
Phase III Site Investigation Report

at Land at Bilsham Road,
Yapton, Arundel, BN18 0JU

for Thakeham Client Ltd and
Bilsham Road Development
LLP

Report Reference: LP2231

Report Date: 16th June 2020

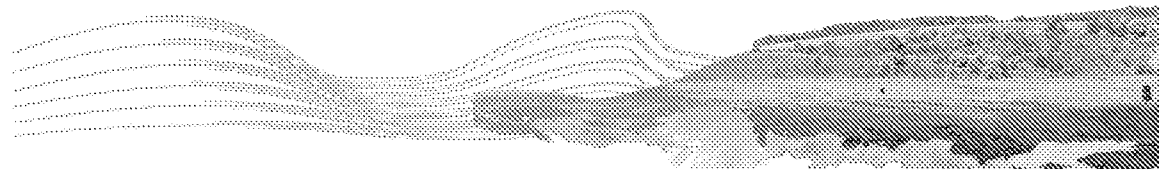


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EXECUTIVE SUMMARY

The site comprises three adjoining agricultural fields with drainage ditches along the boundaries. A culvert also traverses the southern field. It is proposed to redevelop the site with up to 250 residential dwellings with private gardens, public open space, a pumping station and access including adopted roads.

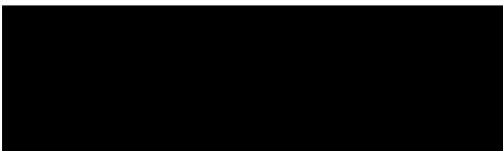
The site has remained undeveloped throughout its history and has been used for agricultural land. A previous desk study by BRD Environmental did not identify any significant sources of contamination on site, other than made ground associated with the backfilled culvert.

The site is mapped as being underlain by River Terrace Deposits comprising sandy silty clays with flint gravels, over the bedrock of the Upper Chalk Formation. Ground conditions encountered on site comprise soft to firm very silty slightly sandy clays, with localised sandy lenses, to 2.9/4.3mbGL, over weathered chalk at depth. Very soft clays were encountered in WS201 from 2.5-3.5m bGL. Overall, the ground conditions were consistent with the findings of the previous intrusive investigations.

Design CBR values of 1%, 2% and 2.5% are recommended for the west, north and south fields respectively. Care must be taken to ensure good construction conditions during road construction, as the soils encountered will soften rapidly when exposed to moisture. Allowance should be made for a frost susceptible sub-grade.

Trial trenches were undertaken over the culvert and encountered reworked natural soils. Contamination testing has been carried out on the backfill culvert material, and did not identify any significant contamination., and as such no remedial works are required. Waste Classification Testing of the backfilled culvert material indicates the soils will be expected to be classified as non-hazardous waste.

As with any redevelopment site, there is always the risk of hitherto undetected contamination.

Signed:	
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Date :	16 June 2020
Revision:	Issue 1

A INTRODUCTION

1 Authority

Leap Environmental Ltd (hereafter referred to as **LEAP**) has been appointed by Thakeham Client Ltd and Bilsham Road Development LLP (the client) to undertake a Phase III intrusive Site Investigation of a site referred to as Land off Bilsham Road, Yapton, Arundel, BN18 0JU. The instruction was given the Thakeham Purchase Order No. IM-C033/000001.

2 Objective

LEAP understands that the site is currently owned by the client and it is proposed to redevelop the site with up to 250 residential dwellings with private gardens, public open space, a pumping station and vehicular access as per the attached layout in Drawing I9284-PI01.

The proposed development is currently at a final design phase (planning reference Y/91/17/OUT) and has been assessed in accordance with BS EN 1997¹, as being a Geotechnical Category I structure.

The site is subject to the Arun District Council outline planning application ref Y/91/17/OUT.

The objectives of this report are to:

- Review the previous investigation reports;
- Provide design CBR values for road design;
- Provide geotechnical information at locations where proposed roads cross existing ditches and at the proposed pumping station location;
- Provide information on the ground conditions at the locations of the proposed culvert;
- Assess the potential for contamination within the backfill material of the culvert.

¹ BS EN 1997-1(2004)+A1:2013 Eurocode 7:Geotechnical Design: General Rules

3 Previous Studies

The site has been the subject of previous investigations by others. The following site investigation reports and documents have been supplied by the Client, and the reader is referred to these earlier reports which should be read in conjunction with this report.

- BRD Environmental Ltd, 'Phase 1 Geo-Environmental Desk Study at Land at Bilsham Road, Yapton for Gleeson Developments', Dated 25th April 2017 (Ref: BRD2693-OR1-B);
- BRD Environmental Ltd, 'Phase 2 Geo-Environmental Ground Investigation at Land at Bilsham Road, Yapton for Gleeson Developments', Dated 28th February 2018 (Ref: BRD2693-OR2-C);
- BRD Environmental Ltd Groundwater Monitoring Data between January and March 2018;
- Soils Limited, 'Main Investigation Report (Geotechnical) – DRAFT at Bilsham Road Yapton, West Sussex BN18 0HB for Gleeson Strategic Land', Dated April 2019 (Ref: I7571_R27);
- JNP Group, 'RE: Land West of Bilsham Road, Yapton – Foundation Assessment' (Ref: C85834-003-AAB-AAB);

4 Scope of Works

The Phase III work was undertaken in order to provide further information to aid the overall design of the site and comprised an intrusive investigation with laboratory testing. The site investigation comprised the following tasks:

- 4 No. 4m deep windowless boreholes drilled with a tracked rig, with Standard Penetrometer Tests (SPTs);
- 25 No. 0.5m to 0.7m deep machine excavated trial pits with in-situ Dynamic Cone Penetrometer CBR tests at the base of the pits;
- 25 No laboratory soaked CBR tests;
- Additional geotechnical laboratory testing including Atterberg Limit Tests and Sieve Analysis;
- Chemical laboratory tests including two LEAP standard soil suites and one WAC test.

The intrusive works were completed by contractors who have been scrutinised and are on LEAP's approved contractor list. The windowless sampling was carried out by Oakland Site Investigation Limited. The machine excavated trial pits were carried out by Harlington Homes. All works were supervised by LEAP.

The chemical laboratory testing has been carried out by The Environmental Laboratory Ltd at its laboratories in East Sussex. The geotechnical laboratory testing has been carried out by Geolabs Ltd at its laboratories in Watford.

5 Limitations

This report has been prepared by Leap Environmental Ltd on the basis of information received from a variety of sources which Leap Environmental Ltd believes to be accurate. Nevertheless, Leap Environmental Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

Leap Environmental Ltd has used all reasonable skill, care and diligence in the design and execution of this report, taking into account the manpower and resources devoted to it in agreement with the Client. Although every reasonable effort has been made to obtain all relevant information, all potential contamination, environmental constraints or liabilities associated with the site may not necessarily have been revealed.

The conclusions reached in this report are necessarily restricted to those which can be determined from the information consulted and may be subject to amendment in the light of additional information becoming available. These conclusions may not be appropriate for alternative schemes.

This report is confidential to the Client, and Leap Environmental Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Leap Environmental Ltd beforehand. Any such party relies upon the report at their own risk.

Full details of the limitations are provided in Appendix A.

B DESK STUDY

6 Site Location and Description

The site is located to the south west of Yapton, and accessed from Bilsham Road. The location of the site is provided in Figure 1 of Appendix B. The site details are summarised in Table 1 below.

Table 1 Summary of the Site Location and Description

Subject	Details
Site Location	Bilsham Road, Yapton, West Sussex, BN18 0JU
National Grid Reference	497620E 102800N
Site Layout and Usage	The site comprises three adjoining fields covered by rough grassland. The northern field is square shaped and the western field rectangular, whilst the southern field is approximately L-shaped with the base of the L adjoining the other fields. Ditches are located on the boundaries between the northern and western field, the southern and western field, and along the north west and south west western field boundaries. A ditch is also present along the eastern boundary of the southern field, going in to a north south aligned culvert which traverses the field, and becoming an open ditch once it extends off site. At the time of the investigation the fields were being used by pedestrians for walking. The site boundaries were lined with mature trees and hedgerows.
Site Area	11.3 ha
Topography and Elevation	The site is relatively flat lying and sits between 4.5m and 6.7m AOD. The ditches on site are approximately 1m deep with a 2m ditch along the eastern boundary of the southern field.
Surrounding Area	- North: Agricultural fields and residential properties. - East: Residential properties. - South and West: Agricultural fields.

7 Environmental Setting

7.1 Geology

The geology of the site has been ascertained by reference to the BGS GeoIndex. The site is mapped as being underlain by River Terrace Deposits comprising sandy silty clays with flint gravels, and underlain by the bedrock of the White Chalk Subgroup.

7.1.1 River Terrace Deposits

River Terrace Gravel consists of sand and gravel, locally with lenses of silt, clay or peat. The main constituent of the gravel is usually flint. Ice age valleys were back filled with gravels silts and clays as sea levels rose to modern day levels, thus forming the infilled buried channels that exist beneath the major flood plains.

7.1.2 White Chalk Subgroup

The White Chalk Subgroup Formation is the collective name given to the chalk strata comprising the Lewes Nodular Chalk Formation, the Seaford Chalk Formation, the Newhaven Chalk Formation, the Culver Chalk Formation and the Portsdown Chalk Formation. The exact formation beneath the site is not defined but typically comprises white chalk with flints.

7.1.3 Solution Features

Solution features generally occur where preferential weathering of the chalk occurs along discontinuities or joints. They are more common along geological boundaries, where surface water runoff from impermeable soils meets the more permeable underlying chalk. They are generally infilled with loose/soft soils, and can be visible at ground level due to surface depressions, although this may be masked by overlying superficial deposits. They may lie dormant for many years, and are generally reactivated by the introduction of water from, for example, a leaking drain, soakaway etc.

7.2 Hydrogeology

The superficial River Terrace Deposits beneath the site are classified as a Secondary A Aquifer whilst the underlying Chalk is classed as a Principal Aquifer,

The site is not situated within a Groundwater Source Protection Zone (SPZ).

No groundwater abstraction licenses are located within 250m of the site.

7.3 Hydrology

Ditches are present along the boundaries of the fields, as described in Section 6. A culvert is also present running approximately in a north /south orientation in the southern field. Evidence from ditches 70m to the south-southwest and 50m to the north-northeast of the southern field suggests the culvert is approximately 2m beneath the site.

8 Previous Investigations

The site has been the subject of investigation reports undertaken by others, the findings of which are summarised below.

8.1 BRD Desk Study

A desk study was undertaken by BRD Environmental Ltd in 2017 (Ref: BRD2693-ORI-B). At the time of the investigation, the site comprised three ploughed agricultural fields bounded by trees and hedgerows. The report indicates that the site had remained undeveloped throughout its history, and was currently used as agricultural land.

The site was reported as underlain by Aeolian Deposits over the Upper Chalk, classified as Secondary A and Principal aquifers respectively. The site was not located within a groundwater Source Protection Zone. No surface water abstractions or discharge consents were identified within 250m of site. Drainage ditches were noted along the site boundaries, and a culvert was reported under the southern field. The majority of the site was reported as within a Flood Zone 1 with the ditch and culvert in the southern field associated with Flood Zones 2 and 3. The potential for backfilled soils was identified along the line of the culvert.

The site was reported to be in an area where radon protection is not required, and in a low risk area for ground dissolution hazards.

A former brickfield was noted 150m north east of the site. When inspected the area was reported to be low lying relative to the surrounding area, and the report indicates the potential for significant infilling as reduced.

BDR Environmental did not identify any significantly hazardous potential contaminant pathways based on the history and environmental setting of the site. Low to moderate risks to future residents and the underlying aquifer were associated with pathways from potential contaminated Made Ground within the infilled culvert/stream/ditch and contamination within fly-tipped waste along the boundaries. Pesticides on site were also considered to be a low to moderate risk to future residents. Intrusive investigation including gas monitoring was recommended.

8.2 BRD Environmental Phase 2 Geo-Environmental Ground Investigation

BRD Environmental undertook an intrusive investigation between 17th and 20th October 2017 (Ref: BRD2693-OR2-C). In total 18 No. trial pits to a maximum depth of 3.40m, 12 No. windowless sampler boreholes with associated in-situ testing to 5.45m and one hand-dug pit to 0.7m were excavated. Soakage testing to BRE DG365 was also undertaken in five of the trial pits. Seven of the windowless boreholes were installed with 4m deep combined groundwater and gas monitoring wells. The trial holes were located to gather information of the general ground conditions, with some windowless boreholes located to investigate potential contamination associated with the backfilled culverts and fly-tipped waste on the boundaries of the site.

The ground conditions were reported as follows:

Table 2 Summary of Ground Conditions in BRD Environmental 2017 Investigation

Depth From (m)	Depth To (m)	Soil Type	Description
GL	0.25/ 0.30	TOPSOIL	Friable brown slightly humic locally fine-sized silty topsoil. Rare brick and clinker fragments were identified in WS11 and HD01 and associated with working of soil.
0.25/ 0.3	1.8/ 5.0	RIVER TERRACE DEPOSITS	Firm to stiff (soft to firm below 1.7m in some locations) orangish brown to brown silty CLAY with localized sub-angular coarse-sized flints. In some locations medium dense pale brown silty sands and gravels were observed.
1.8/ 5.0	>5.45	LEWES NODULAR CHALK FORMATION	Structureless grade Dm and Dc white to light grey/brown CHALK recovered as a silty gravel or gravelly silt, with gravels comprising flint chalk and flint.

Within the investigation, groundwater strikes were encountered at 4.0m bgl in WS07 and 2.0m bgl in WS11 and WS12. The soakage testing undertaken identified relatively slow soil infiltration rates. Six groundwater monitoring rounds were undertaken on a weekly basis between 25th October and 29th November 2017. Over this period groundwater was encountered between 1.59m bgl (WS07 in the centre of the site) and 3.67m bgl (WS09 in the north of the site).

SPT testing undertaken within the windowless boreholes generally identified N-values of between 9 and 19 in the River Terrace Deposits, and between 8 and 48 in the Chalk. However, N-values of between 4 and 6 were observed at 2.0m bgl in the boreholes close to the northeastern and southwestern boundaries of the northern field and eastern corner of the southern field (WS03 to WS06). BRD Environmental interpreted this as low strength soils. The soils were also assessed as Medium VCP. Reinforced trench/strip footings were recommended for light loads, with piled foundations where deepening below 1.5m was required. A preliminary design CBR of 3% was recommended.

BRD reported that geoenvironmental sampling and testing of the soils did not encounter any elevated levels of contamination with respect to human health. The report concluded that no significant risks to human health, water or the built environment were identified. No remedial works were recommended, and the topsoil was deemed suitable for re-use on site. The risks from land gas on site were assessed as negligible.

BRD Environmental recommended further site investigations be undertaken following finalising of the proposed development to investigate the extent and thickness of the low

strength superficial deposits. Further investigation was recommended to comprise Cone Penetration Testing over shallow and deep depths.

8.3 Soils Limited Main Investigation Report (Geotechnical)

Soils Limited were commissioned to undertake a geotechnically-focused investigation report following the preliminary investigation by BRD Environmental (Ref: 17571_R27), to provide information on the ground conditions to assist in the preparation of a foundation scheme for the proposed development. Between 28th and 29th March 2019 33 No. Cone Penetration Tests (CPTs) were undertaken by In Situ Site Investigation Ltd to depths of between 4.67m and 18.01m bgl.

Soils Ltd reported the ground conditions to comprise River Terrace Deposits with both cohesive and granular soils from ground level to between 3.0m and 7.25m bgl, and chalk to the base of the CPT investigation depths. The River Terrace Deposits were reported to be deepest in the northern field; in CPT123 at 6.20m and CPT116 at 7.20m, however 28 of the CPTs were only taken down to 5.0m bgl.

Geotechnical parameters were inferred from the data gathered using empirical correlations. Soils Ltd interpreted undrained cohesions in the River Terrace Deposits of between 11 and >100kPa, typically 60kPa, but also identified pockets of low strength cohesive beds of less than 30kPa at 2.0m bgl and greater scattered across the site. Soils Limited interpreted these pockets of low strength soils to be randomly located across the site. The N values of the SPTs in chalk were between 6 and 59, with an average of 25. No solution features were interpreted by Soils Limited to be within the chalk.

Soils Ltd recommended an allowable bearing value of 60kN/m run, and noted that in areas where soft to very soft soils were found, a founding depth in excess of 1m bGL would result in potentially higher settlements (>25mm).

8.4 JNP Foundation Assessment

JNP Group were commissioned to provide a Foundation Assessment based on the previous investigation results.

The report identified localised pockets of very low strength/extremely low strength deposits within 2.5-3m of the surface, and medium VCP soils.

The site was split in to 6 areas for foundation design: Area 1 – Medium strength clays, normal trench fill footings founded at 1.25m; Area 2 – Medium strength clays, normal trench footings deepened to a maximum of 2.15m near trees; Area 2a – medium strength clays and granular material, normal trench footings deepened to a maximum of 2.15m near trees; Area 3 – medium strength clay/loose silts, deeper wider trench fill with mesh reinforcement; Area 4 – Soft to very soft clay/silt/organic soils, piled foundations; Area 5 - Soft to very soft clay/silt/organic soils in close proximity to trees, piled foundations.

C PHASE III INTRUSIVE INVESTIGATION

9 Investigation Rationale

A total of 32 trial holes were excavated across the site. These included 25 No. machine excavated trial pits to a depth of between 0.5m and 1.2m, 3 No. trial trenches to 1.2-1.5m and 4 No. windowless sampler boreholes to depths of 4.45m.

The windowless sampled trial holes were located at the proposed culverts and pumping station. The majority of the trial pits were located along the proposed road, in order to carry out Dynamic Cone Penetrometer (DCP) testing at the proposed road formation level, and to undertake sampling for laboratory soaked CBR testing. The spacing of the trial pits was approximately 1 every 50m, as per the document 'Guidance for the Design of Road Pavement Foundations' provided by the client. Three trial trenches were located where the present culvert runs approximately north/south across the southern field, to identify potential backfill material above the culvert and assess the potential for contamination from this material.

The investigation rationale for the trial holes is summarised below:

Table 3 Rationale for Investigation Locations

Trial Hole Location	Rationale	Proposed Depth (mbGL)	Notes
WS201 to WS203	Provide information on ground conditions at proposed culvert locations.	4.0	
WS204	Provide information on ground conditions where the proposed pumping station is located.	4.0	
TP201 to TP225	Undertake DCP testing and sampling for laboratory soaked CBR testing on the proposed road foundation.	Approximately 0.5m	
TP226 to TP228	To gather information on the material used to backfill the present culvert and undertake sampling for contamination and WAC testing.	1.0	Trial pits extended to between 1.2m and 1.5m.

The site investigation locations are shown on Figure 2, Appendix B.

10 Site Work

10.1 Date and Weather Conditions

The intrusive investigations were undertaken between 20th April and 22nd April 2020. At the time of the investigations, the weather was sunny and warm with strong winds on the 20th and 21st April.

Prior to site works, the weather was varied. April was mostly dry with generally above average temperatures around 9°C. Rainfall was approximately 40% of the average rainfall in April. March was similar with 82% of average rainfall and generally average temperatures (approximately 6°C). February was also slightly above average temperatures but was extremely rainy at approximately 237% of the average rainfall for February. There were several flood warnings across the UK.

10.2 Site Work Methods

10.2.1 Windowless Sampler

The Windowless sampling rig consists of a tracked barrow with a sampling unit mounted on the top. When in the required position, the mast was raised to a height allowing a mechanised drop weight to fall repeatedly onto an anvil, and drive attached sample tubes or probe rods into the ground to produce reasonably intact continuous samples which were then extracted using the integrated hydraulic ram.

To reduce any tendency of the tubes to stick in the ground, a succession of smaller diameters may be used to obtain full depth. Excavated soils were placed aside for inspection and sampling.

On completion the trial hole was backfilled with excavated material, placed in reverse order, and the surface reinstated unless otherwise specified.

10.2.2 Trial Pitting

Trial pits were dug by a backhoe excavator. The trial pits excavated along the proposed road had a target depth of 0.5m bgl and were typically 0.5m wide by 1m long. The trial pits excavated on the culvert were excavated until backfill material was encountered. The trial pits were extended lengthways to identify the extent of the backfill material and were approximately 3m long. Trial pit dimensions are shown on the trial pit logs, included as Appendix C. Spoil was replaced in reverse order and trial pits were left mounded to allow for future settlement.

10.2.3 Soil Logging and Sampling

Soil samples were recovered from the boreholes and trial pits for field screening, logging and sampling.

Boreholes and trial pits were logged in general accordance with the requirements of BS 5930² and BS EN ISO 14688³, and are presented in Appendix C.

Visual and olfactory evidence of contamination was noted if encountered. These observations were used to aid scheduling of samples for chemical laboratory analyses, and are included on the logs in Appendix C and summarised in Section 11.

Samples were collected by hand using dedicated nitrile gloves for each sampling location. Samples were placed into laboratory supplied sampling containers, specific to the type of analyses required.

All sample containers were sealed and labelled with a unique location identity, depth and date of sampling.

10.3 Field Tests

10.3.1 Standard Penetration Tests

Standard penetration tests were undertaken in the boreholes at 1m centres in accordance with BS EN ISO 22476-3:2005. Uncorrected blow counts, 'N values', are recorded on the borehole logs in Appendix C.

10.3.2 In-situ California Bearing Ratio Test – Dynamic Cone Penetrometer

25 No. in-situ CBR tests have been undertaken at the proposed road formation level (approximately 0.5m) within the trial pits using the Dynamic Cone Penetrometer (DCP), recording blow counts over 900mm of penetration from test level. The test method and interpretation of the results have been undertaken in accordance with DMRB HD 29/08⁴ using a modified DCP. The results are attached in Appendix D.

10.4 Laboratory Analysis

10.4.1 Chemical Soil Analysis

Selected samples of soil have been subjected to laboratory testing. Sampling techniques and storage have been undertaken as per BS 10175:2011+AI:2013 Code of Practice for Investigation of Potentially Contaminated Sites. The laboratory testing has been carried out

² BS5930:2015+AI:2020 Code of Practice for Ground Investigation

³ BS EN ISO 14688 Parts 1-2 (2018) Geotechnical Investigation and Testing. Identification and classification of soil

⁴ HD22/08 Data for Pavement Assessment. Design Manual for Roads and Bridges; Volume 7 Pavement Design and Maintenance; Section 3 Pavement Maintenance Assessment Part 2

by The Environmental Laboratory Ltd at its laboratories in East Sussex. Where available, the tests procedures are UKAS and MCERTS accredited.

The following analyses were completed on selected samples:-

- Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn)
- Poly-aromatic hydrocarbons (PAHs)
- Asbestos identification
- pH
- Waste Acceptance Criteria (WAC) tests

The chemical soil analysis was limited to the materials related to the backfilled culvert. Additional environmental and chemical testing across the site was outside the scope of works for the investigation.

The full laboratory test results are presented in Appendix F.

10.4.2 Geotechnical Laboratory Testing

Selected samples of the soils have been classified by laboratory analysis for geotechnical design purposes. The laboratory testing has been carried out by Geolabs Ltd at its laboratories in Watford, in accordance with BS1377⁵ and BS EN ISO17892⁶. The sampling technique, type, storage and transport and the number of laboratory tests have been undertaken where possible in accordance with BS EN 1997-2:2007 and BS EN ISO 22475⁷.

The following laboratory tests have been undertaken in the superficial River Terrace Deposits:

Table 4 Geotechnical Laboratory Testing within the River Terrace Deposits

Test	Number of tests
Natural Moisture Content	4
Atterberg Limit Test	4
Particle Size Distribution Test	4
Laboratory soaked CBRs	25

⁵ BS1377 Parts 1-9:1990 Methods of test for Soils for Civil Engineering Purposes

⁶ BS EN ISO 17892 Parts 1-12 Geotechnical Investigation and Testing. Laboratory testing of soil

⁷ BS EN ISO 22475 Parts 1-3 Geotechnical Investigation and Testing. Sampling methods and groundwater measurements

11 Ground Conditions

The ground conditions are described in detail in the logs attached in Appendix C. In summary the soil conditions were as follows:

Table 5: Summary of soils encountered

Depth From (m)	Depth To (m)	Soil Type	Description
GL	0.2 / 0.3	TOPSOIL	Brown to dark brown clayey occasionally to slightly gravelly SAND with rootlets. Gravel is fine sub-rounded to sub-angular flint.
0.2/0.3	2.9/4.3	CLAY	Soft to firm orange brown mottled grey or reddish brown silty sandy gravelly CLAY. Gravel is fine to medium rounded to sub-rounded of chalk and fine to medium sub-rounded to angular of flint. Cobbles are rare but present (RIVER TERRACE DEPOSITS).
0.3/1.0	1.2/1.5	REWORKED CLAY/ SAND	Grey brown sandy clay/ cream grey clayey gravelly SAND (CULVERT BACKFILL) (TP226, 227 and 228 only).
2.0	2.9	SAND	Orangish brown clayey (gravelly) SAND. Gravel is fine to medium rounded to sub-rounded of chalk (RIVER TERRACE DEPOSITS) (WS203 only).
2.9 / 4.3	Not proven	CHALK	White grade Dc or Dm CHALK recovered as a silty gravel or gravelly silt with gravel of fine to coarse sub-rounded to sub-angular chalk and fine to coarse sub-angular flint. (WHITE CHALK SUBROUP)

In general, the soils encountered were consistent with those encountered during the previous investigations.

No made ground was encountered across the site. Rare fine brick and plastic pipe fragments were observed in the topsoil in TP213 but were considered to be a result of ploughing of the field turning materials into the topsoil.

The River Terrace Deposits mostly comprised orangish brown to reddish brown and grey silty sandy clays with varying amounts of gravels. In WS203 orangish brown clayey occasionally gravelly sands were encountered below the clay. Rare cobbles were encountered in WS202 at approximately 3.6m bgl. Very soft very gravelly sandy clays were encountered in WS201 from 2.5-3.5m bGL.

The trial trenches across the backfilled culvert, TP226, TP227 and TP228, generally encountered topsoil over reworked natural soils comprising grey brown sandy clays or cream grey gravelly sands. No deleterious or man made materials or any other signs of contamination were encountered.

Chalk was encountered in all windowless boreholes. The chalk was generally structureless, except in WS204 where a creamish white putty chalk was observed between 2.9m and 3.4m bgl. Flint gravels were observed in the chalk WS201, WS203, and WS204.

No evidence of visual or olfactory contamination was observed in the soils during the investigation.

11.1 Groundwater

No groundwater inflows were encountered in the windowless boreholes or the trial pits. However wet soils were observed in WS201 at 3.5m bgl and WS203 at 2.2m bgl.

D GEOTECHNICAL INFORMATION

12 Strata Encountered

12.1 Made Ground/Fill

No made ground was encountered across the site. However, reworked natural soils were encountered in the backfilled culvert trench in the southern field. No visual or olfactory signs of contamination or deleterious materials were encountered within the reworked soils.

12.2 River Terrace Deposits

The topsoil was underlain by orangish brown and red brown mottled grey silty sandy gravelly clays and orangish brown clayey gravelly sands. The results of the geotechnical laboratory testing are summarised in the tables below.

Table 6: Summary of Particle Size Distribution Tests

Trail Hole	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Cobbles (%)
WS201 @ 0.8m	27	65	8	0	0
WS202 @ 0.5	39	67	3	0	0
WS203 @ 1.2	11	32	50	7	0
WS204 @ 1.5	14	40	28	18	0

Table 7: Summary of Geotechnical Test Results in Sands

Test	Range
SPT 'N value'	6

Table 8: Summary of Geotechnical Test Results in Clays

Test	Range
SPT 'N value'	2-7
Moisture Content (%)	18.5-27.2
Liquid Limit (%)	29-49
Plastic Limit (%)	18-22
Plasticity Index (%)	11-27
CBR (%)	0.7-5.7
DCP CBR (%)	1.2-50

The results of the laboratory testing indicate the shallower soils tested comprise clayey slightly sandy silts, with silty fine sand lenses at depth. The clays comprise low to intermediate plasticity clays, which is consistent with the findings from the previous investigations.

SPT N-Values in the River Terrace Deposits generally ranged between 5 and 7 in the top 3m of the boreholes, which is consistent with the findings of the BRD Environmental investigation for low strength soils. Very low SPT N-values were observed in WS201, with values of 3 and 2 at 2m and 3m respectively. The closest windowless borehole from the BRD Environmental investigation, WS05, recorded SPT N values of 4 to 6 in the top 2m. However, hand pen tests at 2m in TP18, the closest trial hole in the BRD investigation, recorded very low strengths of 30kPa. Similarly, the closest CPT probe in the Soils Limited investigation, CPT127, interpreted low strength soils in the top 2m.

12.3 Chalk

The River Terrace Deposits were underlain by white to cream chalk recovered as either a silty gravel or gravelly silt with gravels of fine to coarse sub-rounded to sub-angular chalk and fine to coarse sub-angular flint to depth.

The results of the geotechnical laboratory testing completed on the chalk are summarised in Table 9 below.

Table 9: Summary of Geotechnical Test Results for Chalk

Test	Range
SPT 'N' value	2-19

SPT N-values were generally between 11 and 19 however an N-value of 2 was observed in WS201 at 4.0m. Very low SPT values were also recorded in the superficial River Terrace Deposits above the chalk in the same borehole.

It is not possible to provide a description of the chalk in accordance with CIRIA C574⁸ from samples from the windowless boreholes, due to the highly disturbed nature of the samples. However, based on the disturbed samples and the SPT blow counts achieved, a preliminary classification of the chalk as low density Grade Dm and Dc is assumed.

⁸ CIRIA C574 Engineering in Chalk (2002)

E GEOTECHNICAL TESTING

13 Swelling and Shrinkage

Based on the laboratory test results in Section D, an overall classification of NHBC low to medium Volume Change Potential (VCP) is indicated for the clay soils, and overall a MEDIUM VCP is recommended for design, in agreement with the previous BRD investigation findings

14 Groundwater

Groundwater was not encountered during the investigation however wet soils were observed at 2.2m bgl and 3.5m bgl.

Groundwater was encountered in the previous investigation and subsequent groundwater monitoring by BRD Environmental. Seven monitoring wells were installed by BRD across the site. The initial investigation recorded groundwater levels during November 2017 between approximately 1.6m and 3.7m bgl. Further additional monitoring was undertaken across the months January-March 2018 to assess winter groundwater levels, and recorded higher groundwater levels which, at their peak, were between 0.44 -1.29m bGL in the January.

15 Excavations

Excavations in made ground and loose superficial soils are likely to be unstable and subject to collapse. Close lateral support will be required in all excavations where man entry is required.

Excavations below the water table will be unstable in the more granular soils, and a rise in groundwater level to 0.5-1.5m below ground level should be anticipated in the wet winter months. Where sand lenses are encountered, running sands and piping in excavation bases should also be anticipated. Excavations extending below the water table will require dewatering.

Appropriate Health and Safety precautions must be adhered to where man entry into excavations is required. Even stiff clay soils at shallow depth can collapse, particularly following wet weather. Alternative foundation methods may need to be adopted where trench footings cannot be safely or satisfactorily constructed.

16 Roads

16.1 CBR test results

16.1.1 Test Results

Given the potential for high groundwater on site, 25 No. laboratory soaked CBR tests were undertaken on samples of the shallow soils at about 0.5-0.6m below ground level. The test returned CBR values in the range 0.7-5.7%. In the southern field, the results recorded an average CBR of 3.5%, with the western field and northern field recording averages of 1.1% and 2.4% respectively. The results are attached in Appendix E.

A series of 25 No. dynamic cone CBR tests were also carried out within the CBR trial pits (TP201-225). The results were in the range 1.2-7%, with a more consistent average CBR of 2.3-2.6% recorded across all three fields. Whilst the DCP tests did not indicate a much softer subgrade in the western field, it is noted the tests were undertaken in the spring, during a period of warmer weather when the soils would be drier and therefore less soft. Lower results would be anticipated in the laboratory soaked CBR tests, which would better represent the potential adverse winter conditions with a high groundwater table.

The shallow soils are assessed as frost susceptible, based on the results of the gradings and plasticity testing (see Section D).

16.1.2 Recommendations

Based on the results obtained, the design CBR for each field is summarised below.

Table 10 CBR Test Summary

Field	Average Laboratory CBR (%)	Average DCP CBR (%)	Design CBR (%)
South	3.5	2.6	2.5
West	1.1	2.4	1
North	2.4	2.3	2

As demonstrated by the laboratory soaked CBRs, the soils encountered on site are highly sensitive to moisture, particularly those in the western field. It is therefore essential that construction of the road is undertaken during dry conditions. Stripping of the road to formation level should only be undertaken just before construction, to ensure wetting up and softening of the formation level does not occur. Any soft spots should be removed and replaced with granular material.

16.2 Culverts

WS201, WS202 and WS 203 were undertaken where the proposed access road will traverse the existing ditches. The detailed design is not available at the time of writing this report,

however it is assumed that the ditches will be culverted under the road, with the culvert invert level at about 1-1.5m below existing ground level.

Assuming that the proposed road level is approximately the same as the existing ground level, the culvert formation level will be within the soft to firm orange brown silty slightly sandy clays in WS202 and WS203. WS201 encountered softer soils with a lower SPT N value of 3 at 2m, over very soft sandy clays below 2.5m.

At this stage net loads at formation level are considered likely to be minimal, and therefore no ground improvements are considered necessary, although this should be confirmed at the design stage.

17 Pumping Station

WS204 was undertake at the location of the proposed pumping station, and encountered soft to firm silty sandy clays to 2.9m, over chalk at depth. The detailed design was not available at the time of writing this report, however it is assumed that the pumping station will be founded within the chalk at around 4-5m below ground level. It is assumed that the pumping station will exert minimal net load at formation level. However, given the high groundwater on site, the pumping station should be designed for buoyancy effects when empty, using for example a thickened base slab or piled foundations. Allowance should also be made for groundwater seepages and unstable excavations during installation, particularly if over the wet winter months.

F CONTAMINATION TESTING

18 Testing Strategy

18.1 Soil Sampling

The site has been the subject of a geoenvironmental investigation undertaken by BRD, which concluded that no unacceptable risks with respect to human health, water environment or land gas were identified on site.

The potential for limited made ground to be present within the backfilled culvert in the southern field has been identified, and therefore soil sampling was undertaken at the location of the culvert present beneath the southern field in TP226, TP227 and TP228. Sampling was undertaken in order to determine if the backfilled material is a potential source of contamination on site.

The samples taken have been tested for the presence of the identified contaminants of concern (heavy metals, PAH compounds and asbestos). Selected samples were also tested for waste classification purposes.

Additional soil sampling and chemical testing, other than around the backfilled culvert, was beyond the scope of the investigation.

19 Assessment Criteria

19.1 Human Health Assessment Criteria

The generic quantitative risk assessment (GQRA) for human health compares the analytical results from the current investigation to Generic Assessment Criteria (GAC). These were selected using the following rationale and assumptions.

Defra and the EA have published a limited number of Soil Guideline Values (SGVs)⁹ that represent minimal chronic risk to human health. CL:AIRE has published a limited number of Category Four Screening Levels (C4SLs)¹⁰ which represent a low but still strongly precautionary level of chronic risk to human health. Both the SGVs and C4SLs have both been derived for a Soil Organic Matter (SOM) content of 6%, which is not always representative of the low SOM that are encountered within Made Ground on brownfield sites.

⁹ Environment Agency Science Report SC050021 series.

¹⁰ CL:AIRE Final Project Report. SPI010 – Development of Category 4 Screening Levels for assessment of land affected by contamination. CL:AIRE, December 2013

LQM responded to the demand for a more comprehensive set of screening values for a wider range of SOM and produced Suitable for Use Levels (S4ULs)¹¹ which are a hybrid of SGVs and C4SLs. The S4ULs have been endorsed by the Chartered Institute of Environmental Health (CIEH).

LEAP uses C4SLs where they are available as generic assessment criteria to quantitatively assess the potential chronic risks to human health. Where C4SLs are not available, the S4ULs are used. It is noted that S4ULs are not equivalent to C4SLs in all their exposure assumptions but are generally more conservative in their assumptions. For benzene and benzo(a)pyrene, LEAP has calculated equivalent C4SLs for 1% and 2.5% SOM. This does not affect the inorganic contaminants.

In accordance with current Public Health England (PHE) guidance¹², the assessment of PAHs has been carried out using a surrogate marker approach, whereby the assessment of risk from benzo(a)pyrene also captures potential risks from other carcinogenic PAHs that may be present. The alternative S4ULs for PAHs using the Toxic Equivalent Factor (TEF) approach have not been used because this approach is likely to under predict the true carcinogenicity of PAHs and is not advocated by PHE. The threshold PAHs have been assessed similarly, by using naphthalene as a marker compound due to its high volatility relative to other PAHs.

Sets of GACs have been generated for SOMs of 1%, 2.5% and 6%. In this case, TOC in the samples that were analysed ranged from 0.43 to 0.62%. Using the conversion of $SOM = TOC \times 1.72$, this equates to a SOM range of 0.74 to 1.07%. Therefore 1% SOM was considered to be appropriate to maintain conservatism.

For some contaminants of concern, direct contact will be the dominant pathway for exposure. In order to support with development options, human exposure to all unsaturated soils, irrespective of depth, was assumed possible for the purpose of this assessment. This will maximise the information available to the design team on the suitability of all unsaturated material and can support with their materials management options.

20 Analytical Test Results

One sample of the culvert backfill material and one sample of culvert topsoil taken were tested for the suite detailed in Section 22. No statistical analysis of the data was undertaken due to the dataset being too small. Based on the proposed development, the GACs selected for screening were for a residential with private gardens end use. The table below summarises

¹¹ The LQM/CIEH S4ULs for Human Health Risk Assessment, Nathaniel P et al, 2015. Copyright Land Quality Management Ltd, reproduced with permission: Publication Number S4UL3509

¹² HPA Contaminated Land Information Sheet. Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs). Public Health England, 2017.

the analytical results against their respective GACs. The full chemical laboratory test certificates can be found in Appendix F.

Table 11: Summary of soil contamination test results

Determinant	Number of Samples	Min. Concentration (mg/kg)	Max. Concentration (mg/kg)	Tier 1 Generic Assessment Criteria (mg/kg) 1% SOM	Samples which exceed GAC (including outliers)
Arsenic	2	4.1	7	37	0
Cadmium	2	<0.5	<0.5	22	0
Hexavalent Chromium	2	<0.8	<0.8	21	0
Copper	2	15.4	18.1	2,400	0
Lead	2	15.2	18.9	200	0
Mercury ¹	2	<0.5	<0.5	40 ¹	0
Nickel	2	15.8	15.8	130	0
Zinc	2	57.4	61.9	3,700	0
Benzo(a)pyrene ²	2	<0.1	<0.1	5.0	0
Napthalene ³	2	<0.1	<0.1	2.3	0

Notes to table

1. Assessment criterion based on inorganic mercury
2. As a surrogate marker for genotoxic PAH
3. As a marker compound for threshold PAH

20.1 Asbestos

The soil samples tested were screened for the presence of asbestos containing materials and/or loose asbestos fibres. No asbestos in any form was identified in the samples.

20.2 Conclusions

Based on the assessment of the results the culvert backfill and topsoil tested do not contain any significant contamination, and as such neither materials pose a risk to human health receptors. In addition, no visual or olfactory signs of contamination of deleterious materials were encountered in the three trial trenches undertaken across the culvert, which encountered reworked natural soils. Based on this assessment, the culvert backfill does not

pose a risk to human health or a land gas risk, and therefore no remedial measures are required.

21 Waste Disposal

It is anticipated that the proposed development will generate waste soils and materials will need to be removed from site as part of the construction process.

Where soils are to be disposed off-site, it is the duty of the waste producer, in this case Thakeham Client Ltd and Bilsham Road Development LLP, to ensure that all waste is disposed of appropriately and that any that is sent to landfill is sent to an appropriately licensed one. All waste sent to landfill must be classified and must be pre-treated. There are various forms of pre-treatment that are acceptable. In this case it could include “reduction in volume”, which could be achieved by segregating the Made Ground and re-using part of it on site.

One sample of the backfill material was tested for waste acceptance criteria to indicate whether it will be accepted at landfill. The results indicate exceedances in the Inert Waste Landfill criteria for Chromium and Nickel. Therefore the sample suggest the waste would be accepted as non hazardous however it is recommended that this is confirmed with a haulier/receiving site.

It is strongly advised that detailed discussions be held with remediation/groundworks contractors and that receiving landfill sites are identified in advance of commencing any waste removal.

APPENDIX A – Limitations

Limitations

LIMITATIONS

This report is confidential to the Client, and Leap Environmental Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Leap Environmental Ltd beforehand. Any such party relies upon the report at their own risk. Unless explicitly agreed otherwise in writing, this report has been prepared under LEAP's standard terms and conditions, as included in the quotation for this works.

This report has been prepared by Leap Environmental Ltd on the basis of information received from a variety of sources which Leap Environmental Ltd believes to be accurate. Nevertheless, Leap Environmental Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

Leap Environmental Ltd has used all reasonable skill, care and diligence in the design and execution of this report, taking into account the manpower and resources devoted to it in agreement with the Client. Although every reasonable effort has been made to obtain all relevant information, all potential contamination, environmental constraints or liabilities associated with the site may not necessarily have been revealed. LEAP cannot be held responsible for any disclosures or changes in regulation that are provided post production of this report, and will not automatically update the report.

The conclusions reached in this report are necessarily restricted to those which can be determined from the information consulted, and may be subject to amendment in the light of additional information becoming available. These conclusions may not be appropriate for alternative schemes.

The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development and site usage, timescales or clients specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an overall assessment of ground conditions on site. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7¹³, although this is subject to the restrictions imposed on the investigation as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and

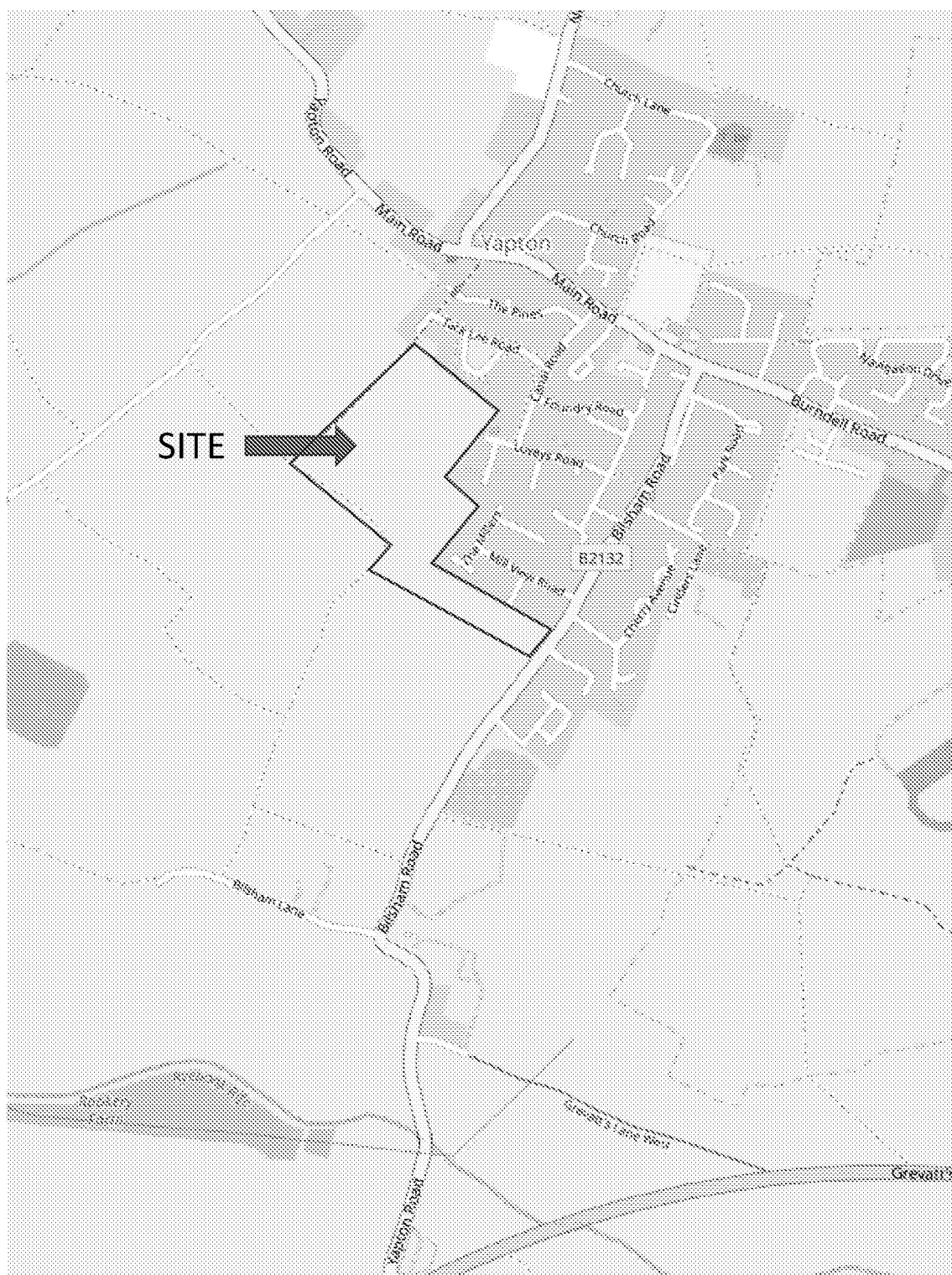
¹³ BS EN 1997 Eurocode 7- Geotechnical Design - Part 1: General Rules (2004) and Part 2: Ground Investigation and Testing (2007)

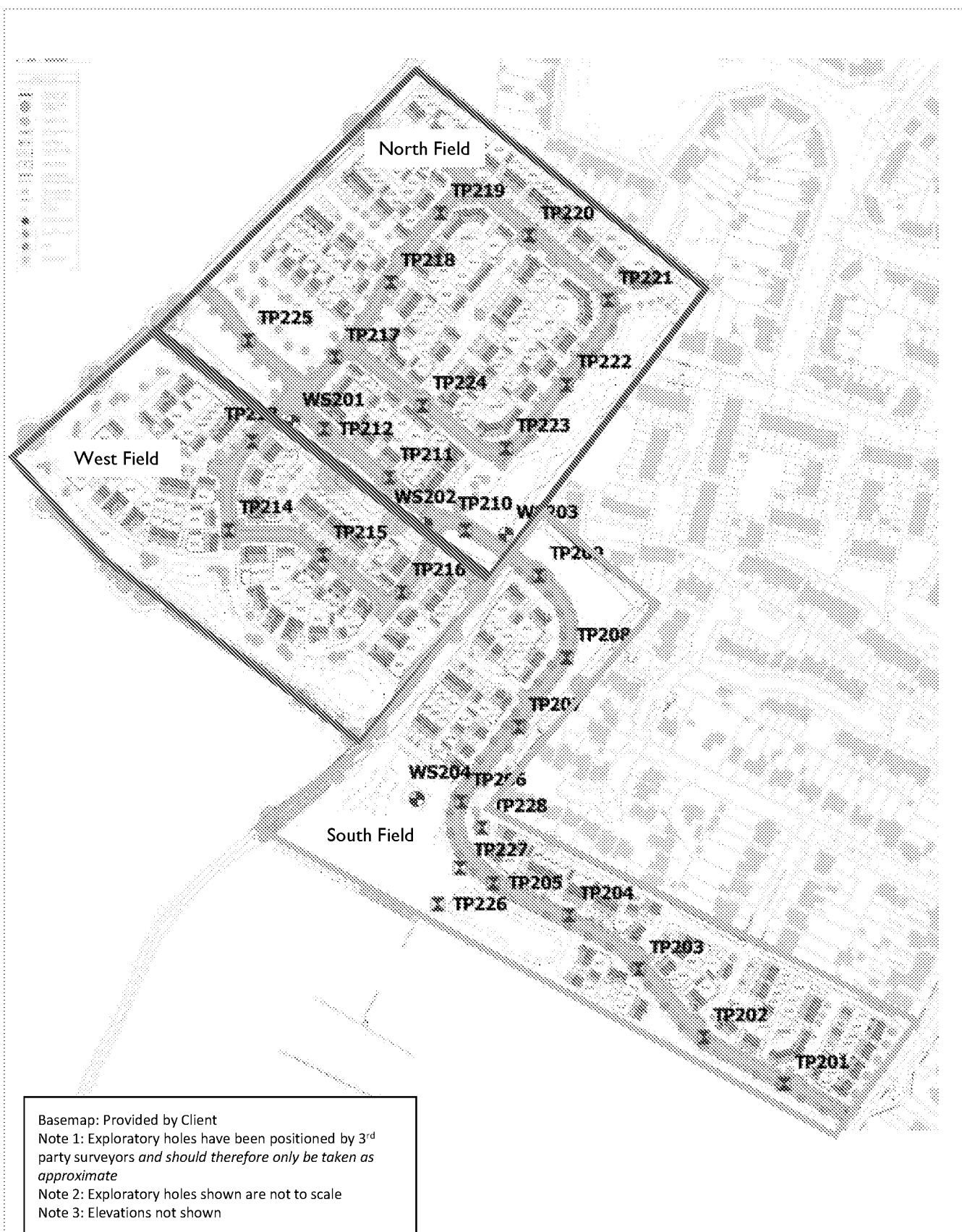
structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this report will not meet the requirements of a Geotechnical Design Report (GDR), and should therefore be used for preliminary guidance only.

The presence of asbestos may be noted during the site walkover survey, intrusive investigations and/or from the results of contamination testing. However, this report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

APPENDIX B – Figures

Figures

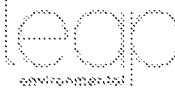
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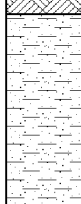
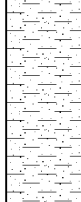
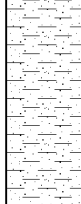
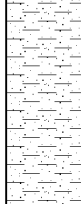
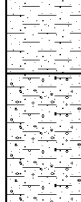
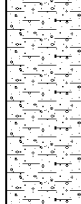
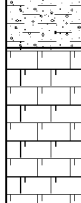


	Client:	Thakeham Client Ltd	Date:	16/6/20	Project ID:	LP2231
	Project:	Bilsham Road Yapton	Title:	Trial Hole Location Plan	Fig. No.	2

APPENDIX C – Trial Hole and Borehole Logs

**Trial Hole and
Borehole Logs**

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA		Borehole Log		Borehole No. WS201 Sheet 1 of 2	
Project Name: Bilsham Road		Project No. LP2231		Co-ords: 497471 - 102916	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU		Level: 6.44		Hole Type WS	
Client: Thakeham Group		Dates: 20/04/2020 - 20/04/2020		Logged By LS	

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.20	6.24		Light brown clayey slightly gravelly sand TOPSOIL with rootlets. Gravel is fine to coarse sub-angular of flint.		
		0.80 - 1.00	B							
		1.00			N=6 (1,1/1,2,2,1)				Low to medium strength soft to firm orangy brown grey mottled very sandy CLAY.	
									<i>Hand Pen at 1m =113kPa</i>	1
		1.60 - 2.00	B							
		2.00			N=3 (0,1/1,1,0,1)				<i>Hand Pen at 1.5m =130kPa</i>	
									<i>Hand Pen at 2m =87kPa</i> <i>From 2.0m: Rare fine rounded chalk gravel.</i>	2
2.50 - 2.90	B			2.50	3.94		Extremely low to low strength very soft to soft orangy brown very gravelly sandy CLAY. Gravel is fine to medium sub-rounded to sub-angular of chalk and rare coarse sub-angular flint.			
							<i>Hand Pen at 2.6m =127kPa</i> <i>Between 2.8m and 2.9m: Band of orangey brown clayey gravelly SAND. Gravel is fine to medium of chalk and coarse flint.</i>			
3.00			N=2 (0,0/0,1,0,1)					3		
3.50 - 4.00	B			3.50	2.94		White grade Dc CHALK recovered as a silty gravel of fine to coarse sub-rounded to sub-angular chalk and coarse flint.			
							<i>At 3.5m: Soils are wet.</i>			
4.00			N=2 (0,0/1,0,1,0)					4		

Continued on next sheet

Remarks No groundwater strike.	
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Leap Environmental Ltd
The Atrium, Curtis Road
Dorking, Surrey RH4 1XA

Borehole Log

Borehole No.

WS201

Sheet 2 of 2

Project Name: Bilsham Road

Project No.
LP2231

Co-ords: 497471 - 102916

Hole Type
WS

Location: Bishlam Road, Yapton, Arundel, BN18 0JU

Level: 6.44

Scale
1:20

Client: Thakeham Group

Dates: 20/04/2020 - 20/04/2020

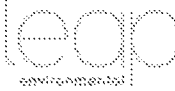
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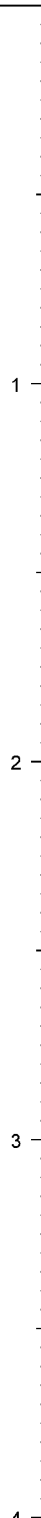
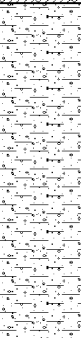
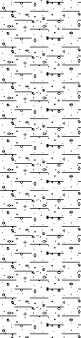
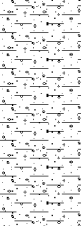
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					4.45	1.99		End of borehole at 4.45 m	
									5
									6
									7
									8

Remarks

No groundwater strike.



 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA		Borehole Log		Borehole No. WS202 Sheet 1 of 2	
Project Name: Bilsham Road		Project No. LP2231		Co-ords: 497546 - 102853	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU		Level: 6.13		Hole Type WS	
Client: Thakeham Group		Dates: 20/04/2020 - 20/04/2020		Logged By LS	

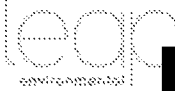
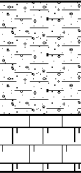
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	5.92		Brown very clayey sand TOPSOIL with rootlets and fine sub-angular flint gravel.	
		0.50 - 0.80	B	N=6 (1,1/1,2,1,2)				Low strength soft orangey brown sandy CLAY with rare fine to coarse rounded to sub-rounded flint gravel.	
		1.00							
		1.40 - 1.70	B						
		2.00		N=5 (1,1/1,1,1,2)				<u>Hand Pen at 1.1m =100kPa</u> <u>Hand Pen at 1.4m =93kPa</u> <i>From 1.5m: Becoming more gravelly of fine sub-rounded chalk.</i> <u>Hand Pen at 1.8m =167kPa</u> <i>At 1.85m: Cobble-sized flint gravel encountered (11cm in length).</i> <i>Between 1.85m to 1.9m: Very gravelly of fine sub-rounded chalk.</i> <u>Hand Pen at 2.1m =117kPa</u>	
		2.60 - 2.90	B						
		3.00							
		3.30 - 3.60	B	N=6 (1,1/1,2,1,2)	2.95	3.18		Soft grey slightly sandy CLAY with patches of orange sandy CLAY.	
		3.60 - 4.00	B						
		4.00							

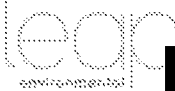
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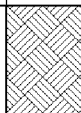
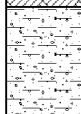
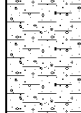
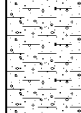
No groundwater strike.

Continued on next sheet



 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA		Borehole Log			Borehole No. WS202				
					Sheet 2 of 2				
Project Name: Bilsham Road		Project No. LP2231		Co-ords: 497546 - 102853		Hole Type WS			
Location: Bishlam Road, Yapton, Arundel, BN18 0JU		Level: 6.13		Scale 1:20					
Client: Thakeham Group		Dates: 20/04/2020 - 20/04/2020		Logged By LS					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					4.30	1.82		Greyish white grade Dm CHALK recovered as a gravelly silt with gravel of fine to coarse sub- rounded chalk.	
					4.45	1.68			
								End of borehole at 4.45 m	
									5
									6
									7
									8
Remarks No groundwater strike.									

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA		Borehole Log			Borehole No. WS203 Sheet 1 of 2	
Project Name: Bilsham Road		Project No. LP2231		Co-ords: 497592 - 102848		Hole Type WS
Location: Bishlam Road, Yapton, Arundel, BN18 0JU				Level: 5.80		Scale 1:20
Client: Thakeham Group				Dates: 20/04/2020 - 20/04/2020		Logged By LS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40 - 0.70	B	N=5 (1,1/1,1,2,1)	0.30	5.50		Greyish brown clayey sand TOPSOIL with rootlets and rare fine sub-rounded chalk gravel.	1
		1.00						Low strength soft to firm orangy brown and grey mottled sandy CLAY with rare gravel of fine sub-rounded chalk.	
		1.20 - 1.50	B	N=6 (1,2/1,2,1,2)	1.20	4.60		Orangy brown slightly clayey gravelly SAND. Gravel of fine to medium rounded to sub-rounded chalk.	
		1.50					Low strength soft becoming firm orange grey mottled sandy CLAY with occasional fine to medium rounded to sub-rounded chalk gravel.		
		2.00 - 2.50	B	2.00	3.80		Loose orangy brown grey clayey gravelly SAND with occasional thin (0.1m) of greyish brown sandy clay. <i>Hand Pen at 2m =133kPa</i> <i>From 2.2m: Water present.</i>	2	
2.90					At 2.8m Very gravelly with gravels of fine to medium sub-rounded chalk and fine to coarse flint.				
		3.00 - 3.50	B	N=11 (3,3/3,3,2,3)		2.90		White grade Dm CHALK recovered as a gravelly silt with gravel of fine to medium sub-rounded chalk and occasional fine to coarse sub-angular flint. Becoming less gravelly with finer gravels and more silt with depth.	3
		4.00		N=19 (4,6/5,4,5,5)					
Continued on next sheet									4

Remarks No groundwater strike.	
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Leap Environmental Ltd
The Atrium, Curtis Road
Dorking, Surrey RH4 1YA

Borehole Log

Borehole No.

WS203

Sheet 2 of 2

Project Name: Bilsham Road

Project No.
LP2231

Co-ords: 497592 - 102848

Hole Type
WS

Location: Bishlam Road, Yapton, Arundel, BN18 0JU

Level: 5.80

Scale
1:20

Client: Thakeham Group

Dates: 20/04/2020 - 20/04/2020

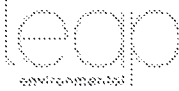
Logged By
LS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					4.45	1.35		End of borehole at 4.45 m	
									5
									6
									7
									8

Remarks

No groundwater strike.



 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA 		Borehole Log		Borehole No. WS204 Sheet 1 of 2	
Project Name: Bilsham Road		Project No. LP2231		Co-ords: 497541 - 102696	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU		Level: 4.86		Hole Type WS	
Client: Thakeham Group		Dates: 20/04/2020 - 20/04/2020		Logged By LS	

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25			0.25	4.61		Brown clayey sand TOPSOIL with rootlets and occasional fine angular flint gravel.	1
		0.70 - 1.00	B					Low strength soft to firm orangy brown sandy CLAY with occasional gravels of fine to medium sub-rounded of chalk and fine to coarse sub-angular to angular of flint. <u>Hand Pen at 1.1m =150kPa</u> <u>Hand Pen at 1.3m =130kPa</u>	
		1.00		N=5 (1,1/1,1,1,2)					
		1.50 - 2.00	B						
		2.00		N=7 (1,2/2,1,2,2)				Low strength soft to firm orange grey mottled sandy gravelly CLAY. Gravel is fine to medium sub-rounded of chalk and fine to coarse sub-angular of flint. From 2.0m: Some separation of soils into grey clay and orange sandy clay. <u>Hand Pen at 2.2m =113kPa</u> <u>Hand Pen at 2.5m =87kPa</u> Between 2.7m and 2.9m: Gradual boundary between overlying sandy clay and underlying chalk.	
		3.00		N=13 (2,2/2,3,4,4)	2.90	1.96		Creamish white PUTTY CHALK.	3
		3.00 - 3.80	B						
		3.40			3.40	1.46		White grade Dc CHALK recovered as a silty gravel of fine to medium and occasionally coarse sub-angular to sub-rounded chalk and fine to coarse angular flint.	4
		4.00		N=18 (5,5/4,4,5,5)					

Continued on next sheet

Remarks No groundwater strike.	
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Borehole Log

Borehole No.

WS204

Sheet 2 of 2

Project Name: Bilsham Road

Project No.
LP2231

Co-ords: 497541 - 102696

Hole Type	WS
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Location: Bishlam Road, Yapton, Arundel, BN18 0JU

Level: 4.86

Scale
1:20

Client: Thakeham Group

Dates: 20/04/2020 - 20/04/2020

Logged By
LS

[illegible]

Remarks	
No groundwater strike.	

AGS

Trial Pit Log

Trialpit No

TP201

Sheet 1 of 1

Project Name: Bilsham Road

Project No.
LP2231

Co-ords: 497752 - 102532
Level: 6.14

Date
22/04/2020

Location: Bishlam Road, Yapton, Arundel, BN18 0JU

Dimensions
(m):

1

0.5

Scale
1:25

Logged
LS

Client: Thakeham Group

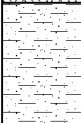
[illegible]

Remarks:	No water encountered.
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Stability: Stable

AGS

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP202 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497705 - 102559 Level: 6.01		Date 22/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): 1 0.5		Scale 1:25	
Client: Thakeham Group						Depth 0.70		Logged LS	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60	B		0.20	5.81		Brown clayey sand TOPSOIL with rootlets.
				0.70	5.31		Firm to stiff orangey brown grey mottled sandy CLAY.
							Hand Pen at 0.6m = 230kPa
							End of pit at 0.70 m

Remarks: No water encountered.



Stability: Stable

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP203 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497669 - 102598 Level: 5.86		Date 22/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m):		Scale 1:25	
Client: Thakeham Group						Depth 0.60		Logged LS	

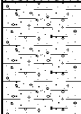
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	B		0.25	5.61		Brown clayey sand TOPSOIL with rootlets.
				0.60	5.26		Firm orangy brown grey mottled sandy CLAY.

Remarks: No water encountered.



Stability: Stable

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA		Trial Pit Log			Trialpit No TP204 Sheet 1 of 1	
Project Name: Bilsham Road		Project No. LP2231	Co-ords: 497628 - 102629 Level: 5.56		Date 22/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU			Dimensions (m): Depth 1 0.5 0.70		Scale 1:25 Logged LS	
Client: Thakeham Group						

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60	B		0.30	5.26		Brown clayey sand TOPSOIL with rootlets.
			0.70	4.86		Soft to firm orangy brown sandy CLAY with rare fine to medium sub-rounded to sub-angular flint and chalk gravel.	
							Hand Pen at 0.6m = 167kPa End of pit at 0.70 m

Remarks: No water encountered.

Stability: Stable



Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP206 Sheet 1 of 1	
Project Name: Bilsham Road			Project No. LP2231		Co-ords: 497567 - 102694 Level: 4.75		Date 21/04/2020		
Location: Bishlam Road, Yapton, Arundel, BN18 0JU					Dimensions (m):		Scale 1:25		
Client: Thakeham Group					Depth 0.70		Logged GD		

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	B		0.20	4.55		Brown silty clay TOPSOIL.	1
			0.70	4.05		Stiff brown mottled pale brown silty CLAY with occasional flint gravel. <i>Hand Pen at 0.5m = 170kPa</i>	2	
							End of pit at 0.70 m	3
								4
								5

Remarks: No water encountered.	
Stability: Stable	

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA 				Trial Pit Log				Trialpit No TP208 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497627 - 102777 Level: 5.31		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): 1 0.5		Scale 1:25	
Client: Thakeham Group						Depth 0.60		Logged GD	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	B		0.30	5.01		Dark brown silty clay TOPSOIL.
				0.60	4.71		Stiff brown mottled orangy brown silty CLAY.
						<i>Hand Pen at 0.5m = 160kPa</i>	End of pit at 0.60 m

Remarks: No water encountered.



Stability: Stable

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP209	
								Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497611 - 102824 Level: 5.51		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): Depth 0.50 0.5 1		Scale 1:25	
Client: Thakeham Group								Logged GD	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.60	B		0.20	5.31		Brown silty clay TOPSOIL.	1 2 3 4 5	
							Stiff orangy brown mottled pale brown silty CLAY.		
				0.50	5.01		End of pit at 0.50 m		
Remarks: No water encountered.									
Stability: Stable									

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP213 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497446 - 102901 Level: 6.46		Date 22/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): 1		Scale 1:25	
Client: Thakeham Group						Depth 0.60		Logged LS	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	B		0.30	6.16		Brown clayey sand TOPSOIL with rootlets, rare fine to medium flint and chalk gravel and bare brick fragments and plastic pipe.	
			0.60	5.86		Firm orangy brown sandy CLAY with rare fine to medium sub-angular to angular flint gravel.		
			End of pit at 0.60 m					

Remarks: No water encountered.		
Stability: Stable		

Trial Pit Log

Trialpit No

TP216

Sheet 1 of 1

Project Name: Bilsham Road

Project No.
LP2231

Co-ords:	497532 - 102814
Level:	6.19

Date
22/04/2020

Location: Bishlam Road, Yapton, Arundel, BN18 0JU

Dimensions
(m):

1

Depth
0.70

0.5

Scale
1:25

Logged
LS

Client: Thakeham Group

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	B		0.25	5.94		Brown clayey sand TOPSOIL with rootlets.	1 — <

Remarks:	No water encountered.
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Stability: Stable

AGS

Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP217 Sheet 1 of 1	
Project Name: Bilsham Road				LP2231		Co-ords: 497494 - 102949 Level: 6.42		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): 1		Scale 1:25	
Client: Thakeham Group						Depth 0.60		Logged GD	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.30	6.12		Dark brown silty clay TOPSOIL with occasional flint gravel.
							Firm brown silty CLAY.
	0.60	B		0.60	5.82		Hand Pen at 0.5m = 100kPa
End of pit at 0.60 m							

Remarks: No water encountered.

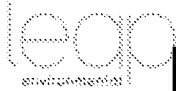
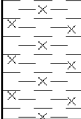
Stability: Stable

Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP219 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497554 - 103032 Level: 6.36		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): Depth 0.60		Scale 1:25	
Client: Thakeham Group								Logged GD	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20	6.16		Brown silty clay TOPSOIL.	
							Firm red brown silty CLAY.	
	0.60	B		0.60	5.76		Hand Pen at 0.5m = 120kPa	
							End of pit at 0.60 m	

Remarks: No water encountered.

Stability: Stable

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP220 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497606 - 103019 Level: 6.26		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): Depth 0.60		Scale 1:25	
Client: Thakeham Group								Logged GD	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.60	B		0.20	6.06		Brown silty clay TOPSOIL.		
				0.60	5.66		Stiff red brown silty CLAY.		
							End of pit at 0.60 m		
1 2 3 4 5									
Remarks: No water encountered.									
Stability: Stable									



Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP222 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497627 - 102934 Level: 6.49		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): Depth 0.70		Scale 1:25	
Client: Thakeham Group								Logged LS	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.30	6.18		Brown clayey sand TOPSOIL with rootlets.
	0.65	B		0.70	5.78		Firm orangy brown sandy CLAY with occasional fine flint gravel.
							Hand Pen at 0.6m = 197kPa
							End of pit at 0.70 m

Remarks: No water encountered.

 Stability: Stable

Trial Pit Log

Trialpit No

TP223

Sheet 1 of 1

Project Name: Bilsham Road

Project No.
LP2231

Co-ords: 497592 - 102897

Level: 6.19

Date
21/04/2020

Location: Bishlam Road, Yapton, Arundel, BN18 0JU

Dimensions
(m):

1

Scale
1:25

Client: Thakeham Group

Depth
0.60

0.5

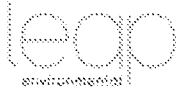
Logged
LS

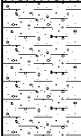
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	B		0.25	5.94		Greyish brown clayey sand TOPSOIL with rootlets.	1 - <

Remarks:	No water encountered.
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Stability: Stable



 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA 				Trial Pit Log				Trialpit No TP224 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497544 - 102921 Level: 6.22		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): 0.5 1		Scale 1:25	
Client: Thakeham Group						Depth 0.75		Logged LS	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	B		0.30	5.92		Brown clayey sand TOPSOIL with rootlets.	
			0.75	5.46		Soft to firm orange grey mottled sandy CLAY with rare fine to medium sub-angular flint gravel.		
							Hand Pen at 0.6m = 117kPa End of pit at 0.75 m	

Remarks: No water encountered.

Stability: Stable



Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH41 1YA				Trial Pit Log				Trialpit No TP226 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497553 - 102635 Level: 4.85		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): 3 0.5		Scale 1:25	
Client: Thakeham Group						Depth 1.50		Logged GD	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.30	4.55		Dark brown silty clay TOPSOIL.	1 2 3 4 5
	0.50	ES					In the East of the trench: Firm orangy brown silty CLAY with fine chalk fragments. In the West of the trench: Firm grey brown mottled red brown and brown reworked silty CLAY.	
				1.50	3.35		End of pit at 1.50 m	

Remarks: No water encountered.	
Stability: Stable	

Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP227 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497566 - 102657 Level: 4.71		Date 22/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): Depth 1.20 0.5 3		Scale 1:25 Logged LS	
Client: Thakeham Group									

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15	ES					Brown clayey sand TOPSOIL with rootlets and occasional fine sub-rounded gravel of flint.	
	0.50	ES					Firm orangey brown grey mottled sandy slightly gravelly CLAY. Gravel of fine to medium sub-rounded to sub-angular of flint.	
							In the East of the trench: Orangy brown silty CLAY. In the West of the trench: Cream orangy brown grey mottled clayey gravelly SAND. Gravel is fine to medium sub-rounded to sub-angular of chalk.	
				1.20	3.51		End of pit at 1.20 m	

Remarks: No water encountered.

Stability: Stable

Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA				Trial Pit Log				Trialpit No TP228 Sheet 1 of 1	
Project Name: Bilsham Road				Project No. LP2231		Co-ords: 497579 - 102679 Level: 4.54		Date 21/04/2020	
Location: Bishlam Road, Yapton, Arundel, BN18 0JU						Dimensions (m): Depth 1.20 0.5 3		Scale 1:25	
Client: Thakeham Group								Logged LS	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.20	4.34		Brown silty slightly gravelly sand TOPSOIL with rootlets.	
	0.50	ES		1.20	3.34		Orangy brown grey mottled sandy slightly gravelly CLAY. Gravel is fine to medium sub-rounded of chalk and medium to coarse sub-angular to angular of flint. Rare cobble sized flints. <i>From 1.0m: In the West of the trench creamy grey silty slightly gravelly SAND. Gravel is fine to medium sub-rounded of chalk.</i>	1
							End of pit at 1.20 m	2
								3
								4
								5

Remarks: No water encountered.

Stability: Stable

APPENDIX D- Dynamic Cone Penetrometer Results

Dynamic Cone
Penetrometer Results

Dynamic Cone CBR Test

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
1	6	50	300
1	7	50	350
1	8	50	400
1	9	50	450
1	10	50	500
1	11	50	550
1	12	50	600
1	13	50	650
1	14	50	700
1	15	50	750
1	16	50	800
1	17	50	850
1	18	50	900

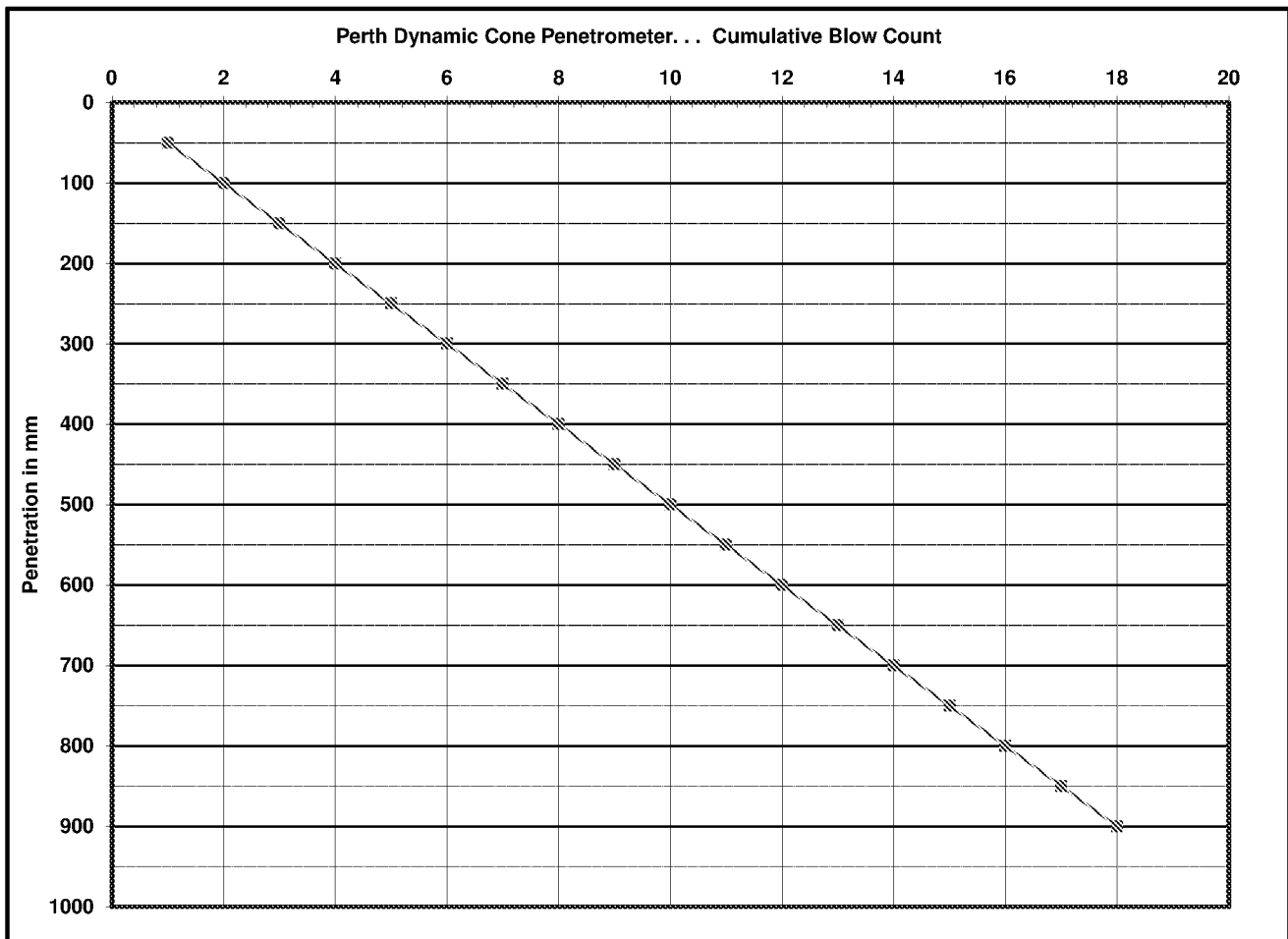
Bilsham Road, Yapton Test Reference: - TP201

Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	900	1	18	50.0	4.8	2.9	2.9
			0				
			0				
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP201

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP202

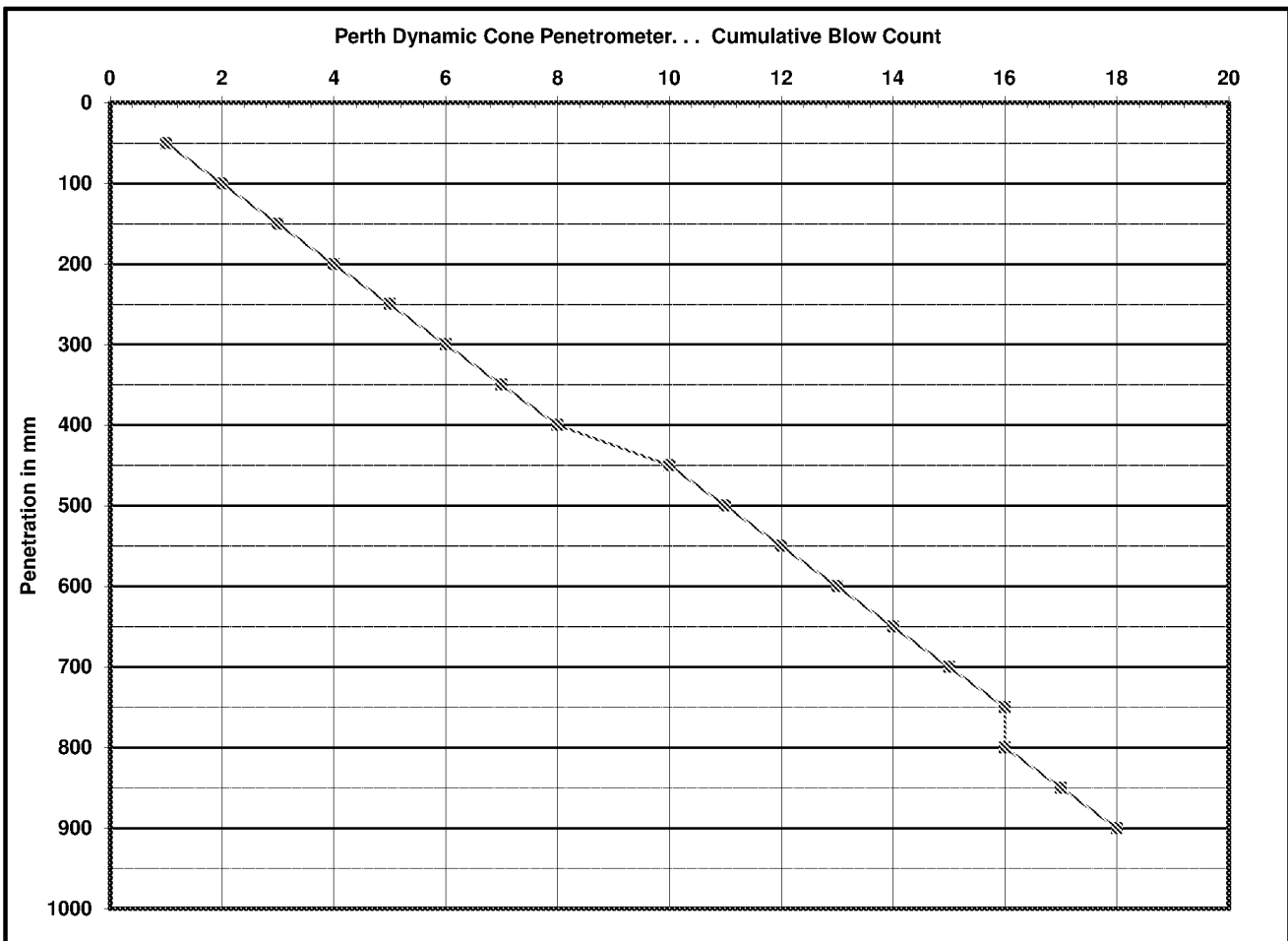
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
1	6	50	300
1	7	50	350
1	8	50	400
2	10	50	450
1	11	50	500
1	12	50	550
1	13	50	600
1	14	50	650
1	15	50	700
1	16	50	750
0	16	50	800
1	17	50	850
1	18	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	750	1	16	46.7	5.2	3.1	3.1
750	900	16	18	75.0	3.1	1.7	1.7



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP202

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP203

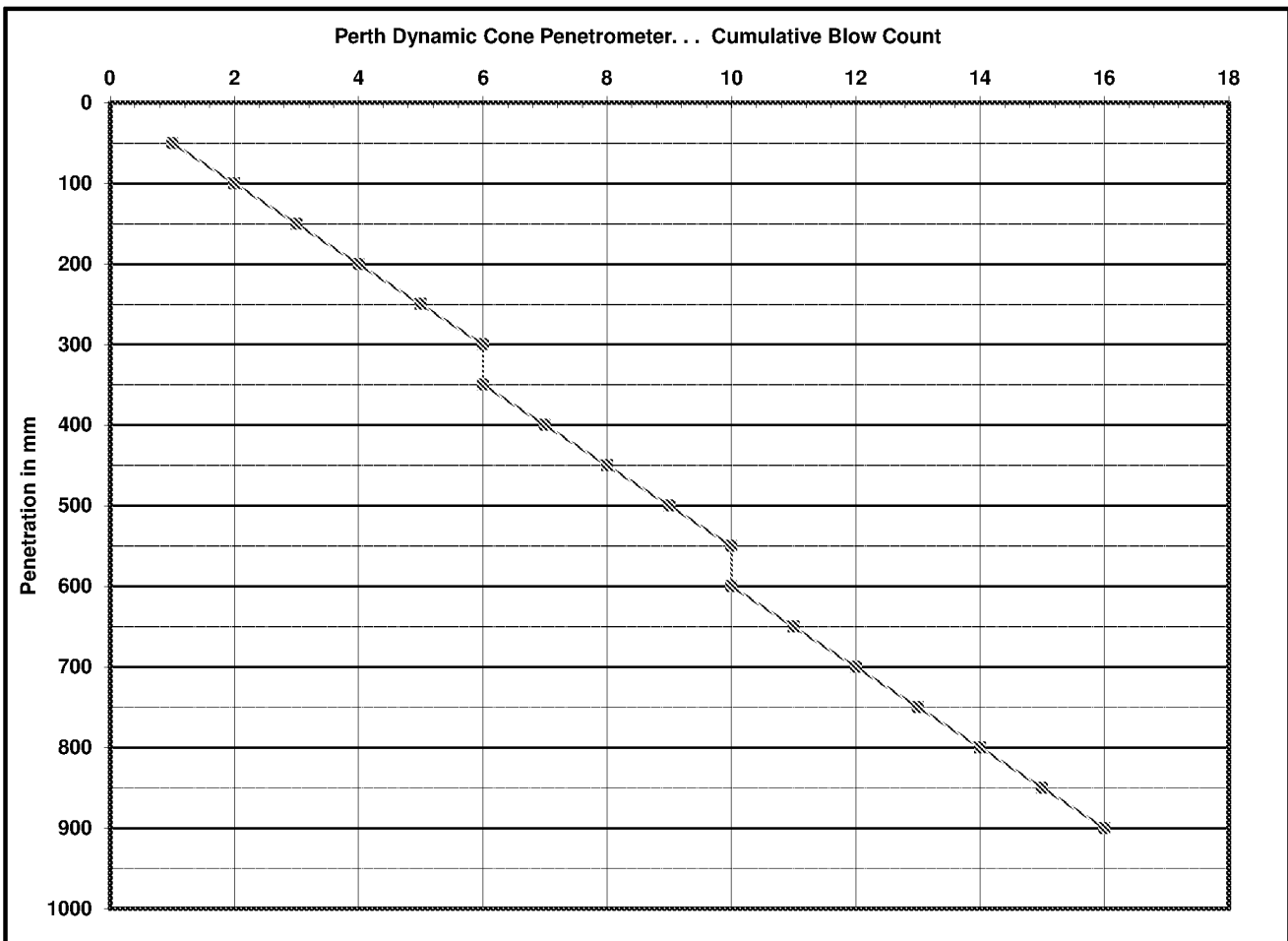
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
1	6	50	300
0	6	50	350
1	7	50	400
1	8	50	450
1	9	50	500
1	10	50	550
0	10	50	600
1	11	50	650
1	12	50	700
1	13	50	750
1	14	50	800
1	15	50	850
1	16	50	900

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
50	300	1	6	50.0	4.8	2.9	2.9
300	600	6	10	75.0	3.1	1.7	1.7
600	900	10	16	50.0	4.8	2.9	2.9



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP203

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP204

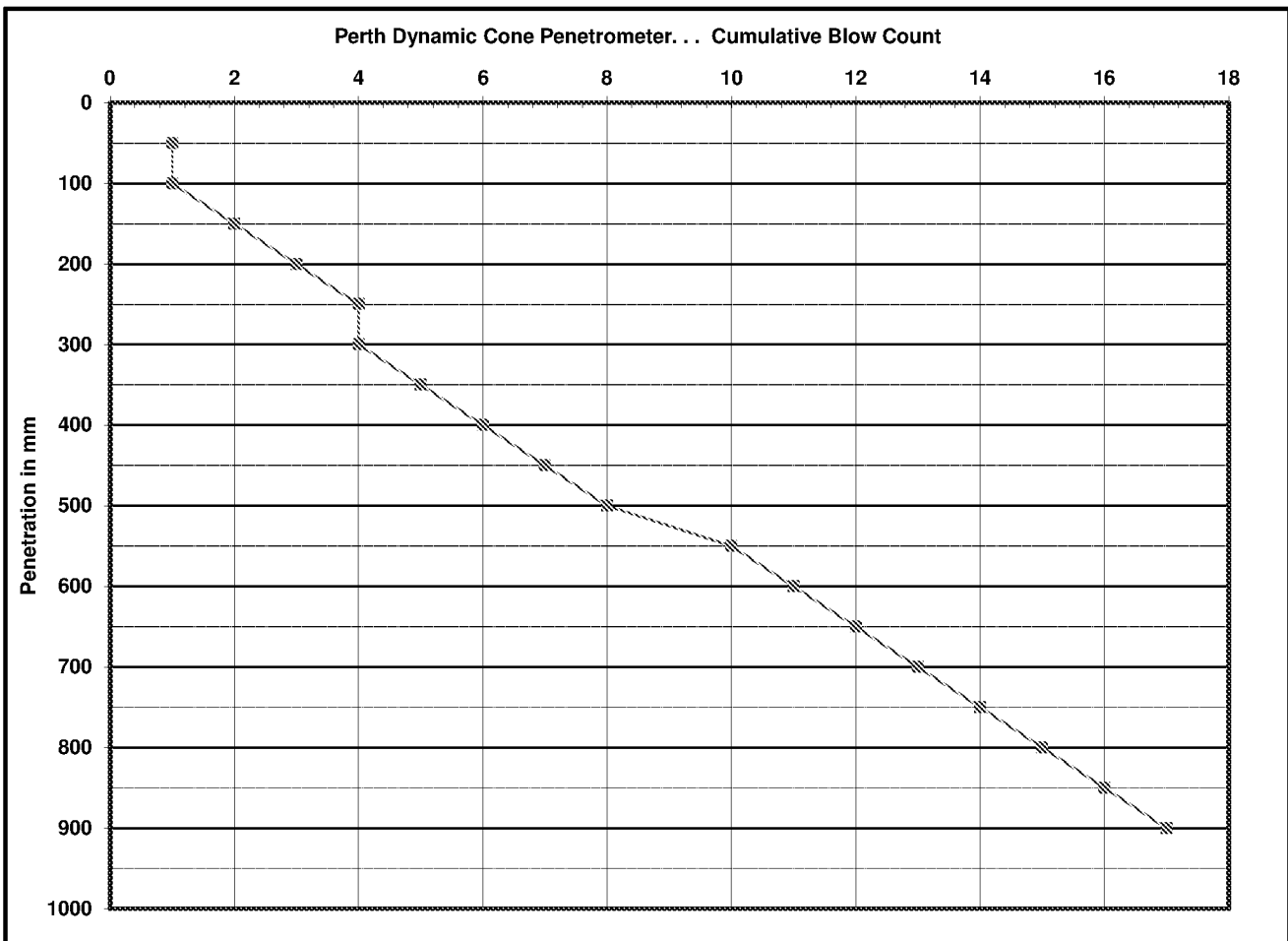
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
0	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
0	4	50	300
1	5	50	350
1	6	50	400
1	7	50	450
1	8	50	500
2	10	50	550
1	11	50	600
1	12	50	650
1	13	50	700
1	14	50	750
1	15	50	800
1	16	50	850
1	17	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	300	1	4	83.3	2.8	1.5	1.5
300	900	4	17	46.2	5.3	3.2	3.2
			0				
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP204

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP205

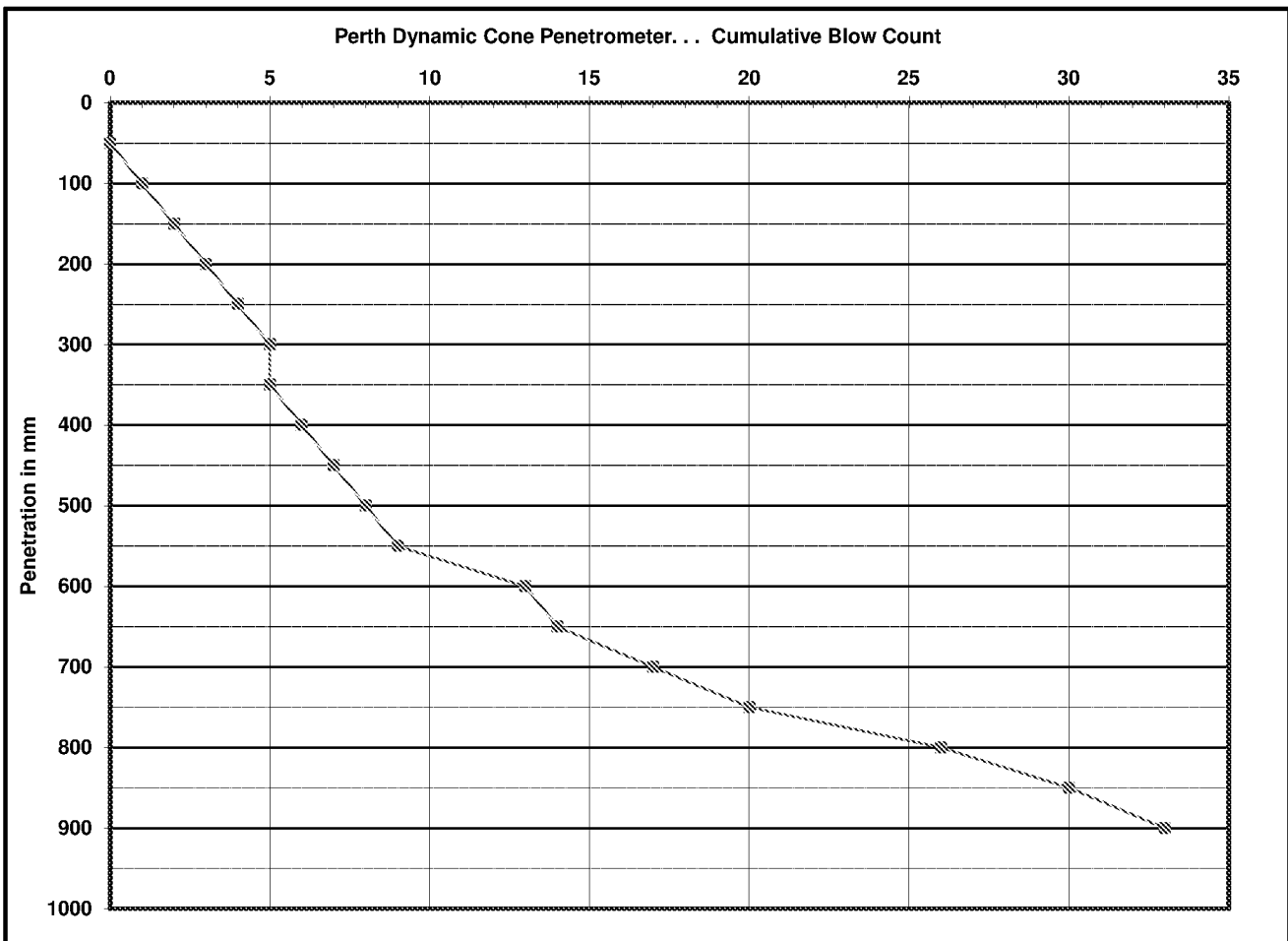
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
100	350	1	5	62.5	3.8	2.2	2.2
350	550	5	9	50.0	4.8	2.9	2.9
550	900	9	33	14.6	17.8	13.9	13.9
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
0	5	50	350
1	6	50	400
1	7	50	450
1	8	50	500
1	9	50	550
4	13	50	600
1	14	50	650
3	17	50	700
3	20	50	750
6	26	50	800
4	30	50	850
3	33	50	900



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP205

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP206

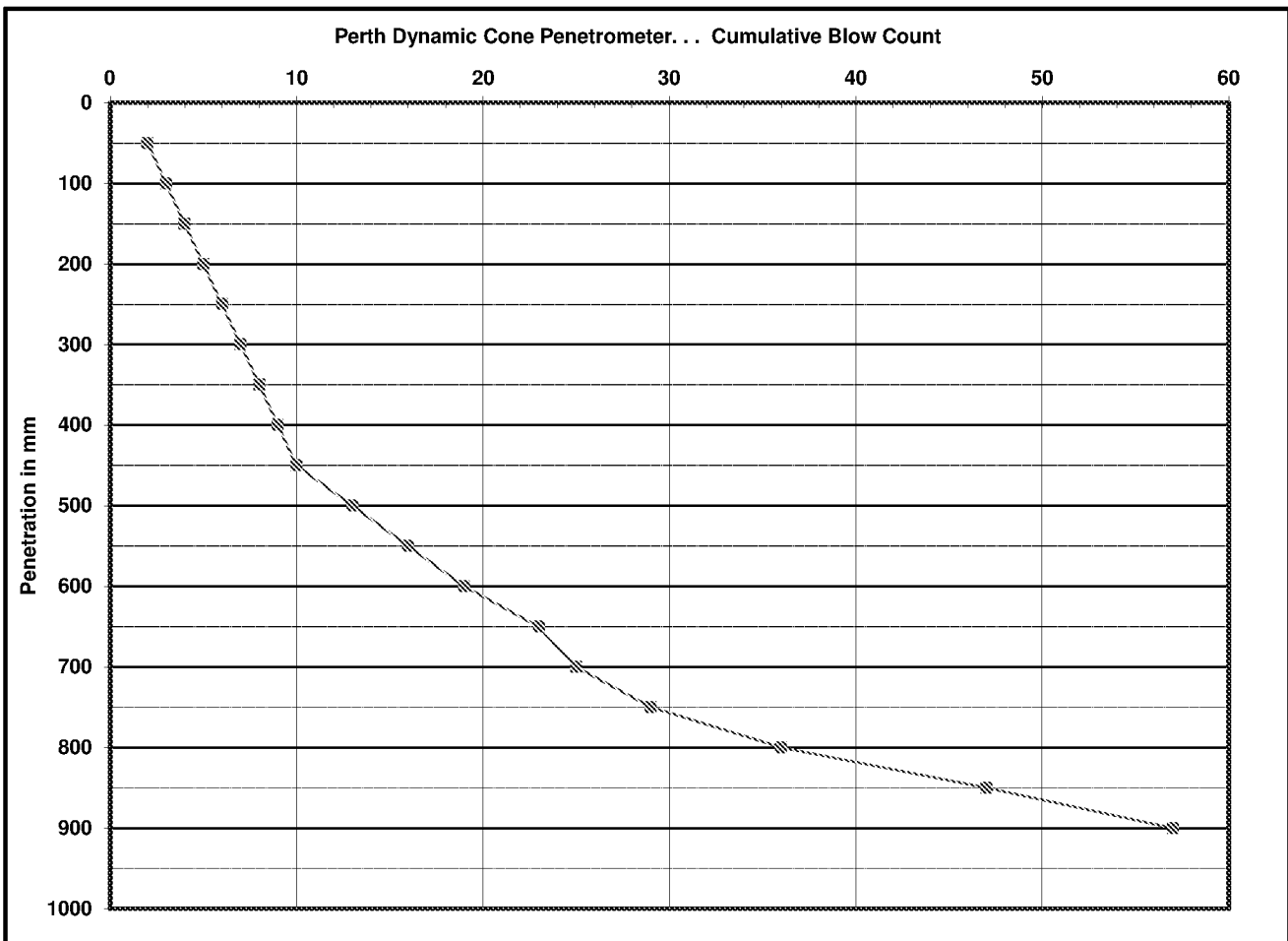
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
2	2	50	50
1	3	50	100
1	4	50	150
1	5	50	200
1	6	50	250
1	7	50	300
1	8	50	350
1	9	50	400
1	10	50	450
3	13	50	500
3	16	50	550
3	19	50	600
4	23	50	650
2	25	50	700
4	29	50	750
7	36	50	800
11	47	50	850
10	57	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	450	2	10	50.0	4.8	2.9	2.9
450	750	10	29	15.8	16.3	12.5	12.5
750	900	29	57	5.4	51.2	50.0	50.0
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP206

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP207

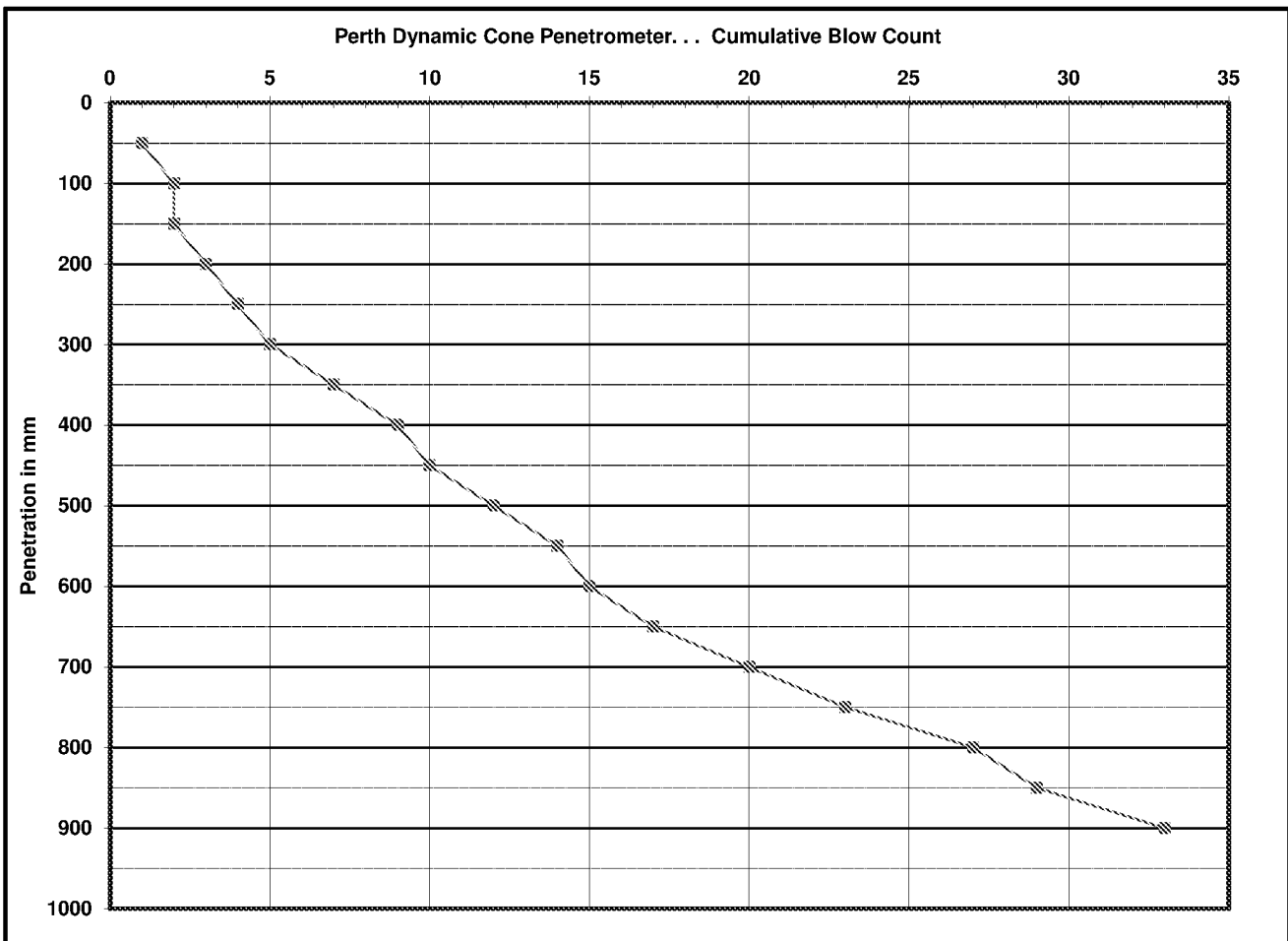
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
0	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
2	7	50	350
2	9	50	400
1	10	50	450
2	12	50	500
2	14	50	550
1	15	50	600
2	17	50	650
3	20	50	700
3	23	50	750
4	27	50	800
2	29	50	850
4	33	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	300	1	5	62.5	3.8	2.2	2.2
300	600	5	15	30.0	8.3	5.5	5.5
600	900	15	33	16.7	15.4	11.7	11.7
			0				
			0				



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP207

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP208

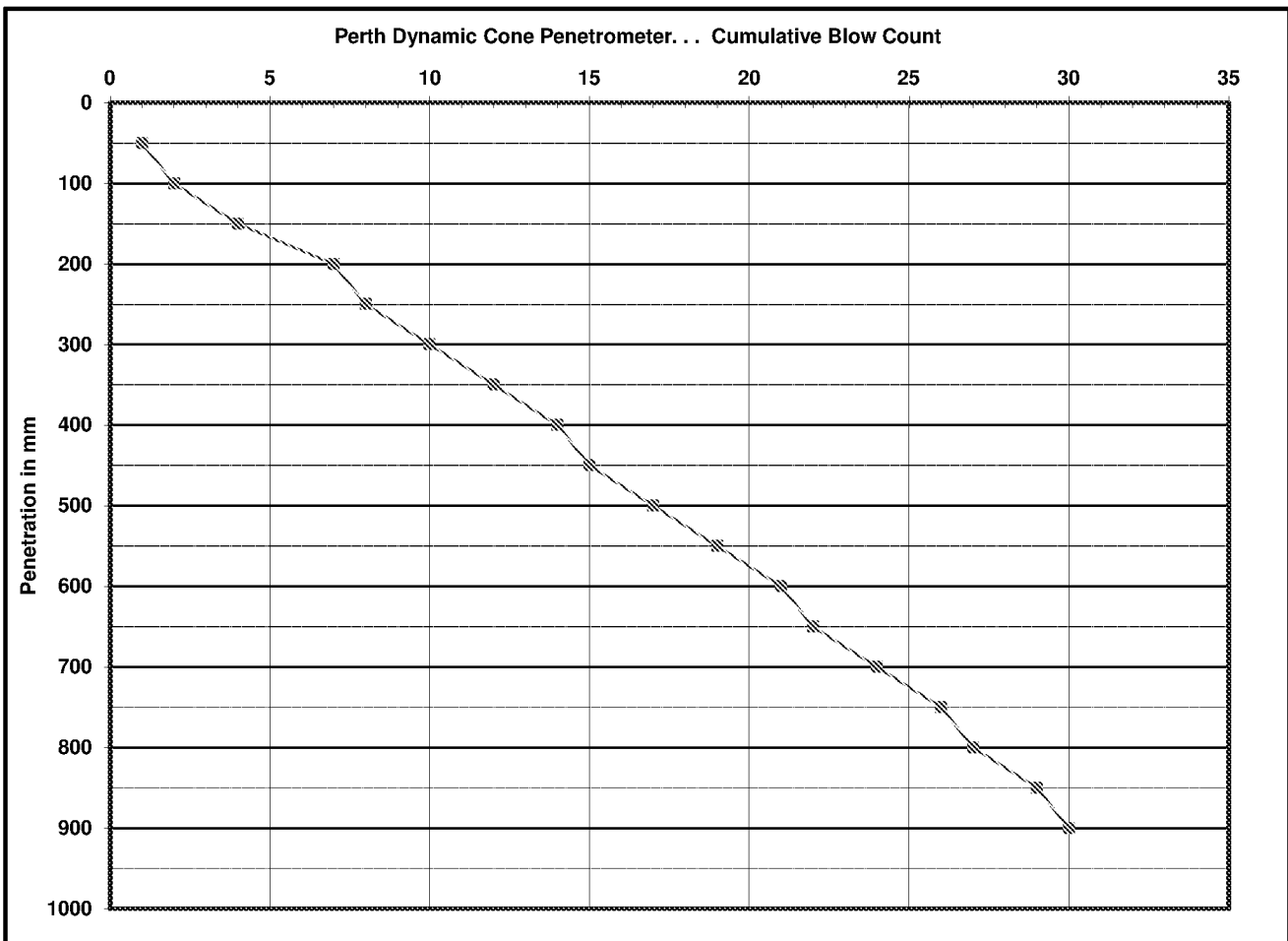
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
50	200	1	7	25.0	10.1	7.0	7.0
200	450	7	15	31.3	7.9	5.2	5.2
450	900	15	30	30.0	8.3	5.5	5.5
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
2	4	50	150
3	7	50	200
1	8	50	250
2	10	50	300
2	12	50	350
2	14	50	400
1	15	50	450
2	17	50	500
2	19	50	550
2	21	50	600
1	22	50	650
2	24	50	700
2	26	50	750
1	27	50	800
2	29	50	850
1	30	50	900



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP208

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP209

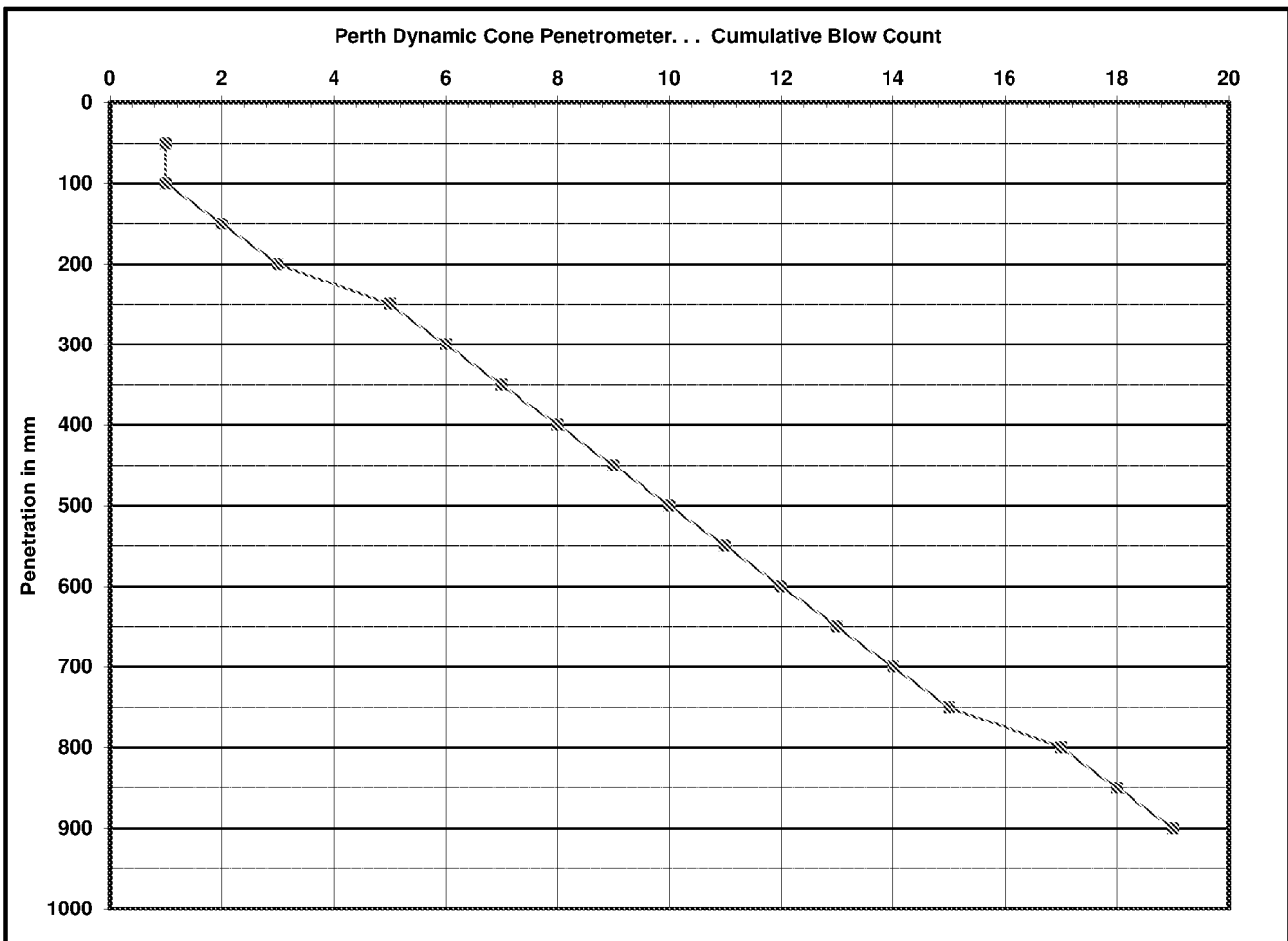
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
0	1	50	100
1	2	50	150
1	3	50	200
2	5	50	250
1	6	50	300
1	7	50	350
1	8	50	400
1	9	50	450
1	10	50	500
1	11	50	550
1	12	50	600
1	13	50	650
1	14	50	700
1	15	50	750
2	17	50	800
1	18	50	850
1	19	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	200	1	3	75.0	3.1	1.7	1.7
250	750	5	15	50.0	4.8	2.9	2.9
750	900	15	19	37.5	6.6	4.1	4.1
			0				
			0				



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP209

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP210

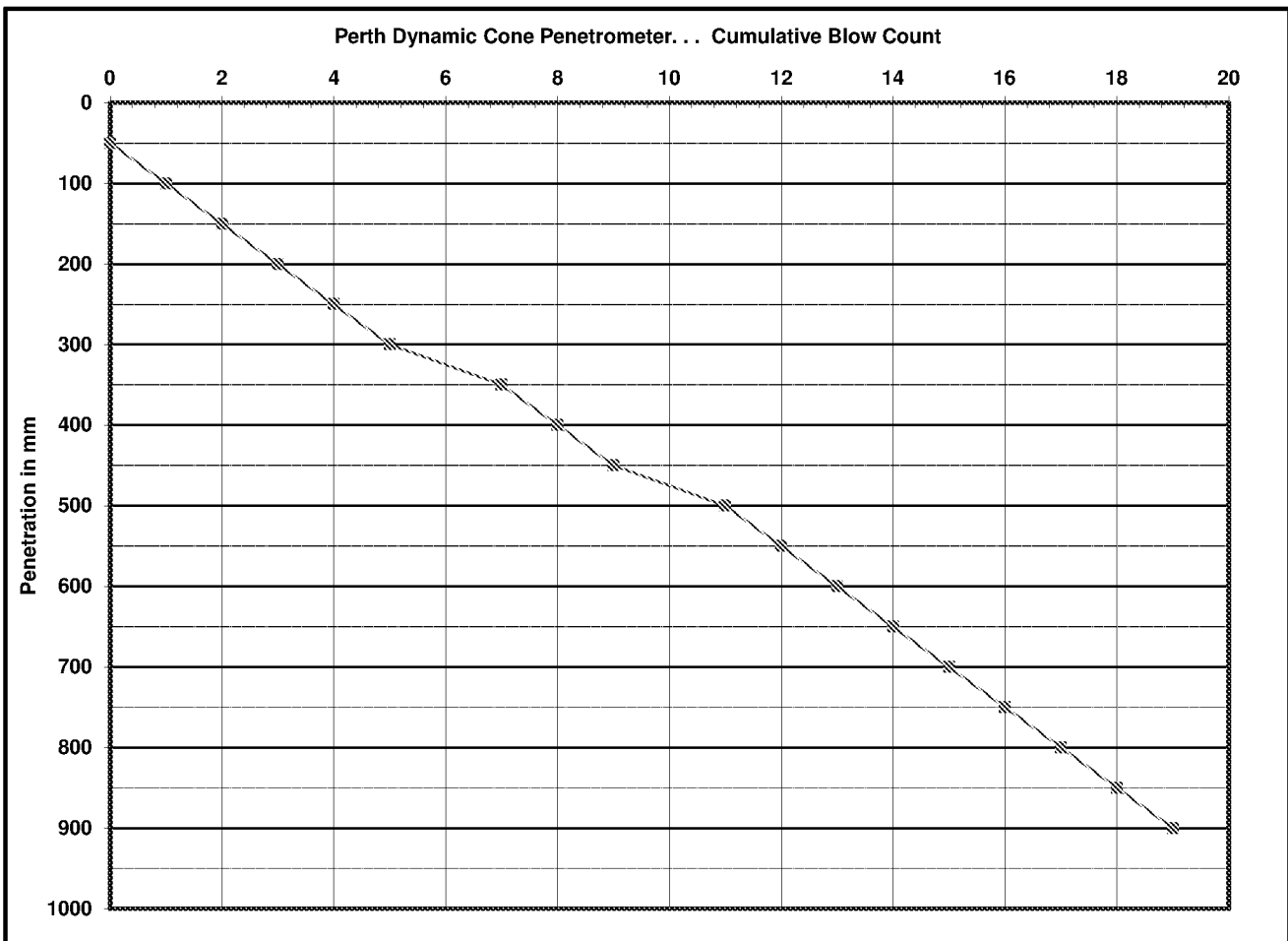
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
100	300	1	5	50.0	4.8	2.9	2.9
300	500	5	11	33.3	7.4	4.8	4.8
500	900	11	19	50.0	4.8	2.9	2.9
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
2	7	50	350
1	8	50	400
1	9	50	450
2	11	50	500
1	12	50	550
1	13	50	600
1	14	50	650
1	15	50	700
1	16	50	750
1	17	50	800
1	18	50	850
1	19	50	900



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP210

Dynamic Cone CBR Test

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
0	1	50	150
1	2	50	200
1	3	50	250
1	4	50	300
0	4	50	350
1	5	50	400
1	6	50	450
2	8	50	500
1	9	50	550
1	10	50	600
2	12	50	650
1	13	50	700
2	15	50	750
1	16	50	800
2	18	50	850
2	20	50	900

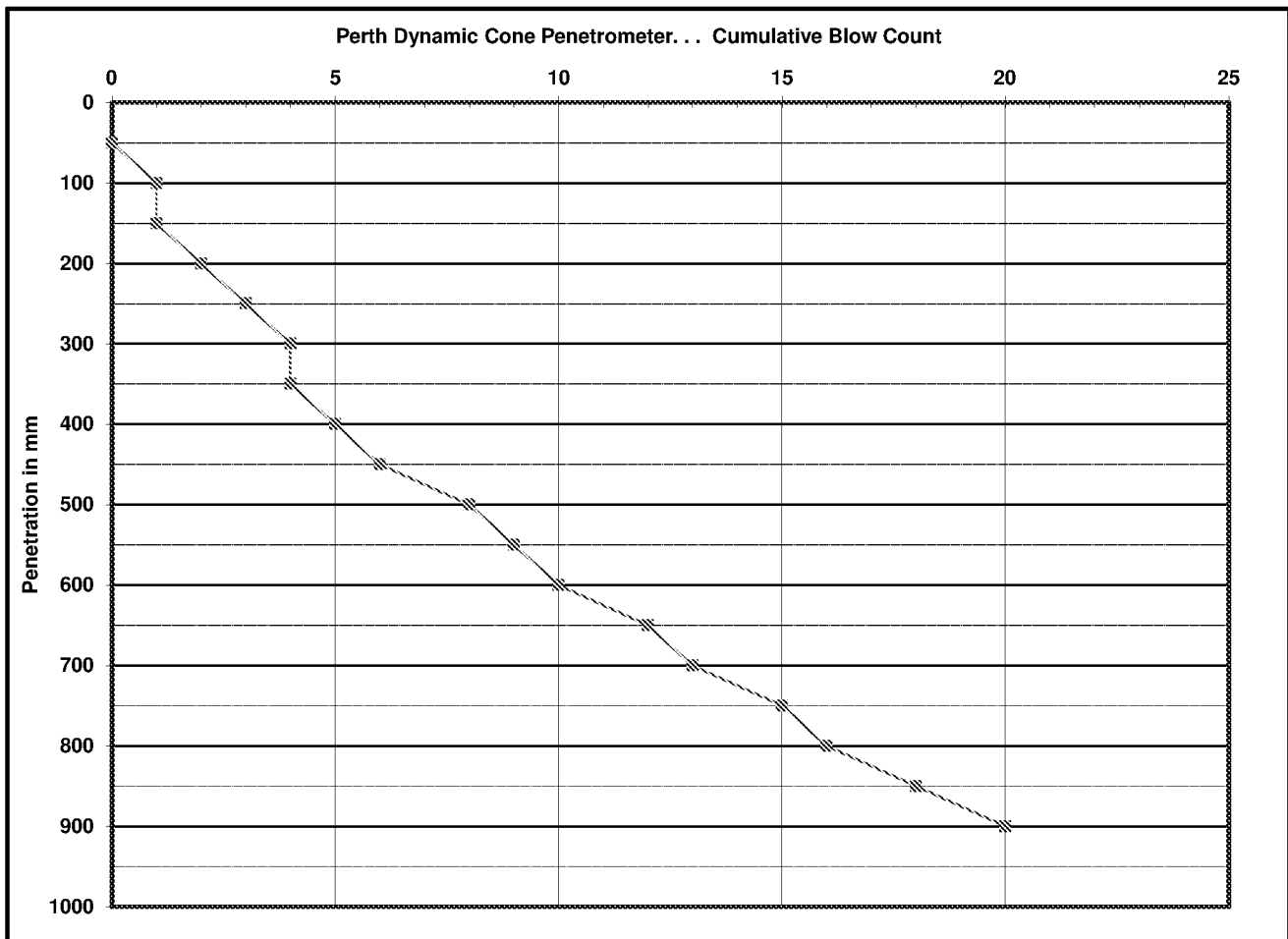
Bilsham Road, Yapton Test Reference: - TP211

Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
100	350	1	4	83.3	2.8	1.5	1.5
350	450	4	6	50.0	4.8	2.9	2.9
450	900	6	20	32.1	7.7	5.0	5.0
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP211

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP212

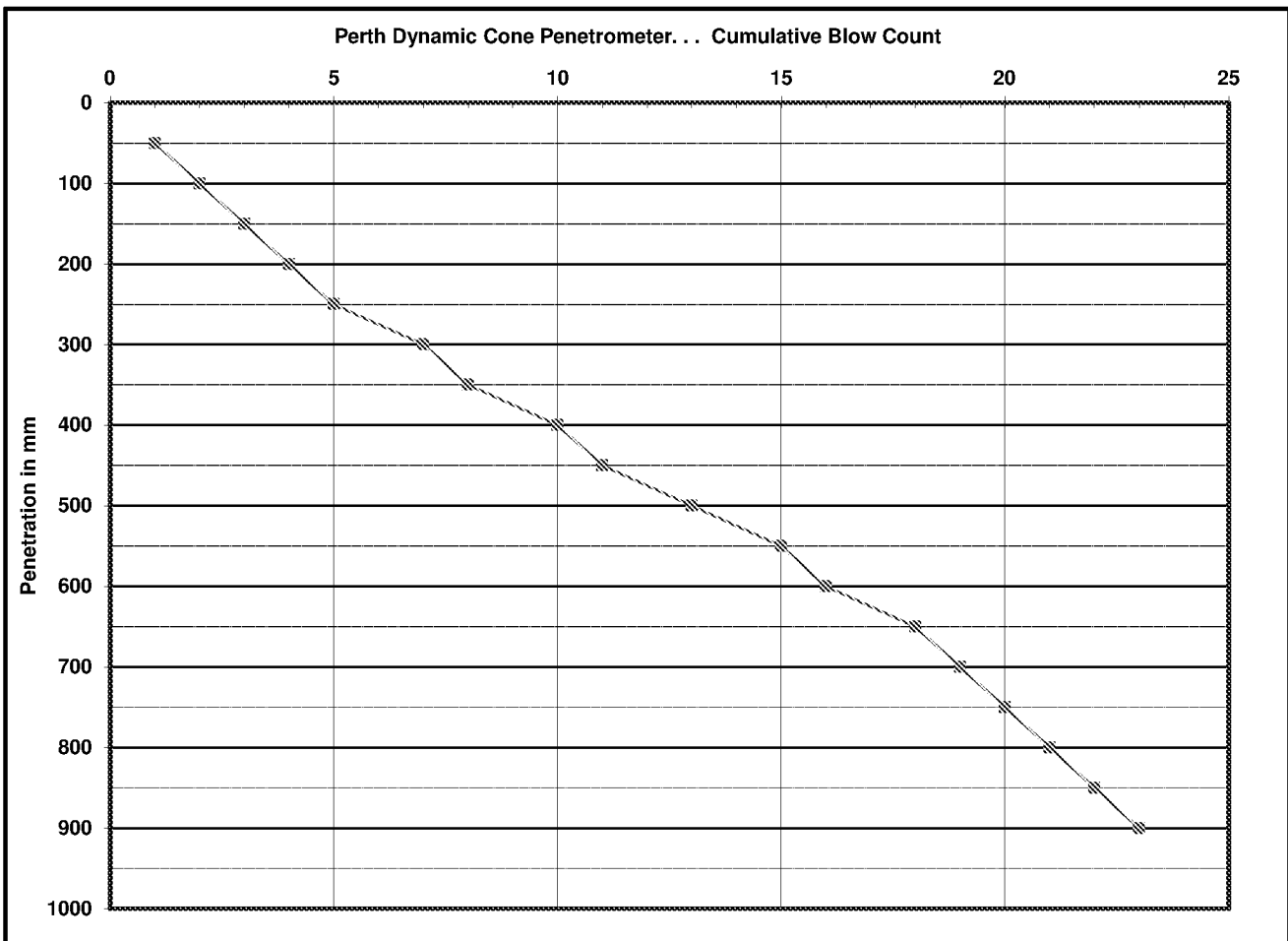
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
2	7	50	300
1	8	50	350
2	10	50	400
1	11	50	450
2	13	50	500
2	15	50	550
1	16	50	600
2	18	50	650
1	19	50	700
1	20	50	750
1	21	50	800
1	22	50	850
1	23	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	250	1	5	50.0	4.8	2.9	2.9
250	650	5	18	30.8	8.1	5.3	5.3
650	900	18	23	50.0	4.8	2.9	2.9
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP212

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP213

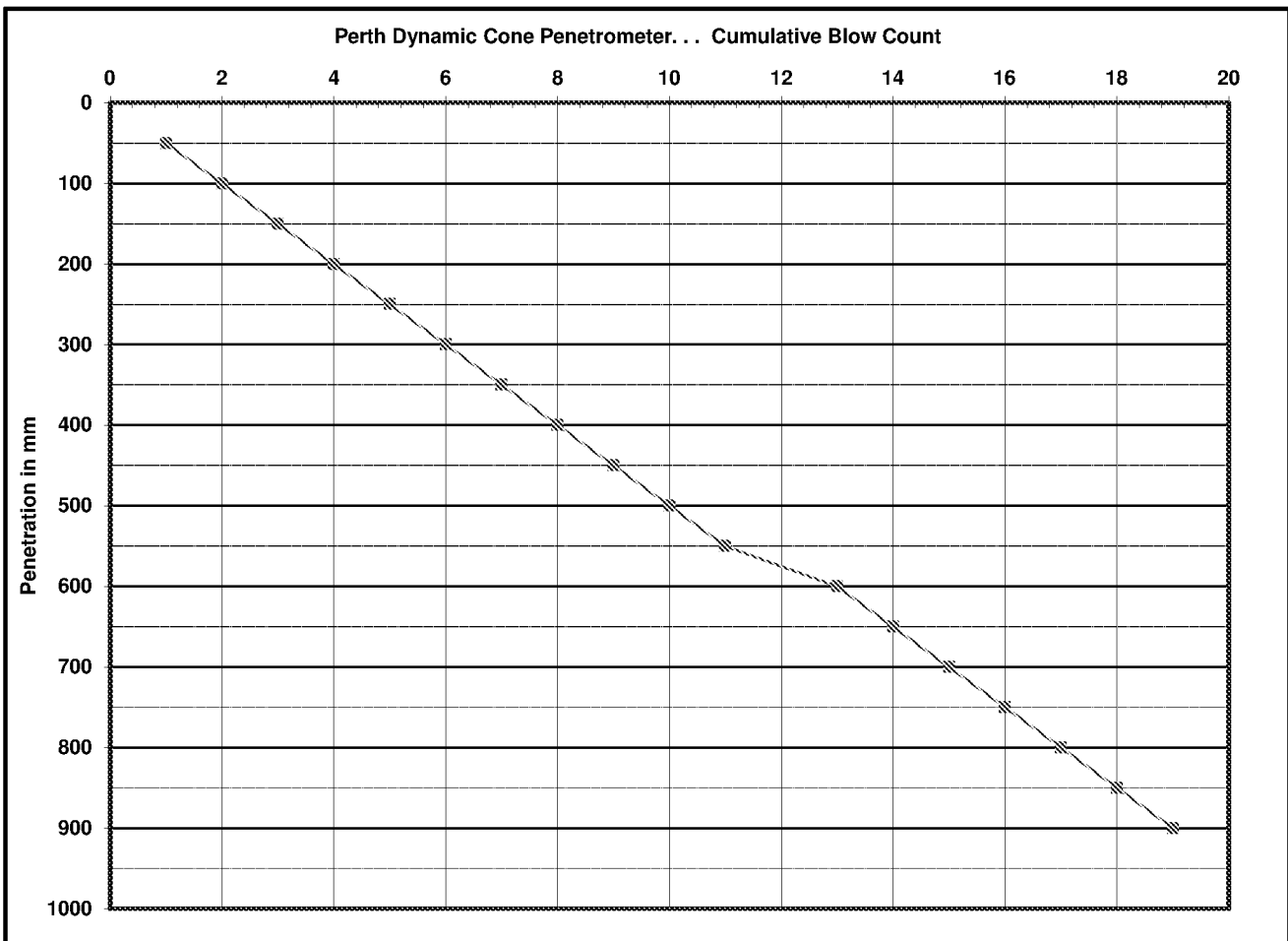
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
1	6	50	300
1	7	50	350
1	8	50	400
1	9	50	450
1	10	50	500
1	11	50	550
2	13	50	600
1	14	50	650
1	15	50	700
1	16	50	750
1	17	50	800
1	18	50	850
1	19	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	550	1	11	50.0	4.8	2.9	2.9
550	900	11	19	43.8	5.6	3.4	3.4
			0				
			0				
			0				



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP213

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP214

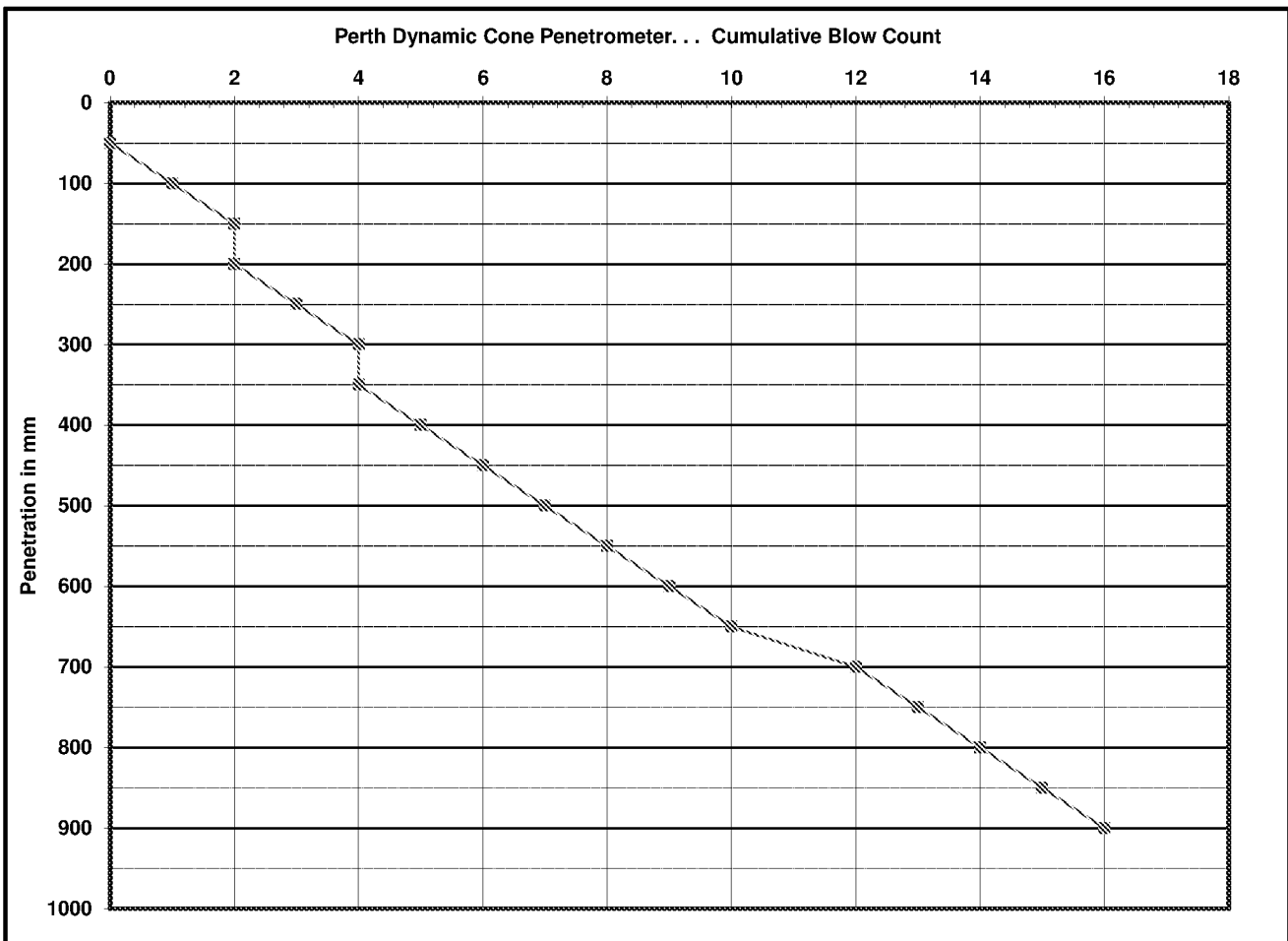
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
100	350	1	4	83.3	2.8	1.5	1.5
350	650	4	10	50.0	4.8	2.9	2.9
650	900	10	16	41.7	5.9	3.6	3.6
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
0	2	50	200
1	3	50	250
1	4	50	300
0	4	50	350
1	5	50	400
1	6	50	450
1	7	50	500
1	8	50	550
1	9	50	600
1	10	50	650
2	12	50	700
1	13	50	750
1	14	50	800
1	15	50	850
1	16	50	900



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP214

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP215

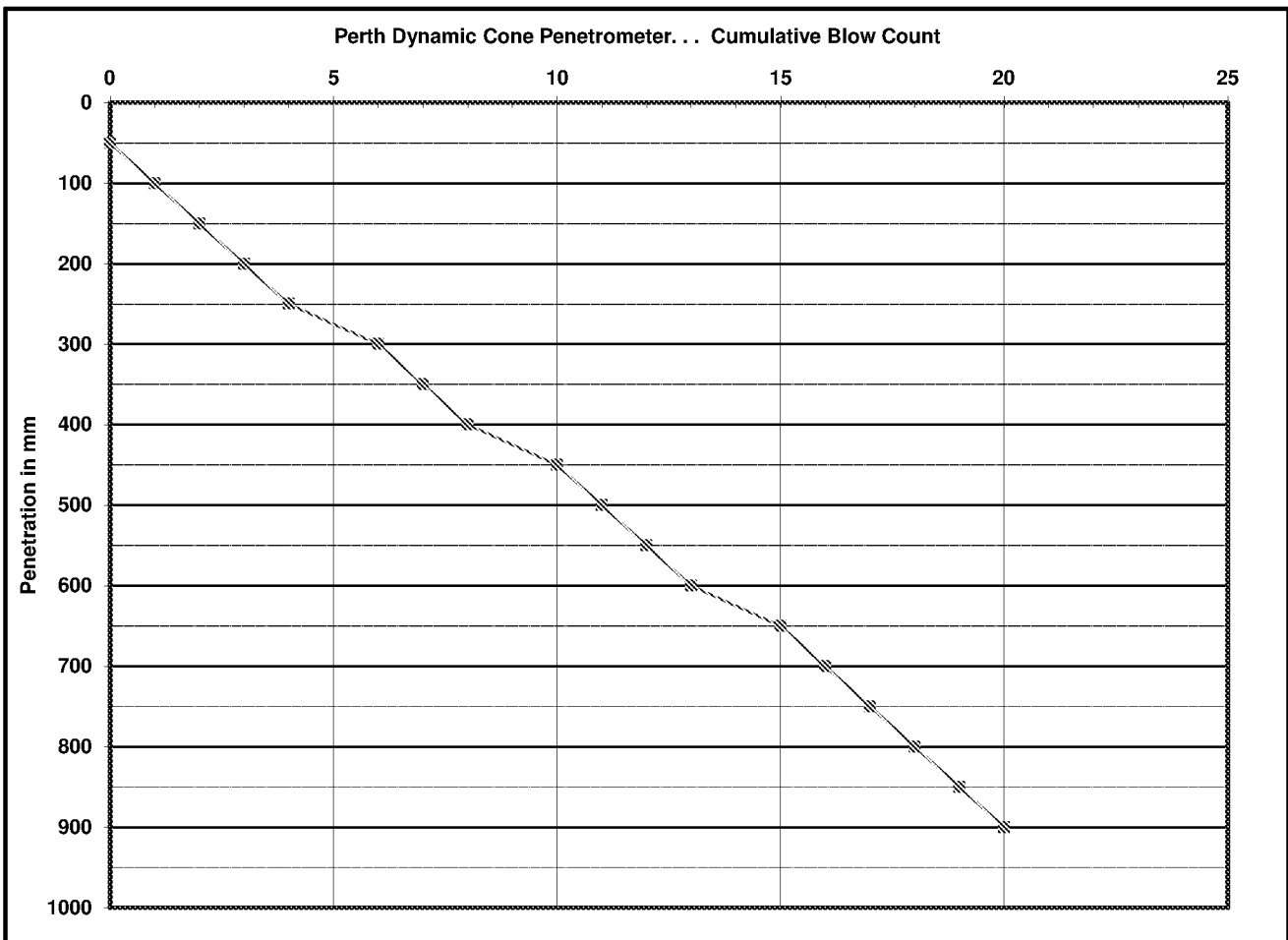
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
2	6	50	300
1	7	50	350
1	8	50	400
2	10	50	450
1	11	50	500
1	12	50	550
1	13	50	600
2	15	50	650
1	16	50	700
1	17	50	750
1	18	50	800
1	19	50	850
1	20	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
100	250	1	4	50.0	4.8	2.9	2.9
250	900	4	20	40.6	6.0	3.7	3.7
			0				
			0				
			0				



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP215

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP216

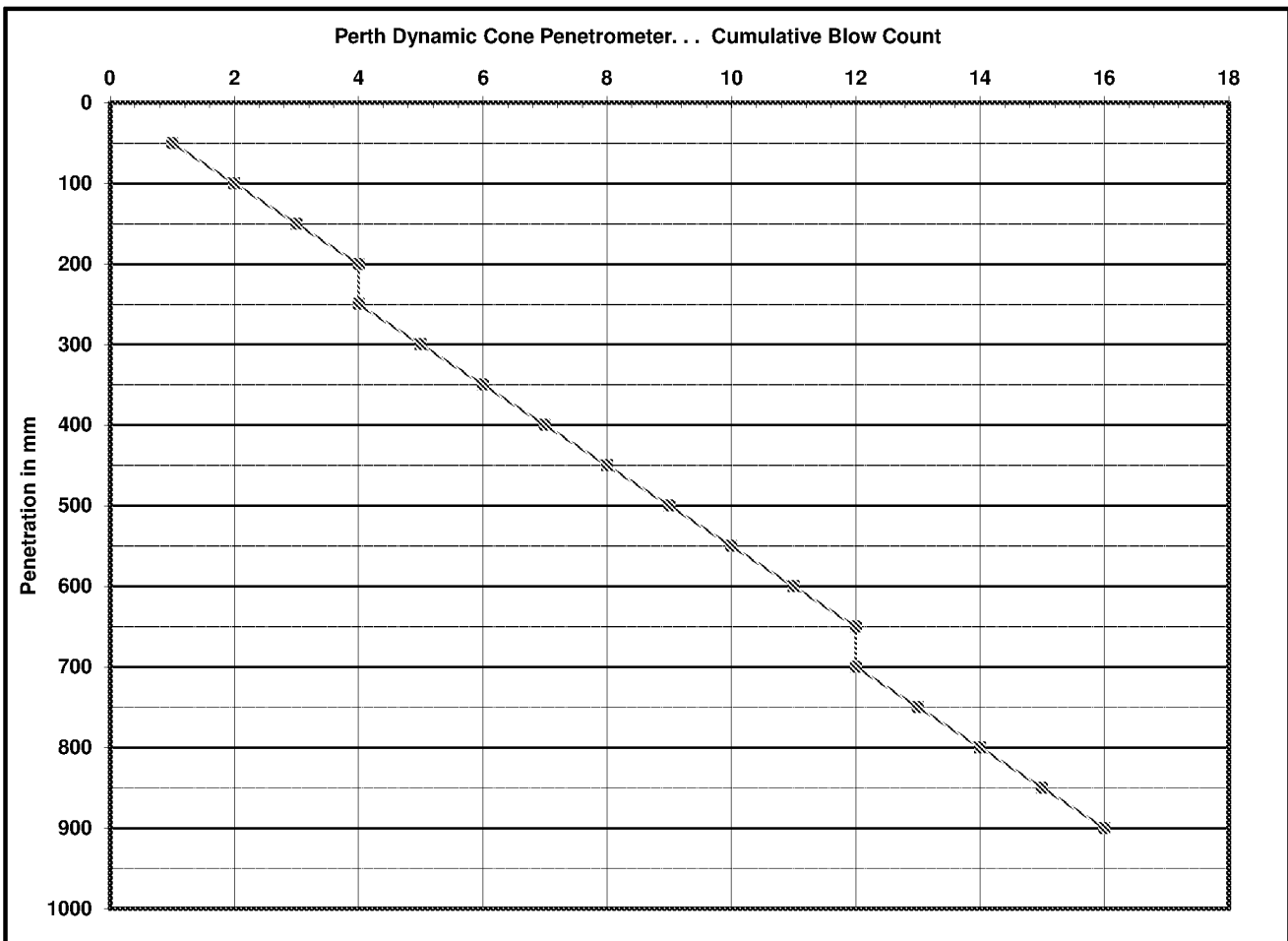
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
0	4	50	250
1	5	50	300
1	6	50	350
1	7	50	400
1	8	50	450
1	9	50	500
1	10	50	550
1	11	50	600
1	12	50	650
0	12	50	700
1	13	50	750
1	14	50	800
1	15	50	850
1	16	50	900

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
50	900	1	16	56.7	4.2	2.4	2.4
			0				
			0				
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP216

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP217

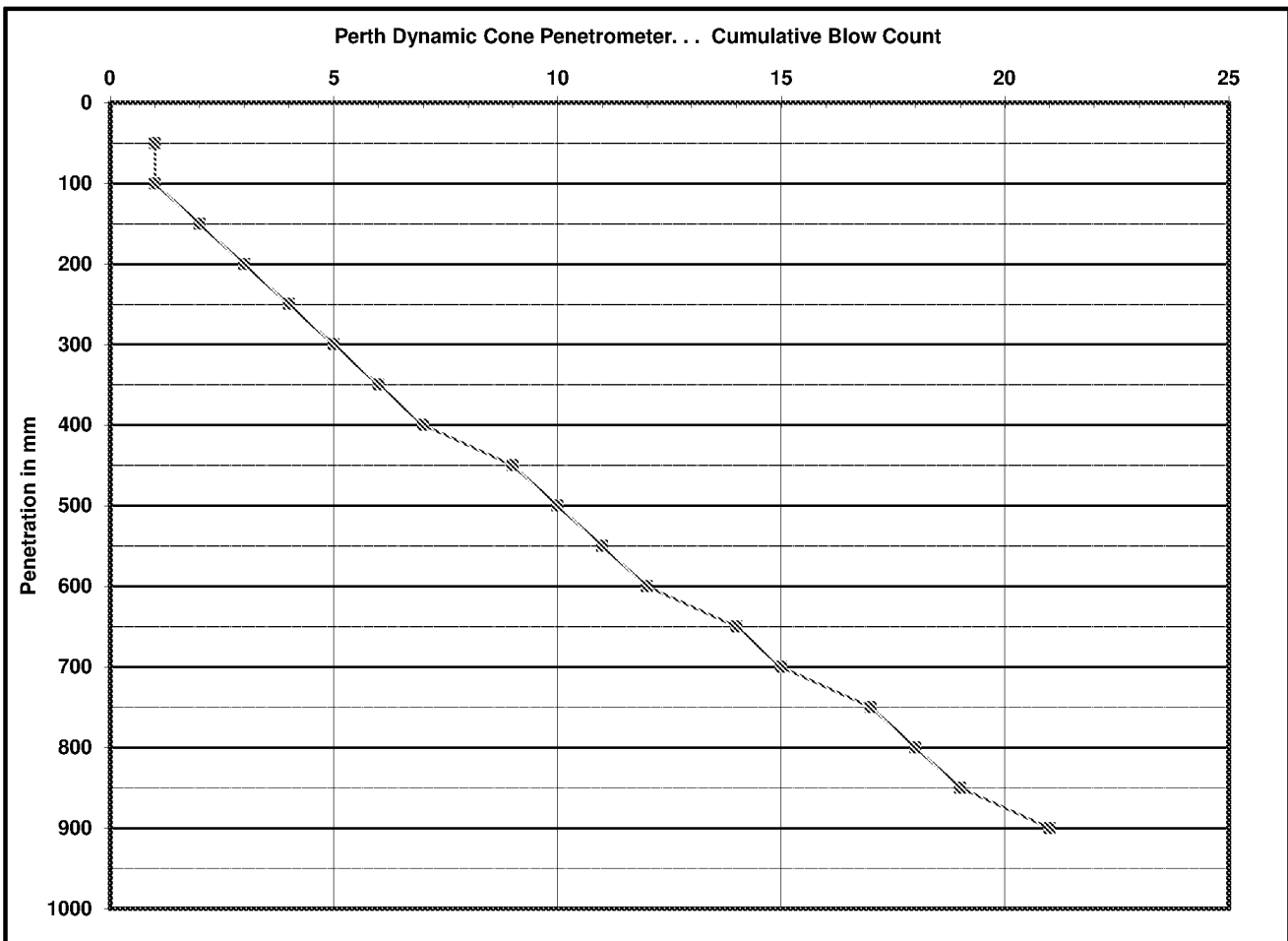
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
50	400	1	7	58.3	4.1	2.4	2.4
400	900	7	21	35.7	6.9	4.4	4.4
			0				
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
0	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
1	6	50	350
1	7	50	400
2	9	50	450
1	10	50	500
1	11	50	550
1	12	50	600
2	14	50	650
1	15	50	700
2	17	50	750
1	18	50	800
1	19	50	850
2	21	50	900



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP217

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP218

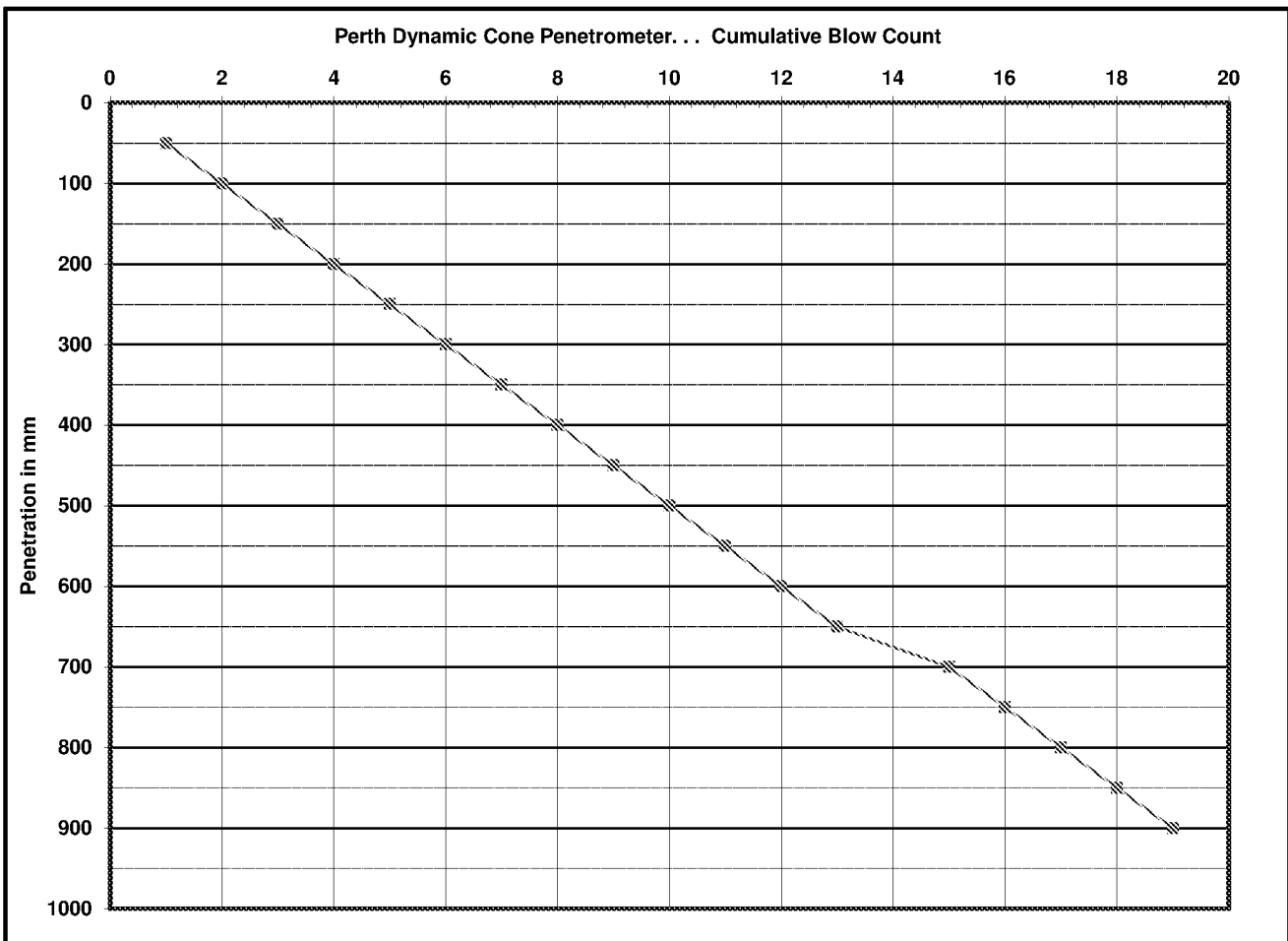
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
50	650	1	13	50.0	4.8	2.9	2.9
650	900	13	19	41.7	5.9	3.6	3.6
			0				
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
1	6	50	300
1	7	50	350
1	8	50	400
1	9	50	450
1	10	50	500
1	11	50	550
1	12	50	600
1	13	50	650
2	15	50	700
1	16	50	750
1	17	50	800
1	18	50	850
1	19	50	900



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP218

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP219

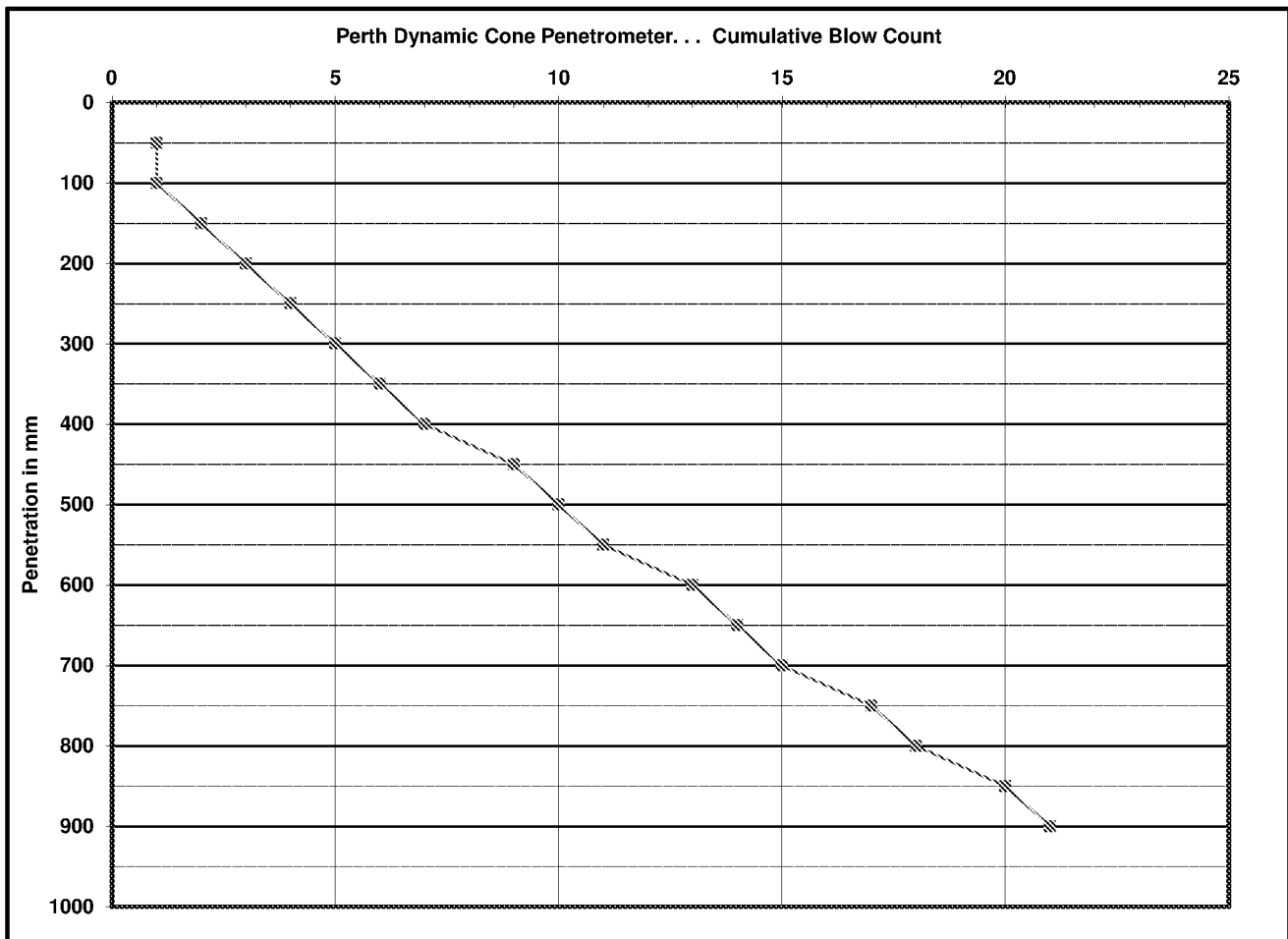
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
50	400	1	7	58.3	4.1	2.4	2.4
400	900	7	21	35.7	6.9	4.4	4.4
			0				
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
0	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
1	6	50	350
1	7	50	400
2	9	50	450
1	10	50	500
1	11	50	550
2	13	50	600
1	14	50	650
1	15	50	700
2	17	50	750
1	18	50	800
2	20	50	850
1	21	50	900



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP219

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP220

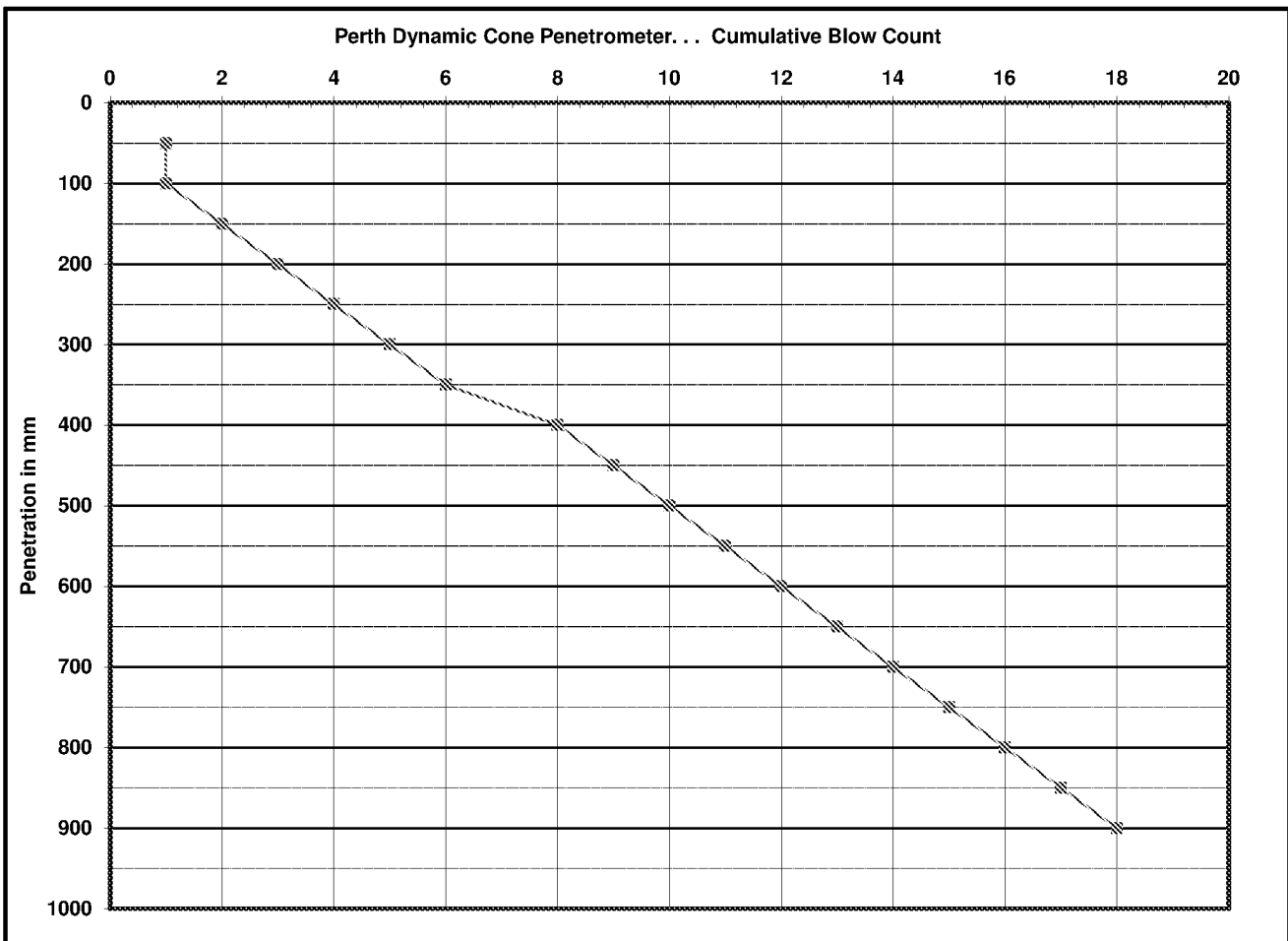
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
0	1	50	100
1	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
1	6	50	350
2	8	50	400
1	9	50	450
1	10	50	500
1	11	50	550
1	12	50	600
1	13	50	650
1	14	50	700
1	15	50	750
1	16	50	800
1	17	50	850
1	18	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	350	1	6	60.0	4.0	2.3	2.3
350	900	6	18	45.8	5.3	3.2	3.2
			0				
			0				
			0				



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP220

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP221

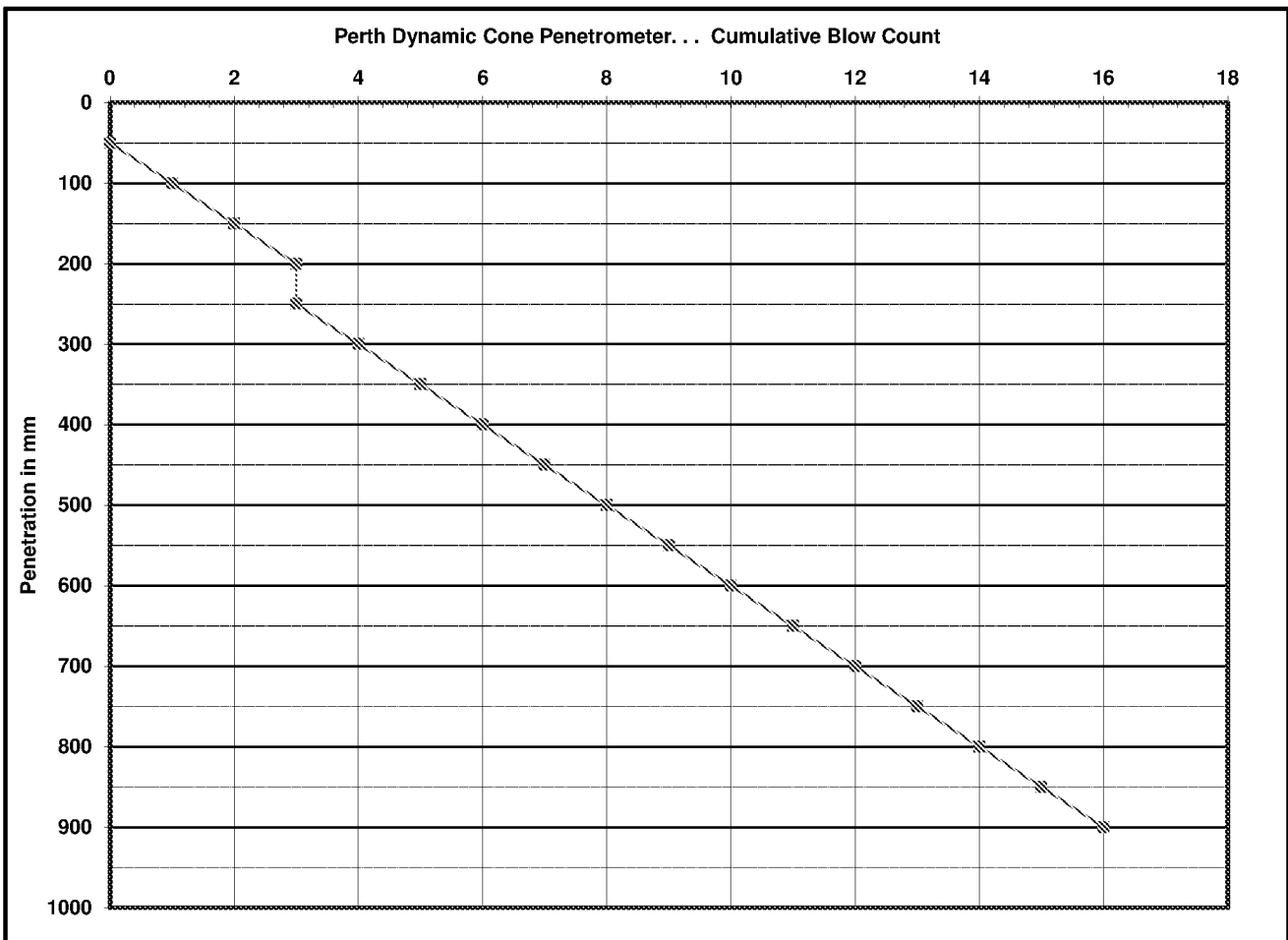
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
100	250	1	3	75.0	3.1	1.7	1.7
250	900	3	16	50.0	4.8	2.9	2.9
			0				
			0				
			0				

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
1	3	50	200
0	3	50	250
1	4	50	300
1	5	50	350
1	6	50	400
1	7	50	450
1	8	50	500
1	9	50	550
1	10	50	600
1	11	50	650
1	12	50	700
1	13	50	750
1	14	50	800
1	15	50	850
1	16	50	900



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP221

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP222

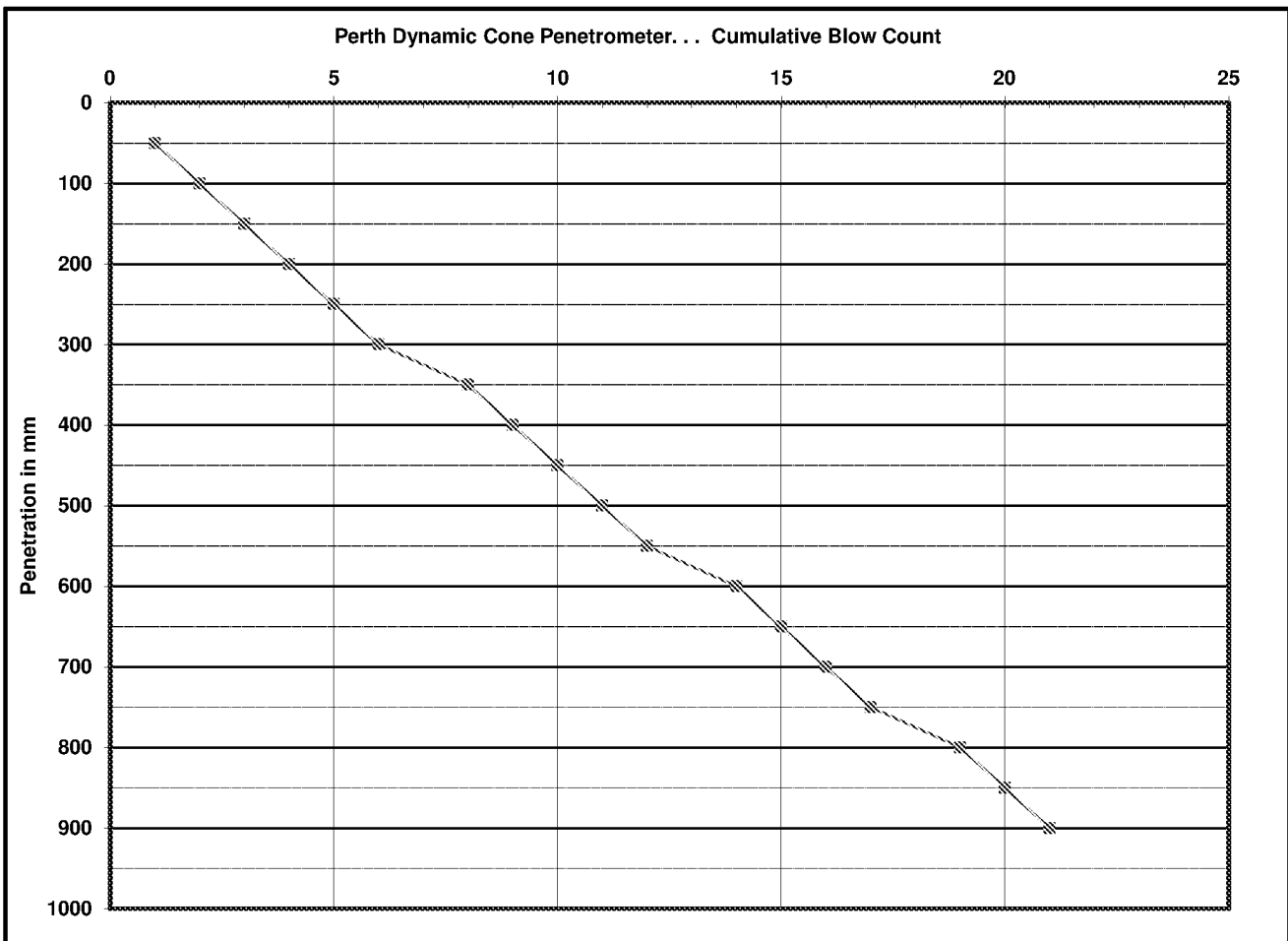
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
1	6	50	300
2	8	50	350
1	9	50	400
1	10	50	450
1	11	50	500
1	12	50	550
2	14	50	600
1	15	50	650
1	16	50	700
1	17	50	750
2	19	50	800
1	20	50	850
1	21	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	300	1	6	50.0	4.8	2.9	2.9
300	900	6	21	40.0	6.1	3.8	3.8
			0				
			0				
			0				



Tested by	LS	Checked	Approved
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP222

Dynamic Cone CBR Test

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
0	2	50	150
1	3	50	200
1	4	50	250
1	5	50	300
1	6	50	350
1	7	50	400
2	9	50	450
1	10	50	500
0	10	50	550
1	11	50	600
1	12	50	650
1	13	50	700
1	14	50	750
1	15	50	800
1	16	50	850
1	17	50	900

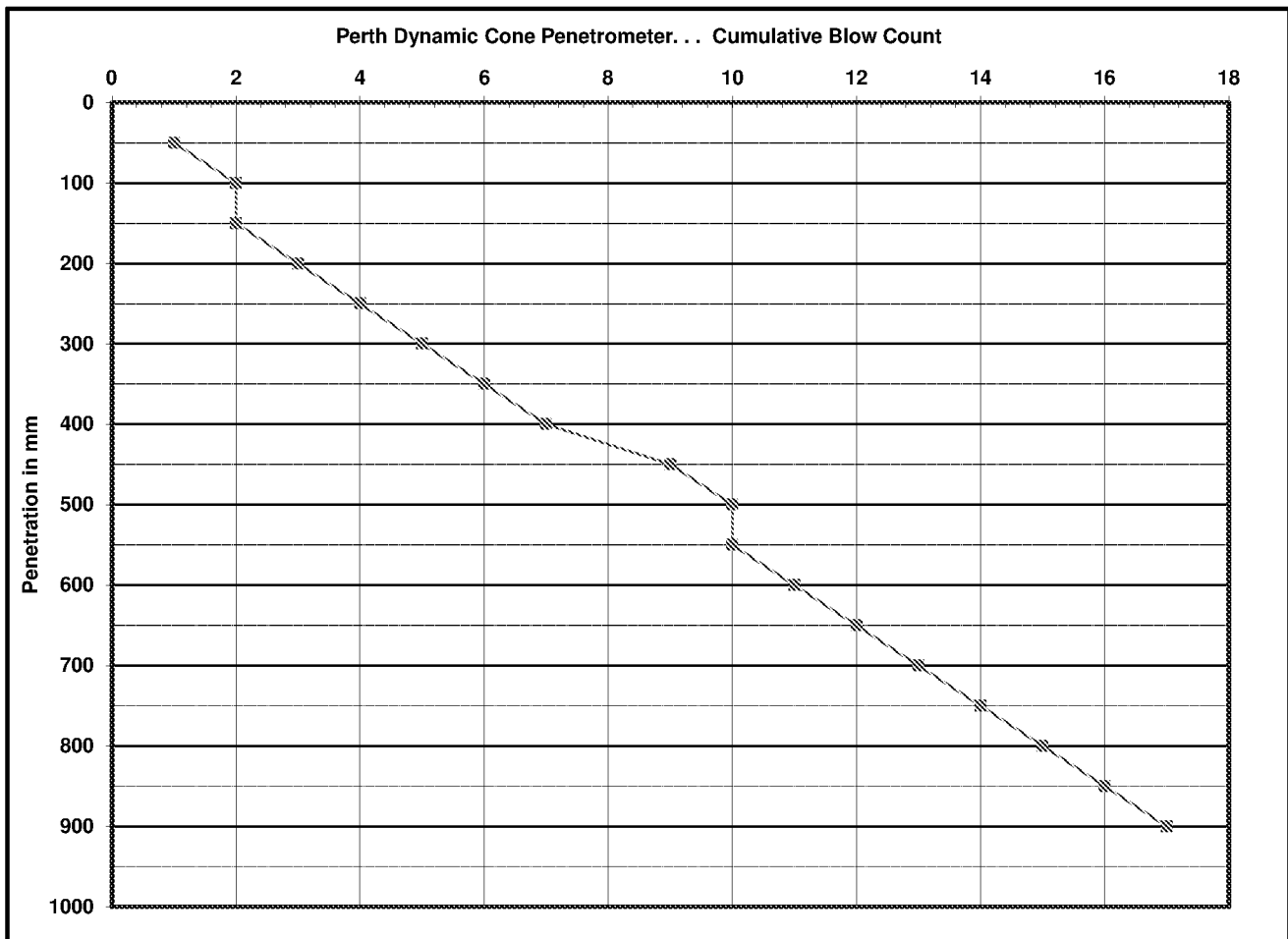
Bilsham Road, Yapton Test Reference: - TP223

Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Initial S	Final S	Initial S	Final S	Pen/Blow	CBR	CBR	CBR
Pen mm	Pen mm	Blows	Blows	mm	TRRL	KVH	Value (%)
50	400	1	7	58.3	4.1	2.4	2.4
400	500	7	10	33.3	7.4	4.8	4.8
500	900	10	17	57.1	4.2	2.4	2.4
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP223

Dynamic Cone CBR Test

Bilsham Road, Yapton Test Reference: - TP224

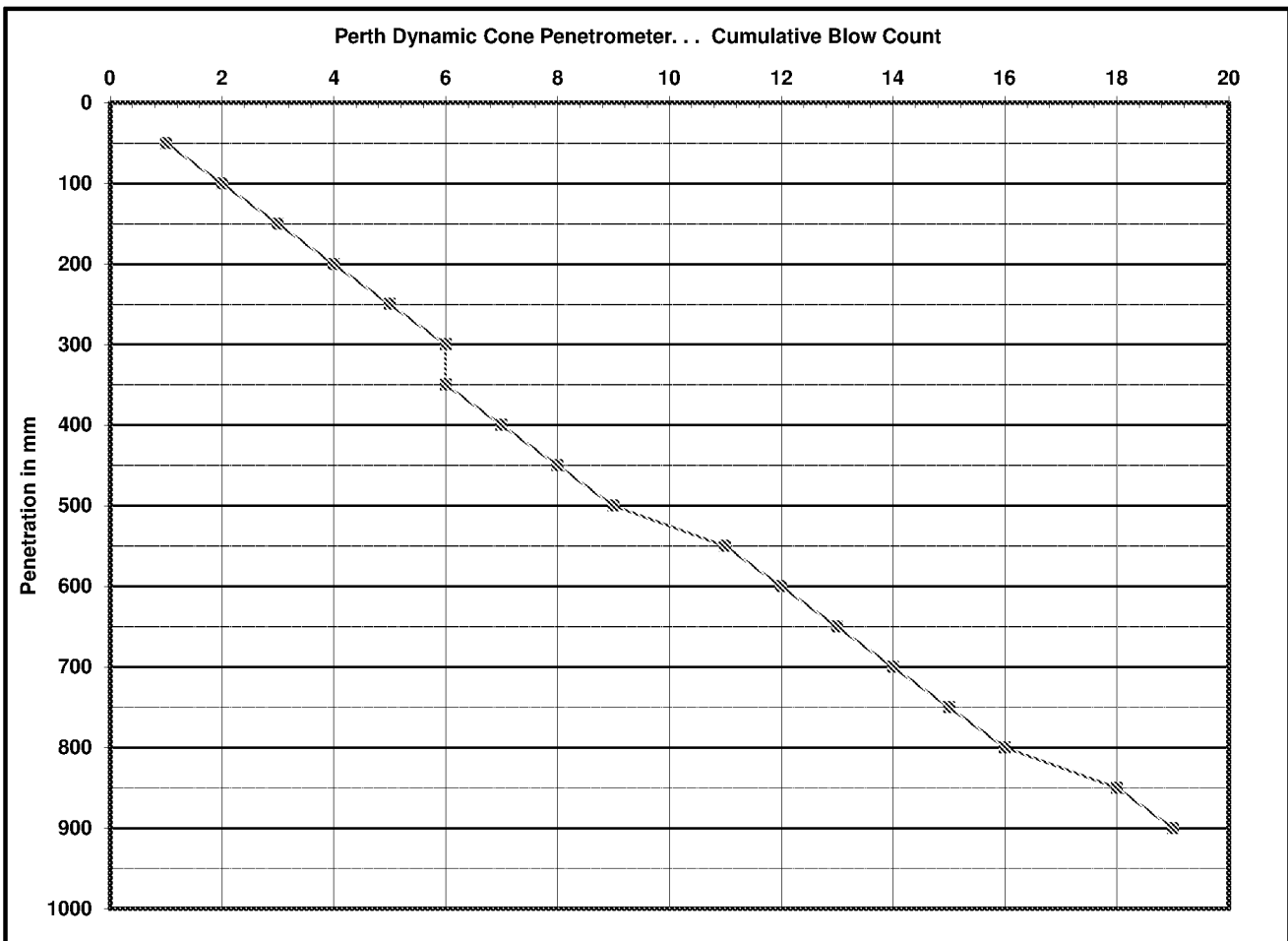
Job Nr LP2231
0

Date 13-May-20

CBR VALUE CALCULATIONS

Nr Blows	S Blows	Penetration mm	S Pen. mm
1	1	50	50
1	2	50	100
1	3	50	150
1	4	50	200
1	5	50	250
1	6	50	300
0	6	50	350
1	7	50	400
1	8	50	450
1	9	50	500
2	11	50	550
1	12	50	600
1	13	50	650
1	14	50	700
1	15	50	750
1	16	50	800
2	18	50	850
1	19	50	900

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	350	1	6	60.0	4.0	2.3	2.3
350	900	6	19	42.3	5.8	3.5	3.5
			0				
			0				
			0				



Tested by	LS	Checked		Approved	
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Site: Bilsham Road, Yapton

Client: Thakeham Group

Date: 13/05/2020

Job No: LP2231

Test No: TP224

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Condition	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					%	%	%	%	%	Mg/m³	Mg/m³		kPa	kPa	kPa		g/L	mg/L	
TP201	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP202	0.60	1	B	Brown fine sandy CLAY and SILT.															California Bearing Ratio
TP203	0.50	1	B	Brown fine sandy CLAY/ SILT.															California Bearing Ratio
TP204	0.60	1	B	Brown slightly fine gravelly fine sandy silty CLAY.															California Bearing Ratio
TP205	0.50	1	B	Brown slightly fine gravelly fine sandy CLAY / SILT.															California Bearing Ratio
TP206	0.60	1	B	Brown slightly fine gravelly fine sandy silty CLAY.															California Bearing Ratio
TP207	0.60	1	B	Brownish grey fine sandy CLAY/ SILT.															California Bearing Ratio
TP208	0.60	1	B	Light brown slightly fine gravelly fine sandy CLAY / SILT.															California Bearing Ratio
TP209	0.60	1	B	Brown and grey mottled fine sandy CLAY / SILT.															California Bearing Ratio
TP210	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by	Project Number:	GEO / 31001 BILSHAM ROAD LP2231	
	Contact Name:		
S Burke - Senior Technician 27/05/2020			

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Condition	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					%	%	%	%	%	Mg/m³	Mg/m³		kPa	kPa	kPa		g/L	mg/L	
TP211	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP212	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP213	0.50	1	B	Brown fine sandy CLAY / SILT with rare chalk nodules.															California Bearing Ratio
TP214	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP215	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP216	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP217	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP218	0.60	1	B	Brown mottled grey fine sandy CLAY / SILT.															California Bearing Ratio
TP219	0.50	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP220	0.60	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by	Project Number:	GEO / 31001	BILSHAM ROAD	LP2231	
	Project Name:				
S Burke - Senior Technician 27/05/2020					

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Condition	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					%	%	%	%	%	Mg/m³	Mg/m³		kPa	kPa	kPa		g/L	mg/L	
TP221	0.60	1	B	Brown clayey fine sandy SILT															California Bearing Ratio
TP222	0.65	1	B	Brown fine sandy CLAY / SILT.															California Bearing Ratio
TP223	0.60	1	B	Geyish brown fine sandy CLAY / SILT.															California Bearing Ratio
TP224	0.60	1	B	Geyish brown fine sandy silty CLAY.															California Bearing Ratio
TP225	0.60	1	B	Brown silty CLAY.															California Bearing Ratio
WS201	0.80-1.00	1	B	Orange brown silty CLAY with rare sand sized chalk.	21.4	41	20	21	100										Particle Size Distribution
WS201	1.60-2.00	2	B	Yellowish brown mottled brown and greyish brown CLAY with rare fine gravel.	27.2	37	19	18	99										
WS202	0.50-0.80	1	B	Orange brown and grey silty CLAY with rare rootlets.	22.4	49	22	27	100										Particle Size Distribution
WS203	1.20-1.50	2	B	Orange brown clayey sandy SILT with occasional sand sized to fine gravel sized chalk.															Particle Size Distribution
WS204	0.70-1.00	1	B	Yellowish brown mottled brown and greyish brown slightly gravelly CLAY. Gravel is fine.	18.5	29	18	11	88										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by  S Burke - Senior Technician 27/05/2020	Project Number: GEO / 31001 Project Name: BILSHAM ROAD LP2231	
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SUMMARY OF GEOTECHNICAL TESTING	
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[illegible]

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Page 4 of 4
(Ref 1590586815)

PARTICLE SIZE DISTRIBUTION

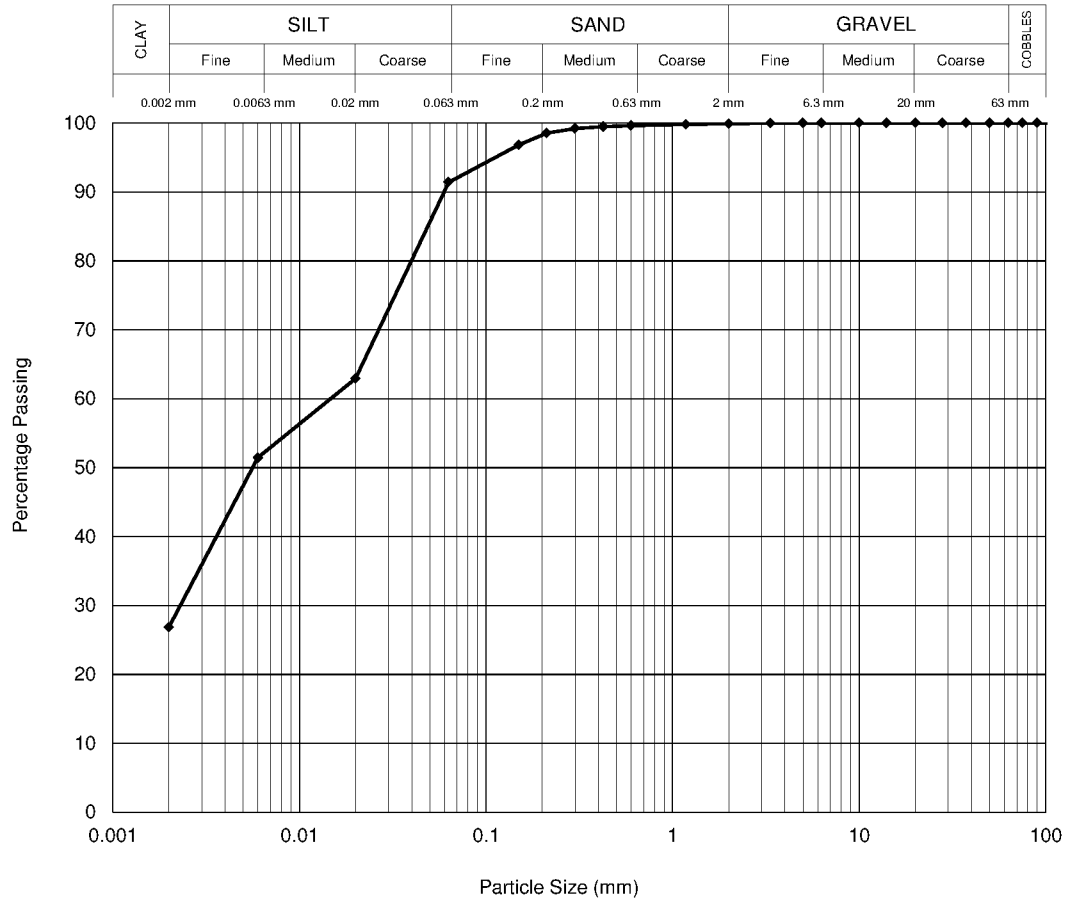
BH / TP No. WS201
 Sample Ref 1
 Depth (m) 0.80-1.00
 Sample Type B

Description

Orange brown silty CLAY with rare sand sized chalk.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
 BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	100
425 µm	99
300 µm	99
212 µm	99
150 µm	97
63 µm	91



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	63
6 µm	51
2 µm	27

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	8
Silt	65
Clay	27

Processed by SB
 Checked and Approved by

Project Number:

GEO / 31001

Project Name:

BILSHAM ROAD
LP2231

S Burke - Senior Technician
 27/05/2020

Test Report By: GEOLABS Limited, Bucknalls Lane, Garston, Watford, Hertfordshire, WD25 9XX
 Client: Leap Environmental, Wyvols Court, Swallowfield, Reading, RG7 1WY



PARTICLE SIZE DISTRIBUTION

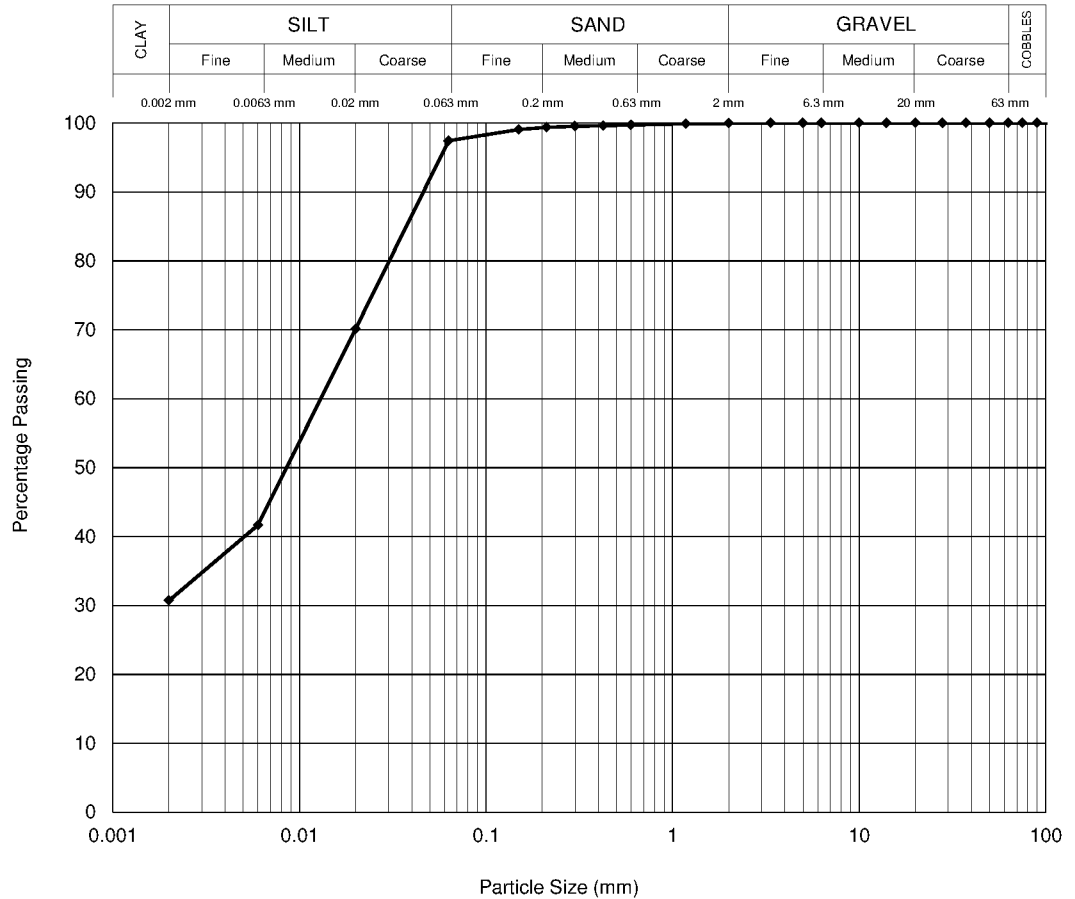
BH / TP No. WS202
 Sample Ref 1
 Depth (m) 0.50-0.80
 Sample Type B

Description

Orange brown and grey silty CLAY with rare rootlets.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
 BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	100
425 µm	100
300 µm	100
212 µm	99
150 µm	99
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	70
6 µm	42
2 µm	31

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	3
Silt	67
Clay	30

Processed by SB
 Checked and Approved by

Project Number:

GEO / 31001

Project Name:

**BILSHAM ROAD
 LP2231**

S Burke - Senior Technician
 27/05/2020

Test Report By GEOLABS Limited Bucknalls Lane, Garston, Watford, Hertfordshire, WD25 9XX
 Client : Leap Environmental, Wyvols Court, Swallowfield, Reading, RG7 1WY



PARTICLE SIZE DISTRIBUTION

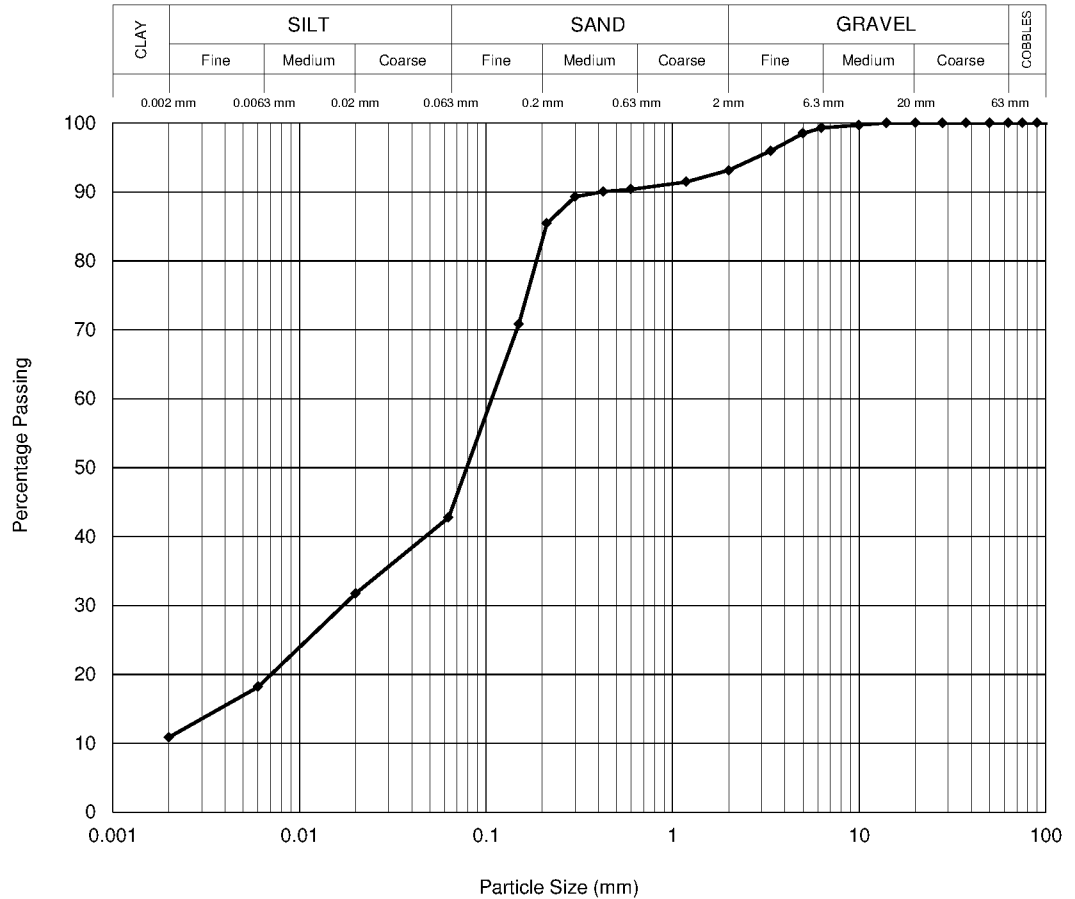
BH / TP No. WS203
 Sample Ref 2
 Depth (m) 1.20-1.50
 Sample Type B

Description

Orange brown clayey sandy SILT with occasional sand sized to fine gravel sized chalk.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
 BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	99
5.00 mm	98
3.35 mm	96
2.00 mm	93
1.18 mm	91
600 µm	90
425 µm	90
300 µm	89
212 µm	85
150 µm	71
63 µm	43



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	32
6 µm	18
2 µm	11

Particle Proportions	
Cobbles	0
Gravel	7
Sand	50
Silt	32
Clay	11

Particle Density 2.70(A) Mg/m³

Processed by SB
 Checked and Approved by

S Burke - Senior Technician
 27/05/2020

Project Number:

GEO / 31001

Project Name:

**BILSHAM ROAD
 LP2231**



PARTICLE SIZE DISTRIBUTION

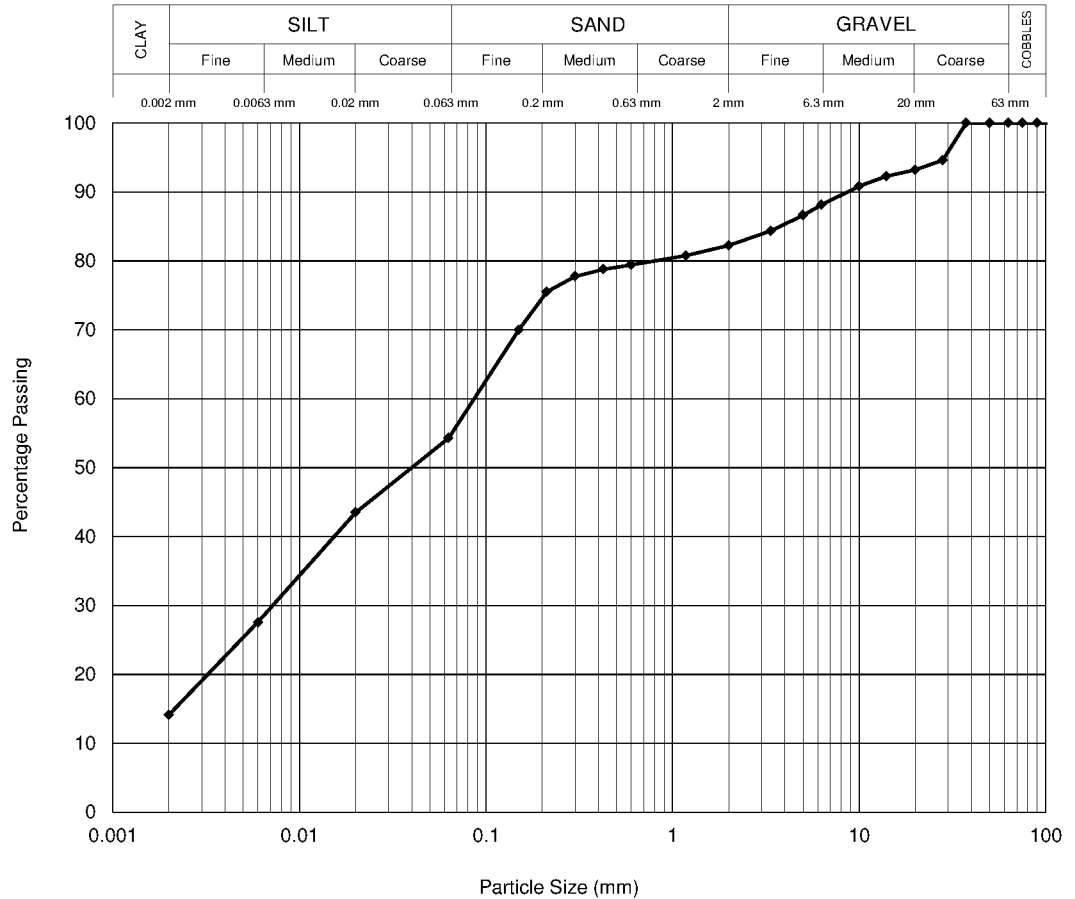
BH / TP No. WS204
 Sample Ref 2
 Depth (m) 1.50-2.00
 Sample Type B

Description

Orange brown and grey gravelly sandy clayey SILT. Gravel is flint and chalk.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
 BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	95
20.0 mm	93
14.0 mm	92
10.0 mm	91
6.30 mm	88
5.00 mm	87
3.35 mm	84
2.00 mm	82
1.18 mm	81
600 µm	79
425 µm	79
300 µm	78
212 µm	75
150 µm	70
63 µm	54



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	43
6 µm	28
2 µm	14

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	18
Sand	28
Silt	40
Clay	14

Processed by SB
 Checked and Approved by

S Burke - Senior Technician
 27/05/2020

Project Number:

GEO / 31001

Project Name:

**BILSHAM ROAD
 LP2231**



CALIFORNIA BEARING RATIO

BH/TP No.: TP201
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

Description:

Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.

The specimen was prepared at its existing moisture content of 22%

The specimen was prepared by dynamic compaction using a 4.5 kg rammer

Soaked specimen bulk density 2.02 Mg/m³ (2.02 Mg/m³ before soaking)

Soaked specimen dry density 1.63 Mg/m³ (1.65 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 24 %

Base

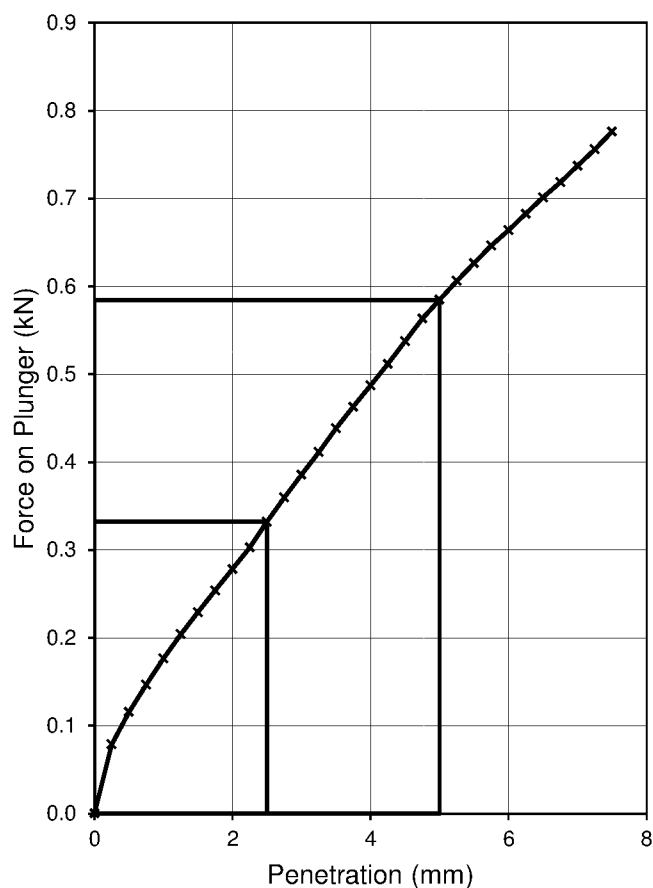
10.0 kg
 10 N
 25 %

CBR Value

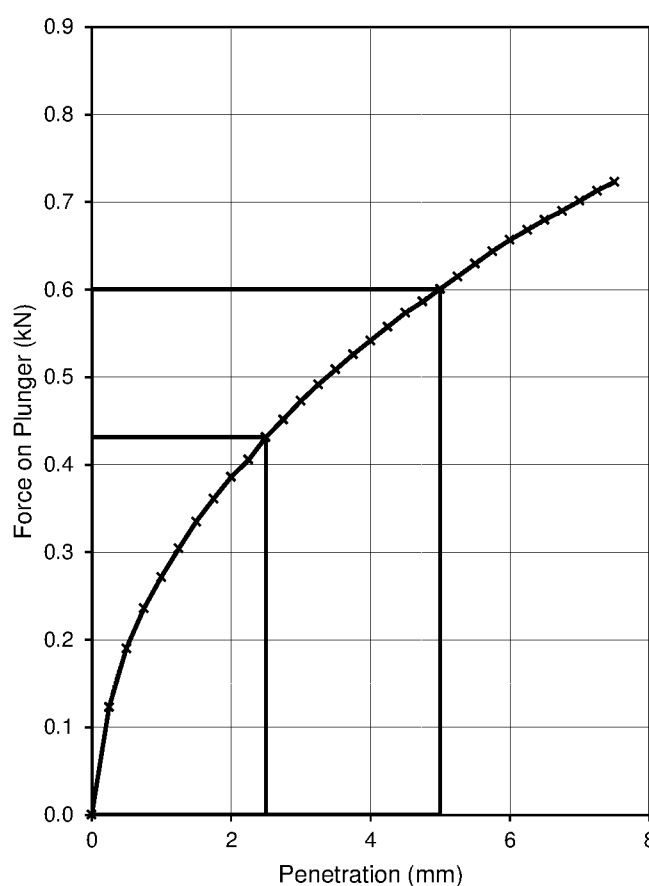
2.9 %

3.3 %

Top of Specimen



Base of Specimen



Checked and Approved by:

Project Number:

GEO / 31001

Project Name:

BILSHAM ROAD
LP2231

S Burke - Senior Technician
 27/05/2020

GEOLABS

BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP202
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

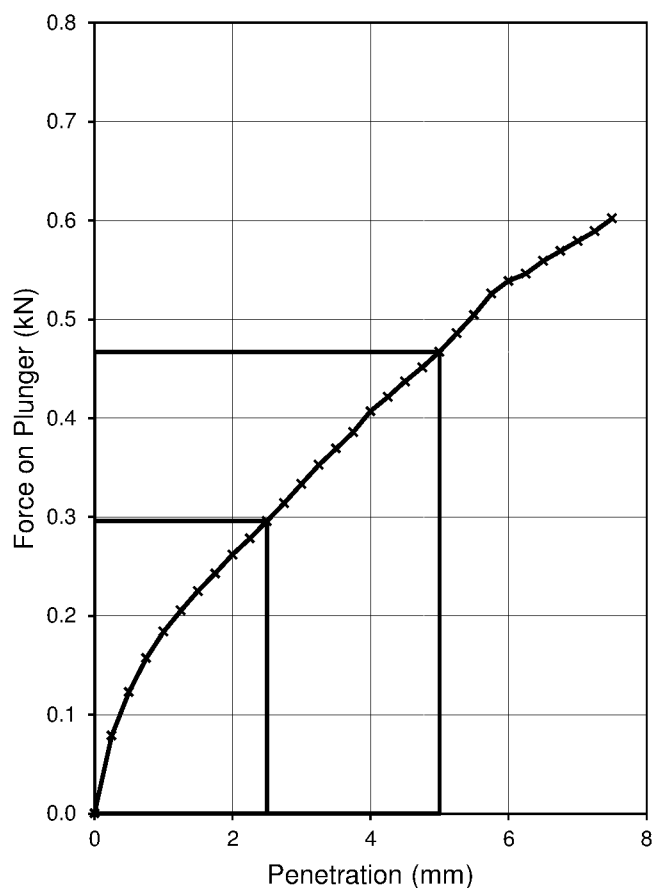
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

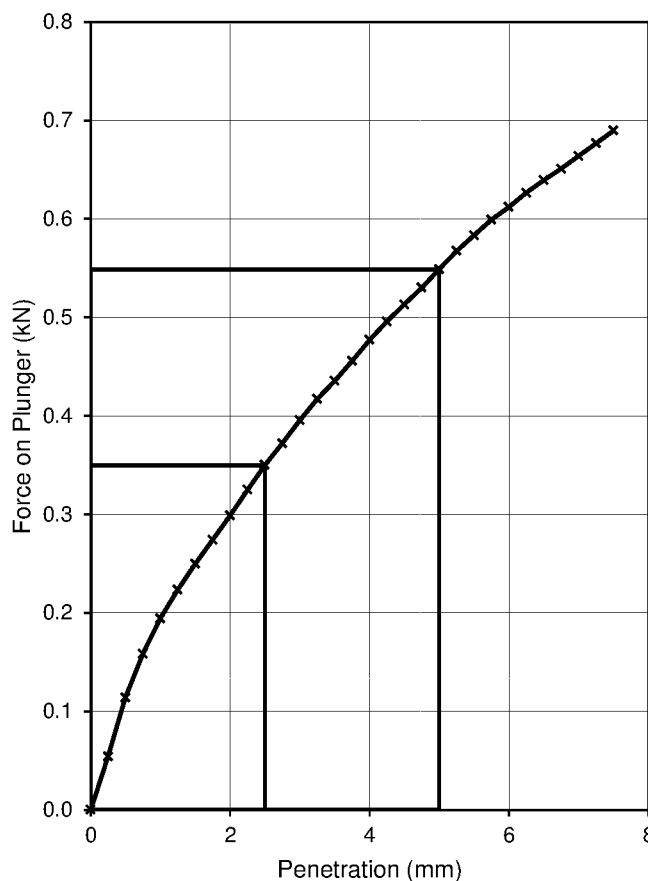
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 22%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.00 Mg/m³ (1.99 Mg/m³ before soaking)
 Soaked specimen dry density 1.61 Mg/m³ (1.63 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	24 %	23 %
CBR Value	2.3 %	2.7 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP203
 Sample No.: 1
 Depth (m): 0.50
 Sample Type: B

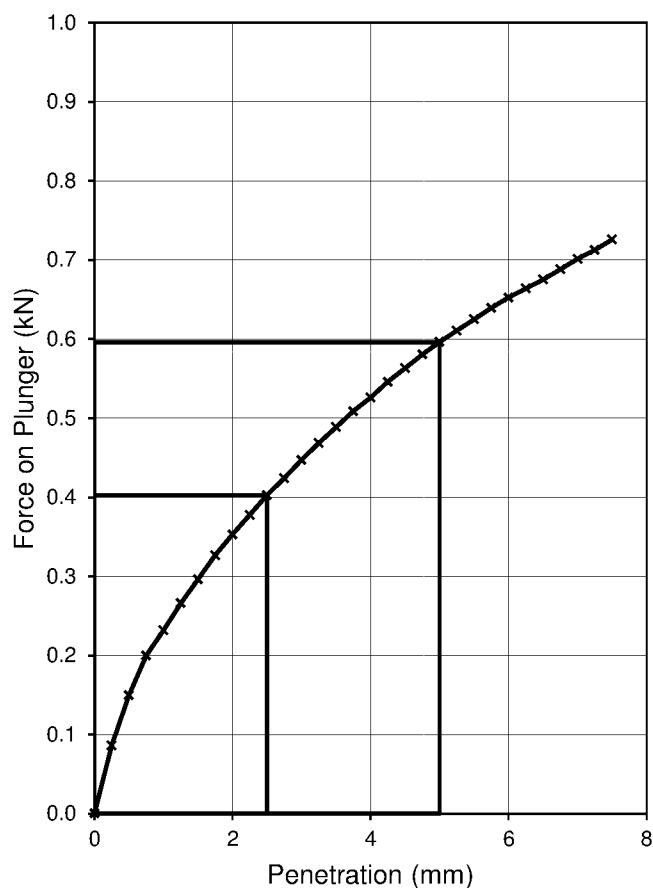
Description:
 Brown fine sandy CLAY/ SILT.

PREPARATION DETAILS

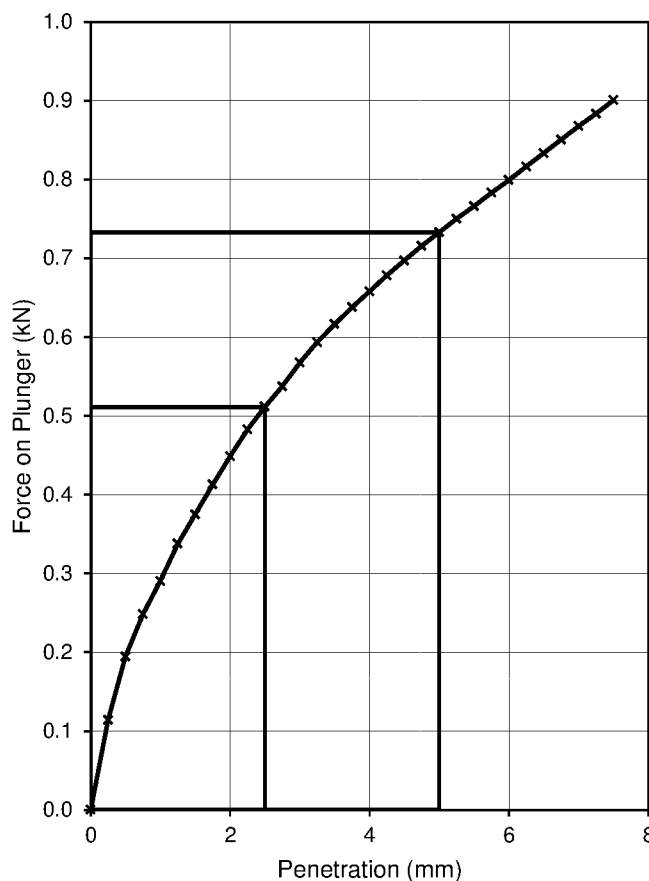
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.3 % vertical swell.
 The specimen was prepared at its existing moisture content of 23%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.00 Mg/m³ (2.00 Mg/m³ before soaking)
 Soaked specimen dry density 1.62 Mg/m³ (1.63 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	24 %	23 %
CBR Value	3.1 %	3.9 %

Top of Specimen



Base of Specimen



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CALIFORNIA BEARING RATIO

BH/TP No.: TP204
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

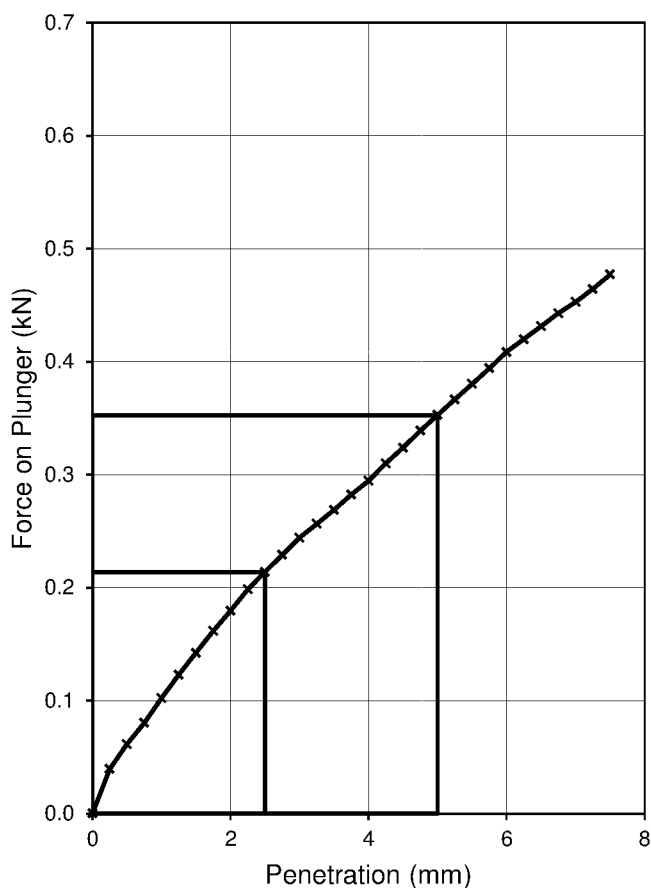
Description:
 Brown slightly fine gravelly fine sandy silty CLAY.

PREPARATION DETAILS

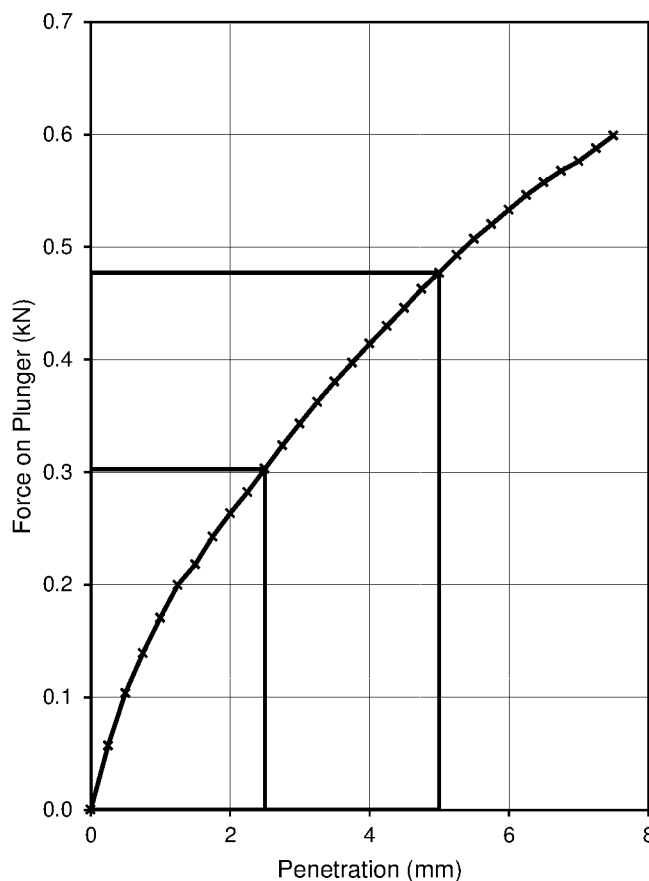
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 21%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.03 Mg/m³ (2.02 Mg/m³ before soaking)
 Soaked specimen dry density 1.66 Mg/m³ (1.67 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	22 %	22 %
CBR Value	1.8 %	2.4 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP205
 Sample No.: 1
 Depth (m): 0.50
 Sample Type: B

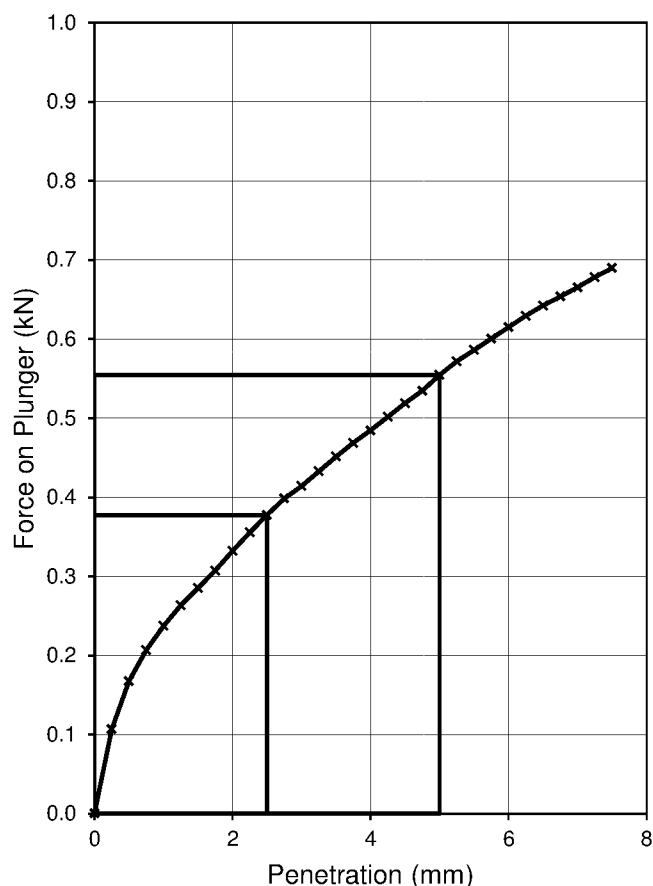
Description:
 Brown slightly fine gravelly fine sandy CLAY/ SILT.

PREPARATION DETAILS

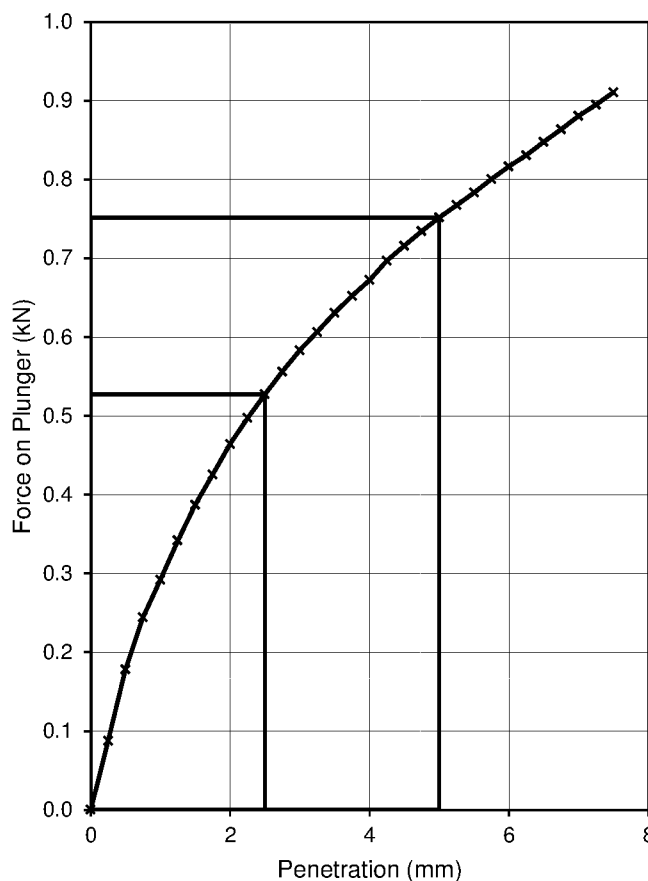
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 20%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.04 Mg/m³ (2.03 Mg/m³ before soaking)
 Soaked specimen dry density 1.68 Mg/m³ (1.69 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	21 %	21 %
CBR Value	2.9 %	4.0 %

Top of Specimen



Base of Specimen



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CALIFORNIA BEARING RATIO

BH/TP No.: TP206
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

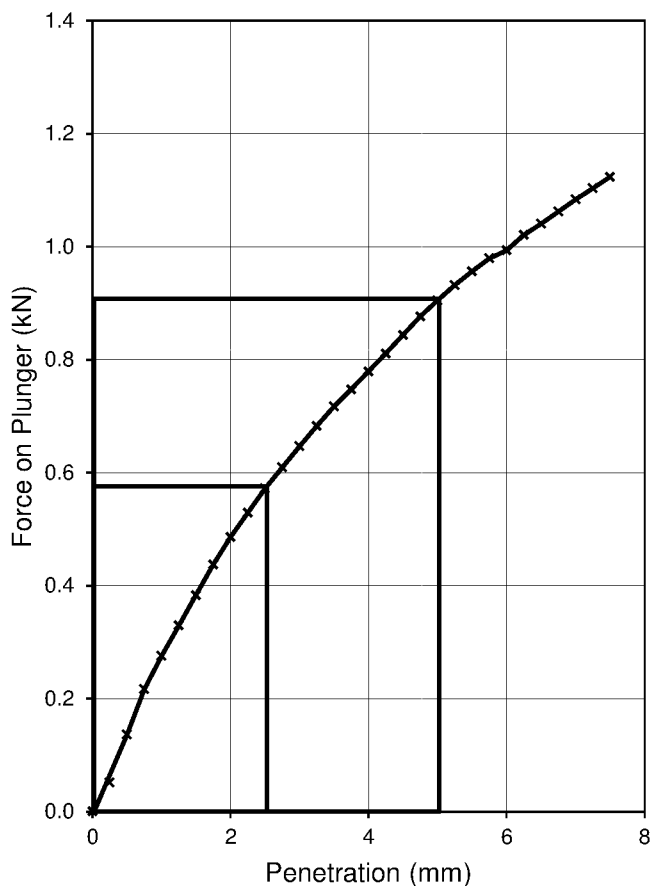
Description:
 Brown slightly fine gravelly fine sandy silty CLAY.

PREPARATION DETAILS

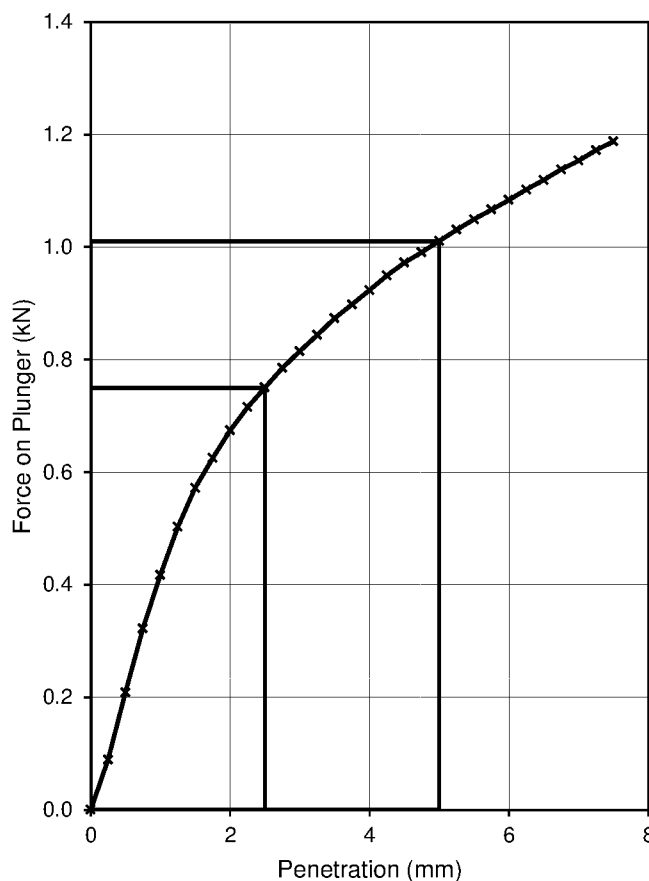
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.5 % vertical swell.
 The specimen was prepared at its existing moisture content of 21%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.03 Mg/m³ (2.03 Mg/m³ before soaking)
 Soaked specimen dry density 1.67 Mg/m³ (1.67 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	22 %	21 %
CBR Value	4.5 %	5.7 %

Top of Specimen



Base of Specimen



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CALIFORNIA BEARING RATIO

BH/TP No.: TP207
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

Description:

Brownish grey fine sandy CLAY/ SILT.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.

The specimen was prepared at its existing moisture content of 20%

The specimen was prepared by dynamic compaction using a 4.5 kg rammer

Soaked specimen bulk density 2.06 Mg/m³ (2.05 Mg/m³ before soaking)

Soaked specimen dry density 1.71 Mg/m³ (1.71 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 20 %

Base

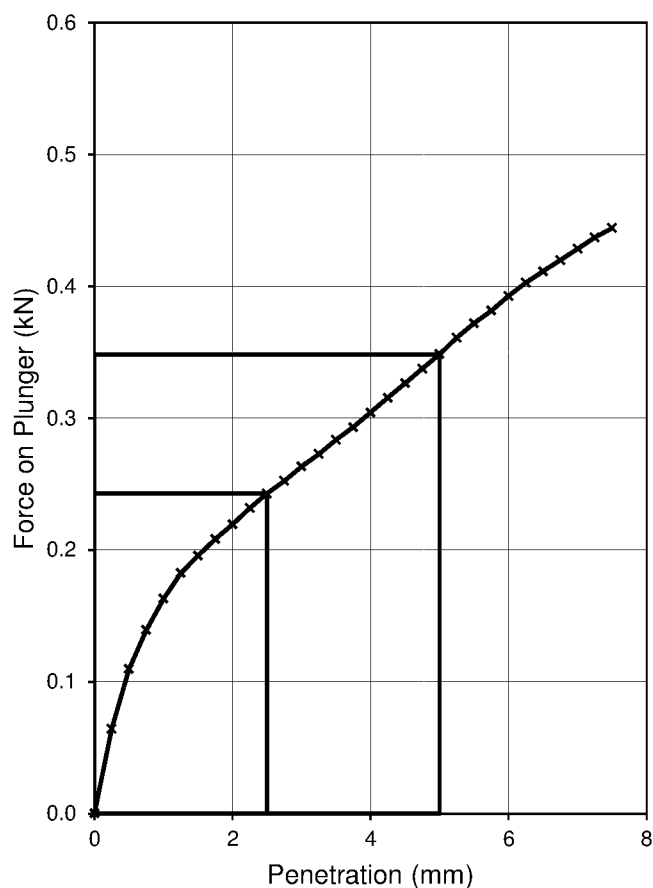
10.0 kg
 10 N
 20 %

CBR Value

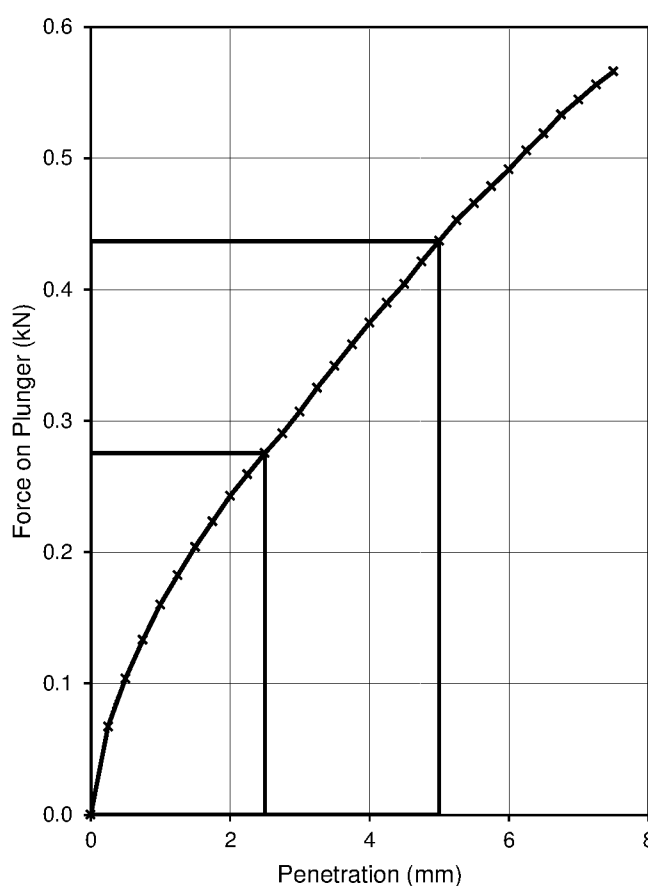
1.8 %

2.2 %

Top of Specimen



Base of Specimen



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CALIFORNIA BEARING RATIO

BH/TP No.: TP208
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

Description:

Light brown slightly fine gravelly fine sandy CLAY / SILT.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.

The specimen was prepared at its existing moisture content of 17%

The specimen was prepared by dynamic compaction using a 4.5 kg rammer

Soaked specimen bulk density 2.05 Mg/m³ (2.04 Mg/m³ before soaking)

Soaked specimen dry density 1.70 Mg/m³ (1.74 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 20 %

Base

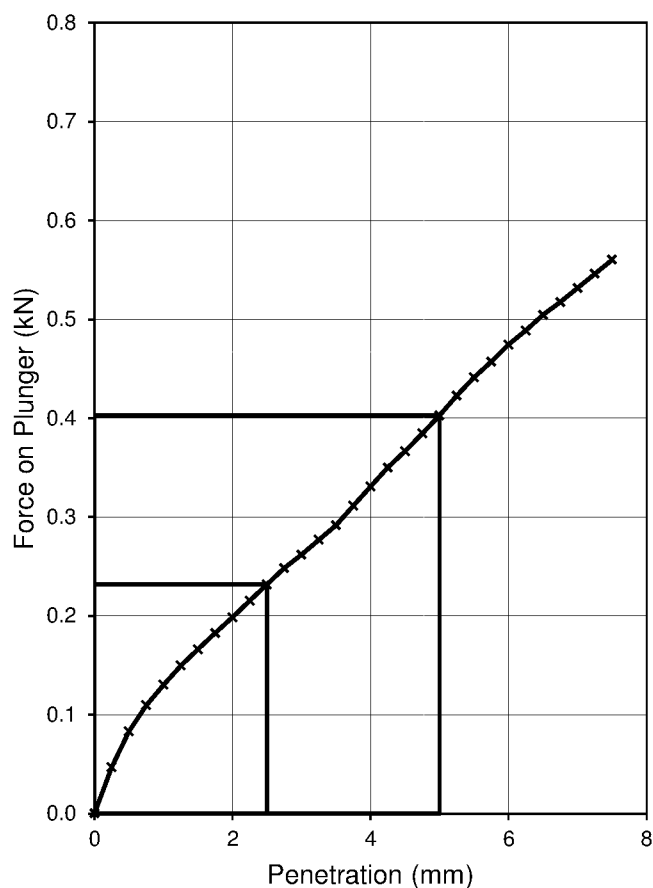
10.0 kg
 10 N
 21 %

CBR Value

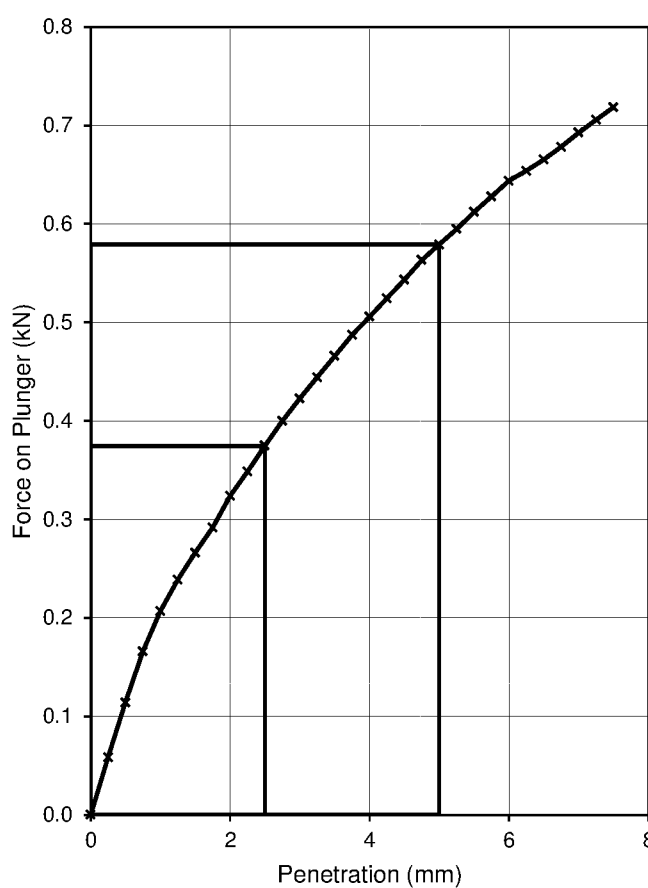
2.0 %

2.9 %

Top of Specimen



Base of Specimen



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CALIFORNIA BEARING RATIO

BH/TP No.: TP209
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

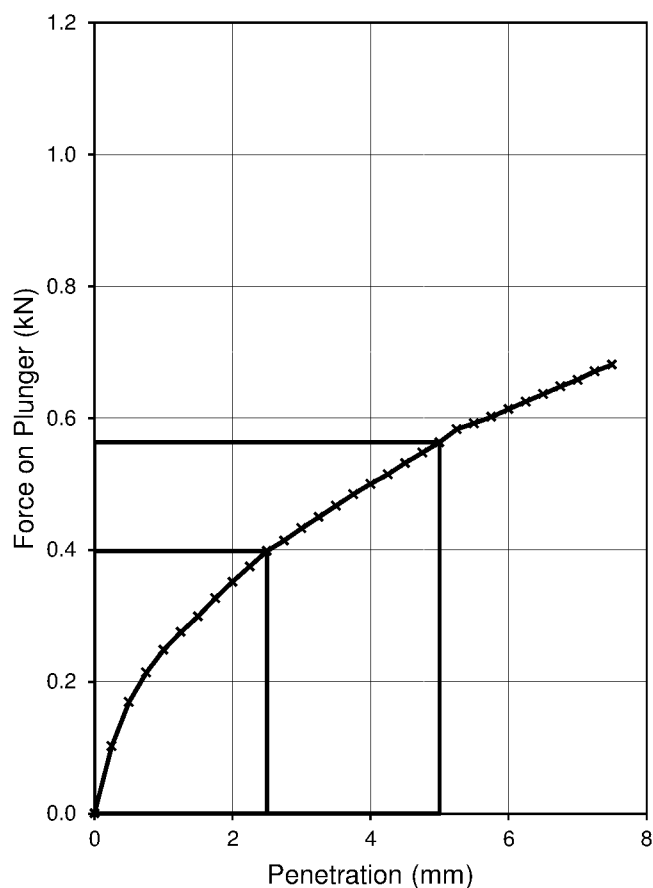
Description:
 Brown and grey mottled fine sandy CLAY / SILT.

PREPARATION DETAILS

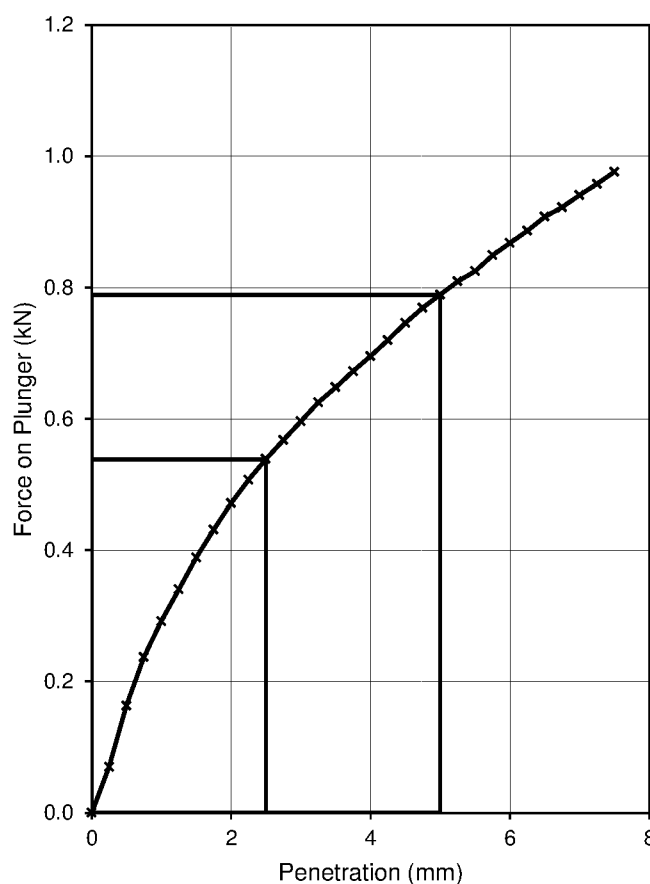
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.3 % vertical swell.
 The specimen was prepared at its existing moisture content of 23%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.00 Mg/m³ (1.99 Mg/m³ before soaking)
 Soaked specimen dry density 1.60 Mg/m³ (1.62 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	25 %	25 %
CBR Value	3.0 %	4.1 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP210
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

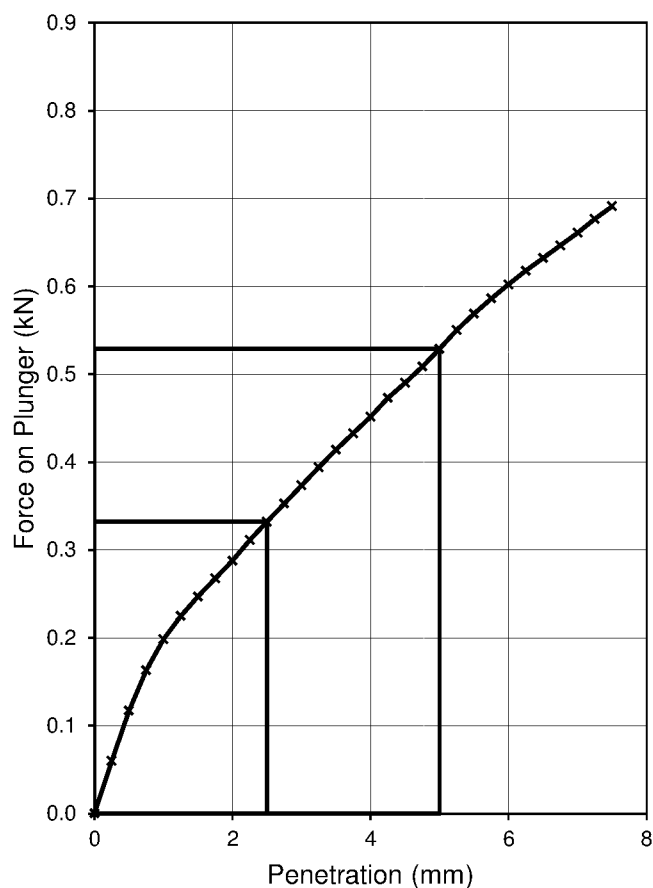
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

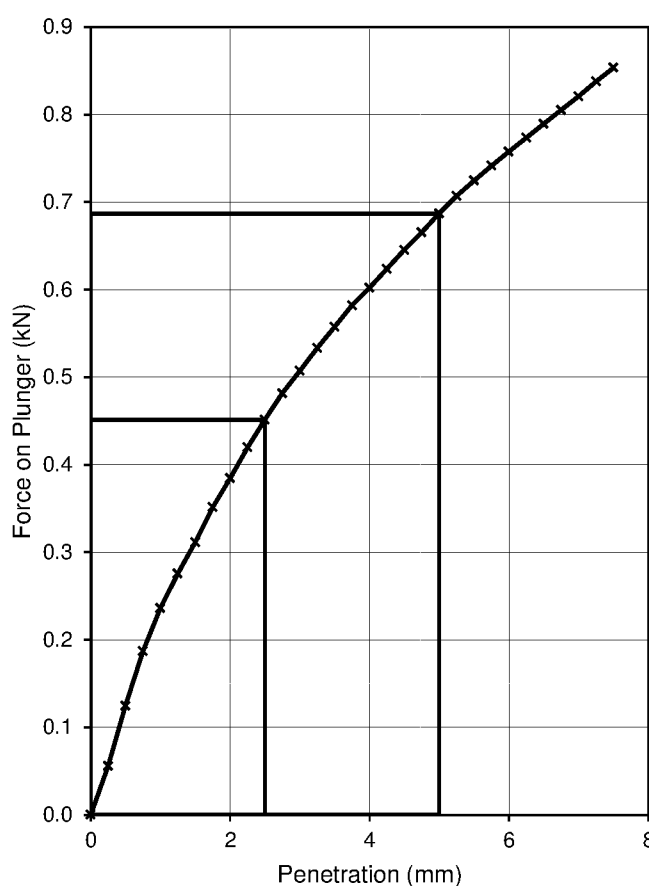
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 22%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 1.99 Mg/m³ (1.98 Mg/m³ before soaking)
 Soaked specimen dry density 1.62 Mg/m³ (1.62 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	23 %	23 %
CBR Value	2.6 %	3.4 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP211
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

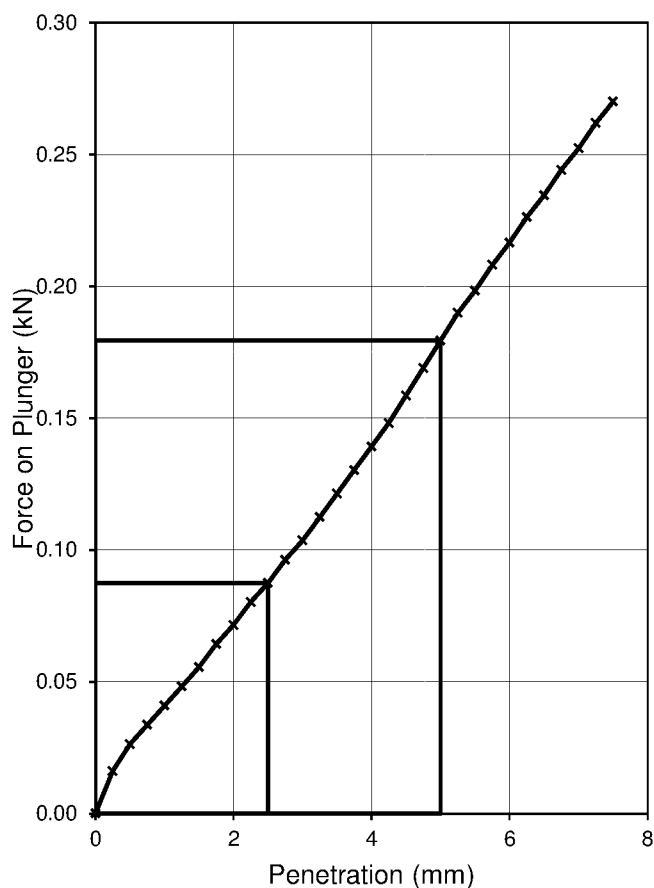
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

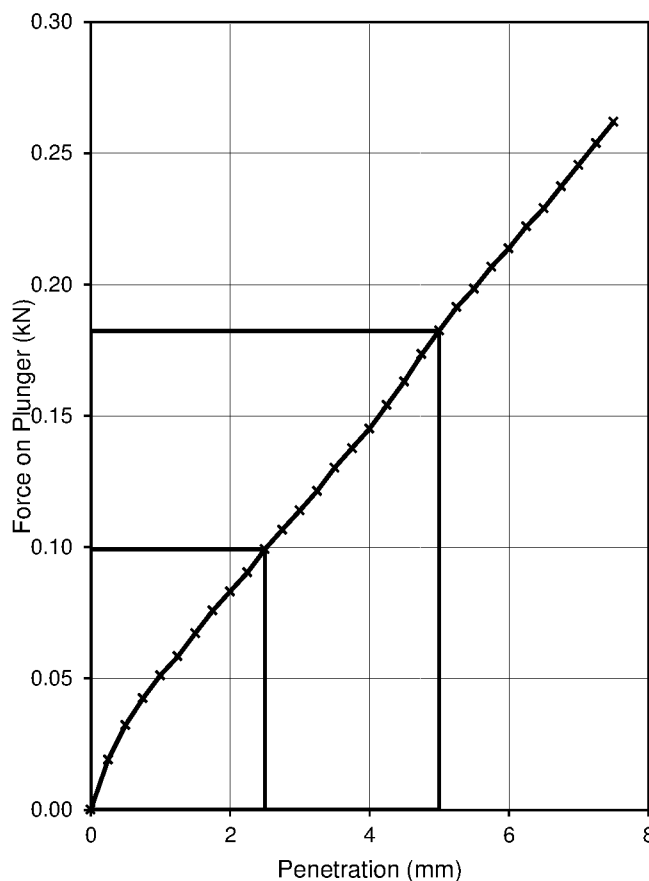
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with -0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 20%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.01 Mg/m³ (2.00 Mg/m³ before soaking)
 Soaked specimen dry density 1.67 Mg/m³ (1.67 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	21 %	21 %
CBR Value	0.9 %	0.9 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP212
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

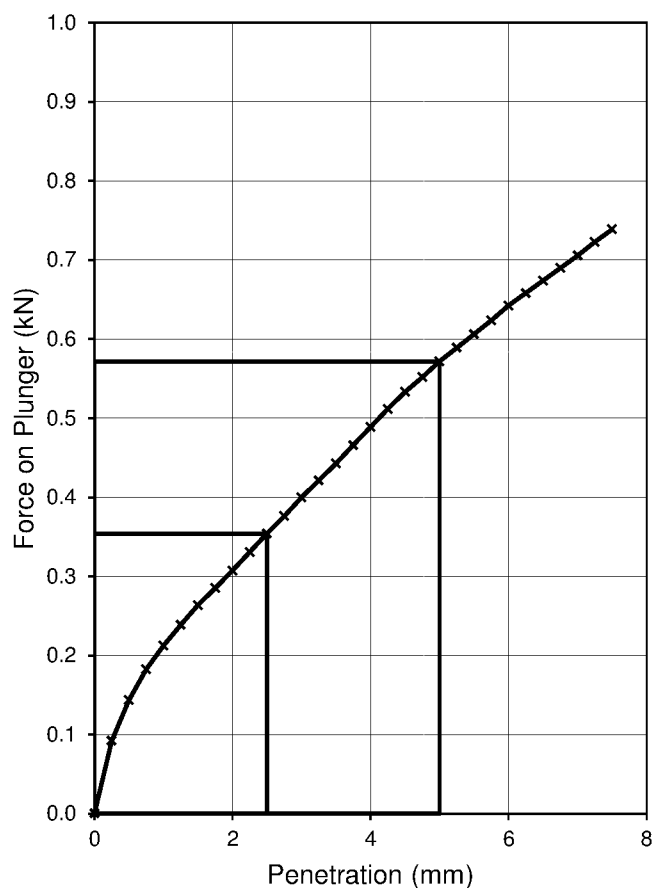
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

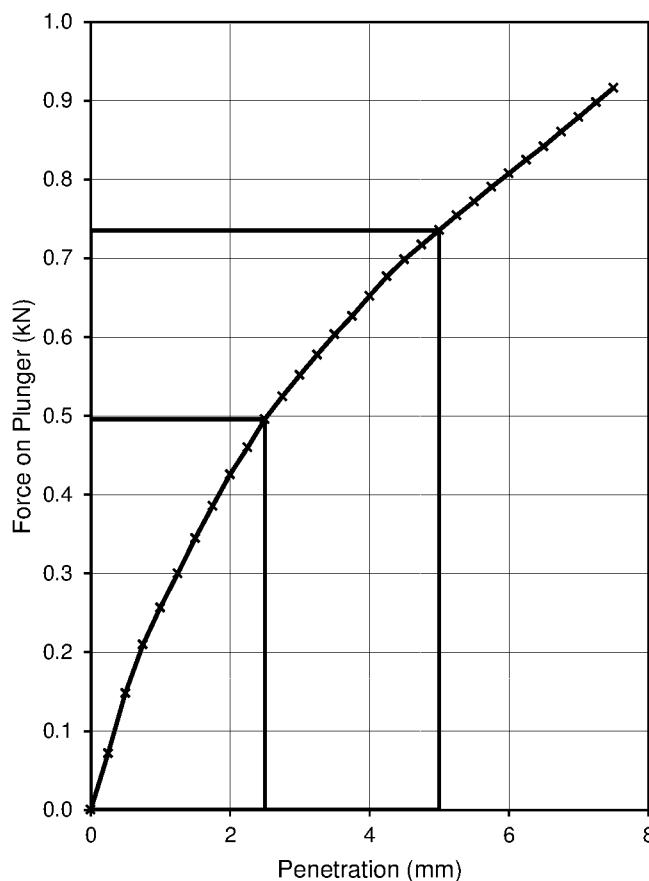
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 22%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.01 Mg/m³ (2.00 Mg/m³ before soaking)
 Soaked specimen dry density 1.63 Mg/m³ (1.64 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	24 %	23 %
CBR Value	2.9 %	3.8 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP213
 Sample No.: 1
 Depth (m): 0.50
 Sample Type: B

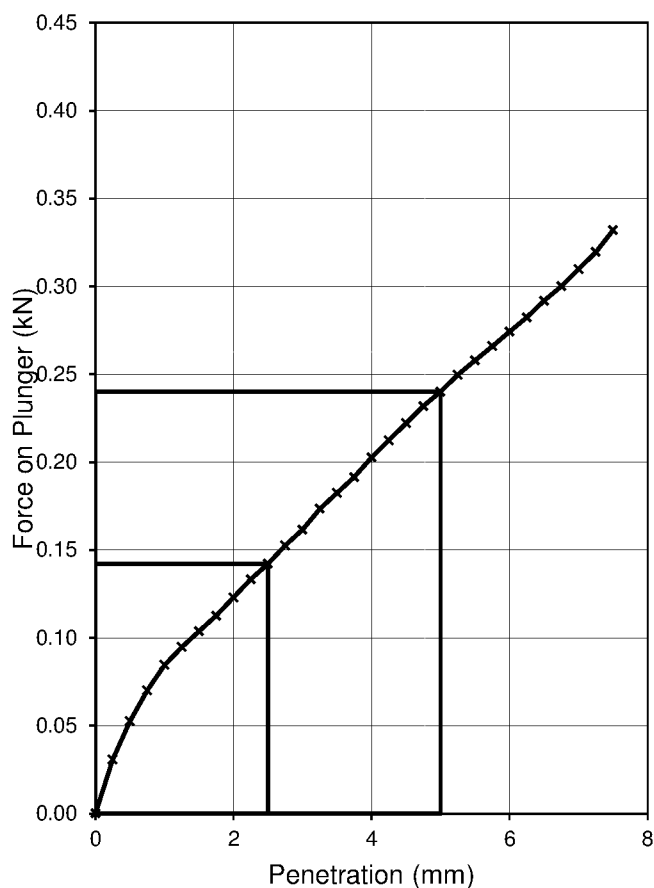
Description:
 Brown fine sandy CLAY / SILT with rare chalk nodules.

PREPARATION DETAILS

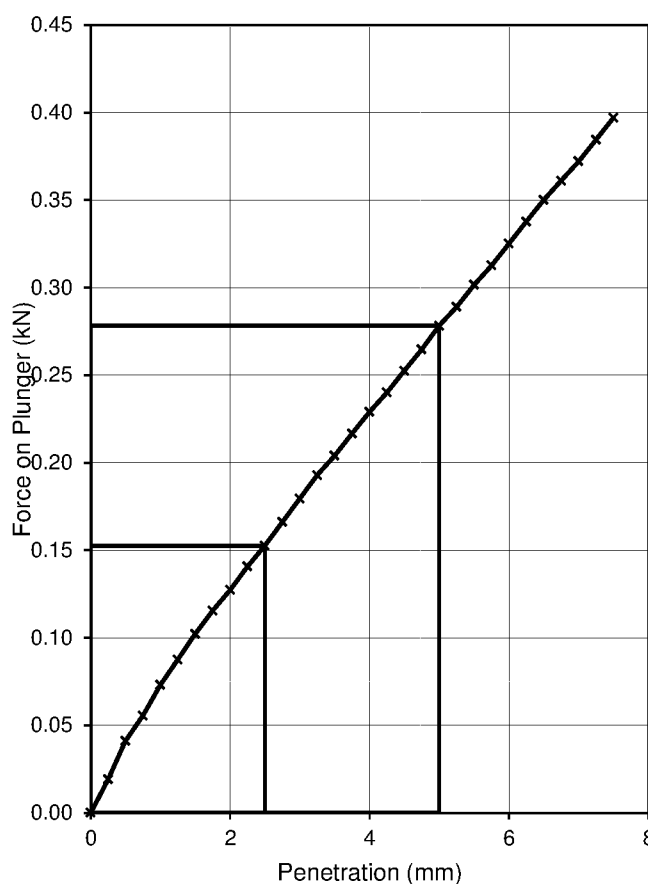
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.0 % vertical swell.
 The specimen was prepared at its existing moisture content of 20%
 The specimen was prepared by dynamic compaction using a 2.5 kg rammer
 Soaked specimen bulk density 2.01 Mg/m³ (2.00 Mg/m³ before soaking)
 Soaked specimen dry density 1.65 Mg/m³ (1.66 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	21 %	22 %
CBR Value	1.2 %	1.4 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP214
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

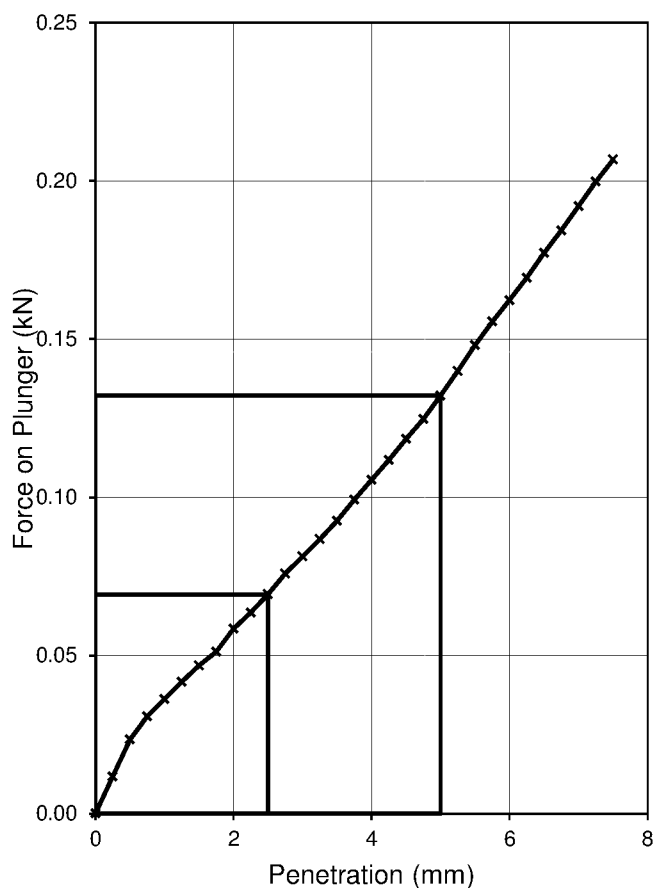
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

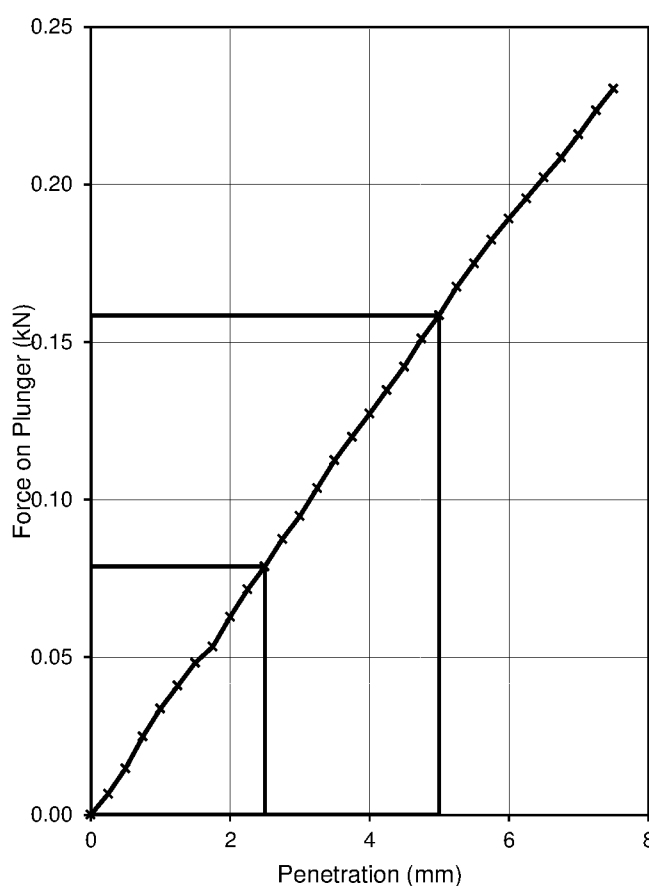
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with -0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 21%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 1.99 Mg/m³ (1.99 Mg/m³ before soaking)
 Soaked specimen dry density 1.64 Mg/m³ (1.64 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	22 %	22 %
CBR Value	0.7 %	0.8 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP215
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

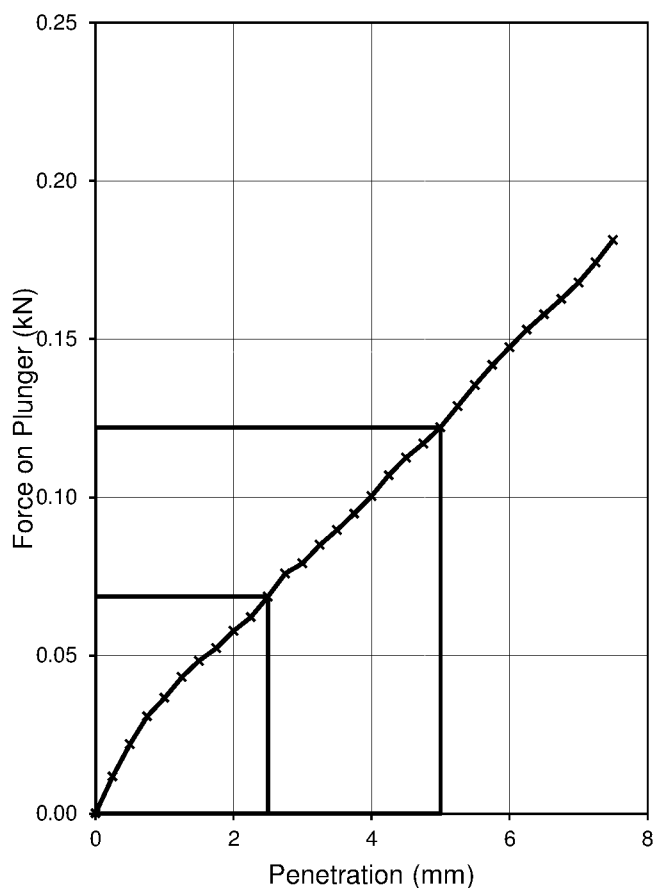
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

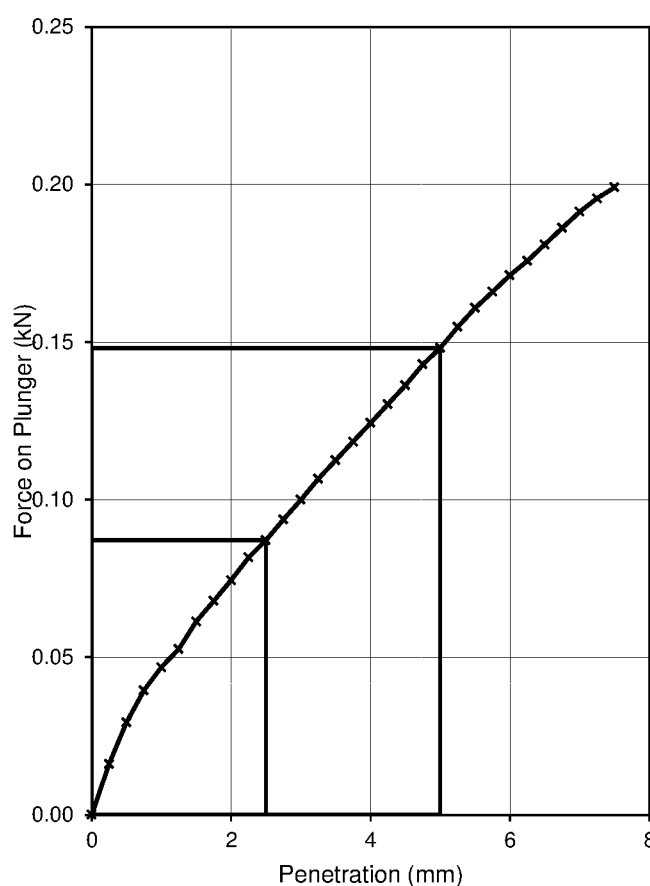
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.0 % vertical swell.
 The specimen was prepared at its existing moisture content of 23%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 1.98 Mg/m³ (1.98 Mg/m³ before soaking)
 Soaked specimen dry density 1.61 Mg/m³ (1.61 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	23 %	23 %
CBR Value	0.6 %	0.7 %

Top of Specimen



Base of Specimen



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CALIFORNIA BEARING RATIO

BH/TP No.: TP216
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

Description:

Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.0 % vertical swell.

The specimen was prepared at its existing moisture content of 21%

The specimen was prepared by dynamic compaction using a 4.5 kg rammer

Soaked specimen bulk density 1.98 Mg/m³ (1.98 Mg/m³ before soaking)

Soaked specimen dry density 1.61 Mg/m³ (1.63 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 23 %

Base

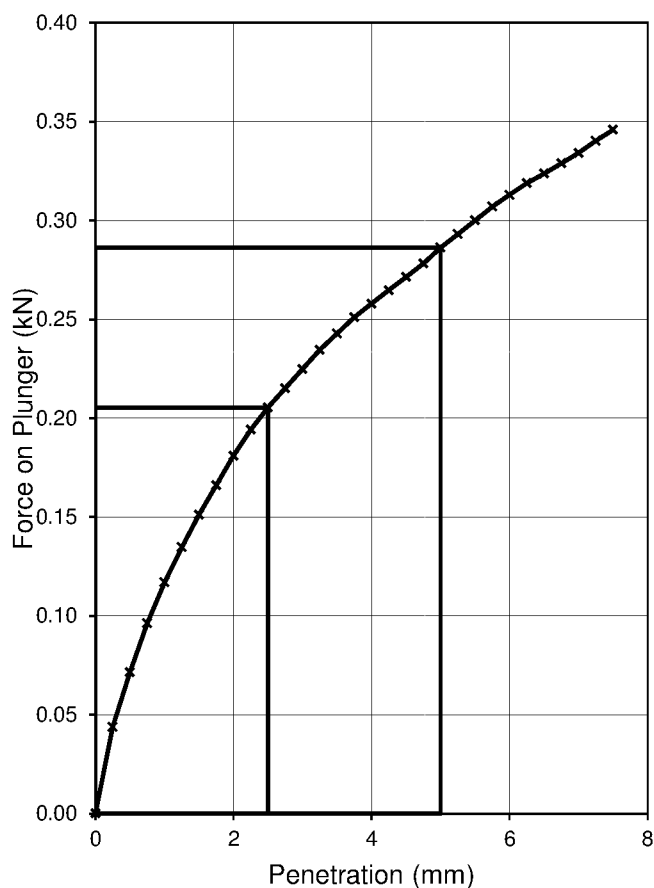
10.0 kg
 10 N
 23 %

CBR Value

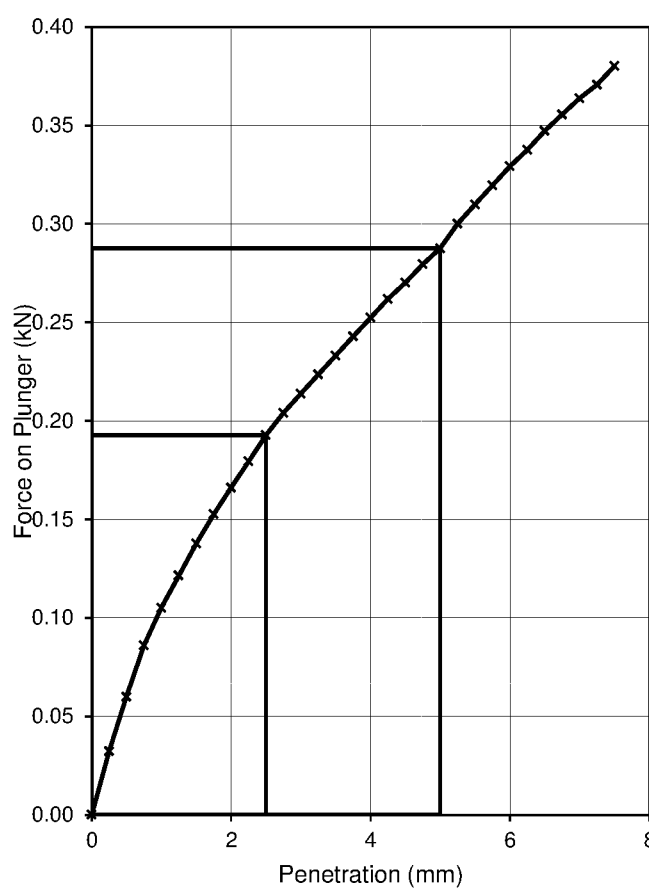
1.6 %

1.5 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP217
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

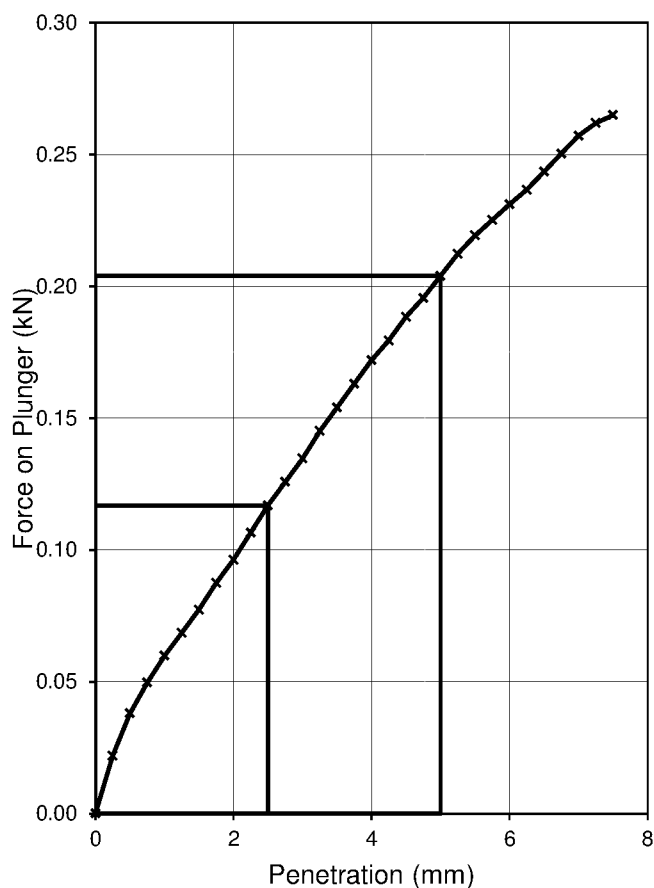
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

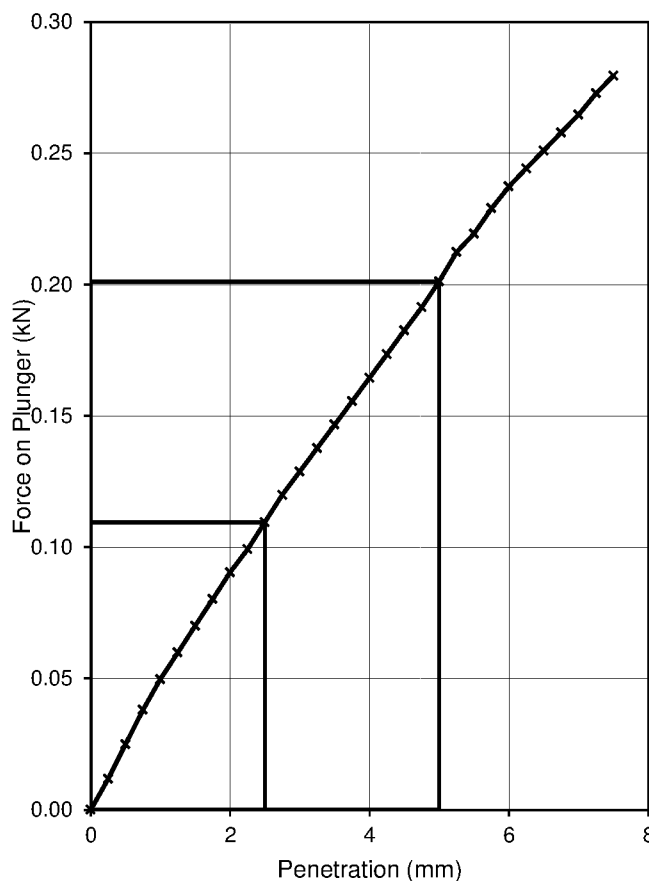
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with -0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 20%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.01 Mg/m³ (2.00 Mg/m³ before soaking)
 Soaked specimen dry density 1.65 Mg/m³ (1.66 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	22 %	21 %
CBR Value	1.0 %	1.0 %

Top of Specimen



Base of Specimen



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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP218
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

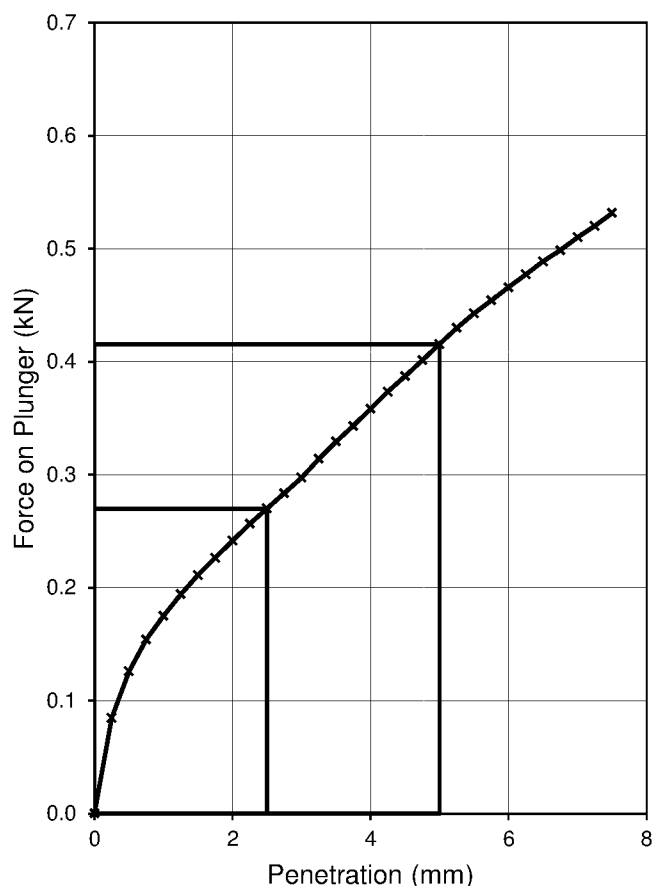
Description:
 Brown mottled grey fine sandy CLAY / SILT.

PREPARATION DETAILS

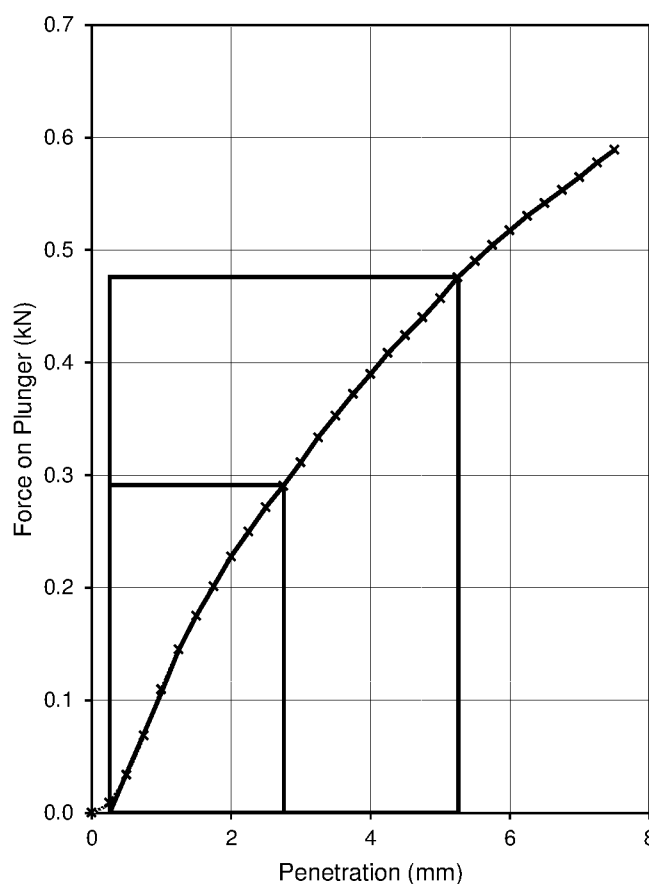
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.0 % vertical swell.
 The specimen was prepared at its existing moisture content of 23%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 1.99 Mg/m³ (1.99 Mg/m³ before soaking)
 Soaked specimen dry density 1.61 Mg/m³ (1.62 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	24 %	23 %
CBR Value	2.1 %	2.4 %

Top of Specimen



Base of Specimen



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CALIFORNIA BEARING RATIO

BH/TP No.: TP219
 Sample No.: 1
 Depth (m): 0.50
 Sample Type: B

Description:

Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with -0.1 % vertical swell.

The specimen was prepared at its existing moisture content of 19%

The specimen was prepared by dynamic compaction using a 4.5 kg rammer

Soaked specimen bulk density 2.02 Mg/m³ (2.02 Mg/m³ before soaking)

Soaked specimen dry density 1.68 Mg/m³ (1.69 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 21 %

Base

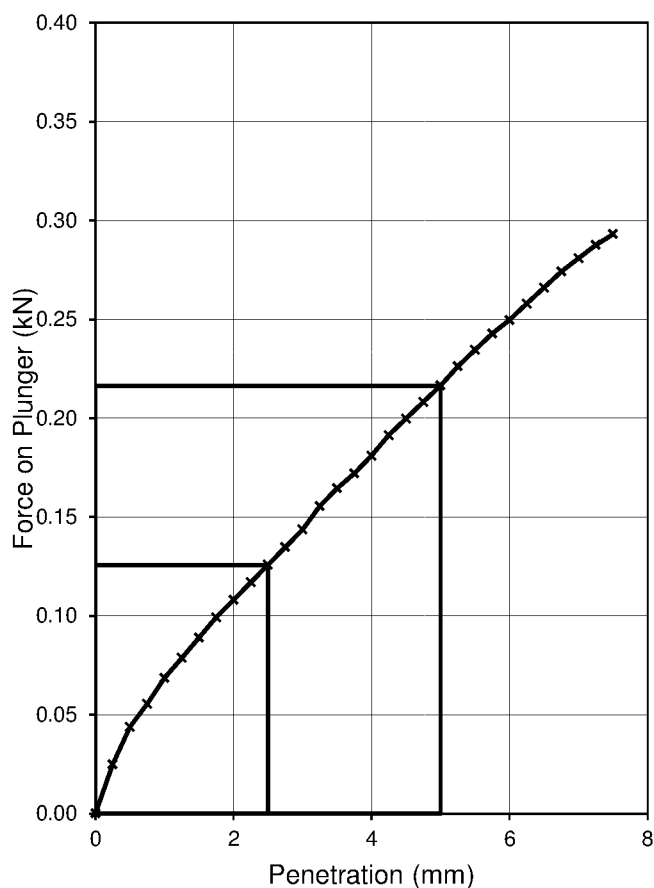
10.0 kg
 10 N
 20 %

CBR Value

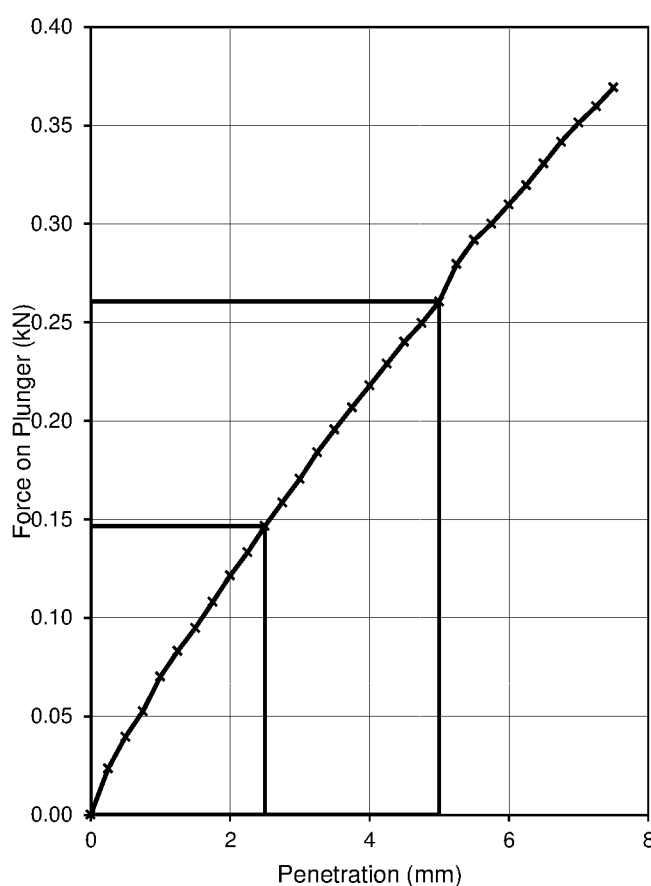
1.1 %

1.3 %

Top of Specimen



Base of Specimen



Checked and Approved by:

Project Number:

GEO / 31001

Project Name:

**BILSHAM ROAD
LP2231**

S Burke - Senior Technician
 27/05/2020

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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP220
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

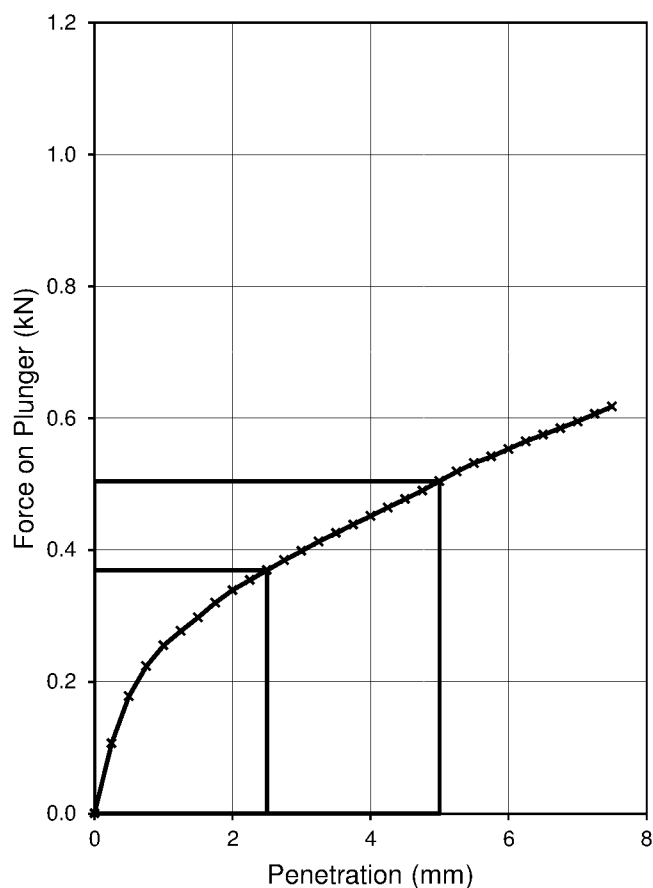
Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

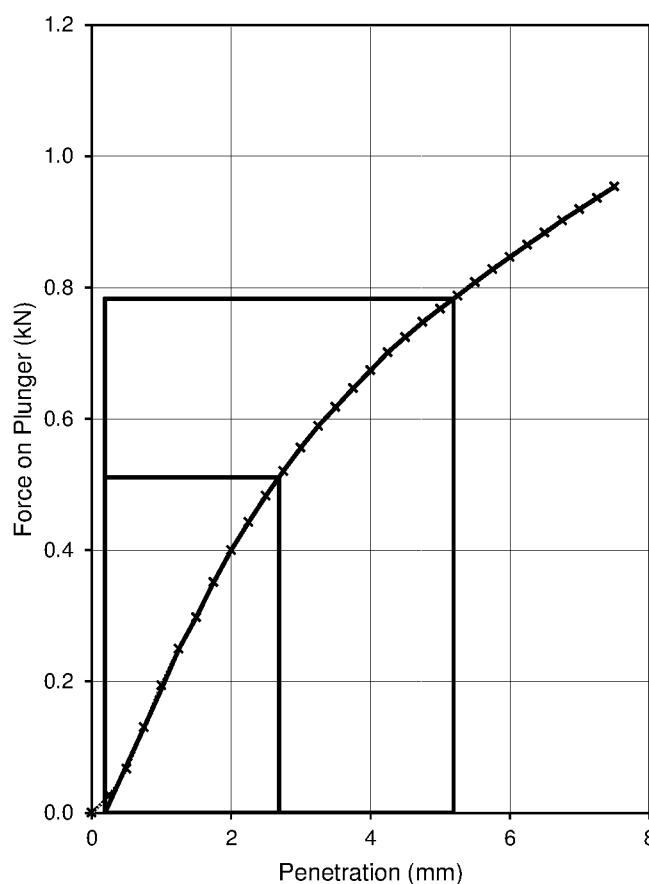
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.0 % vertical swell.
 The specimen was prepared at its existing moisture content of 22%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.01 Mg/m³ (2.00 Mg/m³ before soaking)
 Soaked specimen dry density 1.62 Mg/m³ (1.64 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	24 %	24 %
CBR Value	2.8 %	3.9 %

Top of Specimen



Base of Specimen



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Project Name:

**BILSHAM ROAD
 LP2231**

S Burke - Senior Technician
 27/05/2020

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CALIFORNIA BEARING RATIO

BH/TP No.: TP221
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

Description:
 Brown clayey fine sandy SILT.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with -0.1 % vertical swell.

The specimen was prepared at its existing moisture content of 22%

The specimen was prepared by dynamic compaction using a 4.5 kg rammer

Soaked specimen bulk density 1.96 Mg/m³ (1.96 Mg/m³ before soaking)

Soaked specimen dry density 1.60 Mg/m³ (1.61 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 23 %

Base

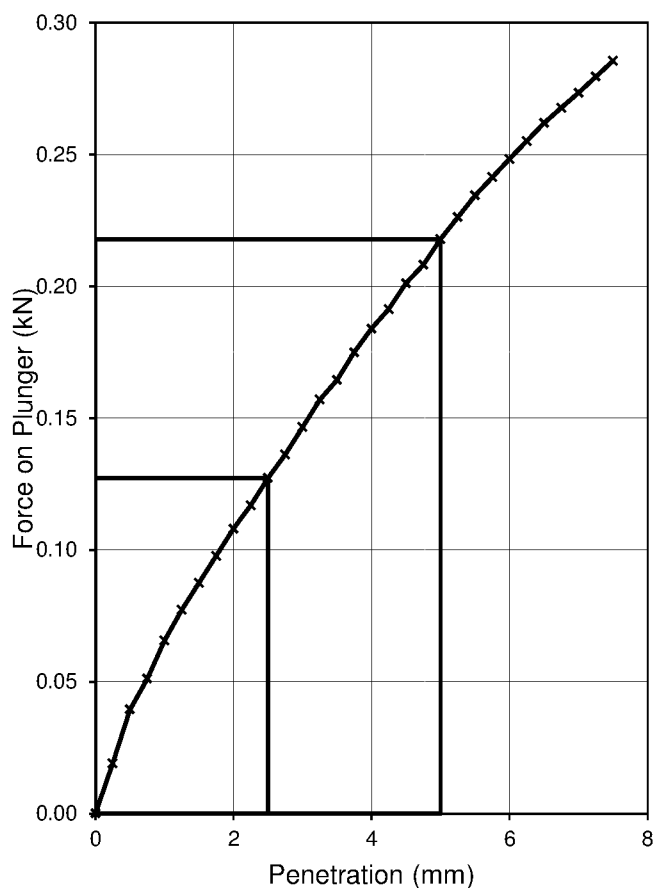
10.0 kg
 10 N
 23 %

CBR Value

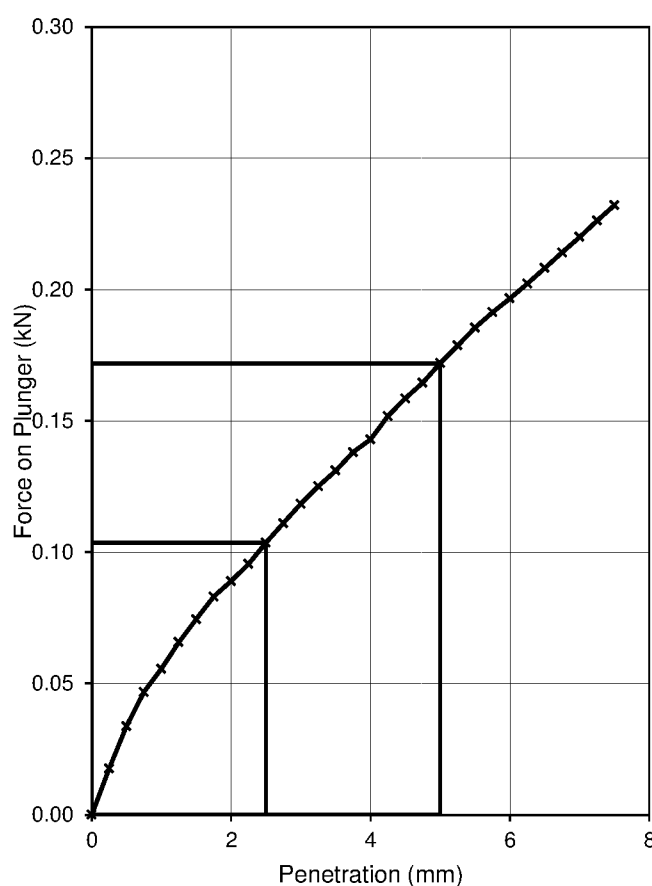
1.1 %

0.9 %

Top of Specimen



Base of Specimen



Checked and Approved by:

Project Number:

GEO / 31001

Project Name:

**BILSHAM ROAD
 LP2231**

S Burke - Senior Technician
 27/05/2020

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CALIFORNIA BEARING RATIO

BH/TP No.: TP222
 Sample No.: 1
 Depth (m): 0.65
 Sample Type: B

Description:
 Brown fine sandy CLAY / SILT.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 22%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.03 Mg/m³ (2.02 Mg/m³ before soaking)
 Soaked specimen dry density 1.65 Mg/m³ (1.65 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 24 %

Base

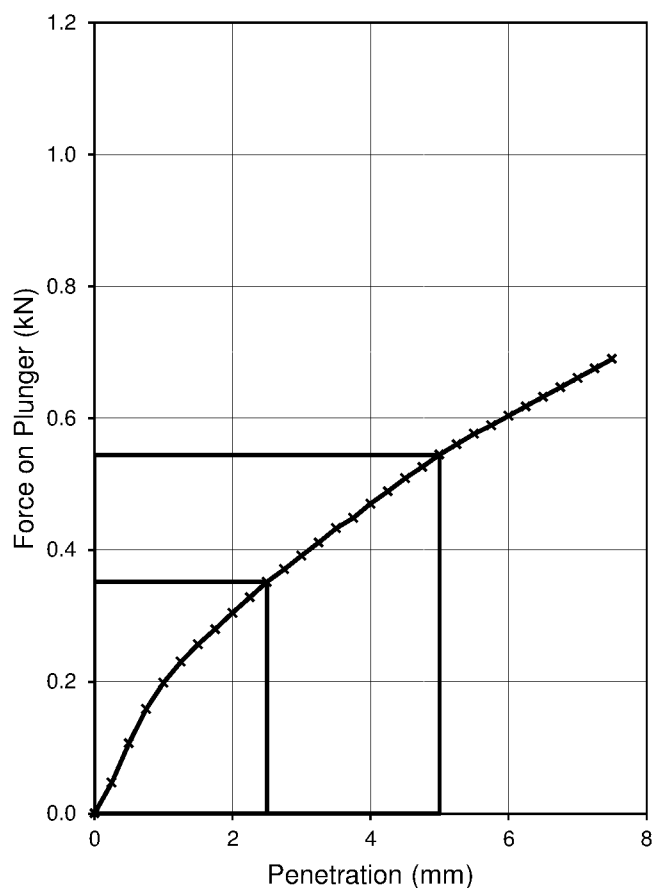
10.0 kg
 10 N
 22 %

CBR Value

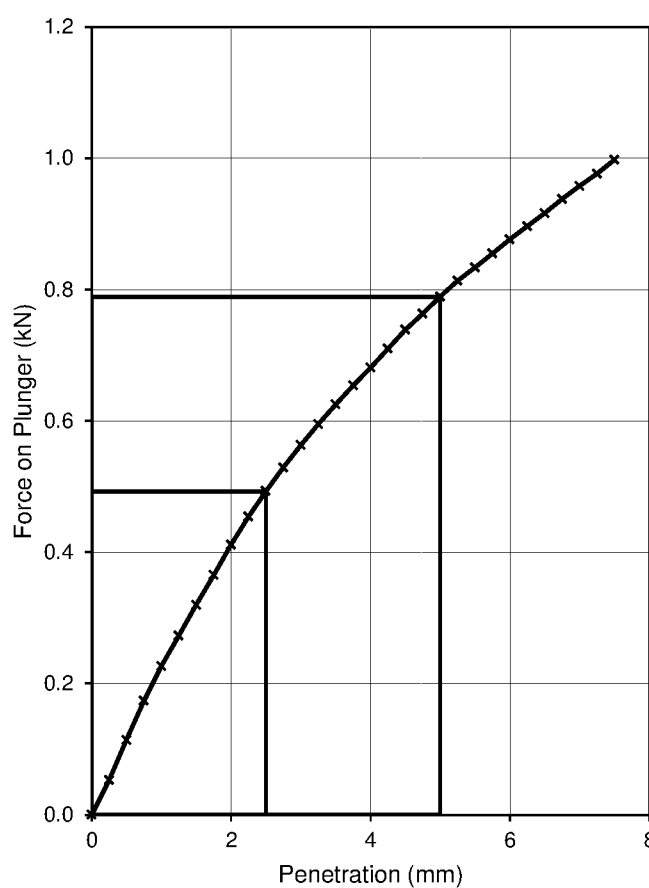
2.7 %

3.9 %

Top of Specimen



Base of Specimen



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 27/05/2020

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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP223
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

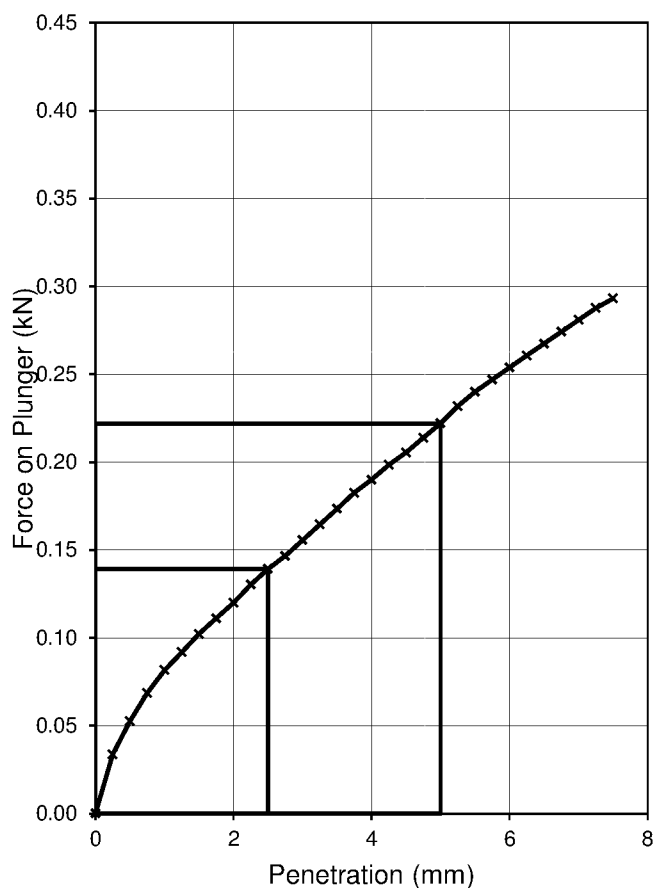
Description:
 Geyish brown fine sandy CLAY / SILT.

PREPARATION DETAILS

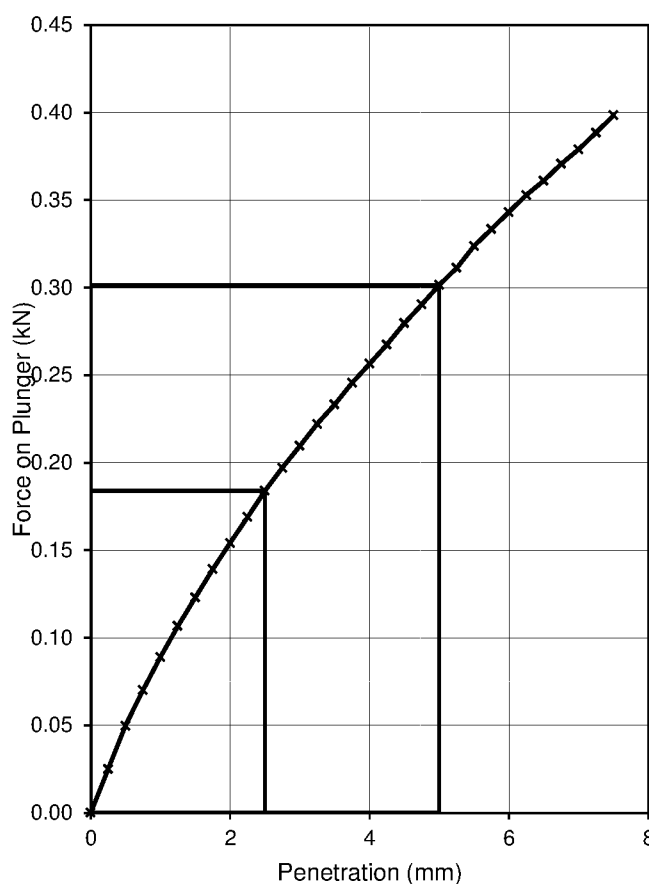
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.0 % vertical swell.
 The specimen was prepared at its existing moisture content of 24%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 1.94 Mg/m³ (1.94 Mg/m³ before soaking)
 Soaked specimen dry density 1.55 Mg/m³ (1.56 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	25 %	25 %
CBR Value	1.1 %	1.5 %

Top of Specimen



Base of Specimen



Checked and Approved by:

Project Number:

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Project Name:

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S Burke - Senior Technician
 27/05/2020

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CALIFORNIA BEARING RATIO

BH/TP No.: TP224
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

Description:

Geyish brown fine sandy silty CLAY.

PREPARATION DETAILS

The specimen was soaked for 4 days, after which swelling equilibrium had been reached with -0.1 % vertical swell.

The specimen was prepared at its existing moisture content of 21%

The specimen was prepared by dynamic compaction using a 4.5 kg rammer

Soaked specimen bulk density 2.01 Mg/m³ (2.00 Mg/m³ before soaking)

Soaked specimen dry density 1.65 Mg/m³ (1.65 Mg/m³ before soaking)

Test Details

Surcharge
 Seating load
 Moisture content

Top

10.0 kg
 10 N
 22 %

Base

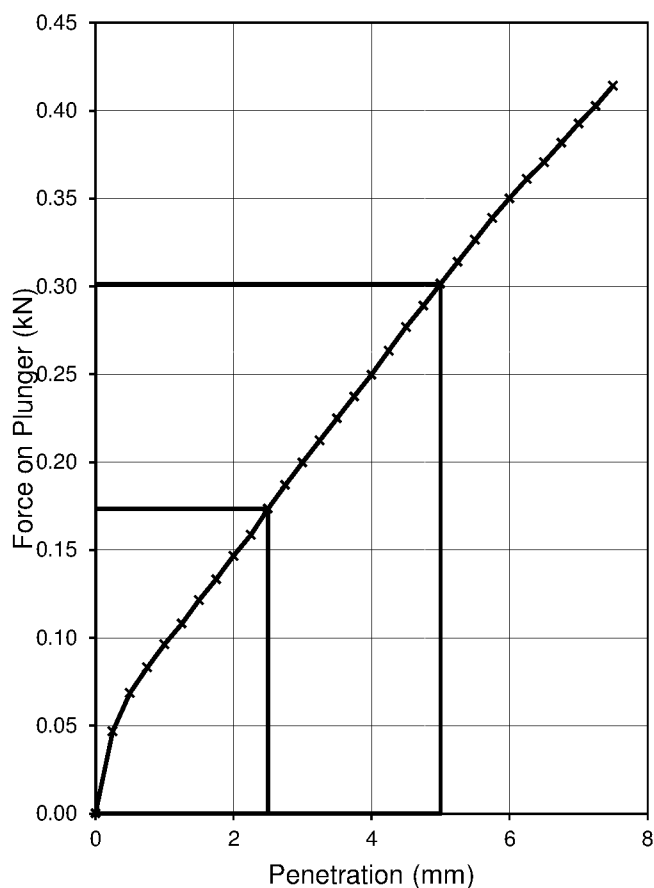
10.0 kg
 10 N
 22 %

CBR Value

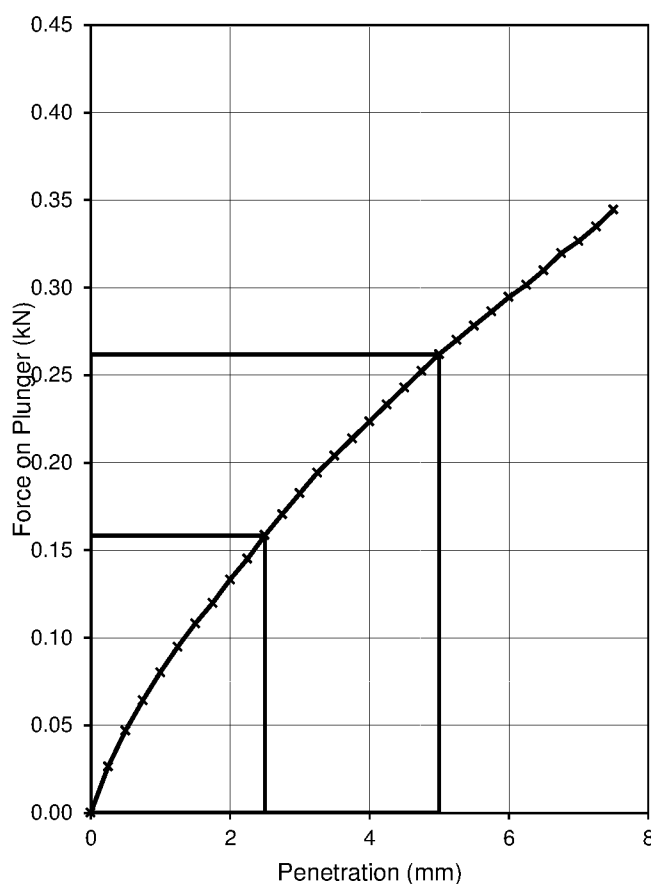
1.5 %

1.3 %

Top of Specimen



Base of Specimen



Checked and Approved by:

Project Number:

GEO / 31001

Project Name:

BILSHAM ROAD
LP2231

S Burke - Senior Technician
 27/05/2020

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BS1377 : Part 4 : Clause 7 : 1990
CALIFORNIA BEARING RATIO

BH/TP No.: TP225
 Sample No.: 1
 Depth (m): 0.60
 Sample Type: B

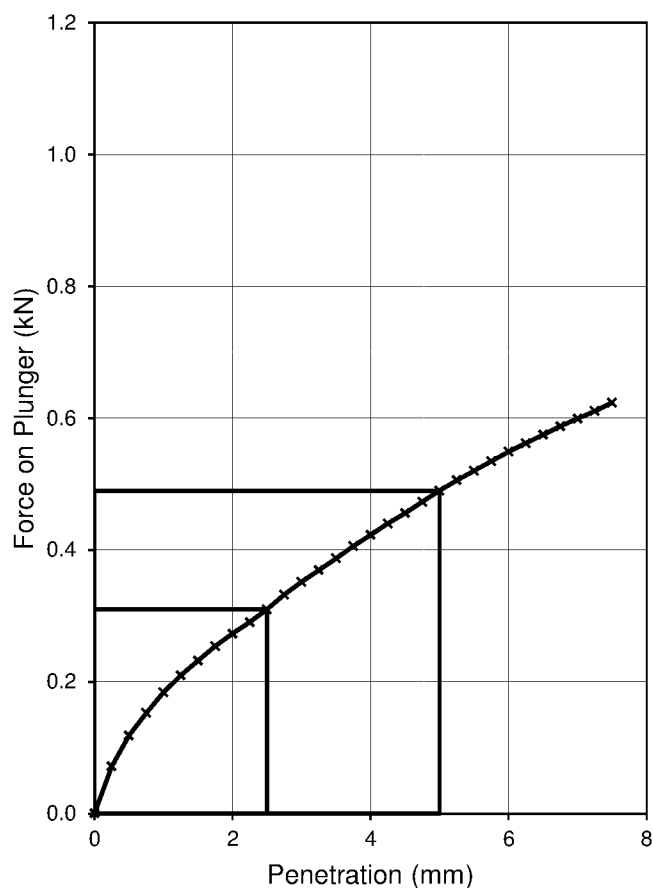
Description:
 Brown silty CLAY.

PREPARATION DETAILS

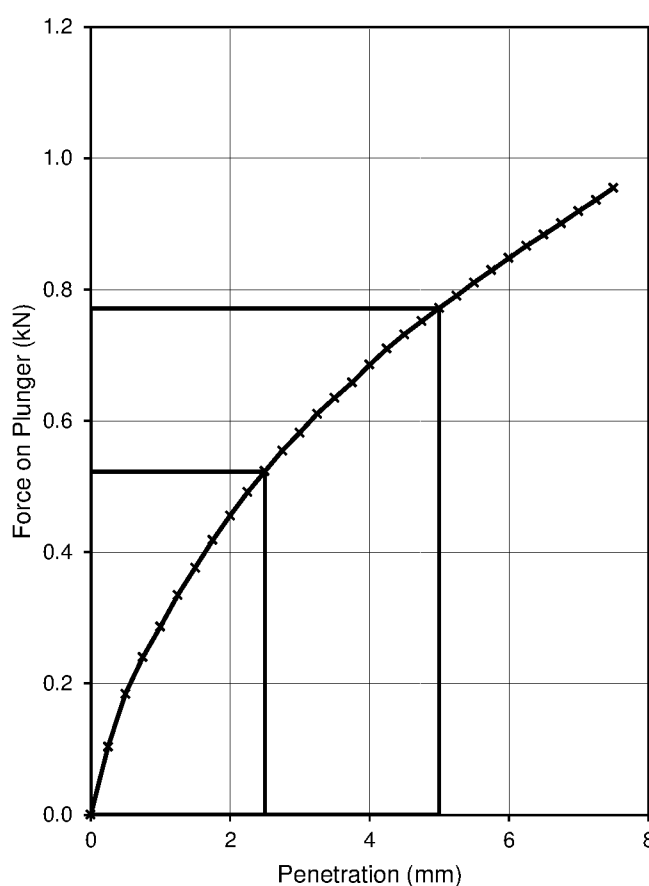
The specimen was soaked for 4 days, after which swelling equilibrium had been reached with 0.1 % vertical swell.
 The specimen was prepared at its existing moisture content of 23%
 The specimen was prepared by dynamic compaction using a 4.5 kg rammer
 Soaked specimen bulk density 2.00 Mg/m³ (1.99 Mg/m³ before soaking)
 Soaked specimen dry density 1.62 Mg/m³ (1.62 Mg/m³ before soaking)

Test Details	Top	Base
Surcharge	10.0 kg	10.0 kg
Seating load	10 N	10 N
Moisture content	24 %	24 %
CBR Value	2.4 %	4.0 %

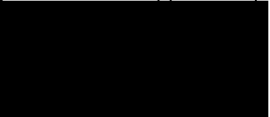
Top of Specimen



Base of Specimen



Checked and Approved by:



S Burke - Senior Technician
 27/05/2020

Project Number:

GEO / 31001

Project Name:

**BILSHAM ROAD
 LP2231**

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APPENDIX E – Geotechnical Laboratory Test Results

Geotechnical Laboratory
Test Results

APPENDIX F – Chemical Laboratory Test Results

Chemical Laboratory Test Results



Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-27941

Issue: 1

Date of Issue: 01/05/2020

Contact: Lauren Stillwell

Customer Details: Leap Environmental Ltd
The Atrium
Curtis Road
Dorking
Surrey RH4 1X4

Quotation No: Q14-00063

Order No: LPO1903

Customer Reference: LP2231

Date Received: 24/04/2020

Date Approved: 01/05/2020

Details: Bilsham Road, Yapton

Approved by:

Mike Varley, Technical Manager

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

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Sample Summary

Report No.: 20-27941, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
202755	TP226 0.20	21/04/2020	24/04/2020		
202756	TP226 0.50	21/04/2020	24/04/2020		
202757	TP227 0.15	21/04/2020	24/04/2020	Silty loam	
202758	TP227 0.50	21/04/2020	24/04/2020	Silty clayey loam	
202759	TP228 0.10	21/04/2020	24/04/2020		
202760	TP228 0.50	21/04/2020	24/04/2020		



Results Summary

2683

Report No.: 20-27941, issue number 1

ELAB Reference	202757	202758
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TP227	TP227
Sample Depth (m)	0.15	0.50
Sampling Date	21/04/2020	21/04/2020

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Material removed	N	%	0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None
Metals					
Arsenic	M	mg/kg	1	7.0	4.1
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	24.7	26.6
Copper	M	mg/kg	5	15.4	18.1
Lead	M	mg/kg	5	18.9	15.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	15.8	15.8
Selenium	M	mg/kg	1	< 1.0	< 1.0
Zinc	M	mg/kg	5	61.9	57.4
Inorganics					
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Miscellaneous					
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	< 0.1
Loss On Ignition (450°C)	M	%	0.01	n/t	1.24
pH	M	pH units	0.1	7.8	7.8
Total Organic Carbon	N	%	0.01	0.62	0.43
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4
Total PAH (Including Coronene GC-FID)	N	mg/kg	2	n/t	< 2
BTEX					
Total BTEX	N	mg/kg	0.01	n/t	< 0.01
Total Petroleum Hydrocarbons					
Mineral Oil	M	mg/kg	5	n/t	^ < 5
PCB (ICES 7 congeners)					
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	< 0.03

Tests marked N are not UKAS accredited.

The Environmental Laboratory Ltd. Reg. No. 3882193

Results Summary

2683

Report No.: 20-27941, issue number 1

WAC Analysis

Elab Ref:	202758				Landfill Waste Acceptance Criteria Limits*		
Sample Date:	21/04/2020				Inert Waste Landfill	Stable Non-reactive Hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	TP227						
Depth (m)	0.5						
Site:	Bilsham Road, Yapton						
Determinand		Code	Units				
Total Organic Carbon		N	%	0.43	3	5	6
Loss on Ignition		M	%	1.2	--	--	10
Total BTEX		M	mg/kg	< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg	< 0.03	1	--	--
TPH Total WAC		M	mg/kg	< 5	500	--	--
Total (of 17) PAHs		N	mg/kg	< 2	100	--	--
pH		M		7.8	--	>6	--
Acid Neutralisation Capacity		N	mol/kg	< 0.1	--	To evaluate	To evaluate

Eluate Analysis

			mg/l	mg/kg	using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	N	< 0.005	< 0.05	0.5	2	25	
Barium	N	< 0.005	< 0.05	20	100	300	
Cadmium	N	< 0.001	< 0.01	0.04	1	5	
Chromium	N	0.497	4.97	0.5	10	70	
Copper	N	0.034	0.34	2	50	100	
Mercury	N	< 0.005	< 0.01	0.01	0.2	2	
Molybdenum	N	< 0.005	< 0.05	0.5	10	30	
Nickel	N	0.106	1.06	0.4	10	40	
Lead	N	< 0.001	< 0.05	0.5	10	50	
Antimony	N	< 0.005	< 0.05	0.06	0.7	5	
Selenium	N	< 0.005	< 0.05	0.1	0.5	7	
Zinc	N	0.043	0.43	4	50	200	
Chloride	N	8	78.00	800	15000	25000	
Fluoride	N	< 5	< 10	10	150	500	
Sulphate	N	10	97.50	1000	20000	50000	
Total Dissolved Solids	N	29	293.00	4000	60000	100000	
Phenol Index	N	< 0.01	< 0.10	1	-	-	
Dissolved Organic Carbon	N	11.500	115.00	500	800	1000	

Leach Test Information

pH	N	7.7				
Conductivity (uS/cm)	N	< 50				
Dry mass of test portion (g)		100.000				
Dry Matter (%)		82				
Moisture (%)		21				
Eluent Volume (ml)		930				

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.



Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY

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Results Summary

Report No.: 20-27941, issue number 1

Asbestos Results

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

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
202757	0.15	TP227	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
202758	0.50	TP227	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-27941, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	28/04/2020	110	Colorimetry
Aqua regia extractable metals	M	Air dried sample	27/04/2020	118	ICPMS
PAH (GC-FID)	M	As submitted sample	27/04/2020	133	GC-FID
Asbestos identification	U	Air dried sample	28/04/2020	PMAN	Microscopy
Leachate					
Arsenic	N		30/04/2020	101	ICPMS
Cadmium	N		30/04/2020	101	ICPMS
Chromium	N		30/04/2020	101	ICPMS
Lead	N		30/04/2020	101	ICPMS
Nickel	N		30/04/2020	101	ICPMS
Copper	N		30/04/2020	101	ICPMS
Zinc	N		30/04/2020	101	ICPMS
Mercury	N		30/04/2020	101	ICPMS
Selenium	N		30/04/2020	101	ICPMS
Antimony	N		30/04/2020	101	ICPMS
Barium	N		30/04/2020	101	ICPMS
Molybdenum	N		30/04/2020	101	ICPMS
pH Value	N		30/04/2020	113	Electrometric
Electrical Conductivity	N		30/04/2020	136	Probe
Dissolved Organic Carbon	N		30/04/2020	102	TOC analyser
Chloride	N		30/04/2020	131	Ion Chromatography
Fluoride	N		30/04/2020	131	Ion Chromatography
Sulphate	N		30/04/2020	131	Ion Chromatography
Total Dissolved Solids	N		30/04/2020	144	Gravimetric
Phenol index	N		30/04/2020	121	HPLC
WAC Solids analysis					
pH Value	M	Air dried sample	28/04/2020	113	Electrometric
Total Organic Carbon	N	Air dried sample	28/04/2020	210	IR
Loss on Ignition	M	Air dried sample	29/04/2020	129	Gravimetric
Acid Neutralization Capacity to pH 7	N	Air dried sample	28/04/2020	NEN 737	Electrometric
Total BTEX	N	As submitted sample	30/04/2020	181	GCMS
Mineral Oil	M	As submitted sample	27/04/2020	117	GCFID
Total PCBs (7 congeners)	M	Air dried sample	27/04/2020	120	GCMS
Total PAH (17)	N	As submitted sample	30/04/2020	133	GCFID

Tests marked N are not UKAS accredited



Report Information

Report No.: 20-27941, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

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

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

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage