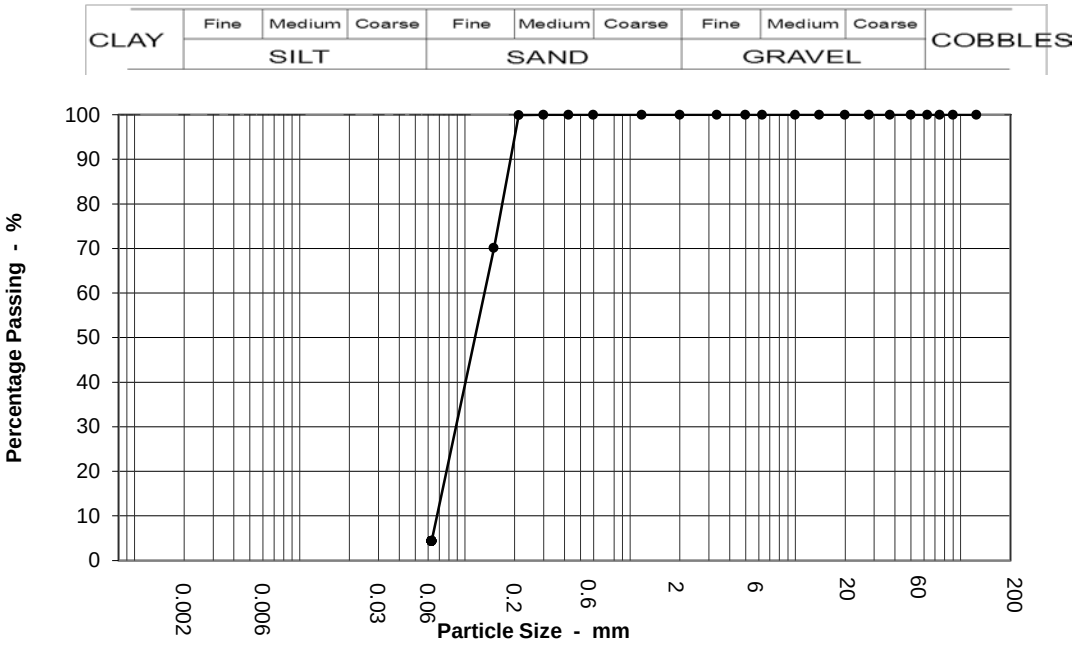
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS251
		Depth	2.50 m
Visual Soil Description	Pale brown slightly silty SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	70		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	95.6
Silt & Clay	4.4

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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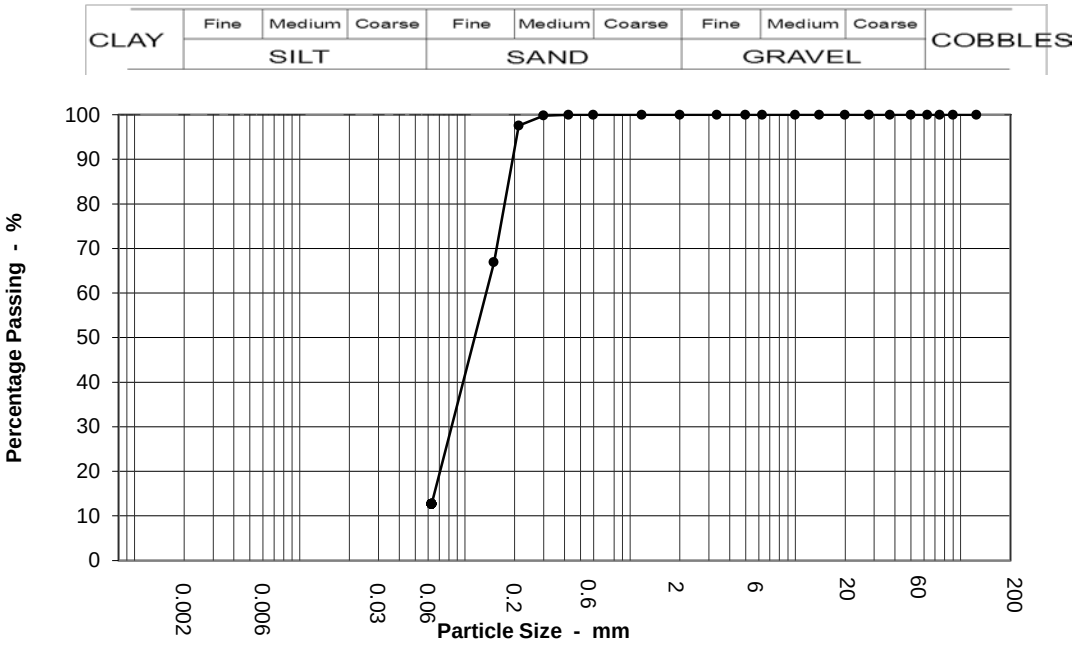
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS256
		Depth	2.50 m
Visual Soil Description	Pale brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	98		
0.15	67		
0.063	13		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	87.3
Silt & Clay	12.7

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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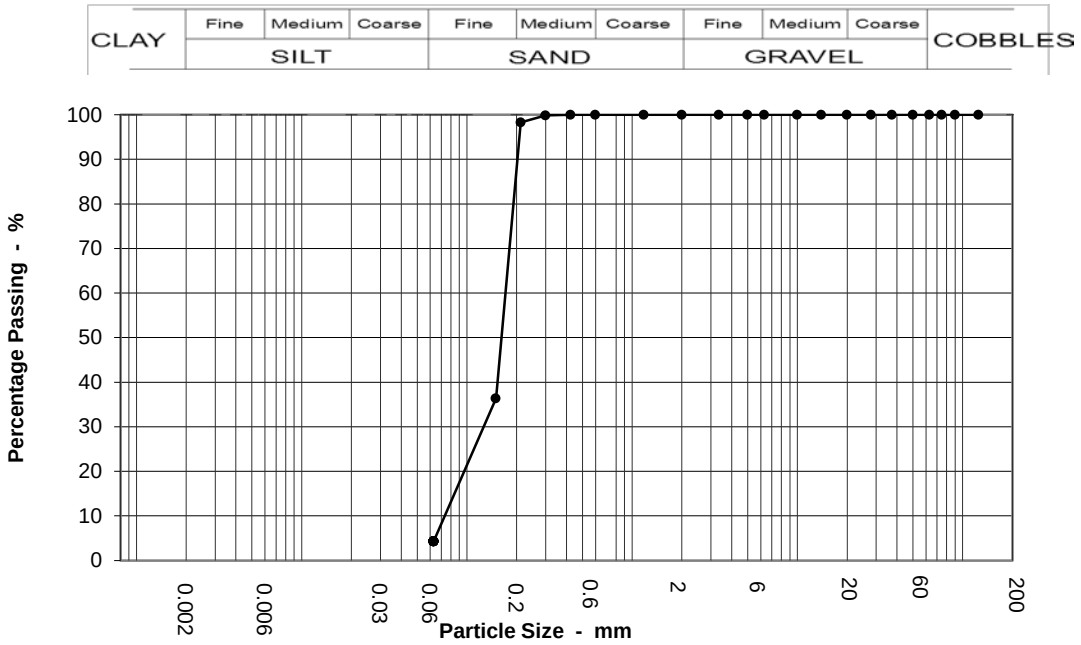
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS258
		Depth	1.50 m
Visual Soil Description	Brown slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	98		
0.15	36		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	95.7
Silt & Clay	4.3

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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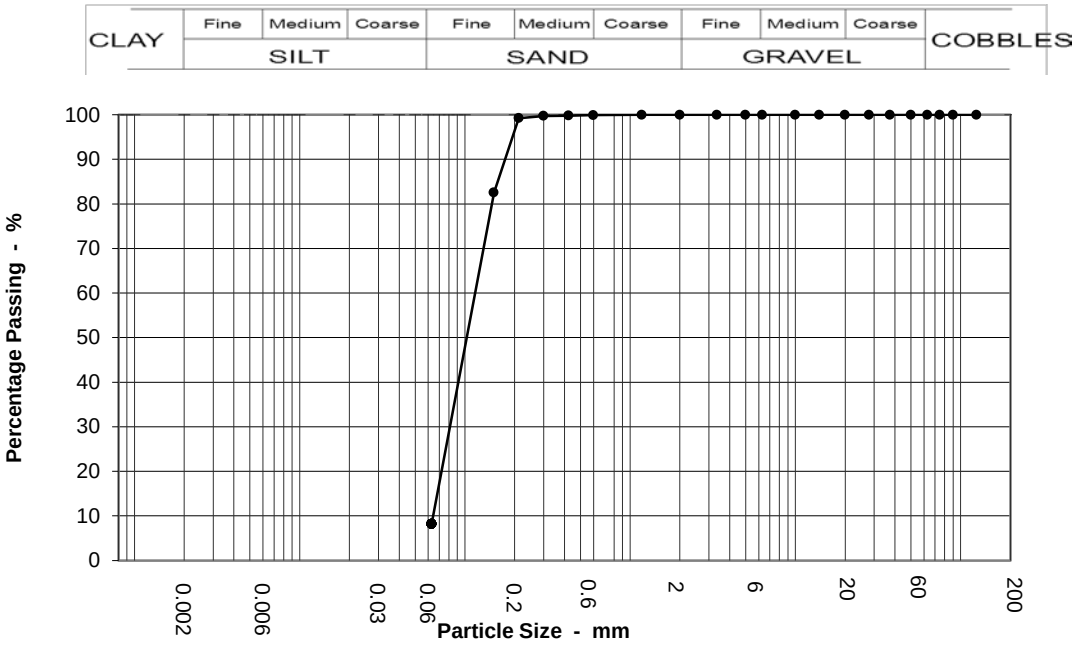
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Initials: kp
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS262
		Depth	1.50 m
Visual Soil Description	Pale brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	83		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	91.8
Silt & Clay	8.2

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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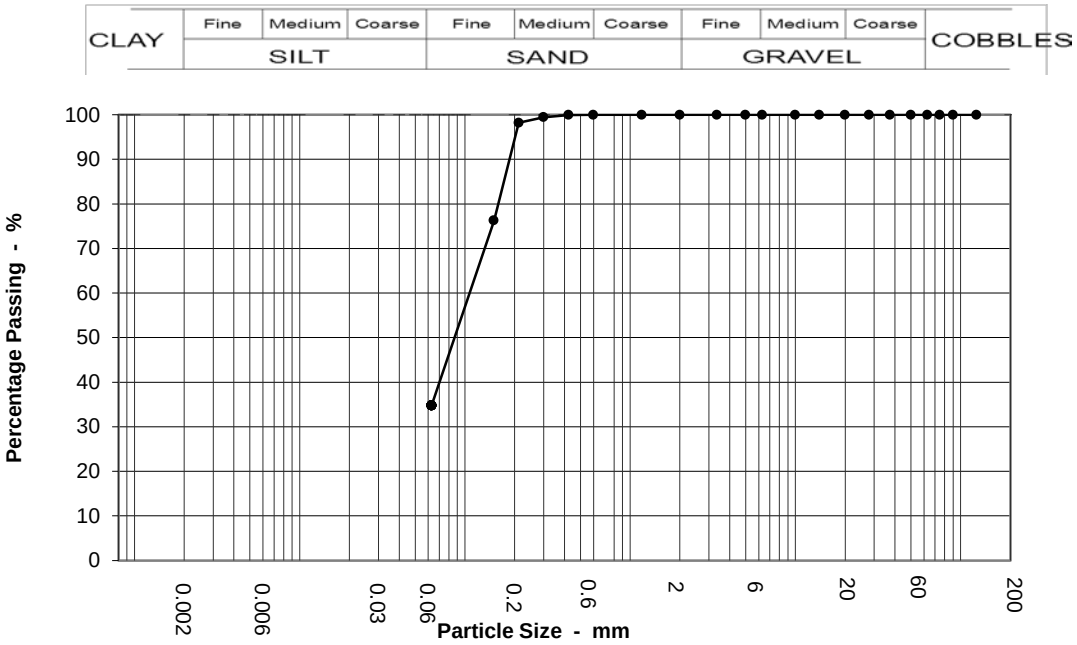
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS273
		Depth	2.50 m
Visual Soil Description	Pale brown clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	98		
0.15	76		
0.063	35		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	65.2
Silt & Clay	34.8

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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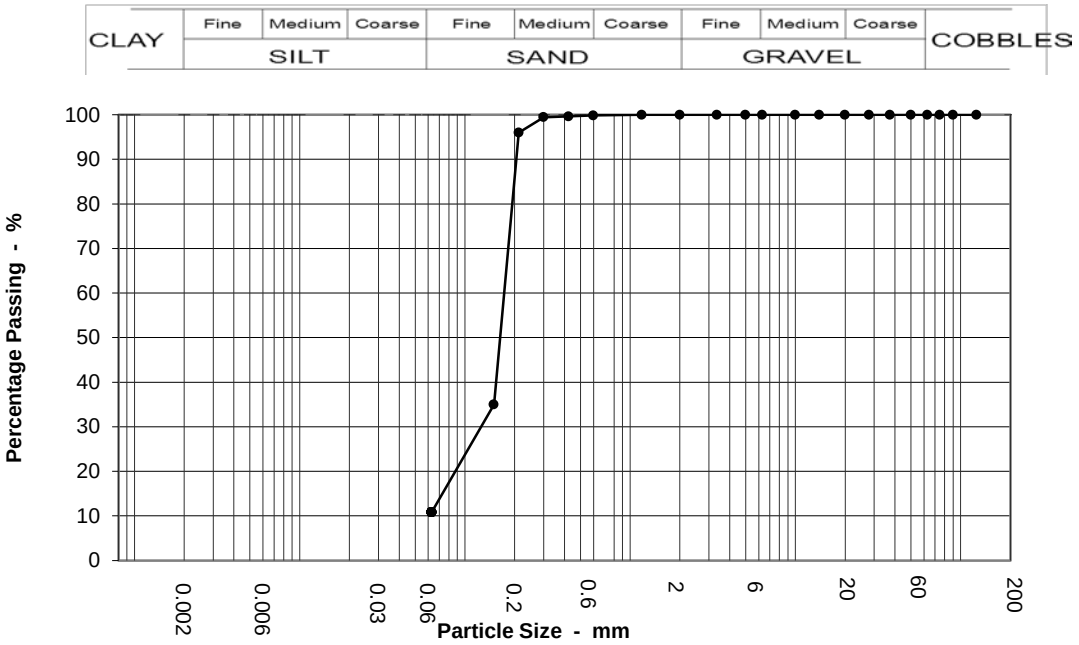
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS280
		Depth	2.00 m
Visual Soil Description	Pale brown and brown slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	96		
0.15	35		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	89.1
Silt & Clay	10.9

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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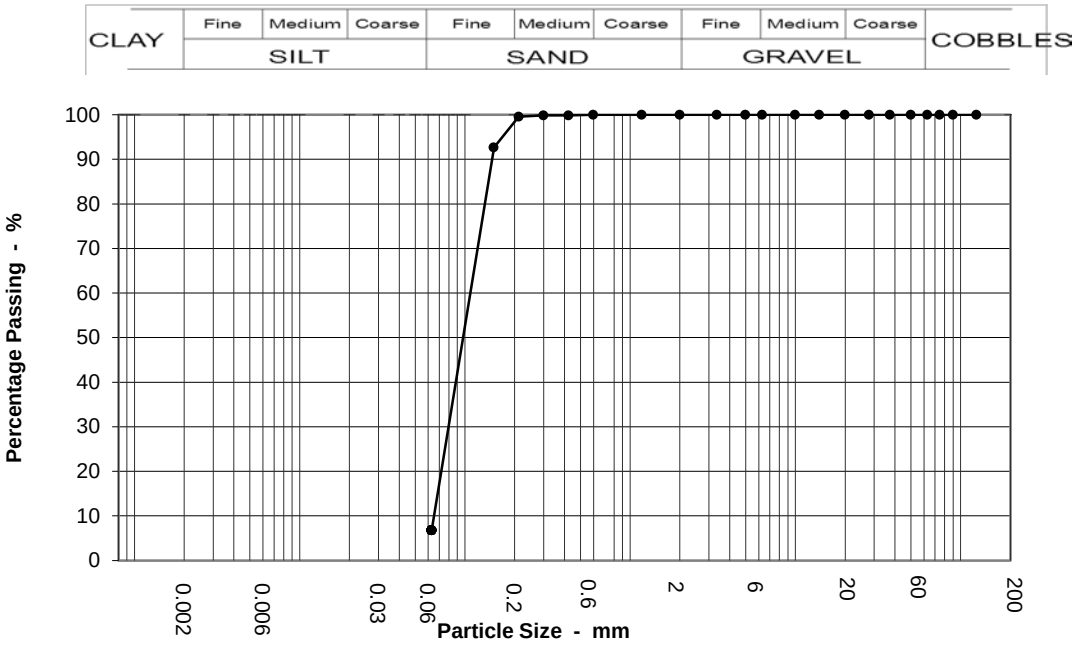
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS282
		Depth	2.50 m
Visual Soil Description	Brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	93		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	93.2
Silt & Clay	6.8

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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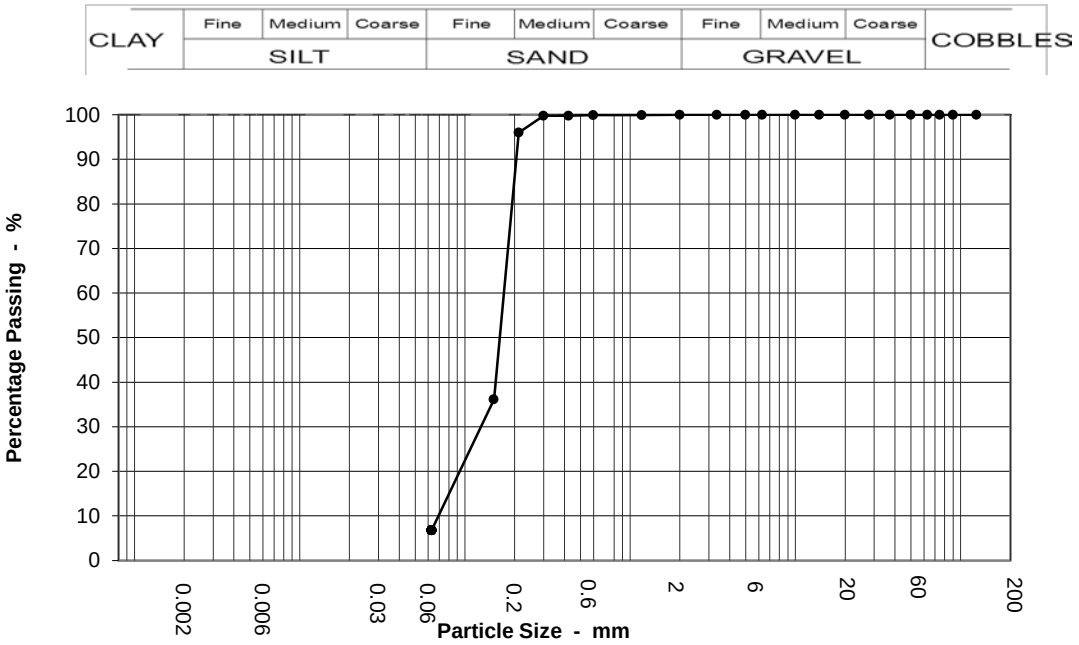
Approved Signatories:
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Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS283
		Depth	1.50 m
Visual Soil Description	Pale brown slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	96		
0.15	36		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	93.2
Silt & Clay	6.8

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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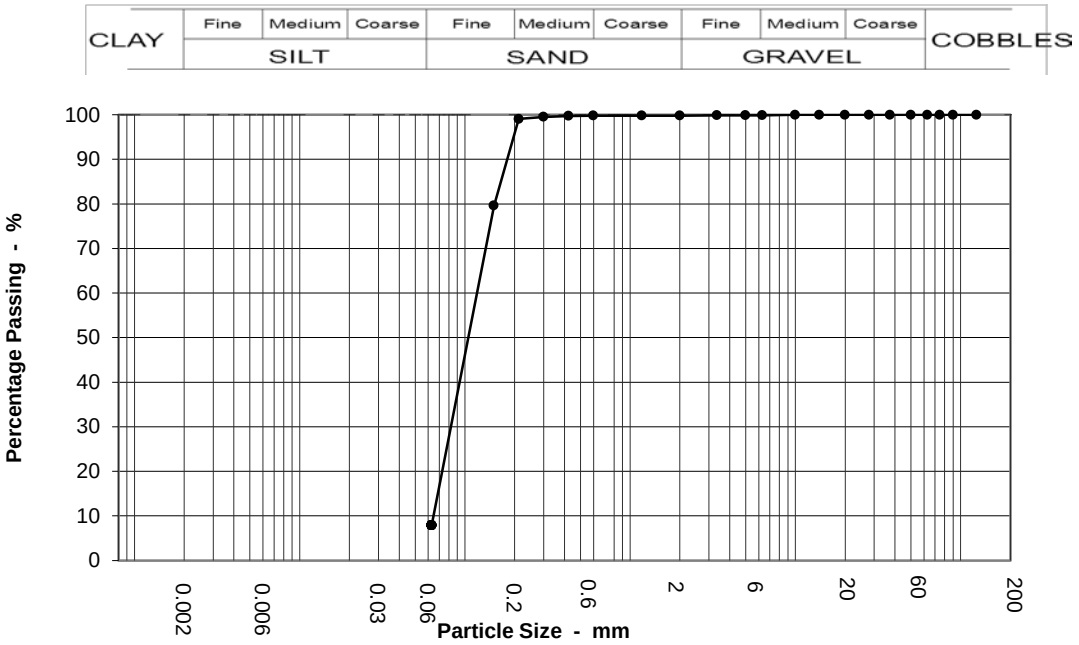
Approved Signatories:
K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

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UKAS TESTING

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS285
		Depth	1.00 m
Visual Soil Description	Brown slightly silty slightly clayey SAND with traces of roots	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	80		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.2
Sand	91.9
Silt & Clay	7.9

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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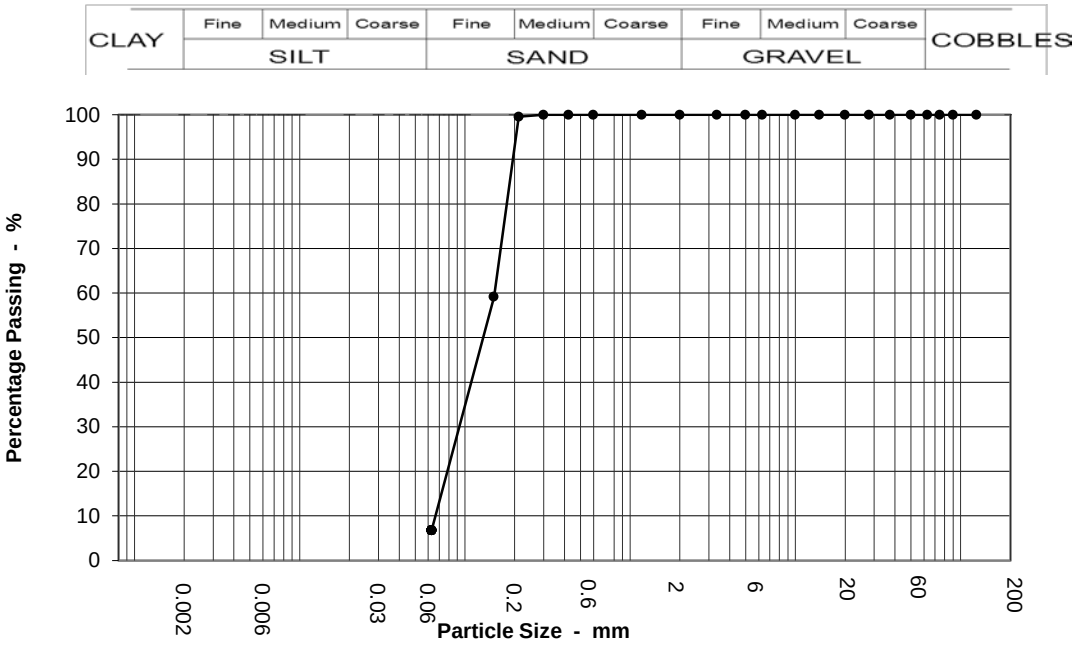
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS287
		Depth	1.00 m
Visual Soil Description	Brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	59		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	93.2
Silt & Clay	6.8

Grading Analysis	
D100	125.0
D60	0.2
D10	0.1
Uniformity Coefficient	2

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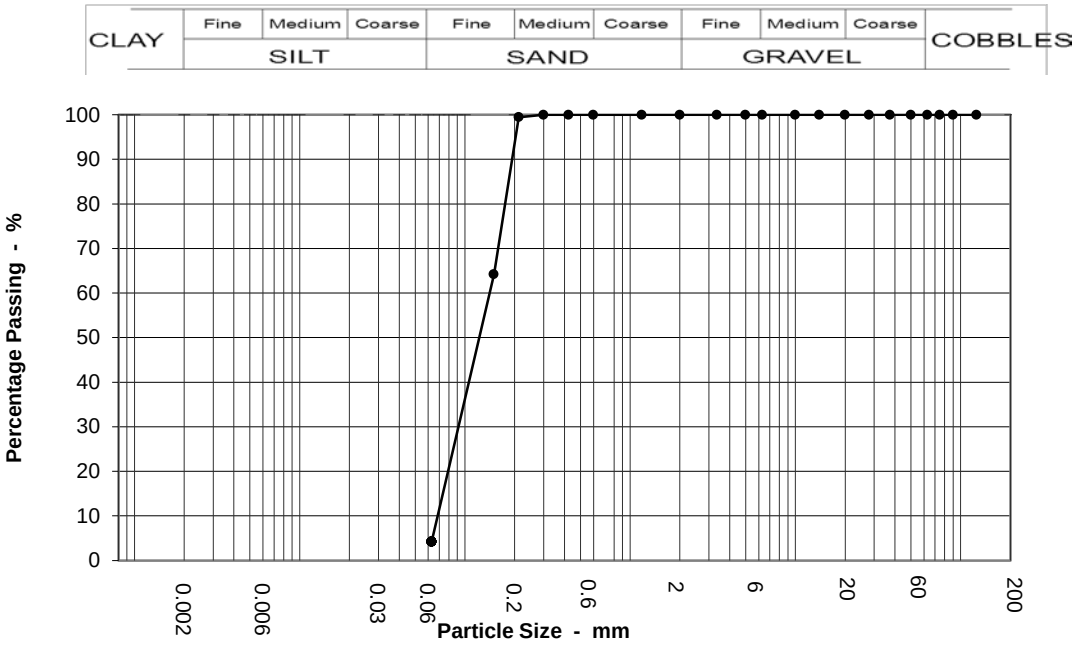
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS288
		Depth	1.50 m
Visual Soil Description	Greenish brown slightly silty SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	64		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	95.8
Silt & Clay	4.2

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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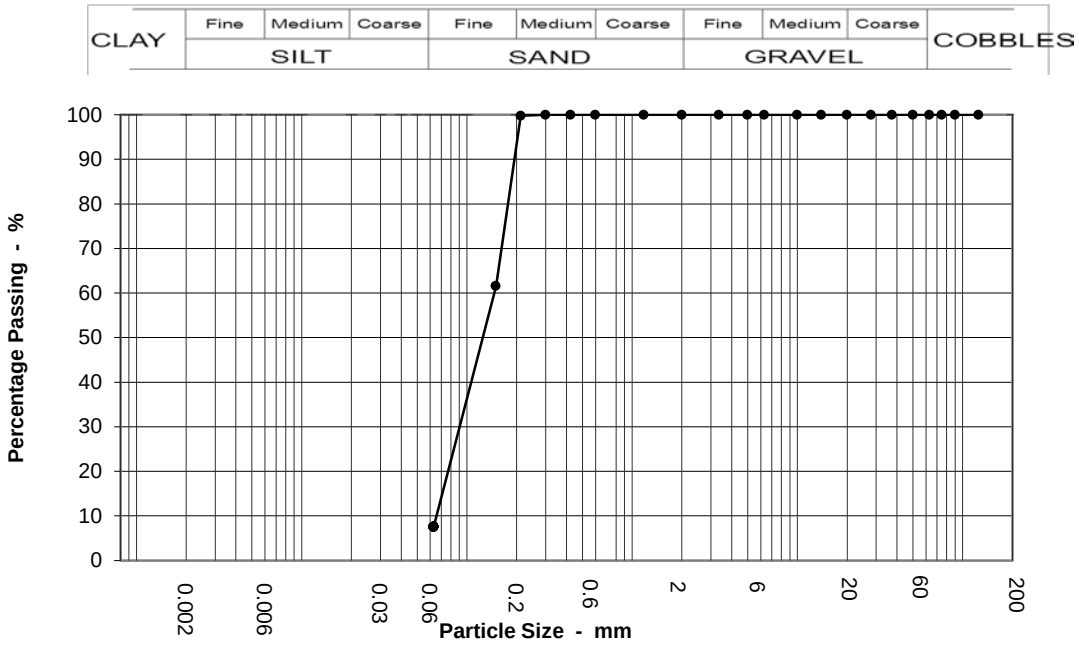
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS303
		Depth	2.50 m
Visual Soil Description	Greenish grey slightly silty SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	62		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	92.5
Silt & Clay	7.5

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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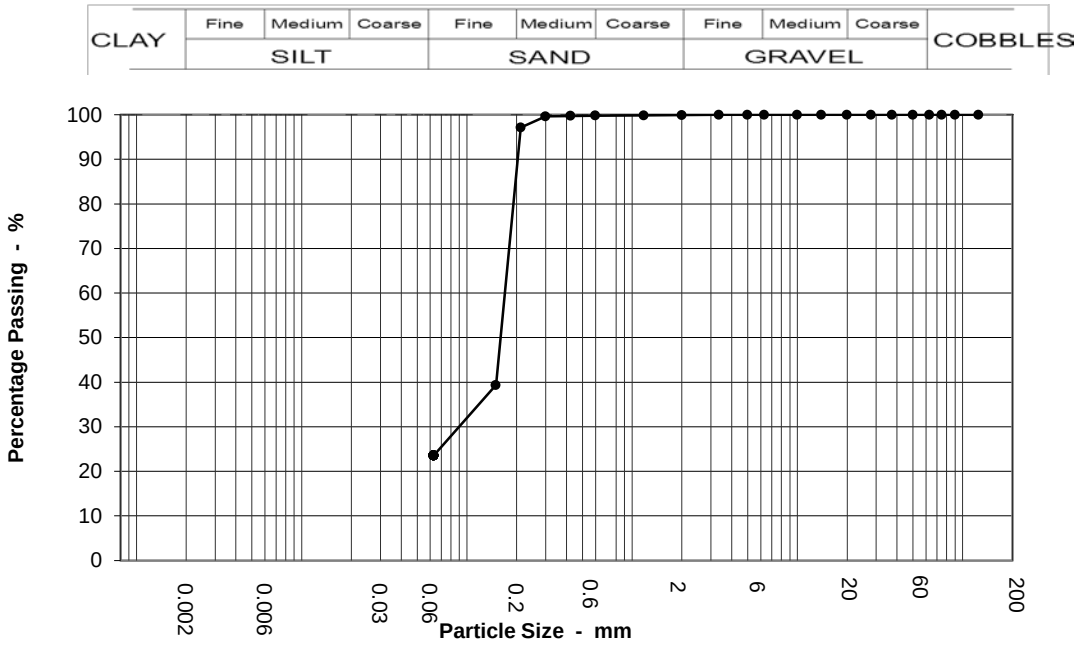
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS308
		Depth	2.50 m
Visual Soil Description	Orange brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	97		
0.15	39		
0.063	24		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	76.4
Silt & Clay	23.6

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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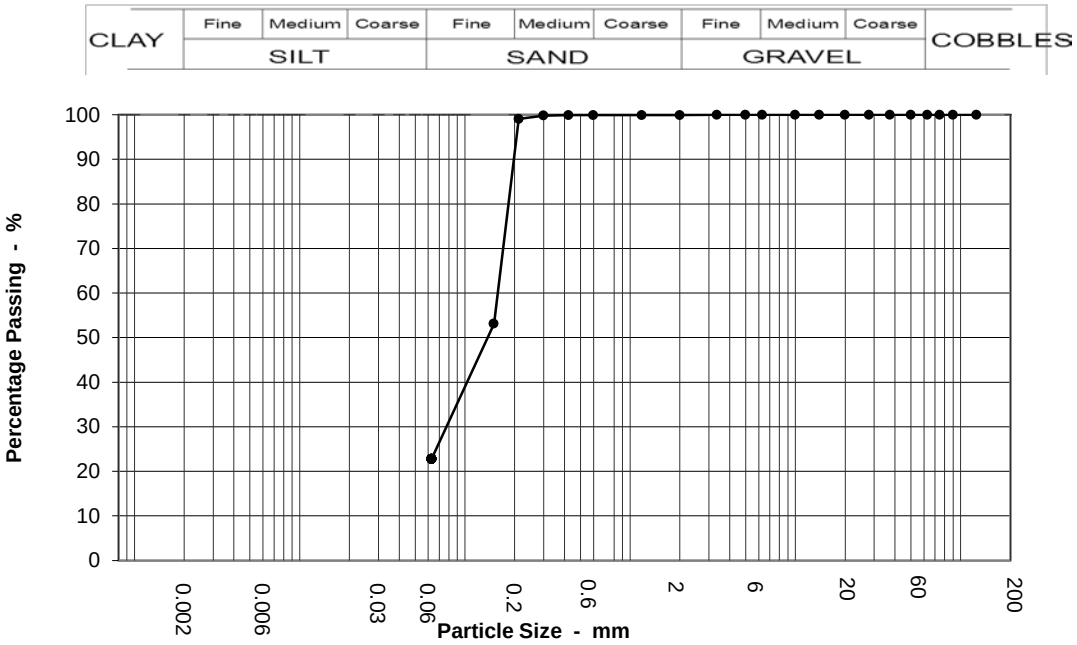
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS324
		Depth	1.50 m
Visual Soil Description	Orange brown and occasional grey slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	53		
0.063	23		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	77.2
Silt & Clay	22.8

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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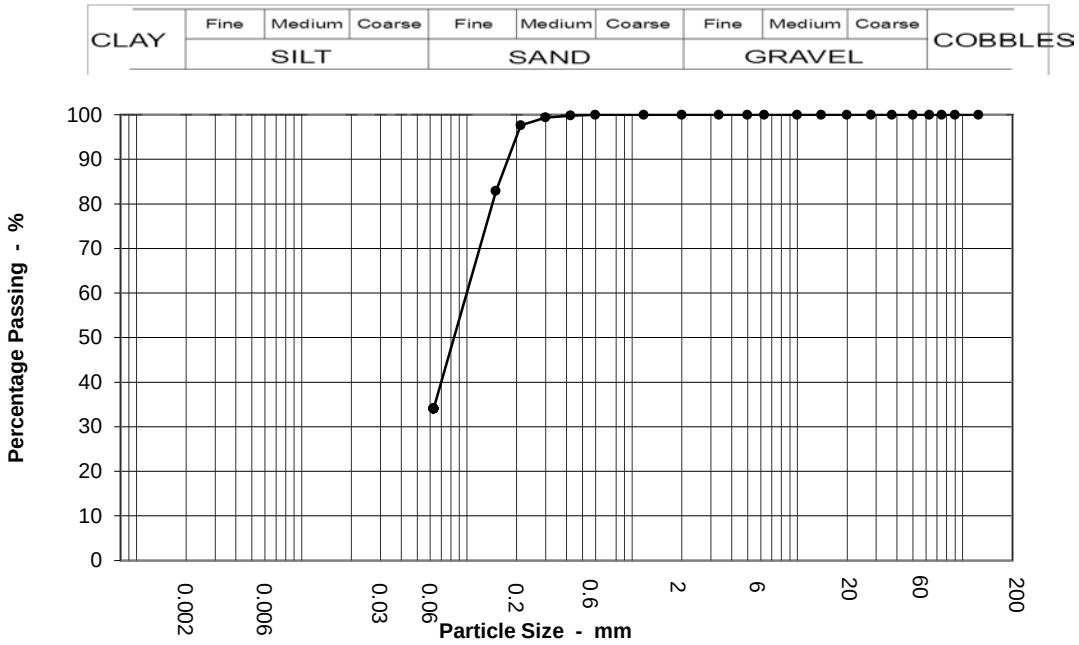
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS328
		Depth	1.50 m
Visual Soil Description	Brown, blue grey and orange brown clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	98		
0.15	83		
0.063	34		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	65.9
Silt & Clay	34.1

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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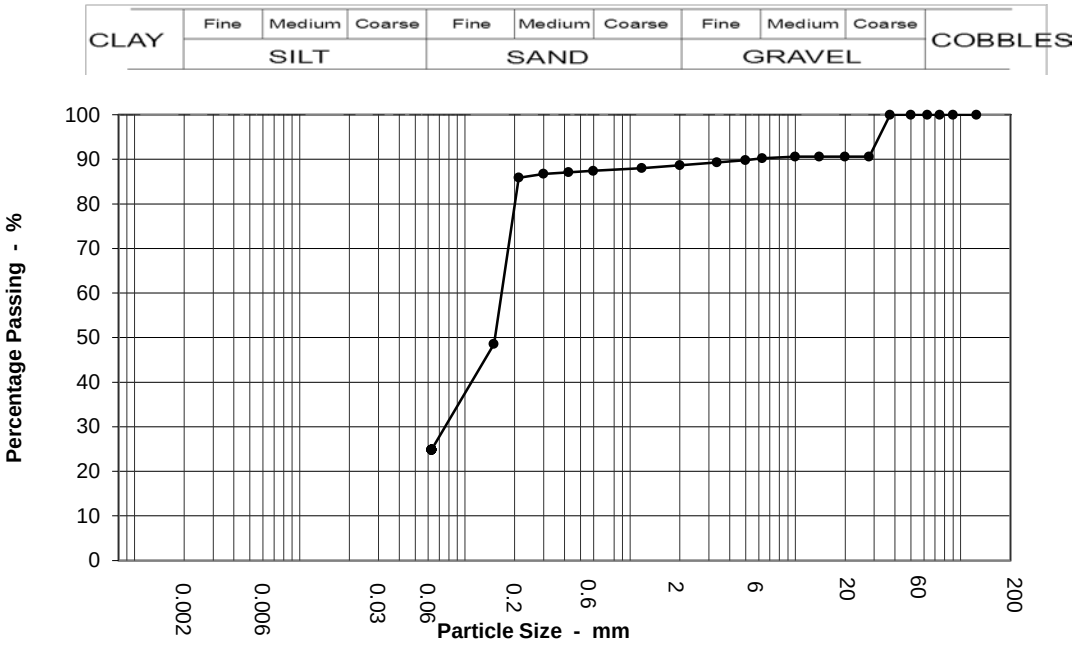
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS330
		Depth	1.50 m
Visual Soil Description	Green slightly gravelly slightly silty clayey SAND (gravel is fmc and sub-angular)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	91		
20	91		
14	91		
10	91		
6.3	90		
5	90		
3.35	89		
2	89		
1.18	88		
0.6	87		
0.425	87		
0.3	87		
0.212	86		
0.15	49		
0.063	25		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	11.3
Sand	63.8
Silt & Clay	24.9

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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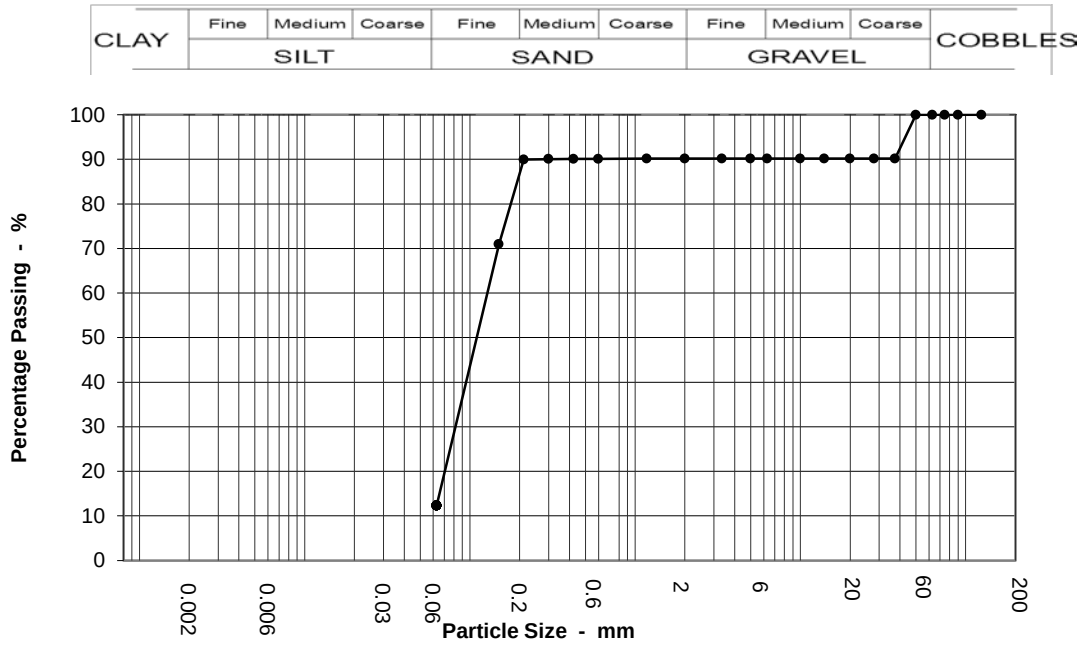
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS331
		Depth	2.50 m
Visual Soil Description	Brownish grey slightly gravelly slightly silty slightly clayey SAND (gravel is coarse and sub-angular)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	90		
28	90		
20	90		
14	90		
10	90		
6.3	90		
5	90		
3.35	90		
2	90		
1.18	90		
0.6	90		
0.425	90		
0.3	90		
0.212	90		
0.15	71		
0.063	12		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	9.8
Sand	77.9
Silt & Clay	12.3

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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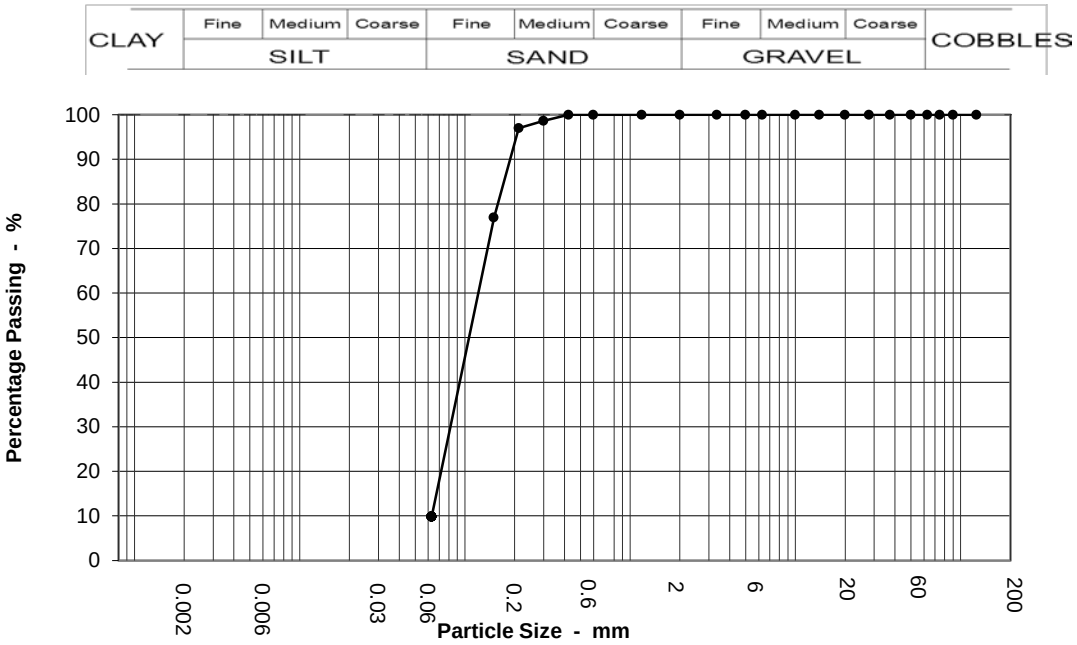
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS333
		Depth	2.00 m
Visual Soil Description	Greenish brown slightly silty slightly clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	97		
0.15	77		
0.063	10		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	90.2
Silt & Clay	9.8

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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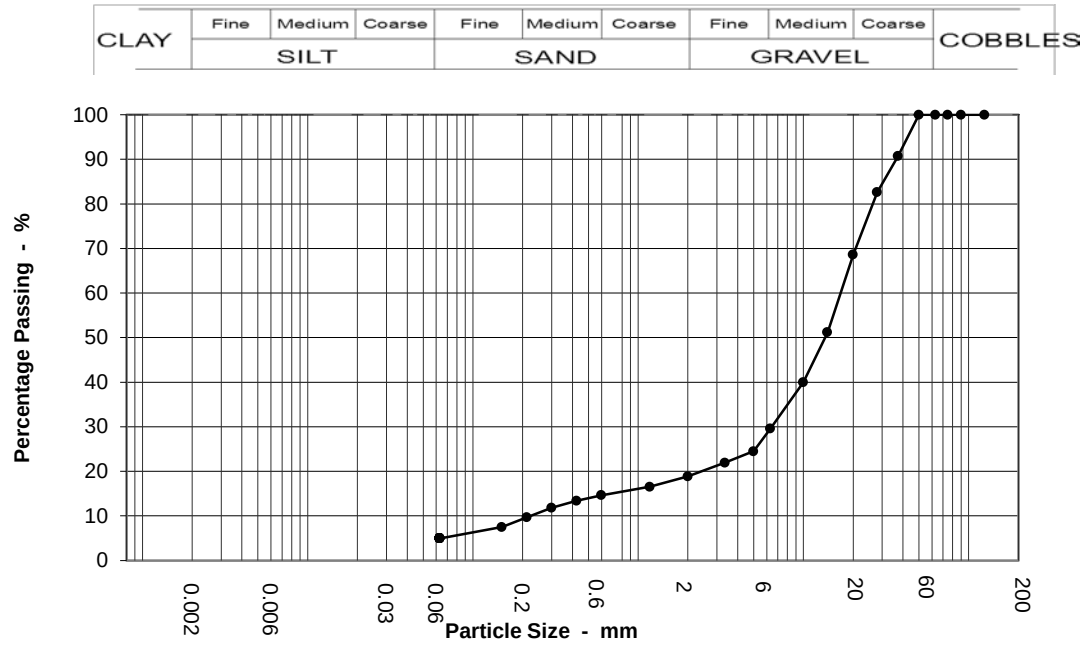
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS334
		Depth	2.50 m
Visual Soil Description	Dark brown slightly clayey slightly sandy GRAVEL (gravel is fmc and angular to rounded)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	91		
28	83		
20	69		
14	51		
10	40		
6.3	30		
5	25		
3.35	22		
2	19		
1.18	17		
0.6	15		
0.425	13		
0.3	12		
0.212	10		
0.15	8		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	81.2
Sand	13.9
Silt & Clay	5.0

Grading Analysis	
D100	125.0
D60	17.0
D10	0.2
Uniformity Coefficient	75

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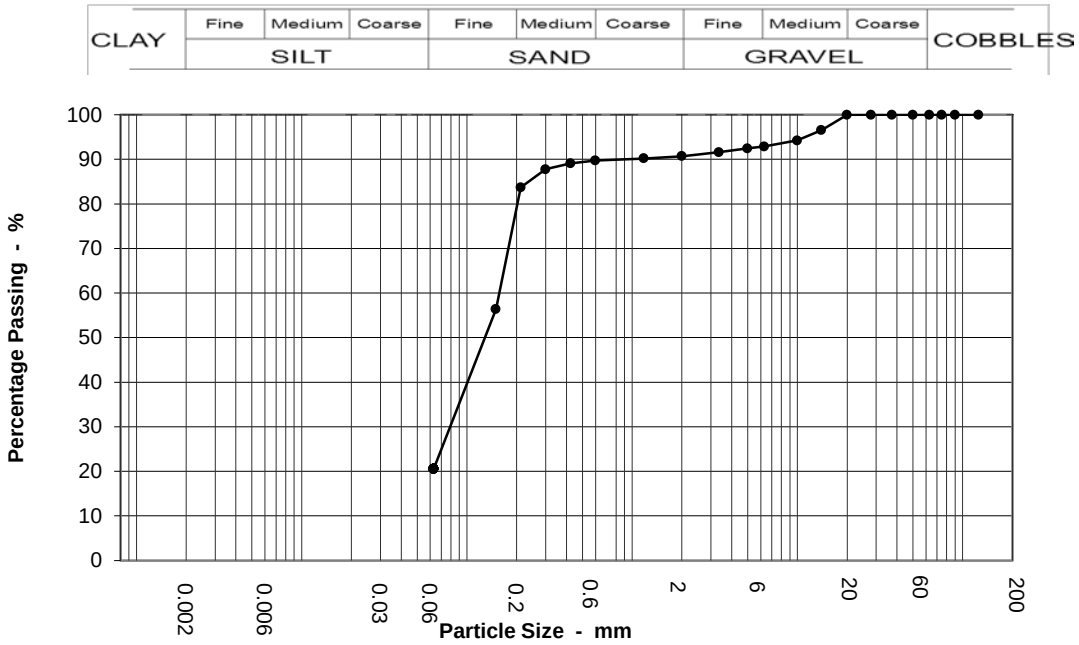
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS336
		Depth	2.00 m
Visual Soil Description	Brown slightly grey slightly gravelly slightly clayey SAND (gravel is fm and sub-angular)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	97		
10	94		
6.3	93		
5	92		
3.35	92		
2	91		
1.18	90		
0.6	90		
0.425	89		
0.3	88		
0.212	84		
0.15	56		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	9.3
Sand	70.2
Silt & Clay	20.5

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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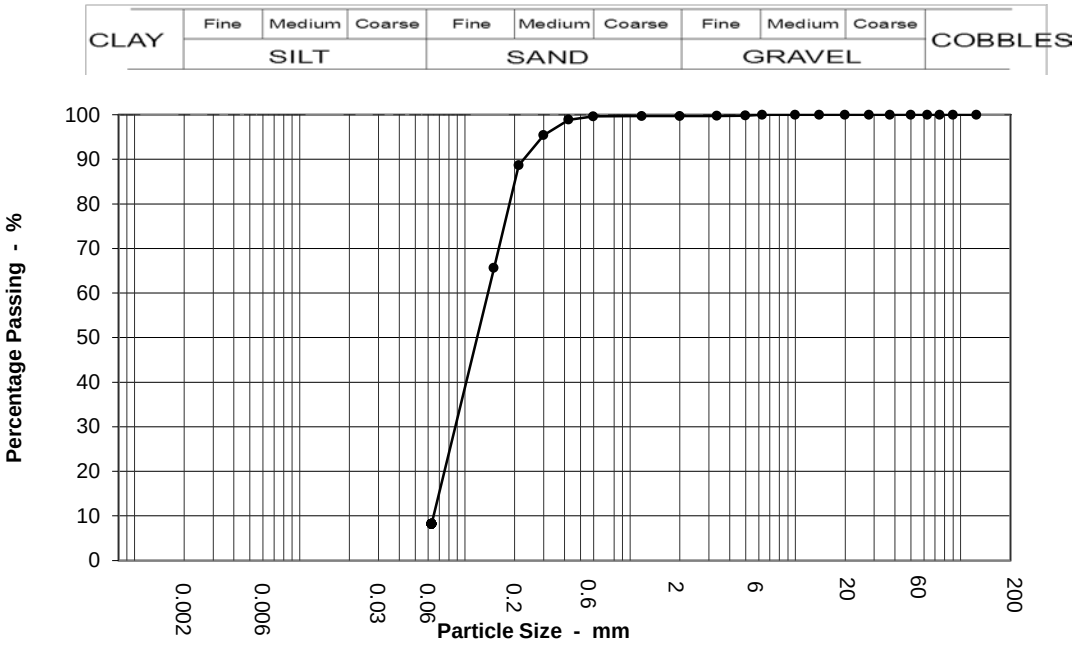
Approved Signatories:
K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS337
		Depth	2.00 m
Visual Soil Description	Pale brown slightly silty slightly clayey SAND with rare fine gravel	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	95		
0.212	89		
0.15	66		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.3
Sand	91.5
Silt & Clay	8.2

Grading Analysis	
D100	125.0
D60	0.1
D10	0.1
Uniformity Coefficient	2

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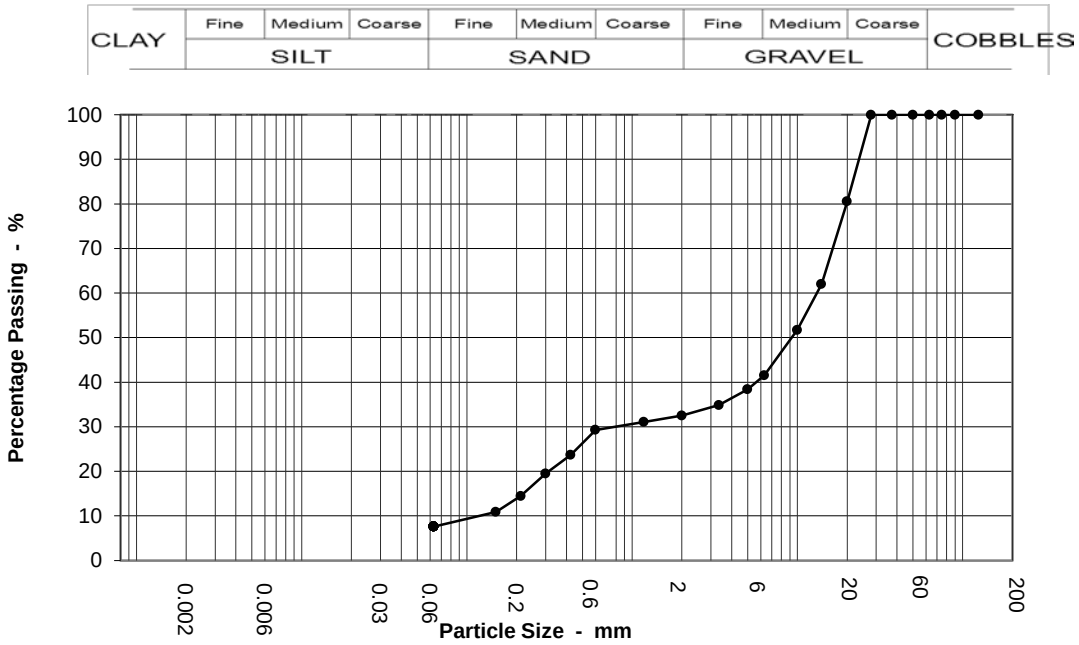
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS339
		Depth	1.50 m
Visual Soil Description	Brown slightly clayey sandy GRAVEL (gravel is fmc and angular to rounded)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	81		
14	62		
10	52		
6.3	42		
5	38		
3.35	35		
2	33		
1.18	31		
0.6	29		
0.425	24		
0.3	20		
0.212	14		
0.15	11		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	67.5
Sand	24.9
Silt & Clay	7.6

Grading Analysis	
D100	125.0
D60	13.2
D10	0.1
Uniformity Coefficient	105

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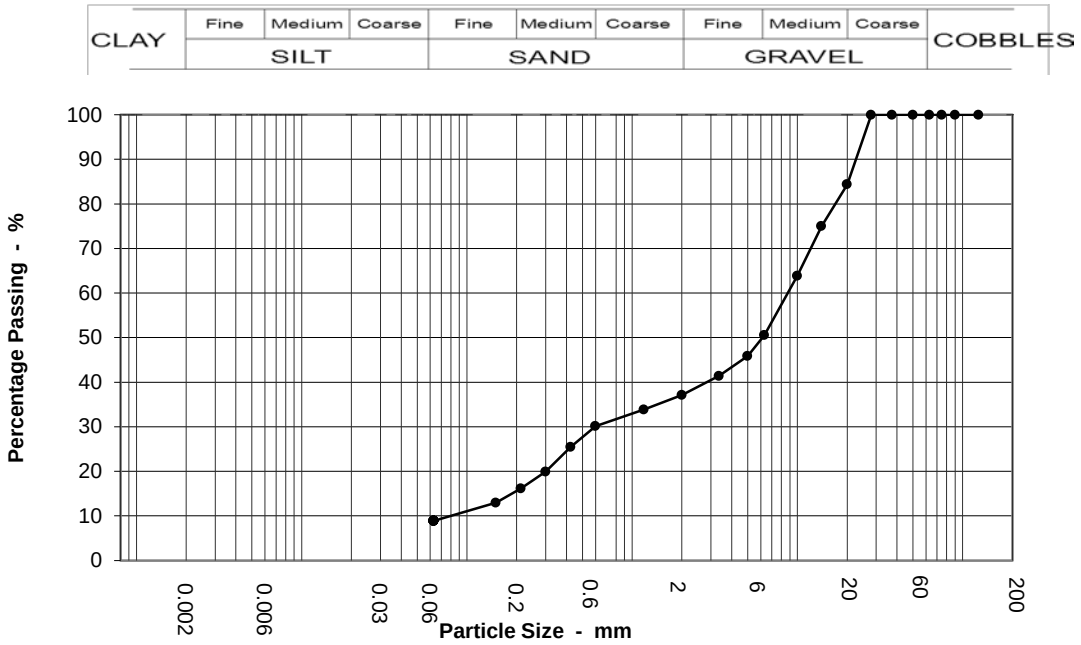
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS340
		Depth	2.00 m
Visual Soil Description	Brown slightly clayey sandy GRAVEL (gravel is fmc and angular to rounded)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	84		
14	75		
10	64		
6.3	51		
5	46		
3.35	41		
2	37		
1.18	34		
0.6	30		
0.425	25		
0.3	20		
0.212	16		
0.15	13		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	62.9
Sand	28.2
Silt & Clay	8.9

Grading Analysis	
D100	125.0
D60	8.9
D10	0.1
Uniformity Coefficient	103

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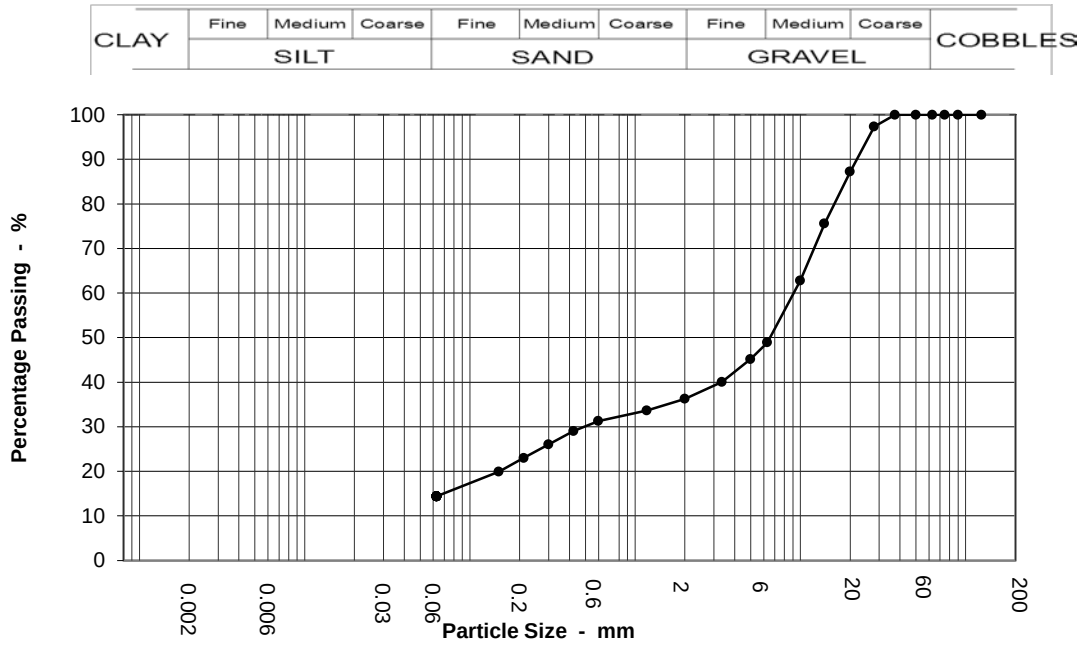
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS343
		Depth	1.50 m
Visual Soil Description	Brown and occasional grey slightly clayey sandy GRAVEL (gravel is fmc and angular to rounded)	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	87		
14	76		
10	63		
6.3	49		
5	45		
3.35	40		
2	36		
1.18	34		
0.6	31		
0.425	29		
0.3	26		
0.212	23		
0.15	20		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	63.7
Sand	21.9
Silt & Clay	14.4

Grading Analysis	
D100	125.0
D60	9.3
D10	
Uniformity Coefficient	N/A

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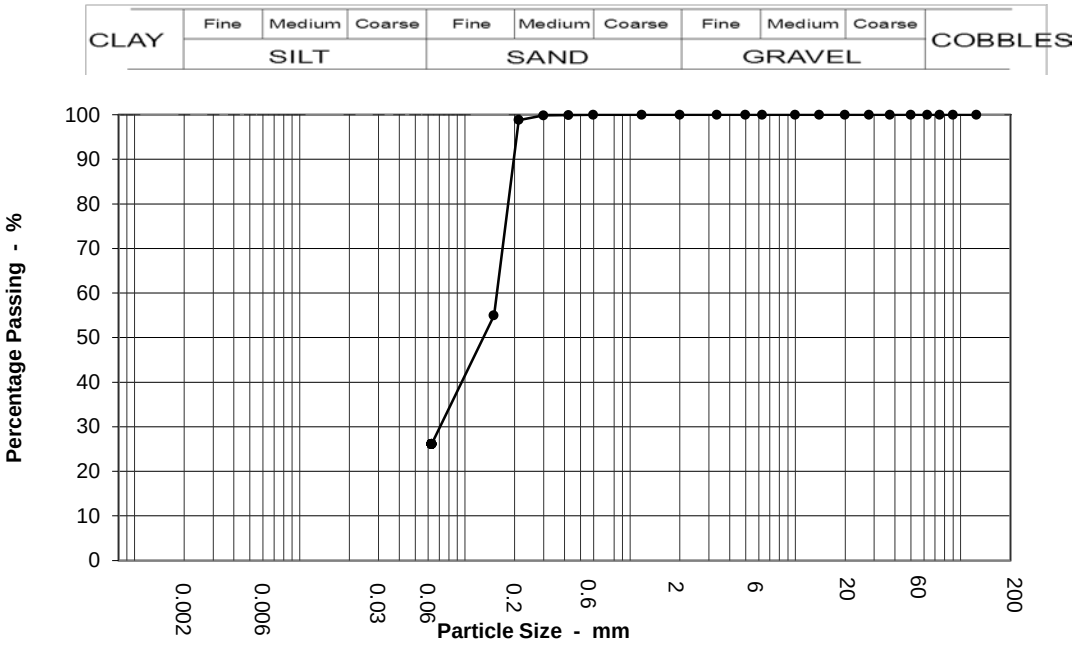
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS346
		Depth	1.50 m
Visual Soil Description	Brown and occasional grey slightly silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	55		
0.063	26		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	73.9
Silt & Clay	26.1

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

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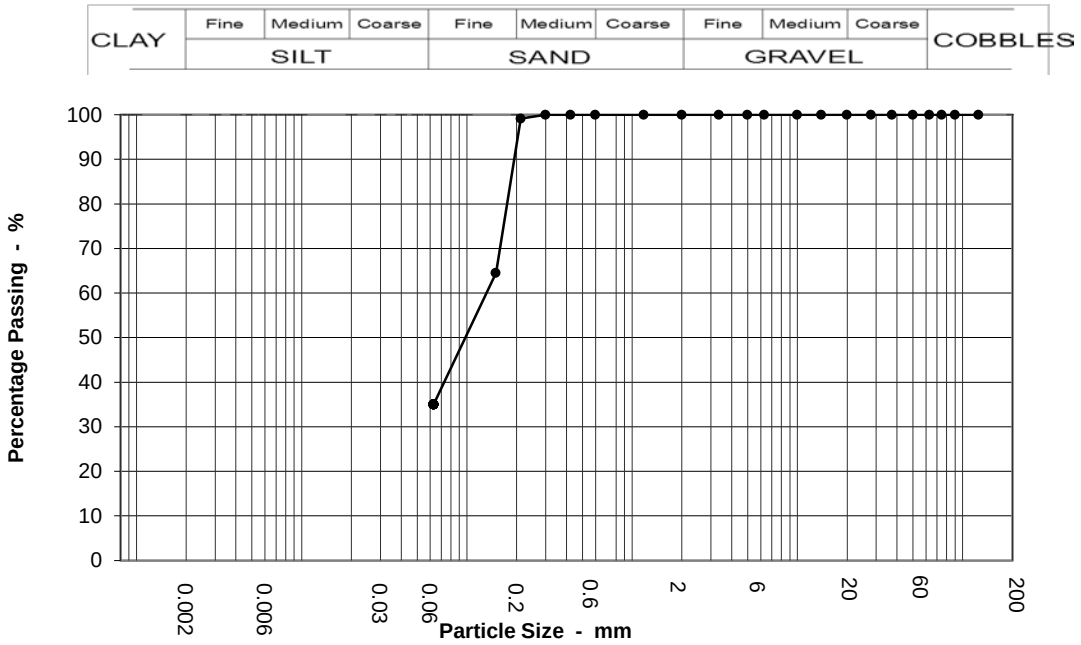
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS347
		Depth	1.00 m
Visual Soil Description	Brown and occasional grey slightly silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	65		
0.063	35		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	65.0
Silt & Clay	35.0

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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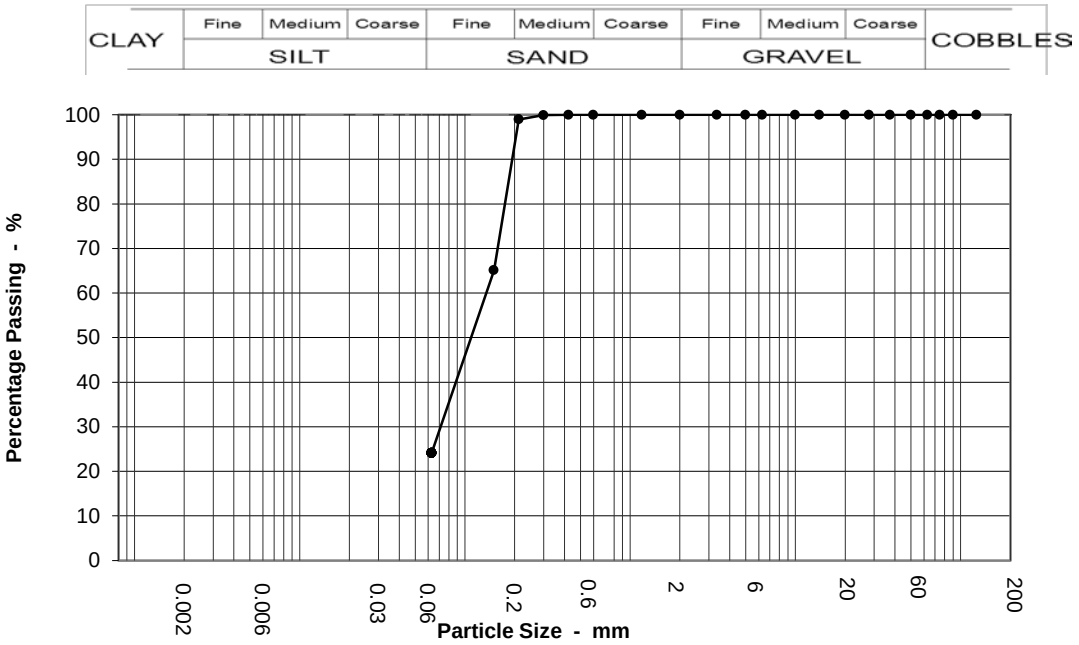
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS349
		Depth	3.00 m
Visual Soil Description	Greenish grey brown slightly silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	65		
0.063	24		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	75.9
Silt & Clay	24.1

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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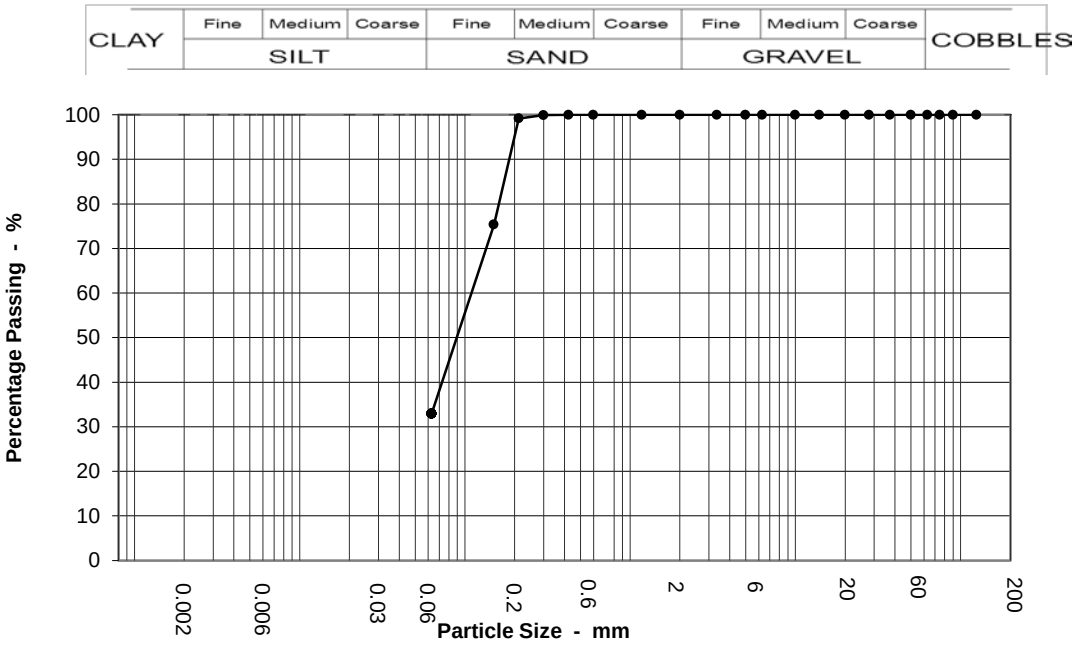
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS351
		Depth	1.50 m
Visual Soil Description	Brown and occasional grey slightly silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	75		
0.063	33		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	67.1
Silt & Clay	32.9

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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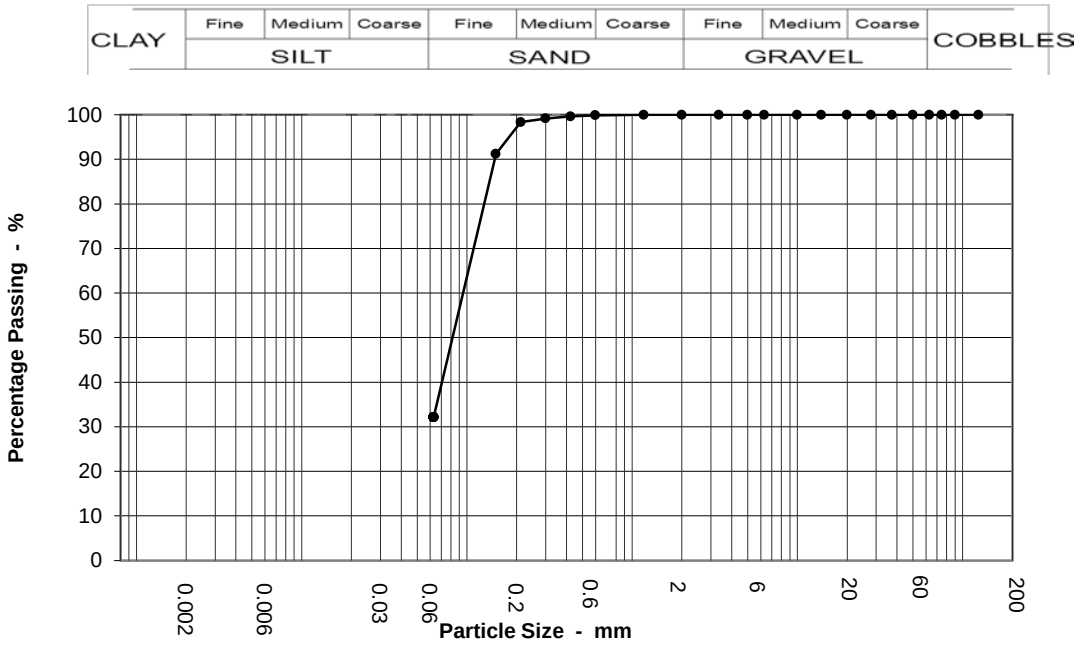
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		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS353
		Depth	1.50 m
Visual Soil Description	Greenish brown slightly silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	98		
0.15	91		
0.063	32		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	67.8
Silt & Clay	32.2

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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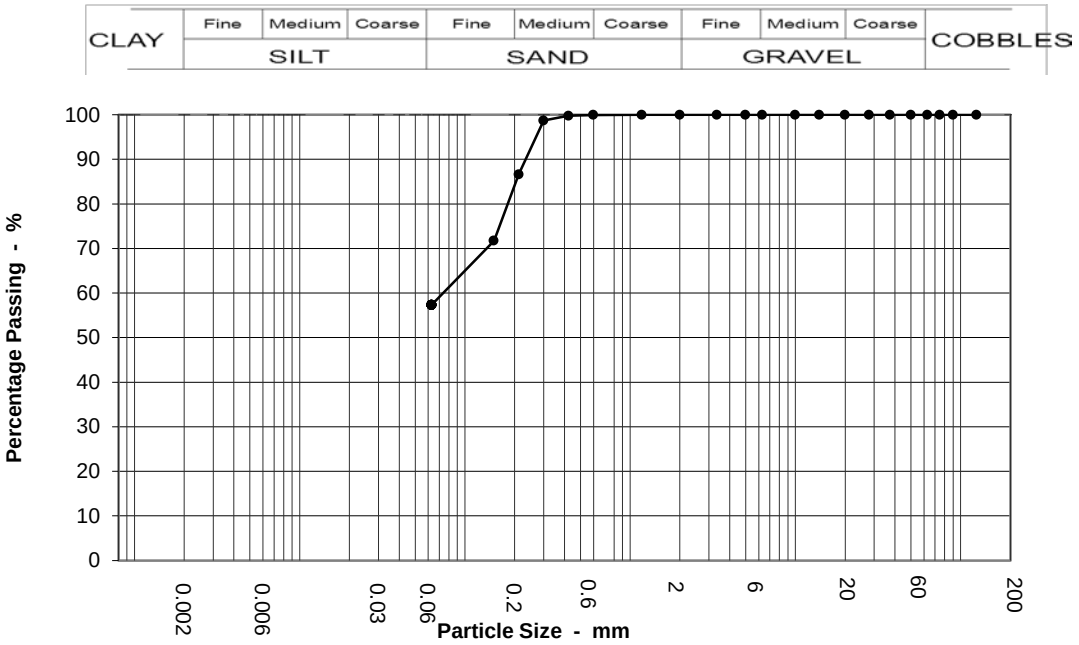
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS354
		Depth	3.00 m
Visual Soil Description	Brown sandy CLAY	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	87		
0.15	72		
0.063	57		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	42.6
Silt & Clay	57.4

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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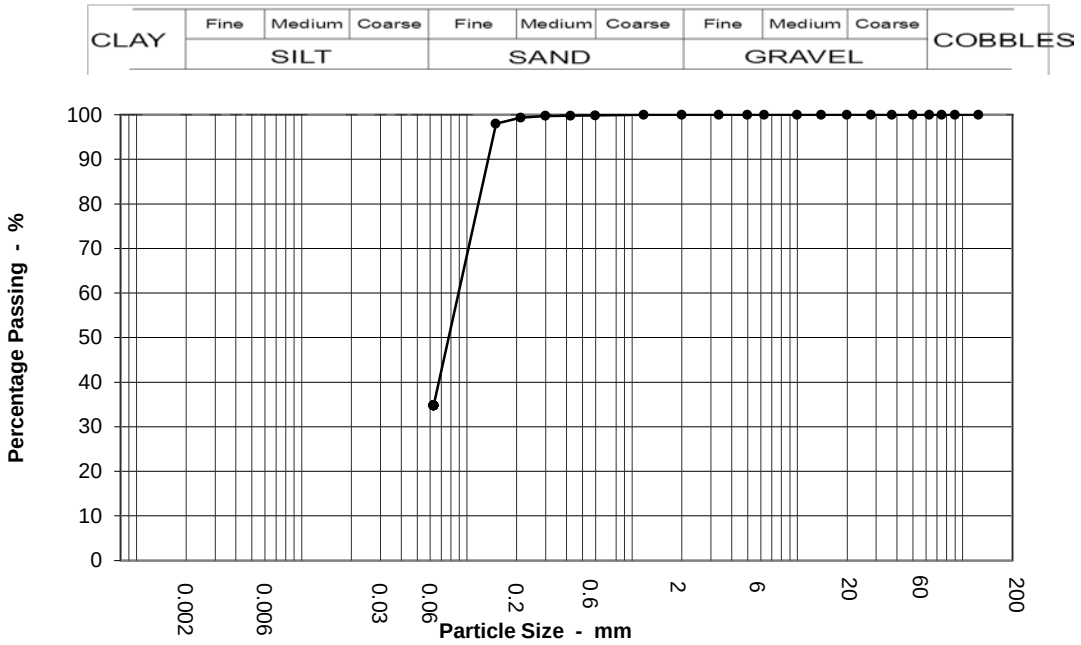
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Date: 15/10/2013

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS358
		Depth	2.00 m
Visual Soil Description	Greyish brown slightly silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	98		
0.063	35		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	65.2
Silt & Clay	34.8

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

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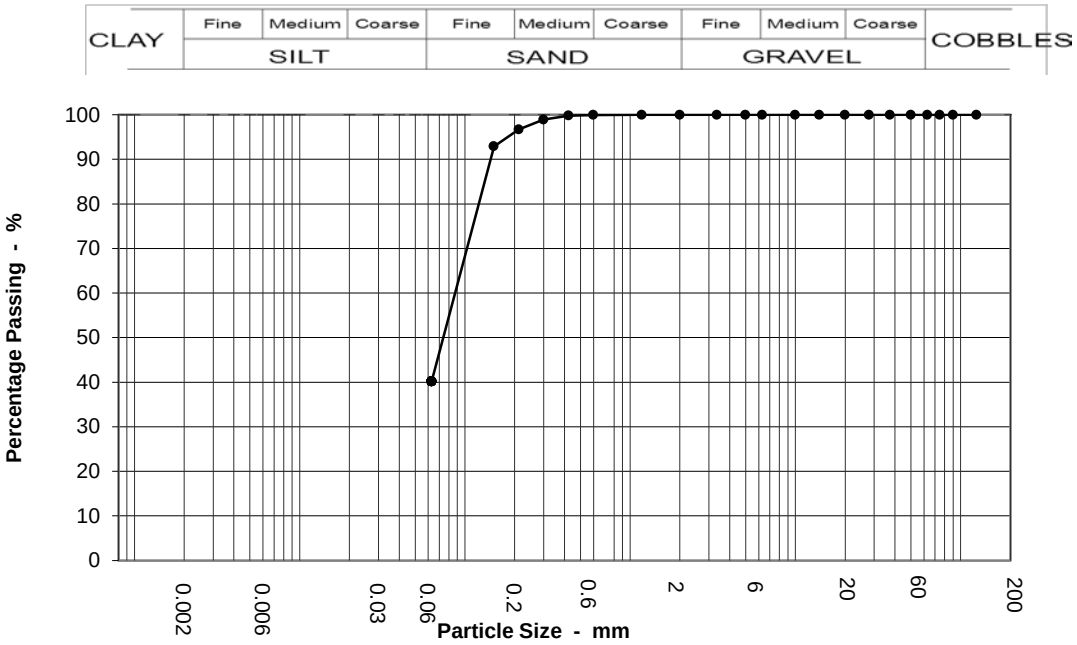
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS362
		Depth	2.50 m
Visual Soil Description	Brown very sandy CLAY	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	97		
0.15	93		
0.063	40		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	59.8
Silt & Clay	40.2

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

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

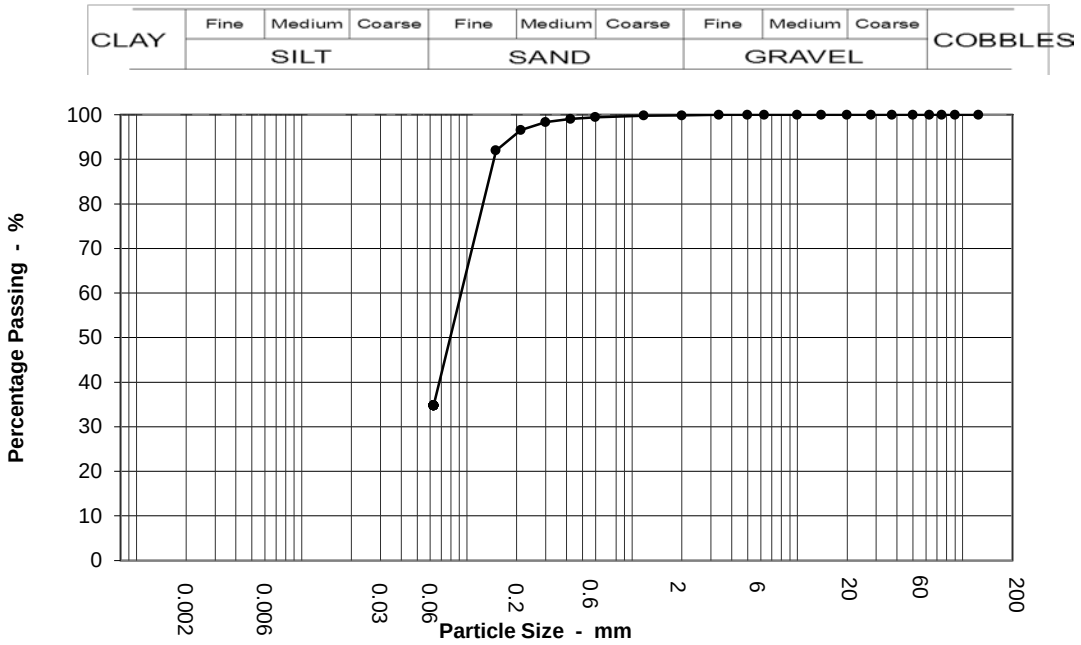
Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	15279
		Project No:	GE9523-1904
Location	Boorley Green (Southampton)	Borehole / Trial Pit No:	WS364
		Depth	1.50 m
Visual Soil Description	Brown and occasional grey slightly silty clayey SAND	Sample Type/No	-



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	97		
0.15	92		
0.063	35		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	65.1
Silt & Clay	34.8

Grading Analysis	
D100	125.0
D60	0.1
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
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Approved Signatories:
K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 15/10/2013

UKAS TESTING

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Project Name:	Boorley Green (Southampton)		
Client:	Geo-Environmental Services Ltd	Project no:	GE9523-1904
		Our job no:	15279

K4 SOILS

Borehole No:	Sample No:	Depth m	Description	pH	Sulphate content (g/l)
BH201	U1	1.00	Medium strength orange brown, brown and pale blue grey mottled silty CLAY with numerous orange brown sandy partings	7.5	0.07
BH201	U5	11.00	Medium strength fissured dark brown, blue grey and rusty brown silty CLAY	7.6	0.14
BH202	U2	3.00	Medium strength pale grey brown, orange brown, yellow brown mottled silty CLAY with fine sandy patches	7.5	0.03
BH202	D	11.45	Brownish grey slightly silty SAND	7.1	0.34
BH203	B	1.00	Brown slightly clayey sandy GRAVEL (gravel is fmc and sub-rounded to angular)	7.4	0.12
BH203	U	4.00	Medium strength dark grey silty CLAY - Sample slighlty disturbed	7.4	0.22
BH203	U	6.50	High strength dark grey slightly fine sandy CLAY with black stains	7.5	0.24
BH204	D	2.45	Brown slightly clayey SAND with rare fm gravel	7.4	0.15
BH204	U	5.00	High strength dark grey and dark blue grey silty fine sandy CLAY	7.5	0.11
BH204	U	14.10	Very high strength fissured dark grey CLAY with occasional fine sand partings	7.6	0.94
BH205	U	1.00	Very high strength reddish brown and blue grey mottled slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular to angular)	7.7	0.04
BH205	U	3.00	Medium strength light brown and light orange brown mottled sandy CLAY	7.7	0.01
BH205	D	6.00	Brown slightly silty slightly clayey SAND	7.5	0.11
BH205	D	10.50	Pale brown slightly silty SAND	7.4	0.16
BH206	U	1.00	Medium strength light brown slightly mottled orange brown and blue grey sandy CLAY	7.7	0.44
BH207	U	1.00	High strength brown slightly blue grey and orange mottled slightly gravelly slightly sandy CLAY (gravel is fm and angular)	7.7	0.26
BH207	D	9.95	Dark grey slightly silty slightly clayey SAND	7.4	0.19
BH208	U	1.00	High strength brown and dark brown sandy CLAY	7.3	0.16
BH208	D	9.00	Dark grey silty CLAY	7.0	0.09
BH209	U	1.00	High strength slightly fissured dark brown, light brown slightly orange and blue grey mottled CLAY with occasional fine rootlets	7.5	0.02
BH209	D	5.45	Brownish grey slightly silty slightly clayey SAND	7.5	0.41
BH209	D	8.45	Brown slightly clayey SAND	7.1	0.08
BH210	D	0.50	Brown sandy CLAY with rare fm and sub-angular gravel and traces of fine rootlets	7.4	0.19
BH210	D	2.45	Orangey brown and occasional grey sandy CLAY	7.0	0.13
BH210	D	7.50	Dark greenish grey slightly silty SAND with rare fine gravel	7.0	0.23

Date 15/10/2013

Summary of Test Results

BS 1377 : Part 3 :Clause 5 : 1990

Determination of sulphate content of soil and ground water : gravimetric method

Checked and Approved

Initials : kp

Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Project Name:	Boorley Green (Southampton)		
Client:	Geo-Environmental Services Ltd	Project no:	GE9523-1904
		Our job no:	15279

K4 SOILS

Borehole No:	Sample No:	Depth m	Description	pH	Sulphate content (g/l)
WS203	-	1.50	Brown and pale grey CLAY with orange brown sandy patches	7.0	0.34
WS216	-	2.50	Brownish grey slightly silty slightly clayey SAND	7.0	0.49
WS224	-	1.50	Brown sandy silty CLAY with rare fmc gravel	7.2	0.12
WS237	-	1.50	Orangey brown and grey sandy CLAY with rare fm and angular gravel	7.0	0.78
WS248	-	1.50	Greenish brown and brown slightly clayey SAND	7.0	0.21
WS261	-	1.00	Brown sandy CLAY with rare fine gravel	7.2	0.27
WS269	-	2.00	Orangey brown and grey silty CLAY	7.0	0.97
WS298	-	2.00	Pale grey and orange brown slightly silty CLAY	7.0	0.32
WS308	-	1.50	Pale grey, light grey and occasional orange silty CLAY with traces of rootlets	7.0	0.10
WS323	-	1.00	Light grey and orangey brown slightly silty CLAYwith fine sandy inclusions	7.0	0.01
WS329	-	1.00	Brown and grey silty CLAY with traces of rootlets	7.0	0.36
WS338	-	1.00	Brown and greyish brown sandy silty CLAY with rare fine gravel and fine rootlets	7.5	0.45
WS339	-	1.50	Brown slightly clayey sandy GRAVEL (gravel is fmc and angular to rounded)	7.7	0.02
WS342	-	1.00	Greenish grey and reddish brown mottled CLAY	7.5	0.05
WS366	-	2.50	Pale grey and occasional brown silty CLAY	7.0	0.95
WS369	-	1.00	Brown and greyish brown sandy silty CLAY	7.5	0.38

Date
15/10/2013

Summary of Test Results

BS 1377 : Part 3 :Clause 5 : 1990

Determination of sulphate content of soil and ground water : gravimetric method

Checked and Approved
Initials : kp

Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

APPENDIX H

CLEA Model Output and ESI Statistical Analysis

CLEA Software Version 1.06

Report generated 30/10/2013

Report title

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BASIC SETTINGS

Land Use	Residential with homegrown produce						
Building	Small terraced house						
Receptor	Female (res)	Start age class	1	End age class	6	Exposure Duration	6 years
Soil	Sandy clay loam						

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✓	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✓			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

Land Use Residential with homegrown produce

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor	
1	180	180	180	180	365	365	23.0	1.0	0.06	1.00	0.10
2	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
3	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
4	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
5	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10
6	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00

Receptor Female (res)

Age Class	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Max exposed skin factor: Indoor (m^2 m^{-2})	Max exposed skin factor: Outdoor (m^2 m^{-2})	Total skin area (m^2)	Consumption rates (g FW kg^{-1} BW day^{-1}): Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	5.60	0.7	8.5	0.32	0.26	3.43E-01	7.12	10.69	16.03	1.83	2.23	3.82
2	9.80	0.8	13.3	0.33	0.26	4.84E-01	6.85	3.30	5.46	3.96	0.54	11.96
3	12.70	0.9	12.7	0.32	0.25	5.82E-01	6.85	3.30	5.46	3.96	0.54	11.96
4	15.10	0.9	12.2	0.35	0.28	6.36E-01	6.85	3.30	5.46	3.96	0.54	11.96
5	16.90	1.0	12.2	0.35	0.28	7.04E-01	3.74	1.77	3.38	1.85	0.16	4.26
6	19.70	1.1	12.2	0.33	0.26	7.94E-01	3.74	1.77	3.38	1.85	0.16	4.26
7	22.10	1.2	12.4	0.22	0.15	8.73E-01	3.74	1.77	3.38	1.85	0.16	4.26
8	25.30	1.2	12.4	0.22	0.15	9.36E-01	3.74	1.77	3.38	1.85	0.16	4.26
9	27.50	1.3	12.4	0.22	0.15	1.01E+00	3.74	1.77	3.38	1.85	0.16	4.26
10	31.40	1.3	12.4	0.22	0.15	1.08E+00	3.74	1.77	3.38	1.85	0.16	4.26
11	35.70	1.4	12.4	0.22	0.14	1.19E+00	3.74	1.77	3.38	1.85	0.16	4.26
12	41.30	1.4	13.4	0.22	0.14	1.29E+00	3.74	1.77	3.38	1.85	0.16	4.26
13	47.20	1.5	13.4	0.22	0.14	1.42E+00	3.74	1.77	3.38	1.85	0.16	4.26
14	51.20	1.6	13.4	0.22	0.14	1.52E+00	3.74	1.77	3.38	1.85	0.16	4.26
15	56.70	1.6	13.4	0.21	0.14	1.60E+00	3.74	1.77	3.38	1.85	0.16	4.26
16	59.00	1.6	13.4	0.21	0.14	1.63E+00	3.74	1.77	3.38	1.85	0.16	4.26
17	70.00	1.6	14.8	0.33	0.27	1.78E+00	2.94	1.40	1.79	1.61	0.22	2.97
18	70.90	1.6	12.0	0.33	0.27	1.80E+00	2.94	1.40	1.79	1.61	0.22	2.97

Building Small terraced house

Soil Sandy clay loam

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor (µg m^{-3})	5.00E+01

Porosity, Total (cm^3 cm^{-3})	5.30E-01
Porosity, Air-Filled (cm^3 cm^{-3})	1.60E-01
Porosity, Water-Filled (cm^3 cm^{-3})	3.70E-01
Residual soil water content (cm^3 cm^{-3})	1.50E-01
Saturated hydraulic conductivity (cm s^{-1})	2.37E-03
van Genuchten shape parameter ***m*** (dimensionless)	3.10E-01
Bulk density (g cm^{-3})	1.20E+00
Threshold value of wind speed at 10m (m s^{-1})	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	1.00E+00
Fraction of organic carbon (g g^{-1})	5.80E-03
Effective total fluid saturation (unitless)	5.79E-01
Intrinsic soil permeability (cm^2)	3.16E-08
Relative soil air permeability (unitless)	5.78E-01
Effective air permeability (cm^2)	1.83E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($m^2\ m^{-2}$)	0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
		Average	High		
	$g\ DW\ g^{-1}\ FW$	dimensionless		$g\ g^{-1}\ DW$	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average

CLEA Software Version 1.06

Report generated 30-Oct-13

Report title

Created by

RESULTS

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
1	Arsenic	3.24E+01	8.50E+01	NR	1.00	0.38	NR	NR	No	No
2	Cadmium	5.45E+00	2.97E+01	5.17E+00	0.91	0.10	1.00	NR	Yes	Yes
3	Chromium III	1.95E+04	3.55E+03	3.01E+03	0.15	0.85	1.00	NR	No	No
4	Mercury, inorganic	1.81E+02	2.55E+03	1.69E+02	0.93	0.07	1.00	NR	No	No
5	Nickel	5.31E+02	1.27E+02	NR	0.14	1.00	NR	NR	Yes	Yes
6	Copper	7.81E+03	1.04E+04	5.20E+03	0.50	0.50	1.00	NR	Yes	No
7	Zinc	1.94E+04	2.55E+07	1.94E+04	1.00	0.00	1.00	NR	Yes	No
8	Selenium	3.50E+02	NR	NR	1.00	NR	NR	NR	Yes	No
9	Chromium VI	4.89E+01	NR	NR	1.00	NR	NR	NR	Yes	No
10	Barium	1.33E+03	NR	NR	1.00	NR	NR	NR	Yes	No
11	Beryllium	1.48E+02	5.10E+01	4.12E+01	0.19	0.81	1.00	NR	Yes	No
12	Vanadium	1.18E+02	6.08E+02	1.07E+02	0.90	0.10	1.00	NR	Yes	Yes
13	Phenol	4.65E+02	3.16E+02	1.88E+02	0.40	0.60	1.00	4.36E+04 (vap)	No	No
14	Acenaphthylene	1.78E+02	3.54E+03	1.69E+02	0.95	0.05	1.00	8.64E+01 (sol)	No	No
15	Acenaphthene	2.18E+02	4.00E+03	2.07E+02	0.95	0.05	1.00	5.71E+01 (sol)	No	No
16	Flourene	1.70E+02	NR	1.64E+02	0.96	0.04	1.00	3.10E+01 (sol)	No	No
17	Phenanthrene	9.35E+01	4.55E+03	9.16E+01	0.98	0.02	1.00	3.60E+01 (sol)	No	No
18	Anthracene	2.31E+03	9.85E+04	2.25E+03	0.98	0.02	1.00	1.17E+00 (vap)	No	No
19	Flouranthene	2.59E+02	2.43E+04	2.57E+02	0.99	0.01	1.00	1.89E+01 (vap)	No	No
20	Pyrene	5.69E+02	5.60E+04	5.63E+02	0.99	0.01	1.00	2.20E+00 (vap)	No	No



		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
21	Benz(a)anthracene	7.00E+00	5.22E+00	2.99E+00	0.43	0.57	1.00	1.71E+00 (sol)	No	No
22	Chrysene	8.67E+00	1.93E+01	5.99E+00	0.69	0.31	1.00	4.40E-01 (vap)	No	No
23	Benzo(b)flouranthene	8.06E+00	1.78E+01	5.54E+00	0.69	0.31	1.00	1.22E+00 (sol)	No	No
24	Benzo(k)flouranthene	1.25E+01	2.64E+01	8.49E+00	0.68	0.32	1.00	6.87E-01 (sol)	No	No
25	Benzo(a)pyrene	1.21E+00	2.60E+00	8.24E-01	0.68	0.32	1.00	9.11E-01 (vap)	No	No
26	Indeno(123-cd)pyrene	4.58E+00	1.03E+01	3.18E+00	0.69	0.31	1.00	6.14E-02 (vap)	No	No
27	Dibenz(ah)anthracene	1.19E+00	2.12E+00	7.61E-01	0.64	0.36	1.00	3.93E-03 (vap)	No	No
28	Benzo(ghi)perylene	6.68E+01	1.27E+02	4.38E+01	0.66	0.34	1.00	1.54E-02 (vap)	No	No
29										
30										

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic	99.9	0.1	0.0	100.0	3.24E+01	NR	1.62E+01	1.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-02	1.30E-02	7.45E-03	1.07E-02	6.48E-03	3.56E-02
2	Cadmium	99.7	0.3	0.0	100.0	5.17E+00	NR	2.59E+00	2.20E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E-01	1.50E-01	1.60E-01	8.28E-02	1.60E-02	7.24E-03
3	Chromium III	100.0	0.0	0.0	100.0	3.01E+03	NR	1.50E+03	1.28E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.66E-03	9.29E-03	1.89E-02	5.23E-03	1.50E-02	1.42E-02
4	Mercury, inorganic	99.9	0.1	0.0	100.0	1.69E+02	NR	8.43E+01	7.18E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.41E-01	1.16E+00	7.25E-01	1.69E-01	1.86E-01	1.69E-01
5	Nickel	99.9	0.1	0.0	100.0	1.27E+02	NR	6.37E+01	5.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.84E-01	5.48E-01	2.42E-01	3.19E-01	3.19E-01	4.33E-01
6	Copper	99.7	0.3	0.0	100.0	5.20E+03	NR	2.60E+03	2.21E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E+01	1.10E+01	2.25E+01	7.03E+00	1.78E+01	1.68E+01
7	Zinc	99.2	0.8	0.0	100.0	1.94E+04	NR	9.69E+03	8.25E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+02	1.08E+02	2.20E+02	1.61E+02	1.74E+02	1.64E+02
8	Selenium	99.4	0.6	0.0	100.0	3.50E+02	NR	1.75E+02	1.49E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.78E+00	1.27E+00	2.91E-01	9.49E-01	1.05E+00	1.05E+00
9	Chromium VI	98.3	1.7	0.0	100.0	4.89E+01	NR	2.45E+01	2.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.39E-04	5.04E-04	1.03E-03	2.55E-01	2.44E-03	6.91E-01
10	Barium	######	#DIV/0!	0.0	#DIV/0!	1.33E+03	NR	6.64E+02	5.66E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	Beryllium	100.0	0.0	0.0	100.0	4.12E+01	NR	2.06E+01	1.75E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-02	5.09E-03	1.04E-02	2.87E-03	8.21E-03	7.76E-03
12	Vanadium	97.6	2.4	0.0	100.0	1.07E+02	NR	5.34E+01	4.55E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E+00	1.43E+00	2.92E-01	8.06E-02	2.31E-01	2.18E-01
13	Phenol	61.0	39.0	0.0	100.0	1.88E+02	1.99E+00	9.40E+01	8.01E-08	0.00E+00	2.55E-03	7.22E-05	0.00E+00	1.88E+02	4.52E+02	2.03E+02	0.00E+00	0.00E+00	3.84E+02
14	Acenaphthylene	97.2	2.8	0.0	100.0	1.69E+02	8.85E+00	8.47E+01	7.21E-08	0.00E+00	3.10E-03	1.82E-05	0.00E+00	8.96E+01	1.22E+02	3.09E+01	0.00E+00	0.00E+00	1.74E+01
15	Acenaphthene	97.8	2.2	0.0	100.0	2.07E+02	1.13E+01	1.04E+02	8.82E-08	0.00E+00	3.35E-03	2.04E-05	0.00E+00	8.94E+01	1.22E+02	3.41E+01	0.00E+00	0.00E+00	1.45E+01
16	Flourene	98.1	1.9	0.0	100.0	1.64E+02	4.05E+00	8.18E+01	6.96E-08	0.00E+00	1.59E-03	1.31E-05	0.00E+00	6.06E+01	8.25E+01	2.39E+01	0.00E+00	0.00E+00	8.45E+00
17	Phenanthrene	99.0	1.0	0.0	100.0	9.16E+01	4.07E-01	4.58E+01	3.90E-08	0.00E+00	2.69E-04	4.77E-06	0.00E+00	1.82E+01	2.59E+01	9.20E+00	0.00E+00	0.00E+00	1.45E+00
18	Anthracene	99.1	0.9	0.0	100.0	2.25E+03	1.24E+01	1.13E+03	9.59E-07	0.00E+00	7.36E-03	1.18E-04	0.00E+00	4.37E+02	6.22E+02	2.22E+02	0.00E+00	0.00E+00	3.49E+01
19	Flouranthene	99.7	0.3	0.0	100.0	2.57E+02	1.52E-01	1.28E+02	1.09E-07	0.00E+00	1.36E-04	6.98E-06	0.00E+00	1.28E+01	2.34E+01	1.24E+01	0.00E+00	0.00E+00	3.94E-01
20	Pyrene	99.7	0.3	0.0	100.0	5.63E+02	3.36E-01	2.81E+02	2.40E-07	0.00E+00	3.11E-04	1.63E-05	0.00E+00	3.23E+01	5.75E+01	2.97E+01	0.00E+00	0.00E+00	1.07E+00

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
21	Benz(a)anthracene	99.9	0.1	0.0	100.0	2.99E+00	2.10E-04	1.49E+00	1.27E-09	0.00E+00	2.20E-07	3.75E-08	0.00E+00	1.77E-02	6.58E-02	4.55E-02	0.00E+00	0.00E+00	1.67E-04
22	Chrysene	99.9	0.1	0.0	100.0	5.99E+00	5.97E-05	2.99E+00	2.55E-09	0.00E+00	7.79E-08	8.79E-08	0.00E+00	6.11E-02	1.85E-01	1.21E-01	0.00E+00	0.00E+00	7.62E-04
23	Benzo(b)flouranthene	99.9	0.1	0.0	100.0	5.54E+00	1.87E-05	2.77E+00	2.36E-09	0.00E+00	2.51E-08	5.78E-08	0.00E+00	1.96E-02	9.07E-02	6.24E-02	0.00E+00	0.00E+00	1.43E-04
24	Benzo(k)flouranthene	100.0	0.0	0.0	100.0	8.49E+00	1.72E-05	4.25E+00	3.61E-09	0.00E+00	2.36E-08	7.45E-08	0.00E+00	1.65E-02	9.85E-02	6.98E-02	0.00E+00	0.00E+00	9.10E-05
25	Benzo(a)pyrene	100.0	0.0	0.0	100.0	8.24E-01	1.94E-06	4.12E-01	3.51E-10	0.00E+00	2.66E-09	7.80E-09	0.00E+00	2.06E-03	1.10E-02	7.77E-03	0.00E+00	0.00E+00	1.29E-05
26	Indeno(123-cd)pyrene	99.9	0.1	0.0	100.0	3.18E+00	1.29E-05	1.59E+00	1.35E-09	0.00E+00	1.72E-08	3.57E-08	0.00E+00	1.55E-02	6.24E-02	4.09E-02	0.00E+00	0.00E+00	1.34E-04
27	Dibenz(ah)anthracene	100.0	0.0	0.0	100.0	7.61E-01	3.80E-06	3.80E-01	3.24E-10	0.00E+00	4.83E-09	5.77E-09	0.00E+00	9.76E-04	7.02E-03	4.76E-03	0.00E+00	0.00E+00	4.46E-06
28	Benzo(ghi)perylene	100.0	0.0	0.0	100.0	4.38E+01	5.18E-05	2.19E+01	1.86E-08	0.00E+00	6.78E-08	2.27E-07	0.00E+00	1.18E-02	1.81E-01	1.33E-01	0.00E+00	0.00E+00	2.69E-05
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		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	2.40E-04	2.27E-05	3.70E-05	7.62E-07	0.00E+00	0.00E+00	0.00E+00	79.89	7.54	12.31	0.25	0.00	0.00	0.00	0.00
2	Cadmium	3.84E-05	1.32E-04	1.97E-07	1.22E-07	0.00E+00	7.54E-04	1.21E-06	11.21	38.70	0.06	0.04	0.00	0.00	49.96	0.04
3	Chromium III	2.23E-02	2.69E-04	0.00E+00	7.08E-05	0.00E+00	3.39E-03	1.64E-05	85.63	1.03	0.00	0.27	0.00	0.00	13.01	0.06
4	Mercury, inorganic	1.25E-03	5.64E-04	0.00E+00	3.97E-06	0.00E+00	5.63E-05	0.00E+00	66.71	30.08	0.00	0.21	0.00	0.00	3.00	0.00
5	Nickel	9.45E-04	4.66E-04	2.43E-05	3.00E-06	0.00E+00	7.31E-03	3.64E-06	32.77	16.18	0.84	0.10	0.00	0.00	49.90	0.10
6	Copper	3.86E-02	1.47E-02	0.00E+00	1.22E-04	0.00E+00	3.94E-01	4.12E-05	36.15	13.78	0.00	0.11	0.00	0.00	49.92	0.04
7	Zinc	1.44E-01	1.56E-01	0.00E+00	4.56E-04	0.00E+00	1.52E+00	1.45E-04	23.95	26.00	0.00	0.08	0.00	0.00	49.95	0.02
8	Selenium	2.60E-03	1.82E-03	0.00E+00	8.24E-06	0.00E+00	1.97E-03	3.64E-06	40.59	28.46	0.00	0.13	0.00	0.00	30.82	0.00
9	Chromium VI	3.63E-04	2.60E-04	0.00E+00	1.15E-06	0.00E+00	3.77E-04	0.00E+00	36.29	26.02	0.00	0.00	0.00	0.00	37.70	0.00
10	Barium	9.86E-03	1.13E-04	0.00E+00	3.13E-05	0.00E+00	4.77E-02	6.06E-02	49.28	0.57	0.00	0.16	0.00	0.00	50.00	0.00
11	Beryllium	3.06E-04	1.61E-05	0.00E+00	9.70E-07	0.00E+00	8.44E-04	0.00E+00	47.43	2.49	0.00	0.15	0.00	0.00	49.92	0.00
12	Vanadium	7.93E-04	7.49E-04	0.00E+00	2.52E-06	0.00E+00	1.29E-03	3.88E-05	27.91	26.36	0.00	0.09	0.00	0.00	45.56	0.09
13	Phenol	1.40E-03	2.74E-01	2.15E-03	4.43E-06	2.36E-03	1.97E-02	2.42E-03	0.46	90.71	0.71	0.00	0.78	0.00	6.53	0.80
14	Acenaphthylene	1.26E-03	5.50E-02	8.39E-04	3.99E-06	2.86E-03	7.88E-06	6.67E-07	2.09	91.71	1.40	0.01	4.77	0.00	0.01	0.00
15	Acenaphthene	1.54E-03	5.43E-02	1.03E-03	4.88E-06	3.10E-03	5.51E-05	1.52E-06	2.56	90.45	1.71	0.01	5.17	0.00	0.09	0.00
16	Flourene	1.21E-03	3.65E-02	8.10E-04	3.85E-06	1.47E-03	3.32E-05	5.82E-06	3.03	91.16	2.03	0.01	3.68	0.00	0.08	0.01
17	Phenanthrene	6.80E-04	1.10E-02	4.54E-04	2.16E-06	2.49E-04	8.66E-05	3.14E-05	5.42	88.01	3.62	0.02	1.99	0.00	0.69	0.25
18	Anthracene	1.67E-02	2.65E-01	1.12E-02	5.30E-05	6.81E-03	4.50E-06	2.49E-06	5.57	88.42	3.72	0.02	2.27	0.00	0.00	0.00
19	Flouranthene	1.90E-03	9.17E-03	1.27E-03	6.04E-06	1.26E-04	1.97E-05	5.09E-06	15.22	73.37	10.16	0.05	1.01	0.00	0.16	0.04
20	Pyrene	4.18E-03	2.27E-02	2.79E-03	1.32E-05	2.88E-04	1.97E-05	3.94E-06	13.92	75.71	9.29	0.04	0.96	0.00	0.07	0.01

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
21	Benz(a)anthracene	2.22E-05	2.20E-05	1.48E-05	7.04E-08	2.05E-07	3.38E-06	6.67E-07	37.44	37.10	25.00	0.12	0.34	0.00	0.00	0.00
22	Chrysene	4.44E-05	6.41E-05	2.97E-05	1.41E-07	7.57E-08	6.19E-06	1.03E-06	32.10	46.31	21.44	0.10	0.05	0.00	0.00	0.00
23	Benzo(b)flouranthene	4.11E-05	2.91E-05	2.75E-05	1.30E-07	2.56E-08	6.19E-06	7.88E-07	42.03	29.73	28.07	0.13	0.02	0.00	0.00	0.00
24	Benzo(k)flouranthene	6.30E-05	3.07E-05	4.21E-05	2.00E-07	2.49E-08	5.06E-06	4.24E-07	46.31	22.60	30.93	0.15	0.02	0.00	0.00	0.00
25	Benzo(a)pyrene	6.11E-06	3.47E-06	4.08E-06	1.94E-08	2.78E-09	6.19E-06	3.64E-07	44.65	25.37	29.82	0.14	0.02	0.00	0.00	0.00
26	Indeno(123-cd)pyrene	2.36E-05	2.03E-05	1.57E-05	7.47E-08	1.74E-08	5.63E-06	5.46E-07	39.47	34.01	26.36	0.13	0.03	0.00	0.00	0.00
27	Dibenz(ah)anthracene	5.64E-06	2.13E-06	3.77E-06	1.79E-08	4.71E-09	2.25E-06	2.00E-06	48.80	18.41	32.59	0.15	0.04	0.00	0.00	0.00
28	Benzo(ghi)perylene	3.25E-04	5.44E-05	2.17E-04	1.03E-06	7.22E-08	3.38E-06	6.06E-07	54.38	9.11	36.32	0.17	0.01	0.00	0.00	0.00
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		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Cadmium	TDI	0.36	TDI	0.0014	13.4	0.02	NR	NR	NR	NR	NR	0.001	0.5	1	1	1
3	Chromium III	TDI	150	TDI	0.1	60.2	0.27	NR	NR	NR	NR	NR	0	0.5	1	1	1
4	Mercury, inorganic	TDI	2	TDI	0.06	1	0	NR	NR	NR	NR	NR	0	0.5	1	1	1
5	Nickel	TDI	12	TDI	0.006	130	0.06	NR	NR	NR	NR	NR	0.005	0.5	1	1	1
6	Copper	TDI	160	TDI	0.286	7000	0.68	NR	NR	NR	NR	NR	0	0.5	1	1	1
7	Zinc	TDI	600	TDI	600	27000	2.4	NR	NR	NR	NR	NR	0	0.5	1	1	1
8	Selenium	TDI	6.4	NR	0	35	0.06	NR	NR	NR	NR	NR	0	0.5	1	1	1
9	Chromium VI	TDI	1	NR	0	6.7	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1
10	Barium	TDI	20	NR	0	847	1000	NR	NR	NR	NR	NR	0	0.5	1	1	1
11	Beryllium	TDI	2	ID	0.0012	15	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1
12	Vanadium	TDI	3	TDI	0.0286	23	0.64	NR	NR	NR	NR	NR	0	0.5	1	1	1
13	Phenol	TDI	700	TDI	10	350	40	8.35E-06	7.90E-06	6.36E-10	1.92	1.48	0.3	0.5	1	1	1
14	Acenaphthylene	TDI	60	TDI	60	0.14	0.011	5.68E-04	5.97E-06	4.82E-10	3.26	3.91	0.13	0.5	1	1	1
15	Acenaphthene	TDI	60	TDI	60	0.98	0.025	7.59E-04	5.85E-06	4.70E-10	3.37	4.03	0.13	0.5	1	1	1
16	Flourene	TDI	40	TDI	40	0.59	0.096	4.12E-04	5.58E-06	4.47E-10	3.45	4.13	0.13	0.5	1	1	1
17	Phenanthrene	TDI	12.5	TDI	12.5	1.54	0.518	1.43E-04	5.34E-06	4.32E-10	3.74	4.5	0.13	0.5	1	1	1
18	Anthracene	TDI	300	TDI	300	0.08	0.041	1.81E-04	5.36E-06	4.36E-10	3.75	4.5	0.13	0.5	1	1	1
19	Flouranthene	TDI	12.5	TDI	12.5	0.35	0.084	6.29E-05	5.01E-06	4.11E-10	4.26	5.13	0.13	0.5	1	1	1
20	Pyrene	TDI	30	TDI	30	0.35	0.065	5.64E-05	5.01E-06	4.15E-10	4.21	5.08	0.13	0.5	1	1	1

		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)	Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
21	Benz(a)anthracene	ID	0.138	ID	0.00048	0.06	0.011	3.16E-05	4.60E-06	3.80E-10	4.89	5.91	0.13	0.5	1	1	1
22	Chrysene	ID	0.2	ID	0.0007	0.11	0.017	3.18E-06	4.57E-06	3.77E-10	4.74	5.73	0.13	0.5	1	1	1
23	Benzo(b)flouranthene	ID	0.142	ID	0.0005	0.11	0.013	2.05E-06	4.36E-06	3.62E-10	5.02	6.08	0.13	0.5	1	1	1
24	Benzo(k)flouranthene	ID	0.2	ID	0.0007	0.09	0.007	1.74E-06	4.36E-06	3.62E-10	5.17	6.26	0.13	0.5	1	1	1
25	Benzo(a)pyrene	ID	0.02	ID	0.00007	0.11	0.006	1.76E-06	4.38E-06	3.67E-10	5.11	6.18	0.13	0.5	1	1	1
26	Indeno(123-cd)pyrene	ID	0.086	ID	0.0003	0.1	0.009	2.05E-06	4.17E-06	3.51E-10	4.94	5.97	0.13	0.5	1	1	1
27	Dibenz(ah)anthracene	ID	0.018	ID	0.000063	0.04	0.033	5.40E-06	4.08E-06	3.40E-10	5.27	6.38	0.13	0.5	1	1	1
28	Benzo(ghi)perylene	ID	0.909	ID	0.0032	0.06	0.01	2.86E-06	4.22E-06	3.56E-10	5.62	6.81	0.13	0.5	1	1	1
29																	
30																	

		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg\ g^{-1}$ plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables ($mg\ g^{-1}$ plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg\ g^{-1}$ plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg\ g^{-1}$ plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg\ g^{-1}$ plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit ($mg\ g^{-1}$ plant DW or FW basis over mg g^{-1} DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Cadmium	1.00E+02	NR	1.62E+06	0.052 fw	0.029 fw	0.031 fw	0.016 fw	0.0031 fw	0.0014 fw
3	Chromium III	4.80E+03	NR	5.85E+05	0.00003 dw	0.00003 dw	0.00003 dw	0.00003 dw	0.00003 dw	0.00003 dw
4	Mercury, inorganic	5.00E+02	NR	7.40E+04	0.0038 fw	0.0069 fw	0.0043 fw	0.001 fw	0.0011 fw	0.001 fw
5	Nickel	5.00E+02	NR	2.50E+06	0.0038 fw	0.0043 fw	0.0019 fw	0.0025 fw	0.0025 fw	0.0034 fw
6	Copper	1.00E+02	NR	1.38E+06	0.0206 dw	0.0206 dw	0.0206 dw	0.0233 dw	0.0206 dw	0.0206 dw
7	Zinc	3.80E+01	NR	4.32E+06	0.054 dw	0.054 dw	0.054 dw	0.143 dw	0.054 dw	0.054 dw
8	Selenium	5.00E+01	NR	2.17E+06	0.0108 fw	0.00364 fw	0.00083 fw	0.00271 fw	0.003 fw	0.003 fw
9	Chromium VI	1.80E+01	NR	2.30E+06	0.0002 dw	0.0001 dw	0.0001 dw	0.09 dw	0.0003 dw	0.09 dw
10	Barium	0.00E+00	NR	8.00E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	Beryllium	1.70E+03	NR	1.66E+06	0.007 dw	0.0012 dw	0.0012 dw	0.0012 dw	0.0012 dw	0.0012 dw
12	Vanadium	1.26E+01	NR	2.11E+05	0.13 dw	0.13 dw	0.013 dw	0.013 dw	0.013 dw	0.013 dw
13	Phenol	4.82E-01	1.15E+01	8.41E+04	model	model	model	0.00E+00	0.00E+00	model
14	Acenaphthylene	1.06E+01	7.08E-02	7.95E+00	model	model	model	model	model	model
15	Acenaphthene	1.36E+01	7.37E-02	4.11E+00	model	model	model	model	model	model
16	Flourene	1.63E+01	1.56E-02	1.86E+00	model	model	model	model	model	model
17	Phenanthrene	3.19E+01	2.82E-03	1.12E+00	model	model	model	model	model	model
18	Anthracene	3.26E+01	8.49E-05	5.60E-02	model	model	model	model	model	model
19	Flouranthene	1.06E+02	1.31E-04	2.30E-01	model	model	model	model	model	model
20	Pyrene	9.41E+01	1.53E-05	1.30E-01	model	model	model	model	model	model

		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
21	Benz(a)anthracene	4.50E+02	1.24E-06	3.80E-03	model	model	model	model	0.00E+00	model
22	Chrysene	3.19E+02	4.52E-08	2.00E-03	model	model	model	model	0.00E+00	model
23	Benzo(b)flouranthene	6.07E+02	6.34E-08	2.00E-03	model	model	model	model	0.00E+00	model
24	Benzo(k)flouranthene	8.58E+02	1.64E-08	8.00E-04	model	model	model	model	0.00E+00	model
25	Benzo(a)pyrene	7.47E+02	2.00E-08	3.80E-03	model	model	model	model	0.00E+00	model
26	Indeno(123-cd)pyrene	5.05E+02	2.12E-09	2.00E-04	model	model	model	model	0.00E+00	model
27	Dibenz(ah)anthracene	1.08E+03	1.66E-10	6.00E-04	model	model	model	model	0.00E+00	model
28	Benzo(ghi)perylene	2.42E+03	1.55E-10	2.60E-04	model	model	model	model	model	model
29										
30										

Client/client ref:
Project ref: Boorley Green
Site ref: GE9523
Data description: Topsoil - All Metals
Contaminant(s):
Test scenario: Planning
Date: 22 October 2013
User details: JT

	Arsenic** (mg/kg)	Cadmium** (mg/kg)	Chromium** (mg/kg)	Lead** (mg/kg)	Mercury** (mg/kg)	Nickel** (mg/kg)	Copper** (mg/kg)	Zinc** (mg/kg)	Selenium** (mg/kg)	Hexavalent Chromium (mg/kg)	Water Soluble Boron (mg/kg)	Barium* (mg/kg)	Beryllium* (mg/kg)	Vanadium** (mg/kg)	Total Monohydric Phenols*** (mg/kg)	TPH (> C8 - < C40)** (mg/kg)
Critical concentration, C_c	32.00	5.20	3010.00	450.00	169.00	127.00	5200.00	19400.00	350.00	48.9		1330	412	107	188	50
Notes																
Full dataset size	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	45
Outliers present?	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes
Number of outliers temporarily excluded	0															
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**45**
Sample mean, $\bar{X}$	7.62572468	0.25	20.8606782	33.7769715	0.26073602	6.04860581	11.914593	40.7878363	1.89285592	1	0.55259375	37.4402111	0.5	31.5464741	0.75336467	3.22786617
Standard deviation, s	7.51623521	0	6.90444698	25.8670099	0.08588812	2.34992411	7.97123629	16.8359263	2.29316836	0	0.23156916	44.4788805	0	9.91645458	0.99099283	3.36425516
Number of non-detects	**13**	**64**	0	0	**63**	0	0	0	**18**	**64**	**19**	0	**64**	0	**57**	**42**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Single value	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Single value	Non-normal	Non-normal	Single value	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev
Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				Evidence level required:		95%	Use Normal distribution to test for outliers								
t statistic, t_0 (or k_0)	-25.94306819	N/A	-3463.436631	-128.7270635	-15717.12185	-411.7627236	-5206.806293	-9199.000688	-1214.414608	N/A		-232.4806334	N/A	-60.87137314	-1511.588222	-93.26195468
Upper confidence limit (on true mean concentration, μ)	11.7210384	0.25	24.6226515	47.8709318	0.30753322	7.32899102	16.2578196	49.961099	3.14231706	1	0.67876707	61.6750793	0.5	36.949577	1.29331937	5.41391304
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**		**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	lower bound	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**		**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	◉	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Back to data | Go to outlier test | Go to normality test | Show individual summary

Client/client ref:
Project ref: Boorley Green
Site ref: GE9523
Data description: Made Ground - All Metals
Contaminant(s):
Test scenario: Planning
Date: 22 October 2013
User details: JT

	Arsenic** (mg/kg)	Cadmium** (mg/kg)	Chromium** (mg/kg)	Lead** (mg/kg)	Mercury** (mg/kg)	Nickel** (mg/kg)	Copper** (mg/kg)	Zinc** (mg/kg)	Selenium** (mg/kg)	Hexavalent Chromium (mg/kg)	Water Soluble Boron (mg/kg)	Barium* (mg/kg)	Beryllium* (mg/kg)	Vanadium** (mg/kg)	Total Monohydric Phenols*** (mg/kg)	TPH (> C8 - < C40)** (mg/kg)
Critical concentration, C_c	32.00	5.20	3010.00	450.00	169.00	127.00	5200.00	19400.00	350.00	48.9		1330	412	107	188	50
Notes																
Full dataset size	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13
Outliers present?	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	No	Yes	Yes
Number of outliers temporarily excluded	0															
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**13**
Sample mean, $\bar{x}$	6.68901326	0.25	21.7806116	66.0286804	0.25	8.16225936	9.41767539	54.5862096	1.91041373	1	0.7742	37.1136284	0.5	32.9362054	0.58461707	5.70955876
Standard deviation, s	2.50394595	0	9.59381285	130.844841	0	1.70377899	3.22098441	31.2183452	2.81841328	0	0.84555377	12.3454665	0	14.8258797	0.22433105	11.5722287
Number of non-detects	**3**	**15**	0	0	**15**	0	0	0	**6**	**15**	**7**	0	**15**	0	**13**	**12**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Normal	Single value	Normal	Non-normal	Single value	Normal	Normal	Non-normal	Non-normal	Single value	Non-normal	Normal	Single value	Normal	Non-normal	Non-normal
Statistical approach	Auto: One-sample t	Auto: Chebychev	Auto: One-sample t	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t	Auto: One-sample t	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t	Auto: Chebychev	Auto: One-sample t	Auto: Chebychev	Auto: Chebychev
Test scenario:	Planning: is true mean lower than critical concentration (μ) < CC?				Evidence level required:		95%	Use Normal distribution to test for outliers								
t statistic, t_0 (or k_0)	-39.14981877	N/A	-1206.332051	-11.36548081	N/A	-270.1386707	-6241.271713	-2400.014	-478.3348061	N/A		-405.6005017	N/A	-19.34777896	-3235.649519	-13.79954211
Upper confidence limit (on true mean concentration, μ)	7.82772856	0.25	26.1435738	213.28969	0.25	8.93708407	10.8824771	89.7212978	5.08243322	1	1.72583937	42.7279554	0.5	39.6785458	0.83709334	19.699701
Evidence level	**100%**	**100%**	**100%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**		**100%**	**100%**	**100%**	**100%**	**99%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	lower bound	evidence level	evidence level	evidence level	evidence level	evidence level
Result	μ < Cc	μ < Cc	μ < Cc	μ < Cc	μ < Cc	μ < Cc	μ < Cc	μ < Cc	μ < Cc	μ < Cc		μ < Cc	μ < Cc	μ < Cc	μ < Cc	μ < Cc
Select dataset	◉ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

Back to data | Go to outlier test | Go to normality test | Show individual summary

Client/client ref:
Project ref: Boorley Green
Site ref: GE9523
Data description: Natural Soils - All Metals
Contaminant(s):
Test scenario: Planning
Date: 22 October 2013
User details: JT

	Arsenic** (mg/kg)	Cadmium** (mg/kg)	Chromium** (mg/kg)	Lead** (mg/kg)	Mercury** (mg/kg)	Nickel** (mg/kg)	Copper** (mg/kg)	Zinc** (mg/kg)	Selenium** (mg/kg)	Hexavalent Chromium (mg/kg)	Water Soluble Boron (mg/kg)	Barium* (mg/kg)	Beryllium* (mg/kg)	Vanadium** (mg/kg)	Total Monohydric Phenols*** (mg/kg)	TPH (> C8 - < C40)** (mg/kg)
Critical concentration, C_c	32.00	5.20	3010.00	450.00	169.00	127.00	5200.00	19400.00	350.00	48.9		1330	412	107	188	50
Notes																
Full dataset size	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	9
Outliers present?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes
Number of outliers temporarily excluded	0															
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**9**
Sample mean, $\bar{x}$	8.88129784	0.25	26.7319943	21.6775132	0.25	6.26377858	9.20245001	39.7873584	2.2031725	1	0.49675	32.1260216	0.5	39.2710224	0.56132771	2.96396912
Standard deviation, s	4.00816226	0	12.8963722	13.2016472	0	1.8856112	3.55120259	13.7018489	2.30925499	0	0.31566038	12.7722324	0	16.837754	0.21244543	1.39190735
Number of non-detects	**2**	**12**	0	0	**12**	0	0	0	**3**	**12**	**7**	0	**12**	0	**11**	**8**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Normal	Single value	Normal	Normal	Single value	Normal	Normal	Normal	Non-normal	Single value	Non-normal	Normal	Single value	Normal	Non-normal	Non-normal
Statistical approach	Auto. One-sample t	Auto. Chebychev	Auto. One-sample t	Auto. One-sample t	Auto. Chebychev	Auto. One-sample t	Auto. One-sample t	Auto. One-sample t	Auto. Chebychev	Auto. Chebychev	Auto. Chebychev	Auto. One-sample t	Auto. Chebychev	Auto. One-sample t	Auto. Chebychev	Auto. Chebychev
Test scenario:	Planning: is true mean lower than critical concentration ($\mu < Cc$)?				**Evidence level required:**		**95%**	Use normal distribution to test for outliers								
t statistic, t_0 (or k_0)	-19.98061161	N/A	-801.3372591	-112.3914766	N/A	-221.8074112	-5063.481936	-4894.649196	-521.7282443	N/A		-352.0110816	N/A	-13.93416609	-3056.345344	-101.3775039
Upper confidence limit (on true mean concentration, μ)	10.9592386	0.25	33.4178256	28.5216074	0.25	7.24133089	11.0434904	46.8907708	5.10892131	1	0.89394727	38.7474954	0.5	48.0001736	0.82864902	4.98636361
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**		**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	lower bound	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**		**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	◉ Y	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

Client/client ref:
Project ref: Boorley Green
Site ref: GE9523
Data description: Topsoil - All PAHs
Contaminant(s):
Test scenario: Planning
Date: 22 October 2013
User details: JT

	Naphthalene**	Acenaphthylene**	Acenaphthene**	Fluorene**	Phenanthrene**	Anthracene**	Fluoranthene**	Pyrene**	Benz(a)anthracene**	Chrysene**	Benzo(b)fluoranthene**	Benzo(k)fluoranthene**	Benzo(a)pyrene**	Indeno(123-cd)pyrene**	Dibenz(ah)anthracene**	Benzo(ghi)perylene**	Total PAH**
Critical concentration, C_c	**1.5**	**169**	**207**	**164**	**92**	**2250**	**257**	**563**	**2.99**	**5.99**	**5.94**	**8.49**	**0.82**	**3.18**	**0.76**	**43.8**	**50**
Notes																	
Full dataset size	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Outliers present?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of outliers temporarily excluded	0																
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**
Sample mean, $\bar{x}$	0.0510173	0.05113734	0.05217327	0.05185007	0.07109321	0.05332109	0.11111693	0.08845427	0.07749669	0.08240923	0.10142341	0.11401651	0.07985316	0.11650977	0.05651439	0.09011662	0.56569078
Standard deviation, s	0.00813842	0.00909873	0.01738618	0.0104909	0.10785673	0.01863753	0.20267287	0.15454828	0.11043925	0.12925566	0.13997618	0.14030864	0.12317805	0.15288456	0.03204125	0.10646244	1.41743054
Number of non-detects	**63**	**63**	**63**	**62**	**61**	**62**	**54**	**57**	**59**	**57**	**52**	**48**	**59**	**49**	**61**	**51**	**47**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration ($\mu < C_c$)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers									
t statistic, t_0 (or k_0)	-1424.338465	-148547.19	-95224.07019	-125021.207	-6818.594268	-965770.3659	-10140.04031	-29138.41721	-210.9759574	-365.6375896	-333.6897267	-477.5747825	-48.0700471	-160.3034469	-175.6450003	-3284.529797	-279.0080091
Upper confidence limit (on true mean concentration, μ)	0.05545162	0.0560949	0.06164635	0.05756616	0.12986028	0.06347598	0.22154575	0.17266182	0.13767088	0.15283577	0.17769116	0.19046541	0.14696825	0.19981081	0.07397246	0.148124	1.33799534
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	◉ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

Client/client ref:
Project ref: Boorley Green
Site ref: GE9523
Data description: Made Ground - All PAHs
Contaminant(s):
Test scenario: Planning
Date: 22 October 2013
User details: JT

	Naphthalene** (mg/kg)	Acenaphthylene** (mg/kg)	Acenaphthene** (mg/kg)	Fluorene** (mg/kg)	Phenanthrene** (mg/kg)	Anthracene** (mg/kg)	Fluoranthene** (mg/kg)	Pyrene** (mg/kg)	Benz(a)anthracene** (mg/kg)	Chrysene** (mg/kg)	Benzo(b)fluoranthene** (mg/kg)	Benzo(k)fluoranthene** (mg/kg)	Benzo(a)pyrene** (mg/kg)	Indeno(123-cd)pyrene** (mg/kg)	Dibenz(ah)anthracene** (mg/kg)	Benzo(ghi)perylene** (mg/kg)	Total PAH** (mg/kg)
Critical concentration, C_c	**1.5**	**169**	**207**	**164**	**92**	**2250**	**257**	**563**	**2.99**	**5.99**	**5.94**	**8.49**	**0.82**	**3.18**	**0.76**	**43.8**	**50**
Notes																	
Full dataset size	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Outliers present?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of outliers temporarily excluded													0				
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**
Sample mean, $\bar{x}$	0.28851759	0.15437461	0.33348801	0.25173831	1.59368078	0.58352749	2.56320367	2.11908282	1.3840884	1.41343116	1.26114698	1.21624854	1.39334772	1.07350091	0.30471574	1.02895302	16.3763791
Standard deviation, s	0.92377464	0.40424111	1.09794435	0.78132911	5.68818318	2.01908015	9.06893135	7.47864577	4.81839974	4.88138041	4.27737826	4.09653683	4.84632011	3.59649654	0.86900973	3.426001	58.4373977
Number of non-detects	**14**	**14**	**14**	**14**	**11**	**13**	**11**	**11**	**11**	**11**	**10**	**10**	**11**	**10**	**11**	**10**	**10**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers									
t statistic, t_0 (or k_0)	-5.079216319	-1617.688731	-729.0132332	-811.6865001	-61.55606414	-4314.812629	-108.6599333	-290.4646802	-1.290816295	-3.63113984	-4.236501594	-6.87681313	0.458196343	-2.268439801	-2.029100812	-48.35128561	-2.228431262
Upper confidence limit (on true mean concentration, μ)	1.32819164	0.60933297	1.56918361	1.13109521	7.99551974	2.85592723	12.7699492	10.5360209	6.80701838	6.90724356	6.07517739	5.82674863	6.84770105	5.12122422	1.28275393	4.88478993	82.1455003
Evidence level	**96%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**62%**	**93%**	**95%**	**98%**	**0%**	**84%**	**80%**	**100%**	**83%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ ≈≥ Cc**	**μ ≈≥ Cc**	**μ ≈≥ Cc**	**μ < Cc**	**μ ≥ Cc**	**μ ≈≥ Cc**	**μ ≈≥ Cc**	**μ < Cc**	**μ ≈≥ Cc**
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y	○ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

Client/client ref:
Project ref: Boorley Green
Site ref: GE9523
Data description: All PAHs
Contaminant(s):
Test scenario: Planning
Date: 22 October 2013
User details: JT

	Naphthalene** (mg/kg)	Acenaphthylene** (mg/kg)	Acenaphthene** (mg/kg)	Fluorene** (mg/kg)	Phenanthrene** (mg/kg)	Anthracene** (mg/kg)	Fluoranthene** (mg/kg)	Pyrene** (mg/kg)	Benz(a)anthracene** (mg/kg)	Chrysene** (mg/kg)	Benzo(b)fluoranthene** (mg/kg)	Benzo(k)fluoranthene** (mg/kg)	Benzo(a)pyrene** (mg/kg)	Indeno(123-cd)pyrene** (mg/kg)	Dibenz(ah)anthracene** (mg/kg)	Benzo(ghi)perylene** (mg/kg)	Total PAH** (mg/kg)
Critical concentration, C_c	**1.5**	**169**	**207**	**164**	**92**	**2250**	**257**	**563**	**2.99**	**5.99**	**5.94**	**8.49**	**0.82**	**3.18**	**0.76**	**43.8**	**50**
Notes																	
Full dataset size	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Outliers present?	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Number of outliers temporarily excluded	0																
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Sample mean, $\bar{x}$	0.05	0.05	0.05	0.05	0.05	0.05	0.05960225	0.07300591	0.05616892	0.06129954	0.09597895	0.11821589	0.07276507	0.09948119	0.06287208	0.10533122	0.41722103
Standard deviation, s	7.2474E-18	7.2474E-18	7.2474E-18	7.2474E-18	7.2474E-18	7.2474E-18	0.03326315	0.05484792	0.02136978	0.03914275	0.09195629	0.13202862	0.07886052	0.10304588	0.04459019	0.12923103	0.75241904
Number of non-detects	**12**	**12**	**12**	**12**	**12**	**12**	**11**	**10**	**11**	**11**	**9**	**9**	**11**	**9**	**11**	**10**	**9**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev
Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers									
t statistic, t_0 (or k_0)	-6.93065E+17	-8.0754E+19	-9.89171E+19	-7.83642E+19	-4.39499E+19	-1.07542E+21	-26758.36597	-35553.51605	-475.5822454	-524.6852163	-220.1511409	-219.654731	-32.82374566	-103.5580497	-54.15814364	-1171.257222	-228.2767649
Upper confidence limit (on true mean concentration, μ)	0.05	0.05	0.05	0.05	0.05	0.05	0.10145746	0.14202136	0.08305864	0.11055308	0.21168808	0.28434826	0.17199572	0.22914441	0.11898017	0.26794336	1.36399423
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	◉ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**