# Phase II Site Investigation Report

Land adj. to Church Lane, Climping, West Sussex, BN17 5GG

On behalf of Foreman Homes

| Report Reference: GWPR6003/SIR/August 2024 | | | Status: Final |
|---|---|---|---|
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| EXECUTIVE SUMMARY | |
|---|---|
| **PROPOSED DEVELOPMENT** | At the time of reporting, August 2024, the proposed development was understood to comprise the construction of 300 residential housing plots comprising a mixture of residential flats, terraced, semi-detached and detached properties with associated garden and soft landscaping areas garages and new roads and supporting infrastructure. A pumping station is to be constructed on the eastern portion of the site. There will be 9 attenuation ponds mainly across the eastern and central area of the site. A new roundabout and road junction will be installed on the south-eastern corner of the site. |
| **GEOLOGY AND HYDROGEOLOGY** | The British Geological Survey (BGS) maps and DEFRA online maps for the area suggest that the western portion of the site was located on the superficial River Terrace Deposits (Sand Silt and Clay) with the eastern portion of the site located on the Raised Beach Deposits. Both are classified as Secondary A superficial aquifers, overlying the Lewes nodular chalk, Seaford chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations, classified as a Principal Aquifer. Based on this, it was anticipated that groundwater would be found at shallow to moderate depths within the Raised Beach deposits and River Terrace deposits. The main groundwater table though is expected at depth within the chalk formations. |
| **VOLUME CHANGE POTENTIAL** | Foundations should be designed in accordance with soils of medium volume change potential. |
| **FOUNDATION DESIGN** | Based on the previous section, foundations should bypass any Made Ground/Topsoil and soft spots/loose granular soils, before extending 300mm below the proved depth of root penetration. Therefore, foundations would be constructed at varying depths across the site on competent, moisture stable soils of the River Terrace Deposits but in certain areas across the site a piled foundation solution is required. |
| **SUB-SURFACE CONCRETE** | According to BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' a Sulphate Design Class of DS-1 could be used for sub-surface concrete in contact with the Topsoil, River Terrace Deposits, Raised beach Deposits and Chalk Formations. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of AC-1. |
| **CONTAMINATION** | Chemical laboratory testing of the Topsoil and River Terrace Deposits did not reveal any elevated levels of determinands above the guideline levels for a 'Residential With Homegrown Produce' land-use scenario. |

| | |
|---|---|
| | In addition, the intrusive investigation did not reveal any visual or olfactory evidence to suggest any hydrocarbon-type contamination in the trial holes excavated on the site. The chemical laboratory results have verified that no elevated concentrations of aliphatic/aromatic hydrocarbons (C5-C35) or BTEX compounds are present in the soils underlying the site.<br><br>Given the low levels of determinands noted during the chemical laboratory testing, it was considered that no remediation was required within the soils for the end users of the site. However, it is recommended that further soil sampling be undertaken across the site on more samples to confirm this risk assessment as at this stage only a small number of samples have been tested. |
| **REMEDIATION** | Given the low levels of determinands noted during the chemical laboratory testing, it was considered that no remediation was required within the soils for the end users of the site.<br>An Asbestos Management Strategy should be put in place so that any potential asbestos containing materials are identified and removed from the site in a suitable manner to prevent cross-contamination.<br>It is recommended that further soil sampling be undertaken across the site to confirm this risk assessment as at this stage only a small number of samples have been tested.<br>A nominal 100mm capping of clean topsoil is required in all areas of proposed soft landscaping to act as a suitable growing medium. |

# 1. INTRODUCTION

## 1.1. General

Ground and Water Limited were instructed by Forman Homes on the 17th May 2024 to conduct a Phase 2 Site investigation and additional site investigation works on the site at Land adj. to Church Lane, Climping, West Sussex, BN17 5GG. The scope of the investigation was detailed within the fee proposal QU0370, dated the 22nd April 2024.

## 1.2. Aims of the Investigation

The aim of this report was to supply the client and their designers with information regarding the ground conditions underlying the site to assist them in preparing an appropriate scheme for development.

The investigation was to be undertaken to provide parameters for the design of foundations by means of in-situ and laboratory geotechnical testing undertaken on soil samples recovered from trial holes.

A contamination assessment was to be undertaken following chemical laboratory testing on soil samples recovered from the site to enable recommendations for the safe redevelopment of the site and the protection of site workers, end-users and the public from any potential contamination identified.

This Site Investigation Report must be read in conjunction with the **Geotechnical Desk Study and Chalk Dissolution Report** referenced GWPR5903/DS/February 2024 and the first phase of site investigation works GWPR5921/July 2024. A full contamination desk study has not been undertaken on site and was not within the remit of this report.

The techniques adopted for the investigation were chosen considering the requirements of the client, anticipated ground conditions, and bearing in mind the nature of the site, limitations to site access and other logistical limitations.

## 1.3. Conditions and Limitations

This report has been prepared based on the terms, conditions and limitations outlined within Appendix A.

Reference has been made to a historical site investigation by another company. Ground and Water Limited cannot be held liable for any shortcomings.

This report has superseded the previously issued reports, GWPR5921/July 2024 and GWPR6003/July 2024.

## 1.4. Technical Glossary

Generic technical terms and their description can be viewed within the glossary provided within Appendix B.

# 2. SITE SETTING

## 2.1. Site Location

The site comprised a ~254,600m$^2$ roughly rectangular shaped plot of land, with a north-east to south-west orientation, situated along the northern side of the A259 road and the western side of Church Lane. The site was located to the south-west of the village center of Climping within the county of West Sussex. A site location plan has been provided within Figure 1.

The national grid reference for the centre of the site was approximately TQ 00062 02007.

## 2.2. Site Description

The site comprised undeveloped agricultural fields with dense woodland located along the western and southern boundaries. The A259 road is located to the south of the site, Church Lane to the east and Yapton Road to the west. A housing development was located to the north of the site. A view of the site development area has been provided within Figure 2, with an aerial view of the site provided in Figure 3.

## 2.3. Proposed Development

At the time of reporting, August 2024, the proposed development was understood to comprise the construction of 300 residential housing plots comprising a mixture of residential flats, terraced, semi-detached and detached properties with associated garden and soft landscaping areas garages and new roads and supporting infrastructure. A pumping station is to be constructed on the eastern portion of the site. There will be 9 attenuation ponds mainly across the eastern and central area of the site. A new roundabout and road junction will be installed on the south-eastern corner of the site. The proposed development plan can be viewed in figure 4.

## 2.4. Historical Mapping

The site formed part of a larger undeveloped area of undeveloped agricultural land with two residential properties recorded on the far northern and western parts of the site from the earliest available map (1876). The village of Climping was recorded to the north-east of the site. The 1912 plan showed the building on the northern portion of the site had been demolished but no other significant changes were recorded on site or to the site environs. The 1937 plans show a number of houses had been built to the north/north-west of the site, but no other significant changes were recorded. The land directly to the north had plant nurseries and greenhouses constructed on it at some time between the late 1960's and early 1970's. Between 1975 and 1994 the residential house on the north-western corner of the site had been demolished but the rest of the site remained unchanged and undeveloped. A works was noted approximately 250m north of the site associated with Rudford Industrial estate. Between 1973 and 1994 the industrial estate increased in size with new works buildings and units and an electricity sub-station building 200m north and 225m north-west of the site. The 11981 plans show the Ford Aerodrome located approximately 300m north of the site. This is the first plan it is recorded on, but the site was likely used as a WWII airbase and hence was not recorded on any maps. The green houses and nurseries just to the north of the site were demolished and replaced by residential houses between 2001-2010. No other significant changes were noted on site or to the site environs up to the present day (2024).

Historical maps, obtained from GroundSure, can be viewed within Appendix C.

## 2.5. Geology, Hydrogeology and Hydrology

The British Geological Survey (BGS) maps and DEFRA online maps for the area suggest that the western portion of the site was located on the superficial River Terrace Deposits (Sand Silt and Clay) with the eastern portion of the site located on the Raised Beach Deposits. Both are classified as Secondary A superficial aquifers, overlying the Lewes nodular chalk, Seaford chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations, classified as a Principal Aquifer. Based on this, it was anticipated that groundwater would be found at shallow to moderate depths within the Raised Beach deposits and River Terrace deposits. The main groundwater table though is expected at depth within the chalk formations.

The nearest surface water feature was observed to be an issue stream associated with the River Arun located 150m east of the site with the River Arun itself located 650m north-east of the site.

Examination of the Environment Agency records showed that the site fell within a Flood Zone 1 (an area with a low probability of fluvial or coastal flooding). The site was not protected by flood defences or benefiting from flood storage.

A BGS borehole record in similar geology ~180m north-east of the site (ref.: TQ00SW120) noted slightly silty gravelly Clay (likely Topsoil) to 0.50m bgl, overlying a sandy gravelly Clay with small chalk fragments to 1.60m bgl. An off white, grey putty chalk with sandy clay was recorded below to 3.00m bgl with a moderately hard off white to white chalk to the base of the borehole at 6.00m bgl. Groundwater was encountered at 3.00m bgl and rose to 2.40m bgl overnight.

## 2.6. Radon

A review of the freely available UK Health Security Agency radon database, UK Radon, indicated that the site was located within a 1km grid square, where the maximum radon potential of <1% was recorded. Basic radon protection measures are required in areas where more than 3% of houses are at or above the Action Level.

The site was in an area where a risk assessment was not required.

Therefore, no radon protection measures are required for properties across the site.

## 2.7. Internet Search (Site Setting)

### 2.7.1. Available Unexploded Ordnance (UXO) Map Review

A review of the data available on www.zeticauxo.com/ revealed the site was located within a low -risk area associated with unexploded ordnance (UXO), as indicated by having <15 bombs dropped per 1000 acres. A total of 1No. known Luftwaffe Bombing Target site was located ~900m north of the site.

### 2.7.2. Historical Landfill Tool Review

A review of the data available on www.groundsure.io/ revealed that no areas of Historical or authorised Landfilling were located within a 500m radius of the site.

## 2.8. Previous site investigation works

A stage 2 Site Investigation was undertaken by Your Environment in February 2019, the report is referenced in Appendix K.

As part of the site works 15No. Windowless sampler boreholes were drilled on site in January 2019. The windowless sampler boreholes were drilled to depths of 4.45m bgl. The general ground conditions comprised a topsoil which was recorded to depths of up to 0.75m bgl comprising a sandy clay. Underlying the topsoil was a sandy silty gravelly Clay recorded to the base of the boreholes in WS3, WS8, WS11 and WS15. Underlying the clays a gravelly sand was recorded to depths of between 1.68 and 4,45m bgl in WS4, WS5, WS7 and WS12. Underlying the superficial deposits the chalk was recorded at depths of between 1.80-3.50m bgl to the base of the boreholes in WS1, WS2, WS6, WS9, WS10, WS13 and WS14. SPT tests undertaken at 1.20m bgl in the clays recorded N values of 8-12 equating to medium undrained shear strength. SPT's at 2.00m bgl recorded N values of 9-60, 7 to 45 at 3.00m bgl and 40-46 at 4.00m bgl.

Groundwater was recorded at depths of between 2.00-3.10m bgl in boreholes WS1, WS2, WS3, WS5, WS7, WS13.

Concrete classification testing recorded water-soluble sulphate concentrations of between 10-16mg/l with pH values of 7.2 to 7.8.

Geotechnical testing results of samples taken on site recorded moisture contents of between 16-28% and modified plasticity indexes of between 6%-26%.

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# 3. SITE WORKS

## 3.1. Scope of Works

Site works were undertaken between the 13th March and 28th March 2024 and comprised the drilling of 6No. Windowless Sampler Boreholes (WS1 – WS5 and WS7) to depths of between 3.00 – 5.00m bgl with Standard Penetration Tests at 1.00m intervals.

| Combined Ground-gas and Groundwater Monitoring Well Construction | | | | | |
|---|---|---|---|---|---|
| **Trial Hole** | Depth of Installation (m bgl) | Thickness of slotted piping with gravel filter pack (m) | Depth of plain piping with bentonite seal (m bgl) | Response Zone (m bgl) | Piping internal diameter (mm) |
| **WS1** | 5.00 | 4.00 | 1.00 | 1.00 – 5.00 | 50 |
| **WS2** | 5.00 | 4.00 | 1.00 | 1.00 – 5.00 | 50 |
| **WS3** | 3.00 | 2.00 | 1.00 | 1.00 – 3.00 | 50 |
| **WS4** | 5.00 | 4.00 | 1.00 | 1.00 – 5.00 | 50 |
| **WS5** | 4.00 | 3.00 | 1.00 | 1.00 – 4.00 | 50 |
| **WS7** | 5.00 | 4.00 | 1.00 | 1.00 – 5.00 | 50 |

In addition, 12No. Trial pits referenced BRE1-BRE12 were excavated to depths of between 0.50-1.50m bgl for BRE365 soakaway testing. A further 23No. trial pits referenced CBR1-CBR23 were excavated to depths of between 1.80-2.20m bgl.

34No. CPT holes were drilled between the 13th and 15th March 2024.

The trial hole location plan for the WS, BRE and CBR's can be seen within Figure 5 with the CPT locations shown in figure 6.

7No. Cable Percussion boreholes (BH1-BH7) were drilled to depths of 20.00m bgl between the 21st May 2024 and 6th June 2024. Standard Penetration Tests were undertaken at 1.00m intervals from 1.20-5.20m bgl and then at 1.50m intervals below to the base of the boreholes.

The Borehole location plan can be seen in figure 7.

Prior to commencing the ground investigation, a walkover survey was carried out to identify the presence of underground services and drainage. Where underground services/drainage were suspected and/or positively identified, the exploratory position was relocated away from these areas.

As a further precautionary measure, the borehole was hand excavated to 1.20m below the local ground level (bgl) and scanned with a Cable Avoidance Tool (CAT scanner) to minimise the risk to services.

Upon completion of the drilling works, the trial holes were backfilled and made good, in relation to the surrounding area.

## 3.2. Sampling Procedures

Small disturbed samples and environmental samples were recovered from the trial holes at the depths shown on the trial hole records. Soil samples were generally retrieved from each change of strata

and/or at specific areas of concern. Samples were also taken at approximately 0.5m intervals during broad homogenous soil horizons.

A selection of samples were despatched to a laboratory for both geotechnical and chemical testing purposes.

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# 4. ENCOUNTERED GROUND CONDITIONS

## 4.1. Soil Conditions

The trial holes were logged by a Ground and Water Limited representative, generally in accordance with BS EN 14688 'Geotechnical Investigation and Testing – Identification and Classification of Soil'. The chalk samples were logged in accordance with CIRIA 574.

The ground conditions encountered within the trial holes constructed on the site did generally conform to that anticipated from examination of the geology map. A capping of Topsoil was noted to overlie the superficial River Terrace Deposits and Raised Beach Deposits and the bedrock Lewes Nodular chalk formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk and Portsdown Chalk Formation.

The succession of conditions and description of soils encountered in the trial holes in descending order is tabulated below.

| Summary of Strata Encountered (WS1-WS5, WS7) | | | |
|---|---|---|---|
| **Strata** | **Top Depth (m bgl)** | **Base Depth (m bgl)** | **Thickness (m)** |
| **TOPSOIL:** Dark brown gravelly sandy CLAY. Sand is fine.to medium Gravel is fine to coarse sub-angular flint. | GL | 0.20 | 0.20 |
| **RIVER TERRACE DEPOSITS:** Dark brown gravelly sandy CLAY. Sand is fine. Gravel is fine to coarse sub-angular flint. | 0.20 | 1.50 – >3.00 | 1.30 – >2.80 |
| **RAISED BEACH DEPOSITS:** Dark brown slightly gravelly SAND. Sand is fine. Gravel is fine to sub-angular to sub-rounded flint. | 2.00 | 3.00 – >5.00 | 1.00 – >3.00 |
| **LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION (WS2, WS4, WS5):** Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). | 1.50-3.00 | >4.00->5.00 | >2.00->3.50 |

| Summary of Strata Encountered (BRE1-BRE12) | | | |
|---|---|---|---|
| **Strata** | **Top Depth (m bgl)** | **Base Depth (m bgl)** | **Thickness (m)** |
| **TOPSOIL:** Dark brown gravelly sandy CLAY. Sand is fine.to medium Gravel is fine to coarse sub-angular flint. | GL | 0.20-0.30 | 0.20-0.30 |
| **RIVER TERRACE DEPOSITS:** Dark brown gravelly sandy CLAY. Sand is fine. Gravel is fine to coarse sub-angular flint. | 0.20-0.70 | >0.50 – >1.50 | >0.30 – >1.30 |
| **RIVER TERRACE DEPOSITS:** Greyish brown slightly gravelly silty fine SAND. Gravel is fine and medium sub-angular of flint. | 0.30 | 0.70 | 0.40 |

| Summary of Strata Encountered (CBR1-CBR23) | | | |
|---|---|---|---|
| **Strata** | **Top Depth (m bgl)** | **Base Depth (m bgl)** | **Thickness (m)** |
| **TOPSOIL:** Dark brown gravelly sandy CLAY. Sand is fine.to medium Gravel is fine to coarse sub-angular flint. | GL | 0.20-0.50 | 0.20-0.50 |
| **RIVER TERRACE DEPOSITS:** Dark brown gravelly sandy CLAY/ gravelly clayey SAND. Sand is fine. Gravel is fine to coarse sub-angular flint. | 0.20-0.50 | 0.80 – >2.20 | 0.60 – >2.00 |
| **RAISED BEACH DEPOSITS:** Dark brown slightly gravelly SAND. Sand is fine. Gravel is fine to sub-angular to sub-rounded flint. | 0.80-1.00 | >2.00 – >2.20 | >1.00 – >1.40 |

| | | | |
|---|---|---|---|
| **LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FOIRMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION (CBR2 Only):** Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). | 1.80 | >2.20 | >0.40 |

| Summary of Strata Encountered (BH1-BH7) | | | |
|---|---|---|---|
| **Strata** | **Top Depth (m bgl)** | **Base Depth (m bgl)** | **Thickness (m)** |
| **TOPSOIL:** Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. | GL | 0.30-0.40 | 0.30-0.40 |
| **RIVER TERRACE DEPOSITS:** Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subangular Flint and chalk. | 0.30-0.40 | 3.20 – 5.20 | 2.80 – 4.90 |
| **RIVER TERRACE DEPOSITS:** Brown, grey, yellow, gravelly clayey SAND. Sand is fine to coarse. Gravel is fine to medium subangular flint. | 3.70 – 4.60 | 5.20 – 6.70 | 1.40 – 2.10 |
| **LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION:** Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). Bands of dark grey cobbles of Flint throughout. | 3.20-6.70 | >20.00 | >13.30->16.80 |

For details of the composition of the soils encountered at particular points, reference must be made to the individual trial hole logs within Appendix D of this report. The trial hole location plan for the WS, BRE and CBR's can be seen within Figure 5 with the CPT locations shown in figure 6 and the cable percussion boreholes shown in figure 7.

### 4.2. Roots Encountered

A summary of the depth of root penetration can be viewed below.

| Summary of Root Penetration | |
|---|---|
| **Trial Hole** | **Fresh Root Depth (m bgl)** |
| WS1 | 0.60 |
| WS2 | 0.80 |
| WS3 | 1.00 |
| WS4 | 0.80 |
| WS5 | 1.00 |
| WS7 | 0.20 |
| BRE1 | 0.30 |
| BRE2 | 0.20 |
| BRE3 | 0.30 |
| BRE4 | 0.40 |
| BRE5 | 0.30 |
| BRE6 | 0.20 |
| BRE7 | 0.30 |
| BRE8 | 0.30 |
| BRE9 | 0.40 |
| BRE10 | 0.20 |

| | |
|---|---|
| BRE11 | 0.20 |
| BRE12 | 0.20 |
| CBR1 | 0.50 |
| CBR2 | 0.20 |
| CBR3 | 0.40 |
| CBR4 | 0.30 |
| CBR5 | 0.40 |
| CBR6 | 0.30 |
| CBR7 | 0.30 |
| CBR8 | 0.20 |
| CBR9 | 0.20 |
| CBR10 | 0.40 |
| CBR11 | 0.40 |
| CBR12 | 0.30 |
| CBR13 | 0.20 |
| CBR14 | 0.20 |
| CBR15 | 0.30 |
| CBR16 | 0.40 |
| CBR17 | 0.30 |
| CBR18 | 0.40 |
| CBR19 | 0.20 |
| CBR20 | 0.40 |
| CBR21 | 0.40 |
| CBR22 | 1.00 |
| CBR23 | >2.00 |
| BH1 | 0.50 |
| BH2 | 1.20 |
| BH3 | 0.80 |
| BH4 | 1.00 |
| BH5 | 0.40 |
| BH6 | 1.00 |
| BH7 | 1.70 |

It must be noted that the chance of determining actual depth of root penetration through a narrow diameter borehole is low. Roots may be found to greater depths at other locations on the site, particularly close to trees and/or trees that have been removed both within the site and its close environs.

### 4.3. Groundwater Conditions

Groundwater strikes were recorded in multiple trial pits across the site. The groundwater strikes are tabulated below.

| Summary of Groundwater strikes | |
|---|---|
| **Trial Hole** | **Groundwater strike Depth (m bgl)** |
| WS1 | 2.80 |
| WS2 | 2.80 |
| WS3 | Dry |
| WS4 | 3.00 |
| WS5 | 2.50 |
| WS7 | 3.00 |

| | |
|---|---|
| BRE1 | 1.50 |
| BRE2 | Dry |
| BRE3 | Dry |
| BRE4 | 1.00 |
| BRE5 | 1.40 |
| BRE6 | 0.50 |
| BRE7 | 0.50 |
| BRE8 | 1.10 |
| BRE9 | 1.30 |
| BRE10 | 1.40 |
| BRE11 | 1.00 |
| BRE12 | 0.50 |
| CBR1 | Dry |
| CBR2 | Dry |
| CBR3 | Dry |
| CBR4 | 1.30 |
| CBR5 | 1.50 |
| CBR6 | 1.40 |
| CBR7 | 1.30 |
| CBR8 | 1.70 |
| CBR9 | 1.70 |
| CBR10 | 1.40 |
| CBR11 | 1.50 |
| CBR12 | 1.40 |
| CBR13 | 1.50 |
| CBR14 | 1.50 |
| CBR15 | 1.50 |
| CBR16 | 1.50 |
| CBR17 | 1.00 |
| CBR18 | 1.20 |
| CBR19 | 1.50 |
| CBR20 | 1.10 |
| CBR21 | 0.80 |
| CBR22 | 0.55 |
| CBR23 | 0.50 |

| Groundwater Strikes during Drilling | | |
|---|---|---|
| **Trial Hole** | **Groundwater reading (m bgl)** | **Depth after 20 minutes (m bgl)** |
| BH1 | 6.10 | 5.80 |
| BH2 | 4.60 | 4.40 |
| BH3 | 5.30 | 5.10 |
| BH4 | 3.30 | 3.10 |
| BH5 | 6.40 | 6.10 |
| BH6 | 4.60 | 4.50 |
| BH6 | 6.60 | 6.10 |
| BH7 | 5.60 | 5.50 |

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The Windowless sampling and trial pit investigation was undertaken in March 2024 when groundwater levels are likely to be at their annual maximum (highest elevation).

The Cable Percussion borehole investigation was undertaken in May/June 2024 when groundwater levels are likely to be falling to their annual minimum (lowest elevation). Exact groundwater levels may only be determined through long term measurements from monitoring wells installed on-site.

Groundwater monitoring was undertaken on three occasions to date. The results can be seen tabulated below.

| Groundwater Observations | | | |
|---|---|---|---|
| **Date** | **Trial Hole** | **Water Level** | **Final Well Depth** |
| 23/04/2024 | WS1 | 2.90 | 3.80 |
| | WS2 | 2.80 | 2.90 |
| | WS3 | Dry | 1.90 |
| | WS4 | 3.00 | 3.90 |
| | WS5 | 2.40 | 3.40 |
| | WS7 | 2.80 | 3.70 |
| 16/05/2024 | WS1 | 2.50 | 3.80 |
| | WS2 | 2.60 | 2.90 |
| | WS3 | 1.50 | 1.90 |
| | WS4 | 2.80 | 3.90 |
| | WS5 | 1.80 | 3.40 |
| | WS7 | 2.80 | 3.70 |
| 04/06/2024 | WS1 | 2.90 | 3.70 |
| | WS2 | 2.50 | 2.60 |
| | WS3 | Dry | 1.90 |
| | WS4 | 3.10 | 4.00 |
| | WS5 | 2.70 | 3.50 |
| | WS7 | 2.10 | 2.20 |
| 25/06/2024 | WS1 | 3.20 | 3.70 |
| | WS2 | Dry | 2.60 |
| | WS3 | Dry | 1.90 |
| | WS4 | 3.40 | 4.00 |
| | WS5 | 2.90 | 3.50 |
| | WS7 | Dry | 2.20 |
| 01/07/2024 | WS1 | 3.05 | 3.70 |
| | WS2 | Dry | 2.60 |
| | WS3 | Dry | 1.90 |
| | WS4 | 3.10 | 4.00 |
| | WS5 | 2.63 | 3.50 |
| | WS7 | Dry | 2.20 |

### 4.4. Obstructions

A possible obstruction or dense soils was recorded in WS3 and WS5 resulting in early termination of the borehole.

No other artificial or natural sub-surface obstructions were noted during construction of the trial holes.

# 5. IN-SITU AND LABORATORY TESTING

## 5.1. In-situ Strength Testing

Standard Penetration Tests (SPTs) were undertaken as part of the site investigation. The results of the SPT's have not been amended to consider hammer efficiency, rod lengths and overburden pressure in accordance with Eurocode 7. The test results are presented on the borehole logs within Appendix D. An interpretation of the in-situ geotechnical testing results is given in the table below.

| Interpretation of In-situ Geotechnical Testing Results WS Holes | | | | | |
|---|---|---|---|---|---|
| **Strata** | **SPT "N" Blow Counts/Equivalent SPT "N Value from DP** | **Equivalent Undrained Shear Strength (Cu) (kPa)** | **Soil Type** | | **Trial Hole/s** |
| | | | **Granular (Density)** | **Cohesive (Cu)** | |
| **Soft spots within River Terrace Deposits (Cohesive)** | 5 – 8 | 25 – 40 | - | Low to Medium | WS1/1.00 – 1.45m bgl WS3/1.00-1.45m bgl WS5/1.00-1.45m bgl WS7/1.00-1.45m bgl |
| **River Terrace Deposits (Cohesive)** | 10-14 | 50-70 | - | Medium | WS2/1.00-1.45m bgl WS3/2.00-2.45m bgl WS4/1.00-1.45m bgl |
| **Loose Raised Beach Deposits (Granular)** | 0-8 | - | Very Loose to medium dense | - | WS1/3.00-5.45m bgl WS4/2.00-2.45m bgl |
| **Raised Beach Deposits (Granular)** | 11-50 | - | Medium dense to extremely dense | - | WS1/2.00-2.45m bgl WS7/2.00-5.45m bgl |
| **Chalk** | 2-46 | - | - | - | WS2/2.00 – >5.45m bgl WS4/3.00-5.45m bgl WS5/2.00-4.45m bgl |

| Interpretation of In-situ Geotechnical Testing Results Cable Percussion Boreholes | | | | | |
|---|---|---|---|---|---|
| **Strata** | **SPT "N" Blow Counts/Equivalent SPT "N Value from DP** | **Equivalent Undrained Shear Strength (Cu) (kPa)** | **Soil Type** | | **Trial Hole/s** |
| | | | **Granular (Density)** | **Cohesive (Cu)** | |
| **Soft spots within River Terrace Deposits (Cohesive)** | 3– 8 | 25 – 40 | - | Low to Medium | BH1/1.20 – 2.65m bgl BH2/1.20- 3.65m bgl BH3/1.20- 2.65m bgl BH4/1.20- 2.65m bgl BH5/1.20- 3.65m bgl BH6/1.20- 4.65m bgl BH7/1.20- 2.65m bgl BH7/4.20- 4.65m bgl |
| **River Terrace Deposits (Cohesive)** | 9-12 | 50-70 | - | Medium | BH1/3.20- 3.65m bgl BH2/4.20- 4.65m bgl BH3/3.20- 3.65m bgl BH5/4.20- 4.65m bgl BH7/3.20- 3.65m bgl |
| **River Terrace Deposits (Granular)** | 12-13 | - | Medium dense | - | BH1/4.20- 4.65m bgl BH2/5.20- 5.65m bgl |
| **Chalk** | 6-50 for 150mm | - | - | - | BH1/5.20 – >20.45m bgl BH2/6.70- >20.45m bgl BH3/6.50- >20.45m bgl BH4/3.20- >20.45m bgl BH5/5.20- >20.45m bgl BH6/6.50- >20.45m bgl BH7/5.20- >20.45m bgl |

It must be noted that field measurements of undrained shear strength (Cu) are dependent on a number of variables including disturbance of sample, method of investigation and also the size of specimen or test zone.

The CPT report produced by In-Situ Site Investigation can be viewed in Appendix E.

### 5.2. Geotechnical Laboratory Testing

A programme of geotechnical laboratory testing, scheduled by Ground and Water Limited and carried out by an accredited geotechnical testing laboratory was undertaken on samples recovered. Details of the specific tests used in each case are given below.

| Standard Methodology for Laboratory Geotechnical Testing March 2024 Investigation | | |
|---|---|---|
| **Test** | **Standard** | **Number of Tests** |
| **Atterberg Limit Tests** | BS1377:2016:Part 2:Clauses 3.2, 4.3 & 5 | 14 |
| **Particle Size Distribution Tests** | BS1377:2016:Part 2:Clause 9 | 2 |
| **Determination of Saturation Moisture Content of Chalk** | BS1377:2016:Part 2:Clause 3.3 | 2 |
| **Soaked CBR Test** | BS 1377:1990 - Part 4 : 7.3 | 10 |
| **Water Soluble Sulphate and pH Test** | BS1377:2018:Part 3:Clause 5 | 2 |
| **BRE Special Digest 1 Tests** | BRE Special Digest 1 "Concrete in Aggressive Ground (BRE, 2005). | 3 |

| Standard Methodology for Laboratory Geotechnical Testing May/June 2024 Investigation | | |
|---|---|---|
| **Test** | **Standard** | **Number of Tests** |
| **Atterberg Limit Tests** | BS1377:2016:Part 2:Clauses 3.2, 4.3 & 5 | 18 |
| **BRE Special Digest 1 Tests** | BRE Special Digest 1 "Concrete in Aggressive Ground (BRE, 2005). | 20 |

### 5.2.1. Atterberg Limit Testing

A précis of Atterberg limit testing undertaken can be seen tabulated below. The test results are presented within Appendix F.

| Atterberg Limit Tests Results Summary March 2024 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Stratum** | **Moisture Content (%)** | **Passing 425 µm sieve (%)** | **Modified PI (%)** | **Soil Class** | **Consistency Index (Ic)** | **Volume Change Potential** | |
| | | | | | | **BRE** | **NHBC** |
| **River Terrace Deposits** | 16-24 | 93-96 | 11.28-25.92 | CL-CI | Firm to Very Stiff | Low to Medium | Low to Medium |
| • **NP – Non-plastic**<br>• **BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)**<br>• **Soil Classification based on British Soil Classification System.**<br>• **Consistency Index (Ic) based on BS EN IS0 14688-2:2018.** | | | | | | | |

| Atterberg Limit Tests Results Summary July 2024 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Stratum** | **Moisture Content (%)** | **Passing 425 µm sieve (%)** | **Modified PI (%)** | **Soil Class** | **Consistency Index (Ic)** | **Volume Change Potential** | |
| | | | | | | **BRE** | **NHBC** |
| **River Terrace Deposits** | 13-26 | 84-96 | 13.44-28.80 | CL-CI | Stiff to Very Stiff | Low to Medium | Low to Medium |

- **NP – Non-plastic**
- **BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)**
- **Soil Classification based on British Soil Classification System.**
- **Consistency Index (Ic) based on BS EN IS0 14688-2:2018.**

### 5.2.2. Moisture Deficit Assessment

The results of the Atterberg Limit tests were analysed to determine the Liquidity Index of the samples, to give an indication as to whether the samples recovered showed a moisture deficit as well assessing their degree of consolidation. Liquid Limit analyses was undertaken to assess whether there were any potentially significant moisture deficits within the samples tested.

No potential moisture deficits were recorded in any of the samples tested.

### 5.2.3. Particle Size Distribution Testing

The results of particle size distribution (PSD) testing undertaken show that the two samples tested have volume change potential in accordance with BRE240 but not NHBC Standards Chapter 4.2. The results of the PSD testing can be viewed within Appendix F and summarised overleaf.

| **Particle Size Distribution Results Summary** | | | |
|---|---|---|---|
| **Stratum** | **Range Passing 63µm Sieve (%)** | **Volume Change Potential** | |
| | | **BRE** | **NHBC** |
| **WS4/2.50m bgl Brown slightly fine to medium gravelly silty clayey fine to coarse SAND** | 24 | Yes | No |
| **WS7/4.00m bgl Brown silty/clayey fine to coarse SAND** | 30 | Yes | No |

- **Volume Change Potential refers to BRE Digest 240 (based on Grading test results).**
- **Shrinkability refers to NHBC Standards Chapter 4.2 (based on Grading test results).**
- **BRE 240 states that a soil has a volume change potential when the clay fraction exceeds 15%. Only the silt and clay combined fraction are determined by sieving therefore the volume change potential is estimated from the percentage passing the 63µm sieve.**
- **NHBC Standards Chapter 4.2 states that a soil is shrinkable if the percentage of silt and clay passing the 63µm sieve is greater than 35% and the Plasticity Index is greater than 10%.**

### 5.2.4. Determination of Saturation Moisture Content and density of Chalk

The results of saturation moisture content testing undertaken are tabulated below. The results can be seen in Appendix F.

| **Summary of Saturation Moisture Content Test Results** | | | | | |
|---|---|---|---|---|---|
| **Stratum** | **Moisture Content (%)** | **Saturation Moisture Content (%)** | **Bulk Density ($Mg/m^3$)** | **Dry Density ($Mg/m^3$)** | **CIRIA Dry Density Classification** |
| **WS2/5.00m bgl** | 26 | 26 | 2.00 | 1.60 | Medium Density |
| **WS5/2.50m bgl** | 19 | 20 | 2.10 | 1.77 | High Density |

- **Density in accordance with CIRIA 574 Chapter 3.0, Table 3.7**

# 6. ENGINEERING CONSIDERATIONS

## 6.1. Chalk Dissolution Risk Assessment

The presence of dissolution features on-site can prove problematic, as they often provide inconsistency within the underlying geology. Often formed during glacial and periglacial conditions, the depth and width of these features can vary substantially, often providing inconsistency in geological strength data.

If a dissolution feature is suspected, a geotechnical engineer and structural engineer should be contacted for suitable engineering designs, based on further works identifying and classifying the area the feature occupies.

The Groundsure datasheets revealed the following information which may be pertinent to this risk assessment. The Groundsure Geoinsight report can be found in Appendix C.

- The site was classified as having very low risk of ground dissolution of soluble rocks.
- No natural cavities were noted within a 500m radius of the site.
- No records of Britpits were noted within a 500m radius of the site.
- 9 records of surface ground workings were noted between 122-202m from the site. These were mainly ponds (west) a sewage works (south-east) and a graveyard (north-east).
- No records of underground workings, Historical Mineral planning areas, No coal mining, mining cavities or JPB mining areas were noted within a 500m radius of the site.
- The historical mapping review undertaken in this report confirmed the findings of the Groundsure datasheets discussed above.
- The site was within a location where LIDAR was available for review, LIDAR data recorded two circular depression features one on the southern boundary and one on the northern portion of the site. The depression on the southern boundary however is within the existing tree line and maybe relating to a heap or vegetation. The rest of the site recorded no anomalies.
- The Edmonds Procedure (Edmonds, C.N., 2001. Predicting natural cavities in chalk. Geological Society, London, Engineering Geology Special Publications, 18(1), pp.29-38.); highlighted a moderately low anticipated subsidence hazard classification.

As a result of the desk-based review of the site, the geology would show a moderately low risk. Based on collective information to date and the relatively incompetent ground encountered to a moderate depth, the risk is considered to be generally moderately low, subject to further testing.

**However, the Lidar data did record a circular feature on the northern portion of the site that should be investigated further.**

The CPT trial holes recorded the top of the chalk head at variable depths across the site between 1.50-3.00m bgl in the Windowless sampler holes and 2.20-5.80m bgl in the CPT holes with no chalk recorded in the CPT or WS holes on the north-eastern portion of the site. Superficial soils comprising clays and sands were recorded above. A general trend of increasingly competent chalk with depth was identified. Soil strength across the site varied significantly within the superficial soils with areas of soft

spots where very low to low undrained shear strength was recorded and areas where high to very high undrained shear strength was recorded.

**Further works should be undertaken on the western portion of the site which at the time of reporting was part of an archaeological no dig zone.**

**Soil Characteristics and Foundation Considerations**

A summary of the soil characteristics following the intrusive site investigation and laboratory testing and the relevant foundation considerations has been provided below. The following information from the ground investigation was considered pertinent to the design of foundations.

- Foundations should be taken through any Topsoil and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.
- Foundations should be designed in accordance with soils of medium volume change potential.
- Given the presence of cohesive soils at shallow depth, special foundation precautions may be required to prevent possible future shrinkage/swelling of the soils affecting the integrity of the faces of foundations (underfloor void diameter/compressible material/void formers etc.). A compressible layer must be provided to accommodate potential seasonal movement, based on NHBC guidance.
- The design of each structural element (slab/piles/beams) should be designed in accordance with the appropriate volume change potential of the respective bearing stratum. Special foundation precautions may be required to prevent possible future shrinkage/swelling of the soils affecting the integrity of the faces of foundations and/or structural element (underfloor void diameter/compressible material/void formers etc.).
- The loads of proposed foundations should not exceed the allowable bearing capacity of the soils they are founding upon.
- If soft spots are encountered, they should be bypassed.
- Care should be taken not to overdig foundations as this may stress underlying soft spots, should they be present.
- Foundations must not be placed within fresh root penetrated and/or desiccated soils with volume change potential. It is recommended that foundations are taken at least 300mm into non-fresh root penetrated strata if the soils have volume change potential, or into soils of no volume change potential.
- The influence of trees on or surrounding the site will need to be taken into account in final design (NHBC Standards Chapter 4. 2) (tree rings).
- Any water ingress must be prevented from entering foundation trenches and excavations must be kept dry and either concreted or blinded as soon after excavation as possible. If water were allowed to accumulate within the excavation for even a short period of time, an increase in heave occur. The shear strength will also be reduced, resulting in lower bearing capacities, resulting in increased settlements. Instability issues may arise within the foundation trenches, in case of perched water being present.
- Live roots were noted to a maximum depth of >2.00m bgl. However roots were generally recorded between 0.20-1.00m bgl. Roots may be encountered at greater depths within the

vicinity of trees.

- Groundwater strikes were recorded in multiple trial pits across the site at depths of between 0.50-3.00m bgl.
- Fine sensitive soils were noted to 3-4m bgl across the entire site where SPT's from the Windowless sampling recorded N values of 5 or less.
- Trial Pits and windowless sampler boreholes were noted to be unstable during their excavation due to the presence of shallow groundwater coupled with loose granular soils.

### 6.2. Shallow Foundations

Based on the previous section, foundations should bypass any Made Ground/Topsoil and soft spots/loose granular soils, before extending 300mm below the proved depth of root penetration. Therefore, foundations would be constructed at varying depths across the site on competent, moisture stable soils of the River Terrace Deposits but in certain areas across the site a piled foundation solution is required due to low strength soils.

The following bearing capacities can be calculated for traditional strip foundations at 0.90 - 2.00m bgl. In areas where the bearing capacities are below 70kN/$m^2$ a piled foundation solution was considered to be necessary. (settlements will be limited to below 25mm).

| Plots | Nearest SI Location | Revised Founding Depth (m bgl) | Bearing Capacity 0.60m wide Foundation (kN/$m^2$) | Bearing Capacity 1.00m wide Foundation (kN/$m^2$) | Bearing Strata |
|---|---|---|---|---|---|
| **245 - 248** | DCP149 | 0.90 | 220 | 190 | River Terrace Deposits |
| **232 - 238** | DCP148 | 0.90 | 120 | 105 | River Terrace Deposits |
| **239** | DCP110 | 0.90 | 180 | 155 | River Terrace Deposits |
| **242 - 244** | DCP110 | 0.90 | 180 | 155 | River Terrace Deposits |
| **256 - 259** | DCP110 | 0.90 | 180 | 155 | River Terrace Deposits |
| **249 - 255** | DCP111 | 0.90 | 155 | 160 | River Terrace Deposits |
| **260 - 261** | DCP122 | 1.50 | 90 | 120 | River Terrace Deposits |
| **260 - 261** | | 2.00 | 175 | 165 | River Terrace Deposits |
| **211 - 224** | DCP119 | 2.00 | 90 | 95 | River Terrace Deposits |
| **29 - 39** | DCP132 | 0.90 | 235 | 285 | River Terrace Deposits |

| | | | | | |
|---|---|---|---|---|---|
| **40 - 41** | DCP130 | 0.90 | 85 | 110 | River Terrace Deposits |
| **80 - 82** | DCP130 | 0.90 | 85 | 110 | River Terrace Deposits |
| **189 - 197** | DCP118 | 0.90 | 125 | 135 | River Terrace Deposits |
| **208 - 210** | DCP118 | 0.90 | 125 | 135 | River Terrace Deposits |
| **197 - 208** | DCP107 | 0.90 | 105 | 85 | River Terrace Deposits |
| | | 1.50 | 60 | 115 | River Terrace Deposits |
| | | 2.00 | 180 | 220 | River Terrace Deposits |
| **166 - 173** | DCP104 | 0.90 | 130 | 270 | River Terrace Deposits |
| **109 - 120** | DCP104 | 0.90 | 130 | 270 | River Terrace Deposits |
| **105 - 108** | DCP128 | 0.90 | 110 | 100 | River Terrace Deposits |
| **121 - 129** | DCP128 | 0.90 | 110 | 100 | River Terrace Deposits |
| **140** | DCP128 | 0.90 | 110 | 100 | River Terrace Deposits |
| **144 - 147** | DCP128/DCP129 | 0.90 | 70 | 130 | River Terrace Deposits |

The Development plan showing areas that require shallow foundations and areas that need to be piled can be seen in figures 9 and 10. The pile calculations and plot numbers required to be piled is shown in section 6.3 of this report.

Based off Bowles values for sub-grade reaction (see table below) and the ground conditions encountered, values for a loam or clay (moist) to clay with sand should be used. Bearing capacities of between 80-90kN/m$^2$ will have $k_s$ values of around 50000 kN/m$^2$/m increasing to 80000-100,000 kN/m$^2$/m with harder clays and sands.

| **Soil Description** | **$K_s$ kN/m$^2$/m** |
|---|---|
| **Humus Soil or peat** | 5000-15000 |
| **Recent Embankment** | 10000-20000 |
| **Fine or slightly compacted soil** | 15000-30000 |
| **Well compacted sand** | 50000-100000 |
| **Very well compacted sand** | 100000-150000 |
| **Loam or clay (moist)** | 30000-60000 |
| **Loam or clay (dry)** | 80000-100000 |

| | |
|---|---|
| **Clay with sand** | 80000-100000 |
| **Crushed stone with sand** | 100000-150000 |
| **Coarse crushed stone** | 200000-250000 |
| **Well compacted crushed stone** | 200000-300000 |

**Additional Comments**
A number of comments and recommendations has been provided below.

- It is prudent to avoid having a foundation spanning across materials of different consistency, like clay and gravel, in order to avoid potential differential settlements. If unavoidable, foundations must be reinforced to allow for such potential differential movement. It should be noted that differential settlement may also occur between strip and isolated pad foundations.
- Foundation excavations must be carefully bottomed out and any loose soil or soft spots removed prior to the foundation concrete or blinding being placed. Failure to ensure that foundation excavations are suitably bottomed out could result in additional settlements.
- Inspection of foundation excavations, prior to concreting, must be made by a competent and suitably qualified person to check for soft spots and to check for the presence of roots.
- Foundations must not be cast over foundations of former structures and/or other hard spots.
- Given soils of volume change potential were encountered, a suspended slab is required.
- Isolated Pad Foundations must be at least 1.5 times the width of the widest pad apart to keep to the anticipated settlements.
- Final designs for the foundations should be carried out by a suitably qualified Engineer based on the findings of this investigation and with reference to the anticipated loadings, serviceability requirements for the structure and the developments proximity to former, present, and proposed trees. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

It must be mentioned that it was assumed that excavations will be kept dry and either concreted or blinded as soon after excavation as possible. If water were allowed to accumulate on the formation for even a short time not only would an increase in heave occur resulting from the soil increasing in volume by taking up water, but also the shear strength and hence the bearing capacity would also be reduced.

Groundwater was noted in the majority of the trial holes and CPT holes at depths of between 0.50-3.00m bgl. It should be noted that groundwater strikes may have been obscured by the drilling process.

**It was considered likely that the excavation would encounter groundwater or significant perched water within the Topsoil and clayey Sand/ sand Clay of the River Terrace Deposits, especially after periods of prolonged rainfall or during winter, therefore dewatering is likely to be required.** The excavation of trial trenches should also be considered to determine the practicality of excavation foundation trenches. The advice of a reputable dewatering contractor, familiar with the type of

ground and groundwater conditions encountered on this site, should be sought prior to finalising the design of the foundations.

Given the results of the investigation if dewatering of shallow groundwater cannot be achieved on site a piled foundation scheme would be necessary across the entire site. The Piled foundation design solution is commented on below.

### 6.3. Groundwater

Rainwater which falls on the site during winter months is likely to be sitting on top or might percolate down through the topsoil and sub-surface geology. It's likely that some near surface water and surface water has caused the flooding problems in the trial holes across the southern portion of the site, but this does not necessarily represent the saturated aquifer level.

**The saturated aquifer level is at worst likely to be between 1.50-2.00m bgl as shown within the monitoring wells installed, within the trial pits referenced CBR1-16 and the groundwater strikes recorded within the cable percussion boreholes and therefore this should be used in the design.** However, this in itself could be water percolating in sand bands, trying to find its way deeper into the saturated aquifer in the chalk. Pits CBR17-23 were excavated along the southern portion of the site and recorded shallow perched water similar to the soakaway testing pits also excavated in this area. The surface water "ponds" are likely to have formed during the winter months due to the water having nowhere to percolate through due to clay rich topsoil, subsoils and superficial deposits. These ponds have since disappeared during the summer months.

### 6.4. Piled Foundation

Given the results of the ground investigation, a piled/minipile foundation system was deemed more suitable for certain areas of the site. Groundwater might also play a role in decision making for the rest of the site as well.

It is proposed that plots 1-28, 42-79, 83-104, 130-139, 141-143, 148-165, 174-188, 225-231, 240-241 and 262-300 will all be required to be piled.

The construction of a piled/minipile foundation is a specialised job and the advice of a reputable contractor familiar with the type of ground encountered on this site, should be sought prior to finalising the foundation design. The actual pile working load will depend on the particular type of pile and method of installation adopted.

In general, for the cumulative pile capacity calculations, shaft friction over desiccated levels should be ignored and piles should not be terminated within desiccated soils where moisture recovery following could occur.

A number of deep boreholes to ~20.00m bgl were therefore undertaken to confirm ground conditions and assist in pile design.

PileDesigns Geotechnical Expertise have provided a technical note providing pile capacities for 300mm, 350mm and 4500mm diameter auger bored piles. The results can be viewed in Appendix L.

*Piling Groundwater Risk Assessment*

Given the geology at the site, piling is the preferred method for foundations for some parts of the site. As these may extend into the aquifer beneath the site, the potential for pathways to be present need to be considered.

Review of the Wilson and Mortimer paper *Piled foundations and pathways for ground gas migration in the UK* (ICE publishing – Environmental Geotechnics), indicates that any preferential pathways for ground gases or contaminated water created by piles needs consideration for ground conditions and the nature of the pile utilised.

An important consideration is the nature of the pile, whether it is a displacement or replacement pile. For there to be a preferential pathway for the movement of groundwater, a continuous open annulus is required around the piles installed. An open annulus will not form around piles during installation except for driven H and I piles. Cast in-situ piles are driven or bored and filled with wet concrete. The pressure exerted on the wet concrete will seal up any annulus around the pile, sealing any pathway.

The Environment Agency recommend that CFA piling is undertaken on any site where contamination may be expected.

Based on the above, the use of CFA piles or other cast in-situ piles should be adopted, which will not result in the downward migration of contamination within the groundwater.

### 6.5. Foundation design Depths

Based on the above sections 6.2 and 6.3 the table below provides the plot numbers and the corresponding founding depths as well as the founding geological formation.

| Plot Number | Minimum founding depth (m bgl) | Founding Geological Formation |
|---|---|---|
| 1 | Piled | Likely Chalk |
| 2 | Piled | Likely Chalk |
| 3 | Piled | Likely Chalk |
| 4 | Piled | Likely Chalk |
| 5 | Piled | Likely Chalk |
| 6 | Piled | Likely Chalk |
| 7 | Piled | Likely Chalk |
| 8 | Piled | Likely Chalk |
| 9 | Piled | Likely Chalk |
| 10 | Piled | Likely Chalk |

| | | |
|---|---|---|
| 11 | Piled | Likely Chalk |
| 12 | Piled | Likely Chalk |
| 13 | Piled | Likely Chalk |
| 14 | Piled | Likely Chalk |
| 15 | Piled | Likely Chalk |
| 16 | Piled | Likely Chalk |
| 17 | Piled | Likely Chalk |
| 18 | Piled | Likely Chalk |
| 19 | Piled | Likely Chalk |
| 20 | Piled | Likely Chalk |
| 21 | Piled | Likely Chalk |
| 22 | Piled | Likely Chalk |
| 23 | Piled | Likely Chalk |
| 24 | Piled | Likely Chalk |
| 25 | Piled | Likely Chalk |
| 26 | Piled | Likely Chalk |
| 27 | Piled | Likely Chalk |
| 28 | Piled | Likely Chalk |
| 29 | 0.90 | River Terrace Deposits |
| 30 | 0.90 | River Terrace Deposits |
| 31 | 0.90 | River Terrace Deposits |
| 32 | 0.90 | River Terrace Deposits |
| 33 | 0.90 | River Terrace Deposits |
| 34 | 0.90 | River Terrace Deposits |
| 35 | 0.90 | River Terrace Deposits |
| 36 | 0.90 | River Terrace Deposits |

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| 37 | 0.90 | River Terrace Deposits |
| 38 | 0.90 | River Terrace Deposits |
| 39 | 0.90 | River Terrace Deposits |
| 40 | 0.90 | River Terrace Deposits |
| 41 | 0.90 | River Terrace Deposits |
| 42 | Piled | Likely Chalk |
| 43 | Piled | Likely Chalk |
| 44 | Piled | Likely Chalk |
| 45 | Piled | Likely Chalk |
| 46 | Piled | Likely Chalk |
| 47 | Piled | Likely Chalk |
| 48 | Piled | Likely Chalk |
| 49 | Piled | Likely Chalk |
| 50 | Piled | Likely Chalk |
| 51 | Piled | Likely Chalk |
| 52 | Piled | Likely Chalk |
| 53 | Piled | Likely Chalk |
| 54 | Piled | Likely Chalk |
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| 58 | Piled | Likely Chalk |
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| 60 | Piled | Likely Chalk |
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| 62 | Piled | Likely Chalk |

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| 63 | Piled | Likely Chalk |
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| 72 | Piled | Likely Chalk |
| 73 | Piled | Likely Chalk |
| 74 | Piled | Likely Chalk |
| 75 | Piled | Likely Chalk |
| 76 | Piled | Likely Chalk |
| 77 | Piled | Likely Chalk |
| 78 | Piled | Likely Chalk |
| 79 | Piled | Likely Chalk |
| 80 | 0.90 | River Terrace Deposits |
| 81 | 0.90 | River Terrace Deposits |
| 82 | 0.90 | River Terrace Deposits |
| 83 | Piled | Likely Chalk |
| 84 | Piled | Likely Chalk |
| 85 | Piled | Likely Chalk |
| 86 | Piled | Likely Chalk |
| 87 | Piled | Likely Chalk |
| 88 | Piled | Likely Chalk |

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| 89 | Piled | Likely Chalk |
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| 91 | Piled | Likely Chalk |
| 92 | Piled | Likely Chalk |
| 93 | Piled | Likely Chalk |
| 94 | Piled | Likely Chalk |
| 95 | Piled | Likely Chalk |
| 96 | Piled | Likely Chalk |
| 97 | Piled | Likely Chalk |
| 98 | Piled | Likely Chalk |
| 99 | Piled | Likely Chalk |
| 100 | Piled | Likely Chalk |
| 101 | Piled | Likely Chalk |
| 102 | Piled | Likely Chalk |
| 103 | Piled | Likely Chalk |
| 104 | Piled | Likely Chalk |
| 105 | 0.90 | River Terrace Deposits |
| 106 | 0.90 | River Terrace Deposits |
| 107 | 0.90 | River Terrace Deposits |
| 108 | 0.90 | River Terrace Deposits |
| 109 | 0.90 | River Terrace Deposits |
| 110 | 0.90 | River Terrace Deposits |
| 111 | 0.90 | River Terrace Deposits |
| 112 | 0.90 | River Terrace Deposits |
| 113 | 0.90 | River Terrace Deposits |
| 114 | 0.90 | River Terrace Deposits |

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| 115 | 0.90 | River Terrace Deposits |
| 116 | 0.90 | River Terrace Deposits |
| 117 | 0.90 | River Terrace Deposits |
| 118 | 0.90 | River Terrace Deposits |
| 119 | 0.90 | River Terrace Deposits |
| 120 | 0.90 | River Terrace Deposits |
| 121 | 0.90 | River Terrace Deposits |
| 122 | 0.90 | River Terrace Deposits |
| 123 | 0.90 | River Terrace Deposits |
| 124 | 0.90 | River Terrace Deposits |
| 125 | 0.90 | River Terrace Deposits |
| 126 | 0.90 | River Terrace Deposits |
| 127 | 0.90 | River Terrace Deposits |
| 128 | 0.90 | River Terrace Deposits |
| 129 | 0.90 | River Terrace Deposits |
| 130 | Piled | Likely Chalk |
| 131 | Piled | Likely Chalk |
| 132 | Piled | Likely Chalk |
| 133 | Piled | Likely Chalk |
| 134 | Piled | Likely Chalk |
| 135 | Piled | Likely Chalk |
| 136 | Piled | Likely Chalk |
| 137 | Piled | Likely Chalk |
| 138 | Piled | Likely Chalk |
| 139 | Piled | Likely Chalk |
| 140 | 0.90 | River Terrace Deposits |

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| 141 | Piled | Likely Chalk |
| 142 | Piled | Likely Chalk |
| 143 | Piled | Likely Chalk |
| 144 | 0.90 | River Terrace Deposits |
| 145 | 0.90 | River Terrace Deposits |
| 146 | 0.90 | River Terrace Deposits |
| 147 | 0.90 | River Terrace Deposits |
| 148 | Piled | Likely Chalk |
| 149 | Piled | Likely Chalk |
| 150 | Piled | Likely Chalk |
| 151 | Piled | Likely Chalk |
| 152 | Piled | Likely Chalk |
| 153 | Piled | Likely Chalk |
| 154 | Piled | Likely Chalk |
| 155 | Piled | Likely Chalk |
| 156 | Piled | Likely Chalk |
| 157 | Piled | Likely Chalk |
| 158 | Piled | Likely Chalk |
| 159 | Piled | Likely Chalk |
| 160 | Piled | Likely Chalk |
| 161 | Piled | Likely Chalk |
| 162 | Piled | Likely Chalk |
| 163 | Piled | Likely Chalk |
| 164 | Piled | Likely Chalk |
| 165 | Piled | Likely Chalk |
| 166 | 0.90 | River Terrace Deposits |

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| 167 | 0.90 | River Terrace Deposits |
| 168 | 0.90 | River Terrace Deposits |
| 169 | 0.90 | River Terrace Deposits |
| 170 | 0.90 | River Terrace Deposits |
| 171 | 0.90 | River Terrace Deposits |
| 172 | 0.90 | River Terrace Deposits |
| 173 | 0.90 | River Terrace Deposits |
| 174 | Piled | Likely Chalk |
| 175 | Piled | Likely Chalk |
| 176 | Piled | Likely Chalk |
| 177 | Piled | Likely Chalk |
| 178 | Piled | Likely Chalk |
| 179 | Piled | Likely Chalk |
| 180 | Piled | Likely Chalk |
| 181 | Piled | Likely Chalk |
| 182 | Piled | Likely Chalk |
| 183 | Piled | Likely Chalk |
| 184 | Piled | Likely Chalk |
| 185 | Piled | Likely Chalk |
| 186 | Piled | Likely Chalk |
| 187 | Piled | Likely Chalk |
| 188 | Piled | Likely Chalk |
| 189 | 0.90 | River Terrace Deposits |
| 190 | 0.90 | River Terrace Deposits |
| 191 | 0.90 | River Terrace Deposits |
| 192 | 0.90 | River Terrace Deposits |

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| 193 | 0.90 | River Terrace Deposits |
| 194 | 0.90 | River Terrace Deposits |
| 195 | 0.90 | River Terrace Deposits |
| 196 | 0.90 | River Terrace Deposits |
| 197 | 0.90/1.50/2.00 | River Terrace Deposits |
| 198 | 0.90/1.50/2.00 | River Terrace Deposits |
| 199 | 0.90/1.50/2.00 | River Terrace Deposits |
| 200 | 0.90/1.50/2.00 | River Terrace Deposits |
| 201 | 0.90/1.50/2.00 | River Terrace Deposits |
| 202 | 0.90/1.50/2.00 | River Terrace Deposits |
| 203 | 0.90/1.50/2.00 | River Terrace Deposits |
| 204 | 0.90/1.50/2.00 | River Terrace Deposits |
| 205 | 0.90/1.50/2.00 | River Terrace Deposits |
| 206 | 0.90/1.50/2.00 | River Terrace Deposits |
| 207 | 0.90/1.50/2.00 | River Terrace Deposits |
| 208 | 0.90/1.50/2.00 | River Terrace Deposits |
| 209 | 0.90 | River Terrace Deposits |
| 210 | 0.90 | River Terrace Deposits |
| 211 | 2.00 | River Terrace Deposits |
| 212 | 2.00 | River Terrace Deposits |
| 213 | 2.00 | River Terrace Deposits |
| 214 | 2.00 | River Terrace Deposits |
| 215 | 2.00 | River Terrace Deposits |
| 216 | 2.00 | River Terrace Deposits |
| 217 | 2.00 | River Terrace Deposits |
| 218 | 2.00 | River Terrace Deposits |

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| 219 | 2.00 | River Terrace Deposits |
| 220 | 2.00 | River Terrace Deposits |
| 221 | 2.00 | River Terrace Deposits |
| 222 | 2.00 | River Terrace Deposits |
| 223 | 2.00 | River Terrace Deposits |
| 224 | 2.00 | River Terrace Deposits |
| 225 | Piled | Likely Chalk |
| 226 | Piled | Likely Chalk |
| 227 | Piled | Likely Chalk |
| 228 | Piled | Likely Chalk |
| 229 | Piled | Likely Chalk |
| 230 | Piled | Likely Chalk |
| 231 | Piled | Likely Chalk |
| 232 | 0.90 | River Terrace Deposits |
| 233 | 0.90 | River Terrace Deposits |
| 234 | 0.90 | River Terrace Deposits |
| 235 | 0.90 | River Terrace Deposits |
| 236 | 0.90 | River Terrace Deposits |
| 237 | 0.90 | River Terrace Deposits |
| 238 | 0.90 | River Terrace Deposits |
| 239 | 0.90 | River Terrace Deposits |
| 240 | Piled | Likely Chalk |
| 241 | Piled | Likely Chalk |
| 242 | 0.90 | River Terrace Deposits |
| 243 | 0.90 | River Terrace Deposits |
| 244 | 0.90 | River Terrace Deposits |

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| 245 | 0.90 | River Terrace Deposits |
| 246 | 0.90 | River Terrace Deposits |
| 247 | 0.90 | River Terrace Deposits |
| 248 | 0.90 | River Terrace Deposits |
| 249 | 0.90 | River Terrace Deposits |
| 250 | 0.90 | River Terrace Deposits |
| 251 | 0.90 | River Terrace Deposits |
| 252 | 0.90 | River Terrace Deposits |
| 253 | 0.90 | River Terrace Deposits |
| 254 | 0.90 | River Terrace Deposits |
| 255 | 0.90 | River Terrace Deposits |
| 256 | 0.90 | River Terrace Deposits |
| 257 | 0.90 | River Terrace Deposits |
| 258 | 0.90 | River Terrace Deposits |
| 259 | 0.90 | River Terrace Deposits |
| 260 | 1.50/2.00 | River Terrace Deposits |
| 261 | 1.50/2.00 | River Terrace Deposits |
| 262 | Piled | Likely Chalk |
| 263 | Piled | Likely Chalk |
| 264 | Piled | Likely Chalk |
| 265 | Piled | Likely Chalk |
| 266 | Piled | Likely Chalk |
| 267 | Piled | Likely Chalk |
| 268 | Piled | Likely Chalk |
| 269 | Piled | Likely Chalk |
| 270 | Piled | Likely Chalk |

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| 271 | Piled | Likely Chalk |
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| 273 | Piled | Likely Chalk |
| 274 | Piled | Likely Chalk |
| 275 | Piled | Likely Chalk |
| 276 | Piled | Likely Chalk |
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| 279 | Piled | Likely Chalk |
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| 281 | Piled | Likely Chalk |
| 282 | Piled | Likely Chalk |
| 283 | Piled | Likely Chalk |
| 284 | Piled | Likely Chalk |
| 285 | Piled | Likely Chalk |
| 286 | Piled | Likely Chalk |
| 287 | Piled | Likely Chalk |
| 288 | Piled | Likely Chalk |
| 289 | Piled | Likely Chalk |
| 290 | Piled | Likely Chalk |
| 291 | Piled | Likely Chalk |
| 292 | Piled | Likely Chalk |
| 293 | Piled | Likely Chalk |
| 294 | Piled | Likely Chalk |
| 295 | Piled | Likely Chalk |
| 296 | Piled | Likely Chalk |

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| 297 | Piled | Likely Chalk |
| 298 | Piled | Likely Chalk |
| 299 | Piled | Likely Chalk |
| 300 | Piled | Likely Chalk |

### 6.6. Further site Investigation works

The depression area located on the north-eastern corner of the site should also be targeted with further site investigation works. Chalk depths across the north-east corner of the site were highly variable and in some instances no chalk was recorded within the CPT holes (up to 6.00m bgl). Further CPT holes or trial holes should be undertaken on this area to confirm the ground conditions and chalk depths.

The western portion of the site had limited site investigation works undertaken on it due to the presence of Archaeological no dig zones. Once these archaeological no digs zones have been removed, it is recommended that further site investigation works be undertaken in these areas as well as across the site to help further delineate the areas of piled foundations and shallow strip foundations.

### 6.7. Excavations and Stability

Shallow excavations in the Topsoil and River Terrace Deposits are likely to be marginally stable at best. Long, deep excavations, through these strata and into the underlying Raised Beach Deposits/River Terrace Deposits and underlying chalk are likely to become unstable.

Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions should therefore be taken to ensure that such earth faces are adequately supported before excavations are entered by personnel.

### 6.8. Sub-Surface Concrete Design Shallow Foundations

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1, 2005, *'Concrete in Aggressive Ground'* considering the pH of the soils. For the classification given below, the "mobile" and "natural" case was adopted given the geology encountered and the use of the site.

**Topsoil**

The water-soluble sulphates in the Topsoil was noted to be between 11.7-18.3mg/l, with a pH of between 7.8-7.9, from chemical laboratory testing.

According to BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' a Sulphate Design Class of DS-1 could be used for sub-surface concrete in contact with the Topsoil. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of AC-1.

**River Terrace Deposits**

The water-soluble sulphates in the River Terrace Deposits were noted to be between 12-13.8mg/l, with a pH of between 7.5-8.4, from chemical laboratory testing.

According to BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' a Sulphate Design Class of DS-1 could be used for sub-surface concrete in contact with the River Terrace Deposits. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of AC-1.

**Raised Beach Deposits**

The water-soluble sulphates in the Raised Beach Deposits were noted to be 9.83-52.1mg/l, with a pH of 8.4-9.1, from chemical laboratory testing.

According to BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' a Sulphate Design Class of DS-1 could be used for sub-surface concrete in contact with the Raised Beach Deposits. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of AC-1.

**Lewes nodular chalk, Seaford chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formation**

The water-soluble sulphates in the chalk were noted to be between 13.8-339mg/l, with a pH of between 8.3-8.9, from chemical laboratory testing.

According to BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' a Sulphate Design Class of DS-1 could be used for sub-surface concrete in contact with the chalk. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of AC-1.

### 6.9. Sub-Surface Concrete Design Piled Foundations

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1, 2005, *'Concrete in Aggressive Ground'* considering the pH of the soils. For the classification given below, the "mobile" and "natural" case was adopted given the geology encountered and the use of the site.

**River Terrace Deposits**

The water-soluble sulphates in the River Terrace Deposits were noted to be between <10-20mg/l, with a pH of between 8.3-9.0, from chemical laboratory testing.

According to BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' a Sulphate Design Class of DS-1 could be used for sub-surface concrete in contact with the River Terrace Deposits. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of AC-1.

**Lewes nodular chalk, Seaford chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formation**

The water-soluble sulphates in the chalk were noted to be between <10-95mg/l, with a pH of between 8.8-9.1 from chemical laboratory testing.

According to BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' a Sulphate Design Class of DS-1 could be used for sub-surface concrete in contact with the chalk. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of AC-1.

### 6.10. Roads and Hardstanding Design

This section provides information relating to the construction of roads and hardstanding, for each strata encountered.

#### 6.10.1. Anticipated CBR Values and Frost Susceptibility

**Topsoil**

Roads and hardstanding should bypass Topsoil given the likely low strength, high compressibility and general variability.

**River Terrace Deposits**

*(From literature / equilibrium method / Suction Method)*

Roads and hardstanding constructed on the cohesive River Terrace Deposits should be designed based on a CBR value of 4.0%. This is based on reference to Table C1 of TRL1132 and average construction conditions. Based on wet conditions a CBR of 2.5% should be adopted, with dry conditions a CBR of 4.5% being applicable. Given the site encountered significant groundwater based on the equilibrium/suction method a design CBR value of >2.5% should be used.

These clay-based soils (poorly drained) with plasticity indexes generally greater than 20% might be non-frost susceptible, however due to the granular content should be treated as frost susceptible.

The results of the California Bearing Ratio (CBR) testing undertaken on samples at 0.50m bgl can be seen in the following table. The CBR testing was undertaken upon bulk disturbed samples under laboratory-soaked conditions. The results can be viewed in Appendix F.

| California Bearing Ratio Results Summary | | | | |
|---|---|---|---|---|
| **Sample** | **Moisture content (%)** | **Bulk Density ($Mg/m^3$)** | **Dry Density ($Mg/m^3$)** | **CBR Value (%)** |
| **CBR1/0.50m bgl** | 17 | 2.01 | 1.72 | 1.40 |
| **CBR5/0.50m bgl** | 16 | 2.06 | 1.78 | 1.80 |
| **CBR7/0.50m bgl** | 18 | 2.05 | 1.74 | 0.99 |
| **CBR9/0.50m bgl** | 20 | 2.04 | 1.69 | 0.88 |
| **CBR10/0.50m bgl** | 19 | 1.99 | 1.67 | 2.30 |
| **CBR11/0.50m bgl** | 18 | 2.00 | 1.69 | 0.72 |
| **CBR13/0.50m bgl** | 15 | 1.88 | 1.64 | 0.86 |
| **CBR17/0.50m bgl** | 19 | 2.04 | 1.71 | 0.75 |
| **CBR21/0.50m bgl** | 17 | 2.00 | 1.71 | 1.40 |
| **CBR23/0.50m bgl** | 18 | 2.01 | 1.71 | 0.58 |

Based on the soaked CBR test results a design CBR value of 0.89% should be used (average value of 1%). It should be noted that the soaked CBR values are likely to produce the lowest CBR values as the samples are submerged in water for 4 days.

### 6.10.2. In-Situ California Bearing Ratio Tests by Dynamic Cone Penetrometer

In-situ California Bearing Ratio (CBR) testing by dynamic cone penetrometer (DCP) was undertaken to determine the CBR values of the soils underlying the site to shallow depth in accordance with BS1377 Part 9: 2016: 4.3 and a summary of the results is tabulated below. The full test results are presented in Appendix J.

| In-situ CBR Test Results Summary | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Location | Layer 1 | | Layer 2 | | Layer 3 | | Layer 4 | | Layer 5 | |
| | Thickness (mm) | In-situ CBR (%) | Thickness (mm) | In-situ CBR (%) | Thickness (mm) | In-situ CBR (%) | Thickness (mm) | In-situ CBR (%) | Thickness (mm) | In-situ CBR (%) |
| CBR1 | 110mm | 2% | 360mm | 5% | 90mm | 8% | 135mm | 11% | 95mm | 16% |
| CBR2 | 50mm | 5% | 110mm | 2% | 215mm | 4% | 145mm | 7% | 250mm | 12% |
| CBR3 | 270mm | 3% | 95mm | 8% | 150mm | 26% | 145mm | 43% | 160mm | 34% |
| CBR4 | 265mm | 5% | 130mm | 8% | 200mm | 15% | 125mm | 28% | 115mm | 23% |
| CBR5 | 20mm | 13% | 105mm | 7% | 165mm | 3% | 230mm | 13% | 320mm | 26% |
| CBR6 | 205mm | 2% | 205mm | 5% | 130mm | 12% | 110mm | 21% | 170mm | 36% |
| CBR7 | 250mm | 4% | 35mm | 7% | 15mm | 17% | 445mm | 19% | 115mm | 35% |
| CBR8 | 210mm | 1% | 90mm | 3% | 170mm | 4% | 280mm | 6% | 40mm | 20% |
| CBR9 | 215mm | 1% | 80mm | 3% | 55mm | 4% | 415mm | 5% | 50mm | 15% |
| CBR10 | 240mm | 2% | 145mm | 5% | 274mm | 6% | 71mm | 11% | 125mm | 30% |
| CBR11 | 175mm | 3% | 185mm | 5% | 205mm | 11% | 55mm | 14% | 220mm | 19% |
| CBR12 | 175mm | 1% | 125mm | 4% | 360mm | 6% | 90mm | 8% | 90mm | 17% |
| CBR13 | 355mm | 1% | 75mm | 3% | 115mm | 4% | 150mm | 7% | 155mm | 10% |
| CBR14 | 210mm | 1% | 420mm | 5% | 170mm | 18% | - | - | - | - |
| CBR15 | 425mm | 3% | 350mm | 6% | - | - | - | - | - | - |
| CBR16 | 290mm | 2% | 80mm | 6% | 140mm | 3% | 110mm | 7% | 190mm | 12% |
| CBR17 | 220mm | 1% | 125mm | 4% | 295mm | 5% | 165mm | 14% | - | - |
| CBR18 | 280mm | 2% | 225mm | 4% | 115mm | 6% | 190mm | 12% | - | - |
| CBR19 | 320mm | 1% | 90mm | 3% | 180mm | 4% | 190mm | 12% | - | - |
| CBR20 | 430mm | 3% | 50mm | 5% | 90mm | 8% | 70mm | 11% | 170mm | 14% |
| CBR21 | 350mm | 3% | 100mm | 5% | 80mm | 9% | 105mm | 15% | 195mm | 20% |
| CBR22 | 335mm | 2% | 165mm | 4% | 150mm | 5% | 160mm | 14% | - | - |
| CBR23 | 80mm | 6% | 195mm | 4% | 165mm | 11% | 300mm | 15% | 110mm | 24% |

Based on the DCP test results a CBR value of 2.90% for the top 250mm, 4.8% for the top 400mm and 8.6% for the top 550mm can be used. Based on the TRL and Atterberg test results a value of 2.5% can be used for the design CBR value which is closer to the DCP tests and the top end of the soaked CBR tests.

### 6.11. Surface Water Disposal

Soakaway testing in accordance with BRE365 was undertaken within BRE1, BRE2, BRE3, and BRE9, with the results tabulated below. Due to the slow infiltration rates and groundwater ingresses within test locations BRE1, BRE3 and BRE9 no infiltration rate could be calculated for these trial pits.

| Soakage Testing Results | | | | | | |
|---|---|---|---|---|---|---|
| Trial Hole | Test Number | Depth (m bgl) | Start Depth (m bgl) | Finish Depth (m bgl) | Time Taken (mins) | Infiltration Rate (m/sec) |
| BRE2 | 1 | 1.05 | 0.45 | 1.05 | 144 | 3.33 x 10^-5 |
| | 2 | 1.05 | 0.63 | 1.05 | 73 | 4.84 x 10^-5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 3 | 1.05 | 0.70 | 1.05 | 1043 | 3.27 x 10^-6 |

Soakaways tests were not possible in BRE4-BR8 and BRE10-BRE12 due to the shallow groundwater ingresses. Photographs showing the groundwater conditions on site can be seen in figure 8.

Soakaway pits were excavated on Monday 18th March 2024 and were left 1-2 days before testing was started. Trial Pits BRE1, BRE2, BRE3 and BRE9 recorded no water in them, and soakaway testing was undertaken in these trial pits. BRE2 recorded infiltration rates of between 4.84 x 10^-5 and 3.27 x 10^-6. No infiltration rate could be calculated for BRE1, BRE3 or BRE9 as the water levels did not move during the test. On the day of excavation, the weather conditions were overcast but on the Tuesday it was raining. Ground conditions back in March were very wet, with a number of large "ponds" on site where surface water had collected. This was more obvious on the southern portion of the site where the ground underfoot was saturated.

Soakaways tests were not possible in BRE4-BR8 and BRE10-BRE12 due to the shallow water ingresses. The table below shows the initial water strike and then the water level 2 days after the initial excavation.

| Soakaway Test Pit | Initial Water Strike (m bgl) | Final water level (m bgl) |
|---|---|---|
| **BRE4** | 1.00 | 0.60 |
| **BRE5** | 1.40 | 0.95 |
| **BRE6** | 0.50 | 0.24 |
| **BRE7** | 0.50 | 0.24 |
| **BRE8** | 1.10 | 0.35 |
| **BRE10** | 1.40 | 0.49 |
| **BRE11** | 1.00 | 0.00 (at ground level) |
| **BRE12** | 0.50 | 0.30 |

The water ingresses into the pits were considered to be from perched water within the topsoil and upper soils of the River Terrace Deposits and would have been affected by some surface water and rainwater. The water level rise would have been from this near surface water migrating into and collecting in the pits rather than from surface water ingress from rainfall.

As the Civil Designers will know, drainage systems need to work all year round, especially during the winter months, when soils are saturated and saturated aquifer levels are higher.

To test this we do BRE365 tests, which are pits filled with water. Even if the pits were filled with shallow near surface water then it did not drain away. Neither did the majority of the pits which remained initially dry. Therefore, unfortunately, the testing has proved soakaways are unlikely to work during

the winter months. This is due to higher saturated aquifer levels and due to the saturated nature of the near surface soils.

**Any soakaways should be located sufficiently away from buildings and infrastructure, in order to prevent undermining of foundations.**

The submission of a Sustainable Urban Drainage Scheme (SUDS) is likely to be required for this site due to the proposed development increasing the amounts of hardstanding.

**Consultation with the Environment Agency must be sought regarding any use that may have an impact on groundwater resources, abstractions and surface water features/watercourses.**

It should be noted that water discharge into the chalk may worsen / create dissolution features. Therefore, soakaways should be remote from structures and undertaken in accordance with available guidance.

A number of published information sources make reference to an appropriate distance at which a soakaway should be sited in relation to any building foundations in the vicinity:

- The British Standard BS8301 :1985 "Code of practice for building drainage" (1985), suggests that: "A soakaway is not desirable nearer to a building than about 5 metres nor in such a position that the ground below foundations is likely to be adversely affected."
- The Building Research Establishment Digest 365 "Soakaway design" (1991), suggests that "Soakaways should not normally be constructed closer than 5m to building foundations. In chalk or other soil and fill material subject to modification or instability, the advice of a specialist geotechnologist should be sought as to the advisability and siting of a soakaway".

In addition, the distance a soakaway is located from any foundations can be informed by both the soakaway type and chalk density present at the site.

- The Kent County Council Soakaway Design Guide (July 2000) states that "Highway soakaways shall be situated the following minimum distances from dwellings (measured from the outside edge of the soakaway): (1) 5 metres for conventional perforated soakaway; (2) 10 metres for deep bored soakaway. In addition, adjacent soakaways of a similar type shall also be spaced a minimum of 10 metres apart.
- CIRIA 574 states that soakaways should be sited at least 5-10m away from any structure, depending on the chalk density. Where the chalk present is of low or unknown density, soakaways should be sited at least 10m from any foundations, and where the chalk is of medium density or higher, any foundations should be sited at least 5m from any foundations. Saturated moisture content testing of the chalk on site indicated that the chalk was classified as medium/high density and therefore soakaways could be located within 5m of any structure. However testing on site proved soakaways were not a viable option.

# 7. CONTAMINATION RISK ASSESSMENT

## 7.1. Results of the Preliminary Risk Assessment

At the time of reporting no Desk Study has been undertaken non the site.

In the UK, the assessment of risk from contamination follows the source-pathway-receptor (SPR) approach. For a risk to be present there must be a source of contamination, a receptor or receptors, and a pathway for contaminants to migrate or be absorbed. If there is a linkage between any given source and receptor, then a quantitative risk assessment is used to assess the significance or impact of the pollutant linkage.

## 7.2. Sampling Locations

The synopsis for the trial hole locations and their final depth can be seen tabulated below. The trial hole location plan for the WS, BRE and CBR's can be seen within Figure 5 with the CPT locations shown in figure 6 and the cable percussion boreholes shown in figure 7. The table also indicates whether any locations targeted a source of contamination as well as the proposed end-use. The proposed development can be seen in Figure 4.

| Trial Hole Location Synopsis | | |
|---|---|---|
| **Trial Hole/Final Depth** | **Sampling Strategy** | **Proposed End-Use** |
| WS1/5.00m | Random | Pond |
| WS2/5.00m | Random | Pond |
| WS3/3.00m | Random | Pond |
| WS4/5.00m | Random | Pond |
| WS5/4.00m | Random | Pond |
| WS7/5.00m | Random | Pond |
| BRE1/1.50m | Random | Road Network |
| BRE2/1.00m | Random | Road Network |
| BRE3/0.50m | Random | Road Network |
| BRE4/1.00m | Random | Road Network |
| BRE5/1.50m | Random | Road Network |
| BRE6/0.50m | Random | Road Network |
| BRE7/0.50m | Random | Road Network |
| BRE8/1.50m | Random | Road Network |
| BRE9/1.50m | Random | Road Network |
| BRE10/1.50m | Random | Road Network |
| BRE11/1.00m | Random | Road Network |
| BRE12/0.50m | Random | Road Network |
| CBR1/2.00m | Random | Road Network |
| CBR2/2.20m | Random | Road Network |
| CBR3/2.00m | Random | Road Network |
| CBR4/2.00m | Random | Road Network |
| CBR5/2.00m | Random | Road Network |
| CBR6/2.00m | Random | Road Network |
| CBR7/2.00m | Random | Road Network |
| CBR8/2.10m | Random | Road Network |
| CBR9/2.00m | Random | Road Network |
| CBR10/2.10m | Random | Road Network |

| | | |
|---|---|---|
| CBR11/2.20m | Random | Road Network |
| CBR12/2.10m | Random | Road Network |
| CBR13/2.00m | Random | Road Network |
| CBR14/2.20m | Random | Road Network |
| CBR15/2.20m | Random | Road Network |
| CBR16/2.20m | Random | Road Network |
| CBR17/2.00m | Random | Road Network |
| CBR18/2.10m | Random | Road Network |
| CBR19/2.10m | Random | Road Network |
| CBR20/2.20m | Random | Road Network |
| CBR21/1.80m | Random | Road Network |
| CBR22/2.00m | Random | Road Network |
| CBR23/2.00m | Random | Road Network |

The investigation area totals approximately 254,600m$^2$ and with forty-one sampling locations, given an unknown hotspot shape, the sampling density means that a hotspot with an area of approximately 9315m$^2$ and a radius of approximately 30.72m would be encountered (CLR 4).

### 7.3. Soil Risk Assessment

Sampling depths were chosen to reflect the receptor of concern (e.g. human health, controlled waters and vegetation). Samples where olfactory or visual evidence of contamination was present underwent targeted scheduling. The remaining samples were scheduled under a random strategy. The receptors relevant to the sampling depths are tabulated below.

| Summary of Receptors per Sample Depth | |
|---|---|
| **Depth** | **Receptors** |
| Shallow Samples (< 0.75m bgl) | • End Users (Residents/Future site visitors)<br>• Construction workers during development<br>• Site operatives during maintenance works<br>• Neighbours and public<br>• Vegetation within soft landscaped areas (shallow rooted)<br>• Secondary A aquifer (River Terrace Deposits and Raised Beach Deposits)<br>• Buried Concrete<br>• Receiving landfill |
| Moderate Samples (0.75 – 1.50m bgl) | • Construction workers during development<br>• Site operatives during maintenance works<br>• Vegetation within soft landscaped areas (deep rooted)<br>• Secondary A aquifer (River Terrace Deposits and Raised Beach Deposits)<br>• Buried Concrete<br>• Receiving landfill<br>• Underground services (water pipes) |
| Deep Samples (> 1.50m bgl) | • Construction workers during development<br>• Secondary A aquifer (River Terrace Deposits and Raised Beach Deposits)<br>• Principal Aquifer (Underlying Chalk)<br>• Buried Concrete<br>• Receiving landfill |

Chemical laboratory testing, scheduled by Ground and Water Limited, and carried out by I2 Laboratories UK Limited, was undertaken on 3 samples of the topsoil and 2 samples of the River Terrace Deposits. The samples were subjected to a combination of analysis that comprised:

- Asbestos screen;
- Semi-metals and heavy metals incl. Arsenic, Cadmium, Chromium (incl. Hexavalent Chromium), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc;
- Polycyclic Aromatic Hydrocarbons (PAH's) incl. Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(ghi)perylene;
- Speciated TPH including full aliphatic/aromatic split;
- BTEX compounds (Benzene, Toluene, Ethylbenzene, Xylene) and MTBE – used as marker compounds for Volatile Organic Compounds (VOCs);

A breakdown of the number of tests undertaken for each determinand is discussed in further sections. The chemical laboratory results are presented in Appendix G.

### 7.3.1. Soil Assessment Criteria and Results

At the time of reporting, August 2024, the proposed development was understood to comprise the construction of 300 residential housing plots comprising a mixture of residential flats, terraced, semi-detached and detached properties with associated garden and soft landscaping areas garages and new roads and supporting infrastructure. A pumping station is to be constructed on the eastern portion of the site. There will be 9 attenuation ponds mainly across the eastern and central area of the site. A new roundabout and road junction will be installed on the south-eastern corner of the site.

Proposed site plans are provided as Figure 4.

Based on the proposed development, the results of the chemical laboratory testing were compared to the Generic Assessment Criteria (GAC) for a ***'Residential with homegrown produce'*** land-use scenario, as this was considered the most appropriate land-use scenario.

Where a contaminant of concern's GAC varies according to the Soil's Organic Matter (SOM), the SOM recorded for each uncontaminated soil type was used to derive the appropriate GAC for each soil type. A SOM value of 1%, the most conservative value, was utilised.

A summary of the analytical results and the comparison to the determinands adopted screening value are presented in the table below and overleaf.

| Soil Contamination Test Results and Screening Values | | | | | |
|---|---|---|---|---|---|
| **Determinand** | **Number of Samples** | **Minimum Concentration (mg/kg)** | **Maximum Concentration (mg/kg)** | **Adopted Screening Value (mg/kg)** | **Was the adopted screening value exceeded for relevant land-use scenario?** |
| **INORGANICS** | | | | | |
| Asbestos | 5 | ND | ND | ND | No |
| Cyanide (total) | 5 | < 1 | < 1 | 24 | No |

| | | | | | |
|---|---|---|---|---|---|
| Phenols | 5 | < 1 | < 1 | 280 | No |
| **METALS** | | | | | |
| Arsenic | 5 | 8.7 | 15 | 37 | No |
| Boron | 5 | <0.2 | 0.6 | 290 | No |
| Cadmium | 5 | < 0.2 | <0.2 | 11 | No |
| Chromium (III) | 5 | 29 | 33 | 910 | No |
| Chromium (Hexavalent) | 5 | < 1.8 | < 1.8 | 6 | No |
| Copper | 5 | 8 | 16 | 2,400 | No |
| Lead | 5 | 10 | 21 | 200 | No |
| Mercury | 5 | <0.3 | <0.3 | 1.2 | No |
| Nickel | 5 | 11 | 23 | 130 | No |
| Selenium | 5 | < 1 | < 1 | 250 | No |
| Vanadium | 5 | 30 | 48 | 410 | No |
| Zinc | 5 | 37 | 61 | 3,700 | No |
| **TOTAL PETROLEUM HYDROCARBONS (TPHs)** | | | | | |
| Aliphatic >C5 - C6 | 2 | < 0.02 | < 0.02 | 42 | No |
| Aliphatic >C6 - C8 | 2 | < 0.02 | < 0.02 | 100 | No |
| Aliphatic >C8 - C10 | 2 | < 0.05 | < 0.05 | 27 | No |
| Aliphatic >C10 - C12 | 2 | < 1 | < 1 | 130 | No |
| Aliphatic >C12 - C16 | 2 | < 2 | <2 | 1,100 | No |
| Aliphatic >C16 - C21 | 2 | < 8 | < 8 | 65,000 | No |
| Aliphatic >C21 - C35 | 2 | < 8 | < 8 | | |
| Aliphatic >C35 – C44 | 2 | <10 | <10 | 65,000 | No |
| Aromatic >C5 - C7 | 2 | < 0.01 | < 0.01 | 70 | No |
| Aromatic >C7 - C8 | 2 | < 0.01 | < 0.01 | 130 | No |
| Aromatic >C8 - C10 | 2 | < 0.05 | < 0.05 | 34 | No |
| Aromatic >C10 - C12 | 2 | < 1 | < 1 | 74 | No |
| Aromatic >C12 - C16 | 2 | < 2 | < 2 | 140 | No |
| Aromatic >C16 - C21 | 2 | <10 | < 10 | 260 | No |
| Aromatic >C21 - C35 | 2 | < 10 | < 10 | 1,100 | No |
| Benzene | 2 | < 0.005 | < 0.005 | 0.087 | No |
| Toluene | 2 | < 0.005 | < 0.005 | 130 | No |
| Ethylbenzene | 2 | < 0.005 | < 0.005 | 47 | No |
| m,p-Xylene | 2 | < 0.005 | < 0.005 | 56 | No |
| o-Xylene | 2 | < 0.005 | < 0.005 | 60 | No |
| **POLYCYCLIC-AROMATIC HYDROCARBONS** | | | | | |
| Acenapthene | 5 | < 0.05 | < 0.05 | 210 | No |
| Acenapthylene | 5 | < 0.05 | < 0.05 | 170 | No |
| Anthracene | 5 | < 0.05 | < 0.05 | 2,400 | No |
| Benzo(a)anthracene | 5 | < 0.05 | 0.12 | 7.2 | No |
| Benzo(a)pyrene | 5 | < 0.05 | 0.16 | 2.2 | No |
| Benzo(b)fluoranthene | 5 | < 0.05 | 0.17 | 2.6 | No |
| Benzo(ghi)perylene | 5 | < 0.05 | 0.13 | 320 | No |
| Benzo(k)fluoranthene | 5 | < 0.05 | 0.10 | 77 | No |
| Chrysene | 5 | < 0.05 | 0.16 | 15 | No |
| Dibenzo(a,h)anthracene | 5 | < 0.05 | < 0.05 | 0.24 | No |
| Fluoranthene | 5 | < 0.05 | 0.28 | 280 | No |
| Fluorene | 5 | < 0.05 | < 0.05 | 170 | No |
| Indeno(1,2,3-cd)pyrene | 5 | < 0.05 | 0.13 | 27 | No |
| Naphthalene | 5 | < 0.05 | < 0.05 | 2.3 | No |
| Phenanthrene | 5 | < 0.05 | 0.09 | 95 | No |

| | | | | | |
|---|---|---|---|---|---|
| Pyrene | 5 | < 0.05 | 0.27 | 620 | No |
| **MARKER FOR VOLATILE ORGANIC COMPOUND** | | | | | |
| Methyl tert-butyl ether (MTBE) | 2 | < 0.005 | < 0.005 | 49 | No |
| **The derivation of the Soil Assessment Criteria used within this report can be seen within Appendix H. The soil concentrations were typically compared to the LQM/CIEH Suitable for Use Levels (S4UL) (2014), based upon the assumption of 1% soil organic matter. A screening value for Lead is based on the Category 4 Screening Levels (C4SLs). Where no S4UL or C4SL is available for Cyanide, a SoBRA acute GAC is assigned. Where no S4UL or C4SL is available for MTBE, a CL:AIRE 2010 GAC is assigned. Where exceedances are noted, the trial hole and depth of sample is recorded.** | | | | | |

The proposed development includes areas of soft-landscaping, where shallow rooted vegetation may be exposed to aggressive ground conditions. The previous table compares the results of the laboratory analysis to GAC that is protective of Human Health and therefore different GAC is required for vegetation.

| **Soil Contamination Test Results and Screening Value** | | | | | |
|---|---|---|---|---|---|
| **Determinand** | **Number of Samples** | **Minimum Concentration (mg/kg)** | **Maximum Concentration (mg/kg)** | **Adopted Screening Value (mg/kg)** | **Was the adopted screening value exceeded for relevant land-use scenario?** |
| Copper | 5 | 8 | 16 | 100 | No |
| Nickel | 5 | 11 | 23 | 60 | No |
| Zinc | 5 | 37 | 61 | 200 | No |
| **The derivation of the Soil Assessment Criteria used within this report can be seen within Appendix H. The soil concentrations were compared to BS3882:2015 *Specification for Topsoil* and based on differing pH. For the purpose of conservatism, the pH of the soils have been assumed to be below 6 within this table. Where exceedances are noted, the trial hole and depth of sample is recorded.** | | | | | |

### 7.3.2. Soil Assessment

Chemical laboratory testing of the Topsoil and River Terrace Deposits did not reveal any elevated levels of determinands above the guideline levels for a 'Residential With Homegrown Produce' land-use scenario.

In addition, the intrusive investigation did not reveal any visual or olfactory evidence to suggest any hydrocarbon-type contamination in the trial holes excavated on the site. The chemical laboratory results have verified that no elevated concentrations of aliphatic/aromatic hydrocarbons (C5-C35) or BTEX compounds are present in the soils underlying the site.

Given the low levels of determinands noted during the chemical laboratory testing, it was considered that no remediation was required within the soils for the end users of the site. However, it is recommended that further soil sampling be undertaken across the site on more samples to confirm this risk assessment as at this stage only a small number of samples have been tested.

*Asbestos*

No asbestos has been identified during the testing; however, an **Asbestos Management Strategy** should be put in place so that any potentially asbestos containing materials are identified and removed from site in a suitable manner to prevent cross-contamination.

### 7.3.3. Water Supply Pipe Risk Assessment

As part of the proposed development, it is expected that new water supply pipes will be installed at the site. Water supply pipes have the potential to be exposed to contaminants in the ground that can lead to unacceptable concentrations within the drinking water. If a risk is identified, specialist pipes that are protective of the drinking water are required.

A pipe selection risk assessment should be submitted to the water supply company as part of the development based on the supplier's assessment criteria. An indication of whether there is likely to be a risk can be seen tabulated below, where the PE pipe thresholds are based on *UKWIR Contaminated Land Assessment Guidance, 2014*.

| Pipe Selection Risk Assessment | | | |
|---|---|---|---|
| **Determinand** | **PE Pipe Threshold (mg/kg)** | **Laboratory Analysis Range (mg/kg)** | **Was the Threshold Exceeded?** |
| Total BTEX and MTBE | 0.1 | LOD | No |
| Total VOCs | 0.5 | N/A | No |
| Total SVOCs | 2 | N/A | No |
| Phenols | 2 | < 1 | No |
| TPH EC5 – EC10 (aliphatics and aromatics) | 2 | LOD | No |
| TPH EC10 – EC16 (aliphatics and aromatics) | 10 | LOD | No |
| TPH EC16 – EC40 (aliphatics and aromatics) | 500 | LOD | No |
| Naphthalene | 5 | < 0.05 | No |

The results indicate that no determinands were above the threshold for the use of a PE pipe at the site.

## 7.4. Groundwater Risk Assessment

In the UK, the water environment is protected under a number of regulatory regimes, mainly governed by the Environment Agency. The Environment Agency is consulted when there may be a risk to Controlled Waters, or where a pollution incident has occurred historically. The Water Framework Directive is implemented in various guises covering groundwater, surface water and drinking water supply.

The soil samples analysed as part of the risk assessments in section 7.3 have been used to undertake a Level 1 (soils) Controlled Waters risk assessment. At Level 1 (soils), the conceptual site model and the determinand concentrations of the soils are used to indicate whether the concentrations are sufficient to impact the receptor. At this stage, dilution, dispersion and attenuation along the pathway are not considered.

The British Geological Survey (BGS) maps and DEFRA online maps for the area suggest that the western portion of the site was located on the superficial River Terrace Deposits (Sand Silt and Clay) with the eastern portion of the site located on the Raised Beach Deposits. Both are classified as Secondary A superficial aquifers, overlying the Lewes nodular chalk, Seaford chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations, classified as a Principal Aquifer. Based on this, it was anticipated

that groundwater would be found at shallow to moderate depths within the Raised Beach deposits and River Terrace deposits. The main groundwater table though is expected at depth within the chalk formations.

The nearest surface water feature was observed to be an issue stream associated with the River Arun located 150m east of the site with the River Arun itself located 650m north-east of the site.

During the site investigation, Topsoil was encountered to 0.20-0.50m bgl, overlying sandy clay and gravelly Sand of the River Terrace Deposits and Raised Beach deposits overlying the chalk below. Groundwater strikes were noted at depths of between 0.50-3.00m bgl.

Comparison between the soil laboratory analysis and the derived Level 1 (soils) target concentrations indicate that Chromium, Nickel and Zinc are elevated and have the theoretical potential to pose a risk to Controlled Waters. It should be noted that a number of determinands at laboratory limit of detection exceed the target concentration for a Level 1 (soils) risk assessment, most notably PAHs. Where a determinand is identified at the laboratory limit of detection, no further assessment is considered necessary.

Given the Level 1 risk assessment does not consider dilution, dispersion or attenuation, and the conceptual site model shows the nearest receptor to be an issue stream, ~150m east of the site, it is not expected that the soils on-site represent an unacceptable risk to controlled water receptors. No further action is considered necessary.

The findings of this risk assessment should be agreed with the Environment Agency.

### 7.5. Ground Gas Risk Assessment

A review of freely available information prior to site works, including historical mapping and landfill registers, did not identify any source of ground gas on-site or within influencing distance of the site that warranted investigation through ground gas monitoring. However, a full Desk Study report is recommended to confirm this risk assessment.

#### 7.5.1. Pragmatic Approach

An alternative approach to ground gas risk assessment considers the uncertainty from the measurement of ground gas concentrations and flow rates in monitoring wells for low-risk sites and removes the need for monitoring. Low risk sites typically comprise:

- Natural soils with high carbonate content (e.g. chalk);
- Natural soils that can produce gases (e.g. alluvium, peat etc.);
- Made Ground between 1.00m to 5.00m, with low organic content; and
- Areas of flooded mine workings, unless a building is to be within 20m of shaft or adit.

The method considers the gas generation potential of the soils from data that is not subject to external influences, for example atmospheric pressure can change the recorded flow and concentrations of ground gas during spot monitoring, or a rising groundwater level can displace ground gases in pore spaces. Determination of the characteristic situation is based on the total organic carbon (TOC) of the

soils, coupled with any organic-rich material identified within the borehole logs, such as wood gravels. TOC is easily analysed by the laboratory and can also be calculated by the equation outlined below.

**Total Organic Carbon (TOC) = 0.58 x Soil Organic Matter (SOM) = 1.33 x Degradable Organic Carbon (DOC)**

As part of the ground investigation works, 3 Topsoil and 2 River Terrace Deposit samples were submitted to the laboratory for analysis, which identified TOC to vary between 0.2 and 1.0% in the Topsoil and River Terrace Deposits.

### 7.5.2. Data Quality

A review was made of the quality of the available data for the site, which can be viewed in the table below. CIRIA Report C665 (2007), BS 8485:2015+A1:2019 and BS 8576:2013 stress the need for risk assessments to be based on good quality data and give guidance as to best practice in this respect.

| Review of Data Quality | | | |
|---|---|---|---|
| **Data Type** | **Current Understanding** | **UK Practice** | **Recommendation** |
| Geological and hydro-geological conditions | The CSM identified the site to be located on limited Made Ground (<0.50m), overlying both permeable and impermeable strata of the River Terrace Deposits and Raised Beach Deposits. Groundwater has been encountered at shallow depth during drilling but has not been identified during monitoring. | CIRA C665 & C659, Wilson and Card (1999) and BS 8485 recommend that geology and hydrogeology be fully understood. | The geological and hydrogeological model is understood to a standard that will not comprise the findings of the risk assessment.<br><br>**No further action required.** |
| Soil Laboratory Analysis | A dataset of soil analysis from 5No. samples have identified a range of TOC concentrations between 0.20% and 1.00%. | CL:AIRE RB17 outlines an approach to ground gas risk assessment away from the influences that directly affect ground gas monitoring.<br>It should typically be used on sites with limited sources identified in the CSM and Made Ground with average thickness <3m and maximum thickness <5m. TOC should be < 6%. | The TOC concentrations are below the limit of 6% in order to use the soil derived approach for the risk assessment.<br><br>**No further action required.** |

### 7.5.3. Risk Assessment

The intrusive investigation has revealed no Made Ground on site and a maximum thickness of Topsoil of 0.50m overlying the River Terrace Deposits and the Raised Beach Deposits comprising cohesive and granular soils.

Using the soil derived method, it is considered that a TOC value of <1% within soil is unlikely to pose an unacceptable risk from ground gases and the site can be characterised as Characteristic Situation CS1. Any value between 3 and 6% warrants classification as a Characteristic Situation CS3. Any value over 6% requires investigation through ground gas monitoring. Any site with Made Ground <1.00m bgl will have a limited gas generation potential from the organic carbon present and consideration should be given to this thickness within the risk assessment.

An alternative approach for ground gas risk assessment (CL:AIRE RB17) can be considered utilising measured concentrations from soil parameters that are independent of influencing factors such as atmospheric pressure and groundwater level. Total Organic Carbon (TOC) was tested on 5No. samples with the analytical results ranging between 0.20 and 1.00%. Furthermore, it is considered that a thickness of Made Ground of <0.80m would not generate sufficient ground gas to pose an unacceptable risk.

Based on the soil derived method outlined and the maximum TOC concentration encountered, the soils from site would warrant classification as **Characteristic Situation CS1**. It should be noted that this only represents the assessment from an on-site source.

### 7.6. Vapour Risk Assessment

In order to assess the potential for a vapour risk at the site, soil samples were sent to the laboratory for analysis (Appendix G). The testing suites included contaminants that may be present in the vapour phrase (Mercury, Napthalene, TPHs and markers for volatile Organic Compounds (VOCs)) taken within Topsoil samples, as well as samples from the River Terrace Deposits.

The samples did not identify any concentrations above the respective soil assessment criteria. In addition, BTEX and MTBE were at LOD.

# 8. CONTAMINATION RECOMMENDATIONS AND REMEDIATION STRATEGY

Given the low levels of determinands noted during the chemical laboratory testing, it was considered that no remediation was required within the soils for the end users of the site.

An Asbestos Management Strategy should be put in place so that any potentially asbestos containing materials are identified and removed from site in a suitable manner to prevent cross-contamination.

It is recommended that further soil sampling be undertaken across the site to confirm this risk assessment as at this stage only a small number of samples have been tested.

A nominal 100mm capping of clean topsoil is required in all areas of proposed soft landscaping to act as a suitable growing medium.

### 8.1.1. Water Supply Pipes

The Water Supply pipe risk assessment indicated that the use of PE pipes is appropriate at the site and no further measures are required.

### 8.2. Groundwater

Comparison between the soil laboratory analysis and the derived Level 1 (soils) target concentrations indicate that Chromium, Nickel and Zinc are elevated and have the potential to pose a risk to Controlled Waters. It should be noted that a number of determinands at laboratory limit of detection exceed the target concentration for a Level 1 (soils) risk assessment, most notably PAHs. Where a determinand is identified at the laboratory limit of detection, no further assessment is considered necessary.

Given the Level 1 risk assessment does not consider dilution, dispersion or attenuation, and the conceptual site model shows the nearest receptor to be an issue stream, ~150m east of the site, it is not expected that the soils on-site represent an unacceptable risk to controlled water receptors. No further action is considered necessary.

### 8.3. Ground Gas and Vapours

Based on risk assessment undertaken, the site warrants classification as **Characteristic Situation CS1**. The risk from vapours was considered to be low due to the very low concentrations of BTEX compounds (Benzene, Toluene, Ethylbenzene, Xylene) and MTBE, which are used as marker compounds for Volatile Organic Compounds (VOCs) and the low anticipated risk level.

### 8.4. Discovery Strategy

There may be areas of contamination that have not been identified during the course of the intrusive investigation (e.g. underground storage tanks). Such occurrences may be discovered during the construction phases for the redevelopment of the site.

Groundworkers should be instructed to report to the Site Manager any evidence for such contamination; this may comprise visual indicators, such as fibrous materials within the soil, discolouration, or odours and emission. Upon discovery advice must be taken from a suitably qualified person and then the Local Authority will need to be informed.

## 8.5. Imported Material

It is not envisaged that soils will be brought onto site as part of the development works, however, any soil which is to be imported onto the site must undergo chemical analysis to prove that it is suitable for the purpose for which it is intended.

The soil must be fit for purpose and must either be supplied with traceable chemical laboratory test certificates or be tested, prior to placing (ideally) and after placing, to ensure that the future receptors (human health and vegetation) cannot come into contact with compounds that could be detrimental to their health. The compounds that are to be tested for are those given in the Generic Assessment Criteria, which can be viewed in Appendix H of this report.

## 8.6. Waste Disposal

The excavation of foundations and other soils is likely to produce waste which will require classification and then recycling or removal from site.

Under the Landfill (England and Wales) Regulations 2002 (as amended), prior to disposal, all waste must be classified as either: Inert; Non-hazardous; or Hazardous.

The Environment Agency's Hazardous Waste Technical Guidance (WM3) document outlines the methodology for classifying wastes. Once classified the waste can be removed to the appropriately licensed facilities, with some waste requiring pre-treatments prior to disposal.

Following the investigation, 3No. samples of topsoil and 2No. samples of the River Terrace Deposits were submitted to the analytical laboratory to undergo a suite of testing for contamination testing, as discussed in the previous sections. Sampling depths were chosen to reflect the receptor of concern, human health, and typically comprised a surface or near surface sample and periodically to 1.00m bgl. Any horizon where olfactory or visual evidence of contamination was present was also sampled.

Based on a risk phase analysis of the chemical laboratory test results, in accordance with EC Hazardous Waste Directive and undertaken by Ground and Water Limited, all soil samples of Topsoil and River Terrace Deposits encountered on-site were NON-HAZARDOUS. The results of the assessment are given within Appendix I.

It is important to note that whilst we consider our in-house assessment tool to be an accurate interpretation of the requirements of WM3, therefore producing an initial classification in accordance with the guidance, this method classifies soils as either non-hazardous or hazardous and landfill operators have their own assessment tools and can often come to different conclusions. As a result, some landfill operators could refuse to take apparently suitable waste. It is recommended that the receiving landfill views the results of this assessment and the chemical laboratory results to determine their own classification.

In addition to the samples described above, 2No. samples of the topsoil were scheduled to undergo Waste Acceptance Criteria (WAC) testing with single batch leachate from samples with a range of depths. The results indicate that 2No. samples of the topsoil conformed to the Inert Waste Classification.

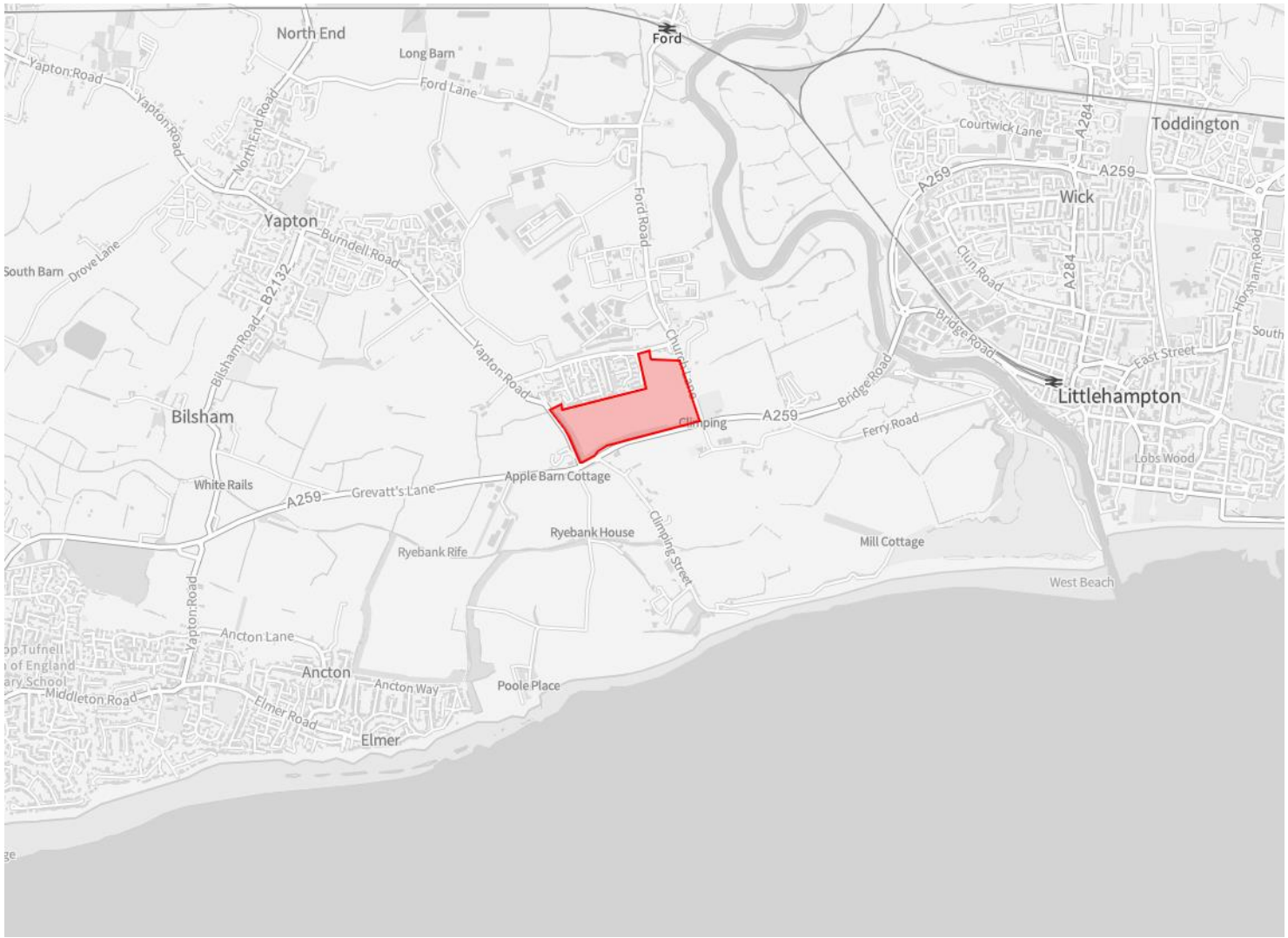
### 8.7. Duty of Care

Groundworkers must maintain a good standard of personal hygiene including the wearing of overalls, boots, gloves and eye protectors and the use of dust masks during periods of dry weather.

To prevent exposure to airborne dust by both the general public and construction personnel the site should be kept damp during dry weather and at other times when dust would be generated as a result of construction activities.

The site should be securely fenced at all times to prevent unauthorised access. Washing facilities should be provided and eating restricted to mess huts.

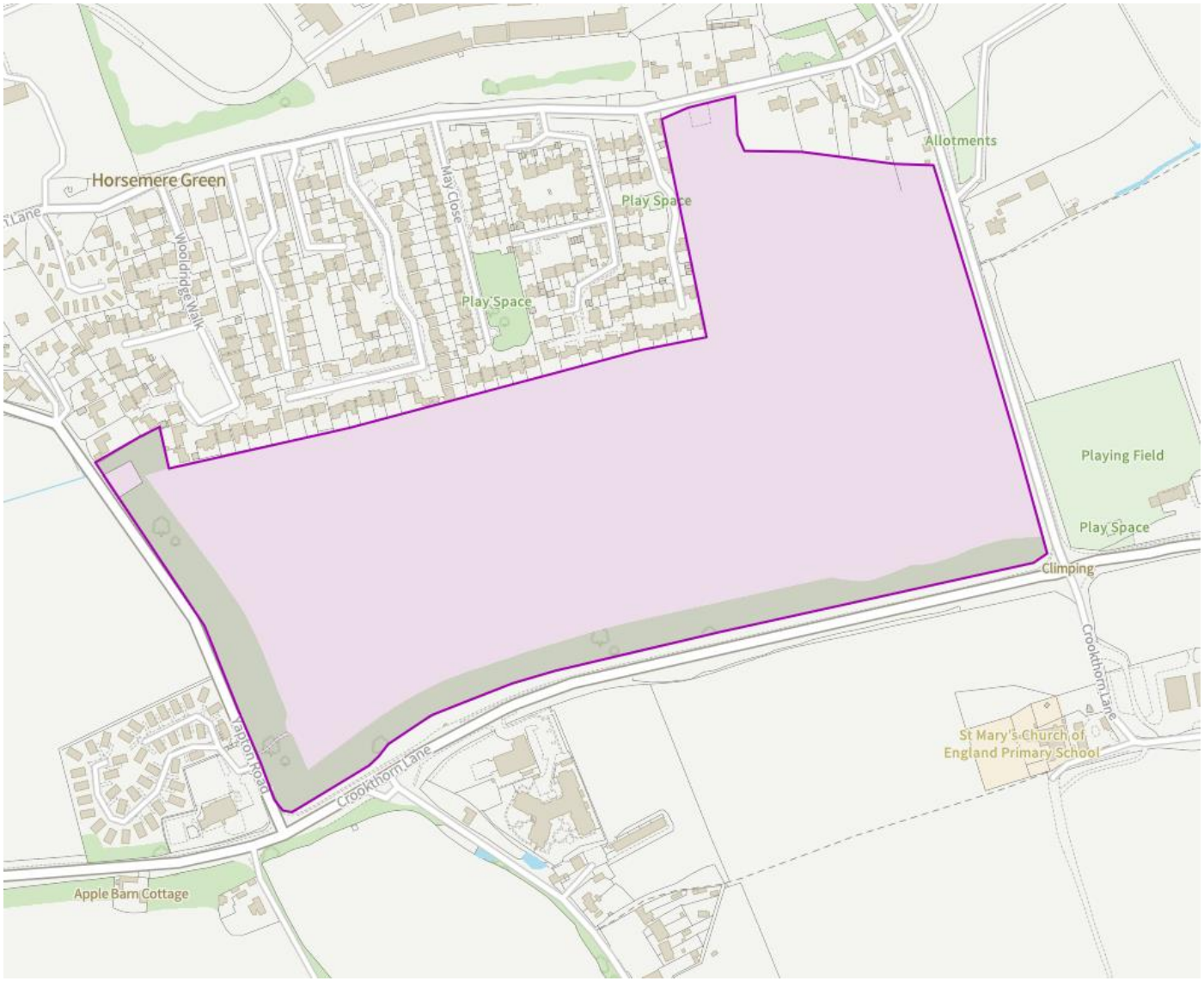
# FIGURES




Site Boundary

| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 1 – Site Location Plan** | **GWPR6003** |

ground&water




| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 2 – Proposed Development Plan** | **GWPR6003** |

ground&water




| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 3 – Aerial Photograph** | **GWPR6003** |

ground&water

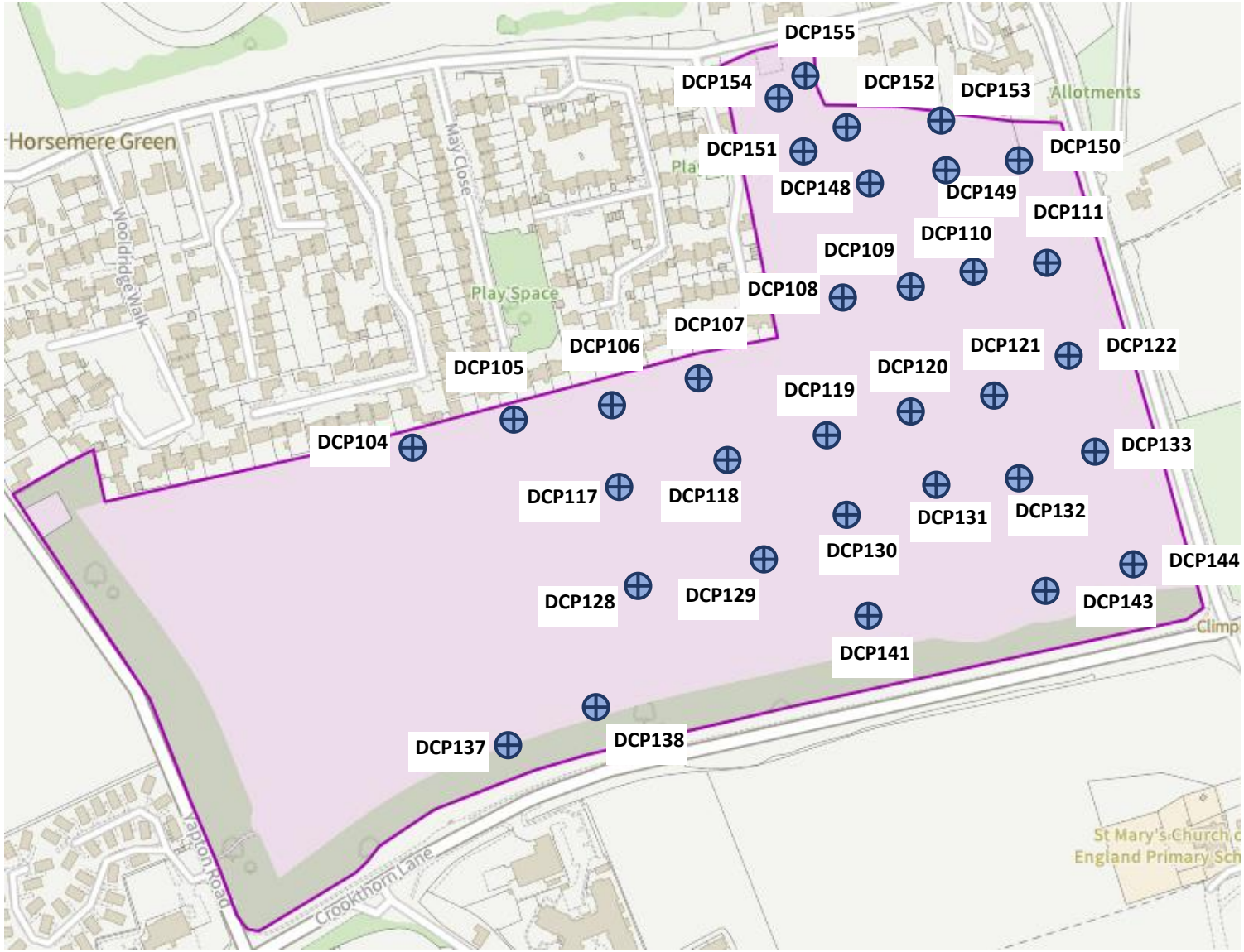



| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 4 –Proposed Development Plan** | **GWPR6003** |




| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 5 –Trial Hole Location Plan (WS, BRE, CBR)** | **GWPR6003** |

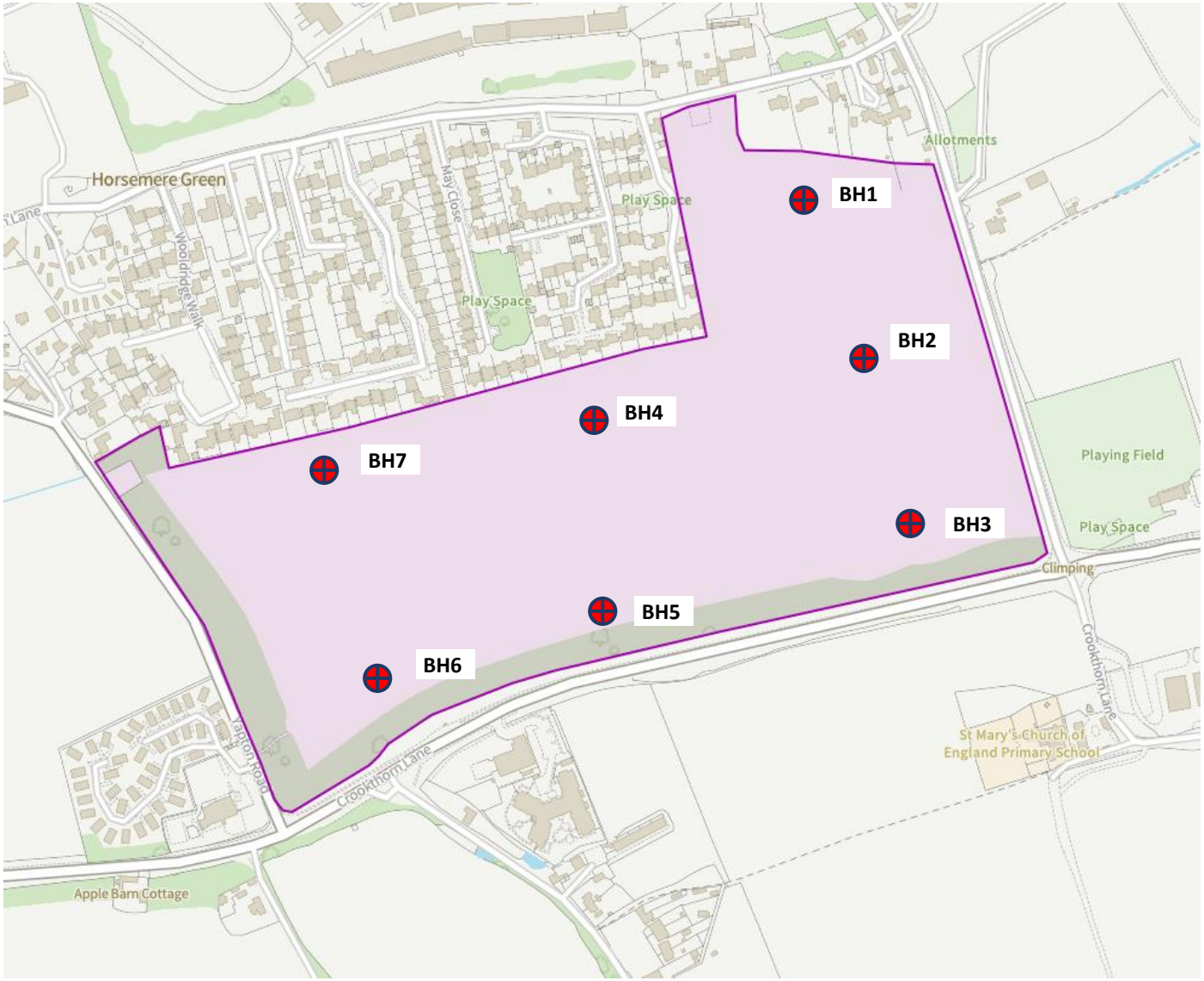
ground&water




CPT Test Locations

| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 6 – Trial Hole Location Plan (CPT)** | **GWPR6003** |

ground&water




Cable Percussion Borehole

| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 7 – Trial Hole Location Plan (BH)** | **GWPR6003** |

ground&water



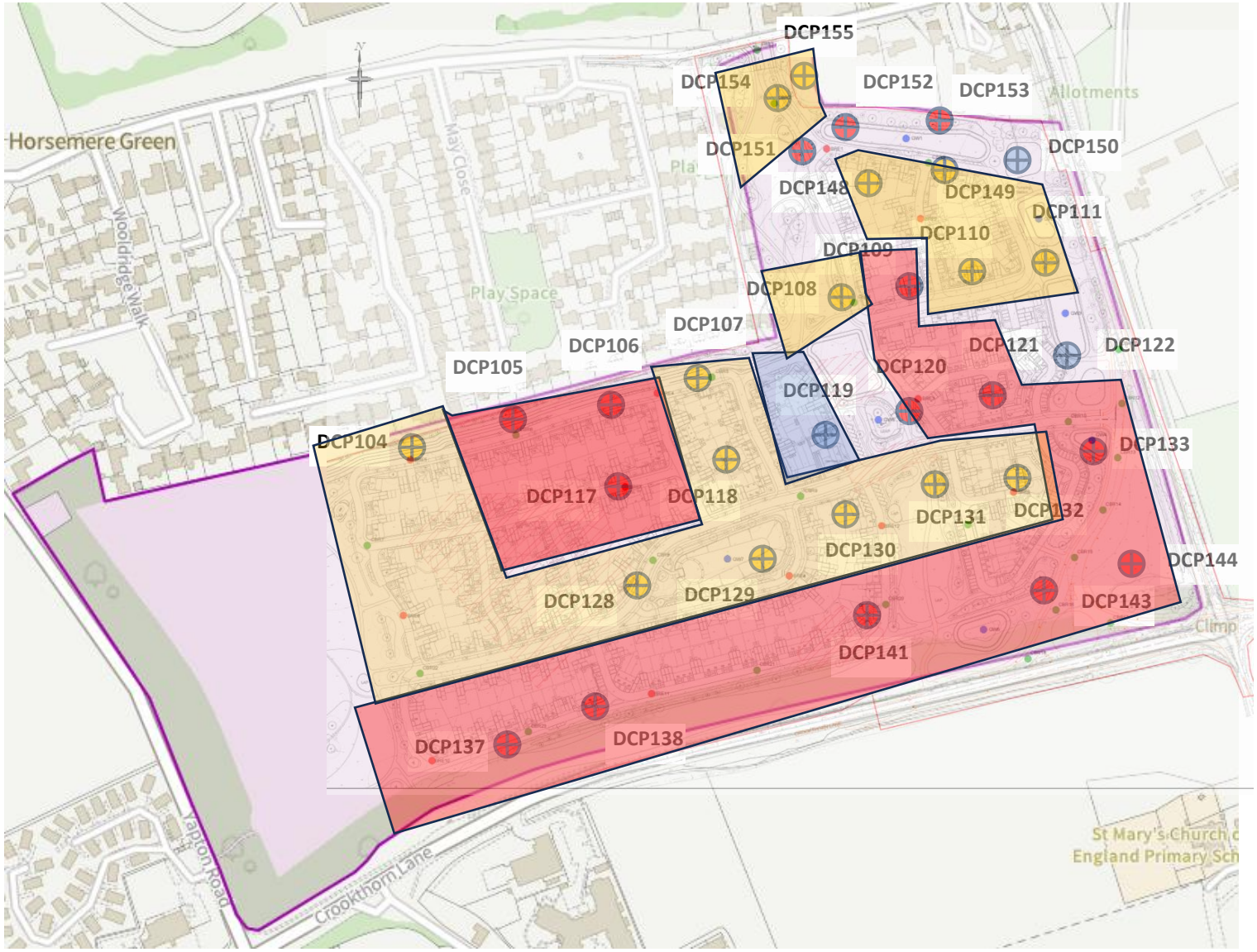
Large Body of standing Water on the southern portion of the site





Soakaway test pit, before any water had been filled. Groundwater levels had risen to close to ground level. No soakaway tests were undertaken in pits BRE4-BRE8 and BRE10-BRE12.

| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 8 –Groundwater Conditions Photos** | **GWPR6003** |




CPT Test Location- 1.00m bgl foundation design

CPT Test Location- 2.00m bgl foundation design

CPT Test Location- Piled foundation design

| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 9 – Foundation solution** | **GWPR6003** |

ground&water




| | |
|---|---|
| **Land adj. to Church Lane, Climping, West Sussex, BN17 5GG** | |
| **Foreman Homes** | **August 2024** |
| **Figure 10 – Foundation solution** | **GWPR6003** |

ground&water

# APPENDIX A: Conditions and Limitations

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly, any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist.

The conclusions and recommendations relate to Land adj. to Church Lane, Climping, West Sussex, BN17 5GG.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Ground and Water Limited. Licence is for the sole use of the client and may not be assigned, transferred or given to a third party.

Only our client may rely on this report and should this report or any information contained in it be provided to any third party we accept no responsibility to the third party for the contents of this report save to the extent expressly outlined by us in writing in a reliance letter addressed from us to the third party.

Recipients are not permitted to publish this report outside of their organisation without our express written consent.

---

# APPENDIX B: Technical Glossary

2 The Long Barn, Norton Farm, Selborne Road, Alton, Hampshire GU34 3NB

[redacted]

# TECHNICAL GLOSSARY

The list of possible definitions within the report may be seen below. Please note that some definitions may not be relevant to this report.

**HYDROGEOLOGY:**

A **Principal Aquifer** is a layer of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

**Secondary (A) Aquifers** consist of deposits with permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Minor Aquifers.

**Secondary (B) Aquifers** consist of deposits with predominantly lower permeability layers with may stoke and yield limited amounts of groundwater due to localised features such as fissures, think permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

**Secondary Aquifers (Undifferentiated)** are assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both a minor aquifer and non-aquifer in different locations due to the variable characteristics of the rock type.

**Unproductive Strata** are rock layers with low permeability that have negligible significance for water supply or river base flow. These were formerly classified as non-aquifers.

**FLOOD ZONES:**

**Environment Agency Flood Zone 2**, defined as; land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.

**Environment Agency Flood Zone 3** shows the extent of a river flood with a 1 in 100 (1%0 or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year.

**Environment Agency Flood Zone 3 area that benefits from flood defences**, defined as; land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

**GROUNDWATER SOURCE PROTECTION ZONES (SPZS):**

**Inner Zone (SPZ1):** This zone is 50 day travel time of pollutant to source with a 50 metres default minimum radius.

**Outer Zone (SPZ2):** This zone is 400 day travel time of pollutant to source. This has a 250 or 500 metres minimum radius around the source depending on the amount of water taken.

**Total Catchment (SPZ3):** This is the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.

**Zone of Special Interest (SPZ4):** This zone is where local conditions require additional protection.

**IN-SITU STRENGTH GEOTECHNICAL TESTING:**

**Windowless Sample and/or Cable Percussion and/or Rotary Boreholes** provide samples of the ground for assessment but they do not give any engineering data. The standard penetration test (SPT) is an in-situ dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The test uses a thick-walled sample tube, with an outside diameter of 50mm and an inside diameter of 35mm, and a length of around 650mm. This is driven into the ground at the bottom of a borehole by blows from a slide hammer with a weight of 63.5kg falling through a distance of 760mm. The sample tube is driven 150mm into the ground and then the number of blows needed for the tube to penetrate each 75mm up to a depth of 450mm is recorded. The sum of the number of blows is termed the "standard penetration resistance" or the "N-value".

**Dynamic Probing** involves the driving of a metal cone into the ground via a series of steel rods. These rods are driven from the surface by a hammer system that lifts and drops a 63.5kg (SHDP) hammer onto the top of the rods through a set height, thus ensuring a consistent energy input. The number of hammer blows that are required to drive the cone down by each 100mm increment are recorded. These blow counts then provide a comparative assessment from which correlations have been published, based on dynamic energy, which permits engineering parameters to be generated. (The Dynamic Probe ‘Super Heavy’ (SHDP) Tests were conducted in accordance with BS 1377; 1990; Part 9, Clause 3.2).

[redacted]

# APPENDIX C: Groundsure Historical Mapping and GeoInsight Report

[redacted]

Groundsure LOCATION INTELLIGENCE

Geo Insight

# Land adj. to Church Lane Climping West Sussex BN17 5GG

## Order Details

**Date:** 28/02/2024

**Your ref:** GWPR5903 Church Lane Climping West Sussex

**Our Ref:** GS-AUV-5SM-6U7-YEE

## Site Details

**Location:** 500037 102014

**Area:** 25.46 ha

**Authority:** Arun District Council ↗





**Summary of findings** p. 2 >

**OS MasterMap site plan** N/A: >10ha

**Aerial image** p. 5 >

groundsure.com/insightuserguide ↗


[redacted]

Certified B Corporation

# Summary of findings

| Page | Section | Geology 1:10,000 scale > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 10 > | 1.1 > | 10k Availability > | Identified (within 500m) | | | | |
| 11 | 1.2 | Artificial and made ground (10k) | 0 | 0 | 0 | 0 | - |
| 12 > | 1.3 > | Superficial geology (10k) > | 4 | 0 | 1 | 2 | - |
| 13 | 1.4 | Landslip (10k) | 0 | 0 | 0 | 0 | - |
| 14 > | 1.5 > | Bedrock geology (10k) > | 2 | 0 | 0 | 0 | - |
| 15 | 1.6 | Bedrock faults and other linear features (10k) | 0 | 0 | 0 | 0 | - |
| Page | Section | Geology 1:50,000 scale > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 16 > | 2.1 > | 50k Availability > | Identified (within 500m) | | | | |
| 17 | 2.2 | Artificial and made ground (50k) | 0 | 0 | 0 | 0 | - |
| 17 | 2.3 | Artificial ground permeability (50k) | 0 | 0 | - | - | - |
| 18 > | 2.4 > | Superficial geology (50k) > | 2 | 0 | 1 | 0 | - |
| 19 > | 2.5 > | Superficial permeability (50k) > | Identified (within 50m) | | | | |
| 19 | 2.6 | Landslip (50k) | 0 | 0 | 0 | 0 | - |
| 19 | 2.7 | Landslip permeability (50k) | None (within 50m) | | | | |
| 20 > | 2.8 > | Bedrock geology (50k) > | 1 | 0 | 0 | 0 | - |
| 21 > | 2.9 > | Bedrock permeability (50k) > | Identified (within 50m) | | | | |
| 21 | 2.10 | Bedrock faults and other linear features (50k) | 0 | 0 | 0 | 0 | - |
| Page | Section | Boreholes > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 22 > | 3.1 > | BGS Boreholes > | 0 | 0 | 1 | - | - |
| Page | Section | Natural ground subsidence > | | | | | |
| 23 > | 4.1 > | Shrink swell clays > | Low (within 50m) | | | | |
| 24 > | 4.2 > | Running sands > | Low (within 50m) | | | | |
| 26 > | 4.3 > | Compressible deposits > | Negligible (within 50m) | | | | |
| 27 > | 4.4 > | Collapsible deposits > | Low (within 50m) | | | | |
| 28 > | 4.5 > | Landslides > | Very low (within 50m) | | | | |
| 29 > | 4.6 > | Ground dissolution of soluble rocks > | Very low (within 50m) | | | | |

| Page | Section | Mining and ground workings > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 31 | 5.1 | BritPits | 0 | 0 | 0 | 0 | - |
| 32 > | 5.2 > | Surface ground workings > | 0 | 0 | 9 | - | - |
| 32 | 5.3 | Underground workings | 0 | 0 | 0 | 0 | 0 |
| 32 | 5.4 | Underground mining extents | 0 | 0 | 0 | 0 | - |
| 33 | 5.5 | Historical Mineral Planning Areas | 0 | 0 | 0 | 0 | - |
| 33 | 5.6 | Non-coal mining | 0 | 0 | 0 | 0 | 0 |
| 33 | 5.7 | JPB mining areas | None (within 0m) | | | | |
| 33 | 5.8 | The Coal Authority non-coal mining | 0 | 0 | 0 | 0 | - |
| 34 | 5.9 | Researched mining | 0 | 0 | 0 | 0 | - |
| 34 | 5.10 | Mining record office plans | 0 | 0 | 0 | 0 | - |
| 34 | 5.11 | BGS mine plans | 0 | 0 | 0 | 0 | - |
| 34 | 5.12 | Coal mining | None (within 0m) | | | | |
| 34 | 5.13 | Brine areas | None (within 0m) | | | | |
| 35 | 5.14 | Gypsum areas | None (within 0m) | | | | |
| 35 | 5.15 | Tin mining | None (within 0m) | | | | |
| 35 | 5.16 | Clay mining | None (within 0m) | | | | |

| Page | Section | Ground cavities and sinkholes | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 36 | 6.1 | Natural cavities | 0 | 0 | 0 | 0 | - |
| 36 | 6.2 | Mining cavities | 0 | 0 | 0 | 0 | 0 |
| 36 | 6.3 | Reported recent incidents | 0 | 0 | 0 | 0 | - |
| 36 | 6.4 | Historical incidents | 0 | 0 | 0 | 0 | - |
| 37 | 6.5 | National karst database | 0 | 0 | 0 | 0 | - |

| Page | Section | Radon > | |
|---|---|---|---|
| 38 > | 7.1 > | Radon > | Less than 1% (within 0m) |

| Page | Section | Soil chemistry > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 40 > | 8.1 > | BGS Estimated Background Soil Chemistry > | 7 | 0 | - | - | - |
| 40 | 8.2 | BGS Estimated Urban Soil Chemistry | 0 | 0 | - | - | - |
| 41 | 8.3 | BGS Measured Urban Soil Chemistry | 0 | 0 | - | - | - |

| Page | Section | Railway infrastructure and projects | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 42 | 9.1 | Underground railways (London) | 0 | 0 | 0 | - | - |
| 42 | 9.2 | Underground railways (Non-London) | 0 | 0 | 0 | - | - |
| 42 | 9.3 | Railway tunnels | 0 | 0 | 0 | - | - |
| 42 | 9.4 | Historical railway and tunnel features | 0 | 0 | 0 | - | - |
| 42 | 9.5 | Royal Mail tunnels | 0 | 0 | 0 | - | - |
| 43 | 9.6 | Historical railways | 0 | 0 | 0 | - | - |
| 43 | 9.7 | Railways | 0 | 0 | 0 | - | - |
| 43 | 9.8 | Crossrail 1 | 0 | 0 | 0 | 0 | - |
| 43 | 9.9 | Crossrail 2 | 0 | 0 | 0 | 0 | - |
| 43 | 9.10 | HS2 | 0 | 0 | 0 | 0 | - |

## Recent aerial photograph




Capture Date: 20/04/2021

Site Area: 25.46ha

## Recent site history - 2018 aerial photograph




Capture Date: 28/06/2018

Site Area: 25.46ha

[redacted]

## Recent site history - 2012 aerial photograph




Capture Date: 13/09/2012

Site Area: 25.46ha

[redacted]

## Recent site history - 2010 aerial photograph




Capture Date: 24/04/2010

Site Area: 25.46ha

## Recent site history - 1999 aerial photograph

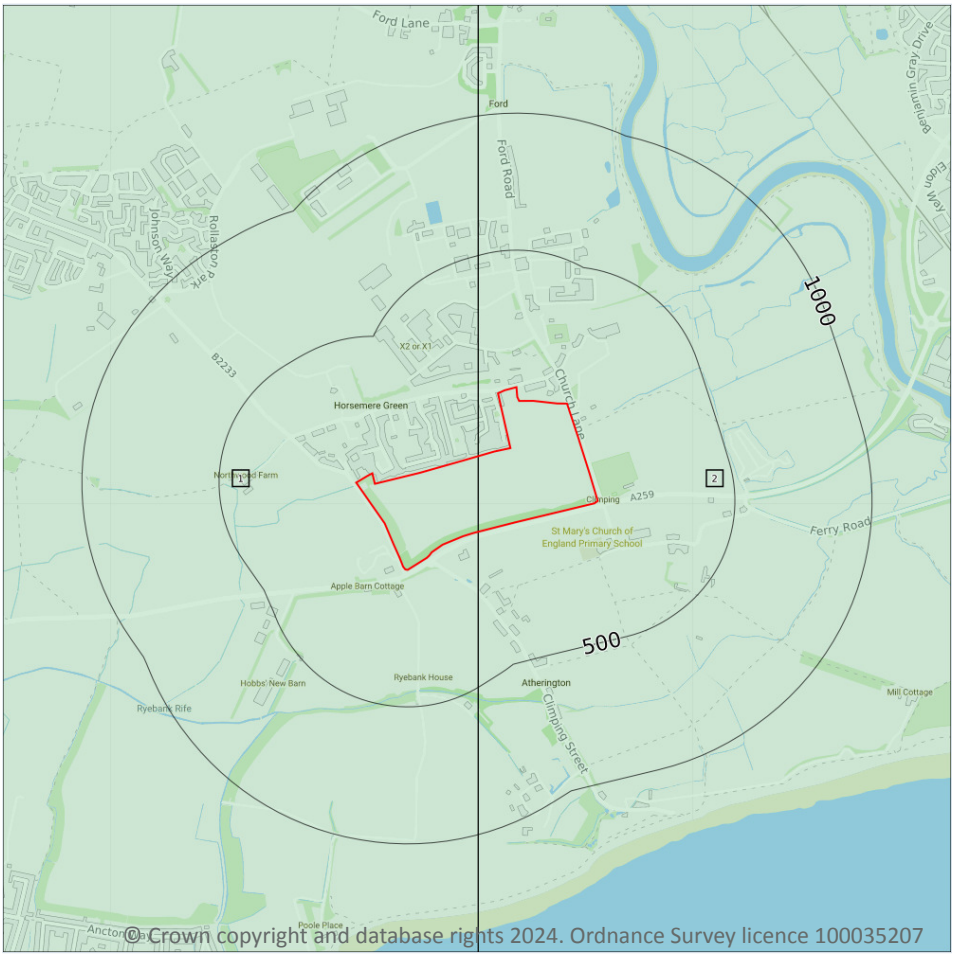



Capture Date: 25/07/1999

Site Area: 25.46ha

[redacted]

# 1 Geology 1:10,000 scale - Availability




Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

## 1.1 10k Availability

| Records within 500m | 2 |
|---|---|

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

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

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **No coverage** | **Full** | **Full** | **No coverage** | **SU90SE** |
| **2** | **On site** | **Full** | **Full** | **Full** | **No coverage** | **TQ00SW** |

*This data is sourced from the British Geological Survey.*

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

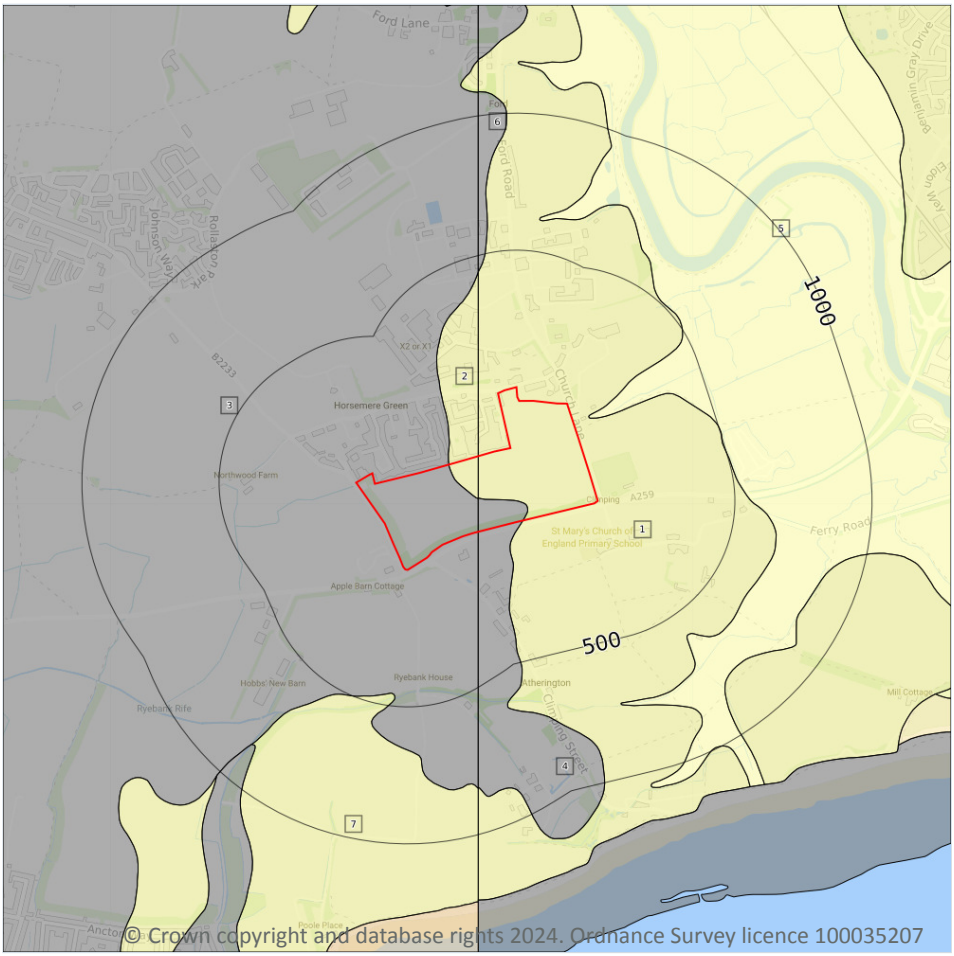
## 1.2 Artificial and made ground (10k)

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

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

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Superficial




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Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

## 1.3 Superficial geology (10k)

**Records within 500m** **7**

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 12 >**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **RBD1-V** | **Raised Beach Deposits, 1 - Gravel** | **Gravel** |
| **2** | **On site** | **RBD1-XSV** | **Raised Beach Deposits, 1 - Sand And Gravel** | **Sand And Gravel** |
| **3** | **On site** | **RTDU-Z** | **River Terrace Deposits (undifferentiated) - Silt (unlithified Deposits Coding Scheme)** | **Silt** |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **4** | **On site** | **BRK-Z** | **Brickearth - Silt** | **Silt** |
| 5 | 61m NE | TRD-XSZC | Tidal River Or Creek Deposits - Sand, Silt And Clay | Sand, Silt And Clay |
| 6 | 442m N | BRK-Z | Brickearth - Silt | Silt |
| 7 | 454m SW | RBD1-XSV | Raised Beach Deposits, 1 - Sand And Gravel | Sand And Gravel |

*This data is sourced from the British Geological Survey.*

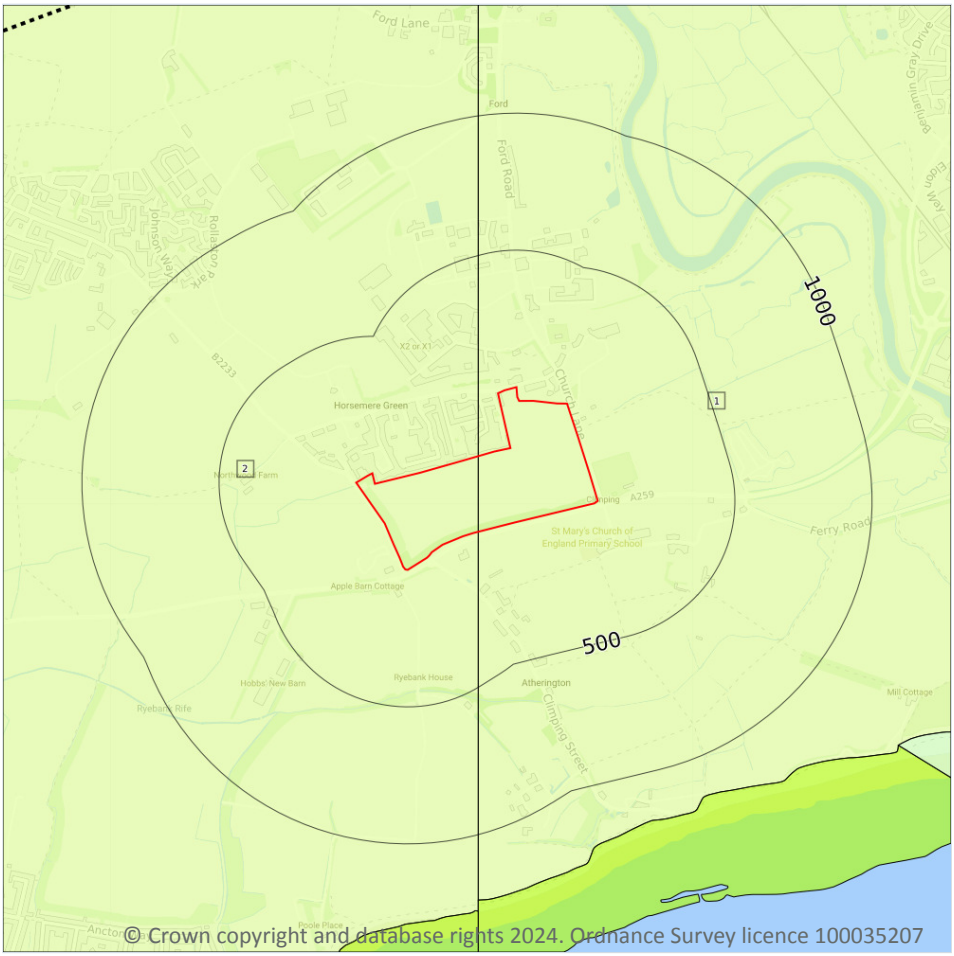
## 1.4 Landslip (10k)

| **Records within 500m** | **0** |
|---|---|

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Bedrock




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Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

## 1.5 Bedrock geology (10k)

| Records within 500m | 2 |
|---|---|

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 14 >**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **LPCK-CHLK** | **Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown Chalk Formation (undifferentiated) - Chalk** | **Campanian Age - Turonian Age** |

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **2** | **On site** | **LPCK-CHLK** | **Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown Chalk Formation (undifferentiated) - Chalk** | **Campanian Age - Turonian Age** |

*This data is sourced from the British Geological Survey.*

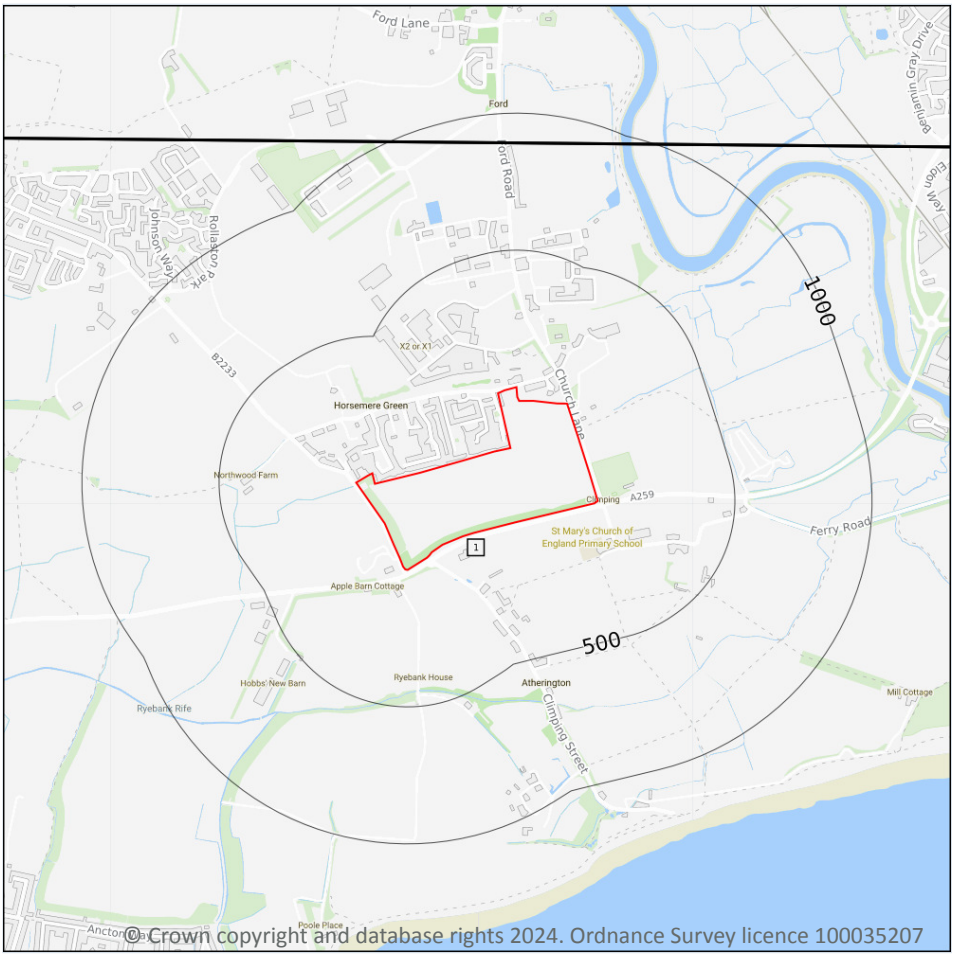
## 1.6 Bedrock faults and other linear features (10k)

| **Records within 500m** | **0** |
|---|---|

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

*This data is sourced from the British Geological Survey.*

# 2 Geology 1:50,000 scale - Availability




Site Outline

Search buffers in metres (m)

Geological map tile

## 2.1 50k Availability

| Records within 500m | 1 |
|---|---|

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

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 16 >**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **Full** | **Full** | **Full** | **Full** | **EW317_332_chichester_and_** |

*This data is sourced from the British Geological Survey.*

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

## 2.2 Artificial and made ground (50k)

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

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

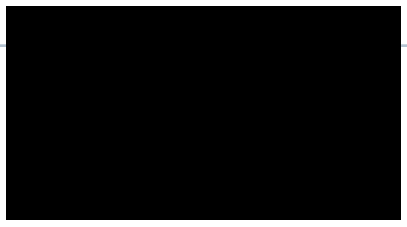
*This data is sourced from the British Geological Survey.*

## 2.3 Artificial ground permeability (50k)

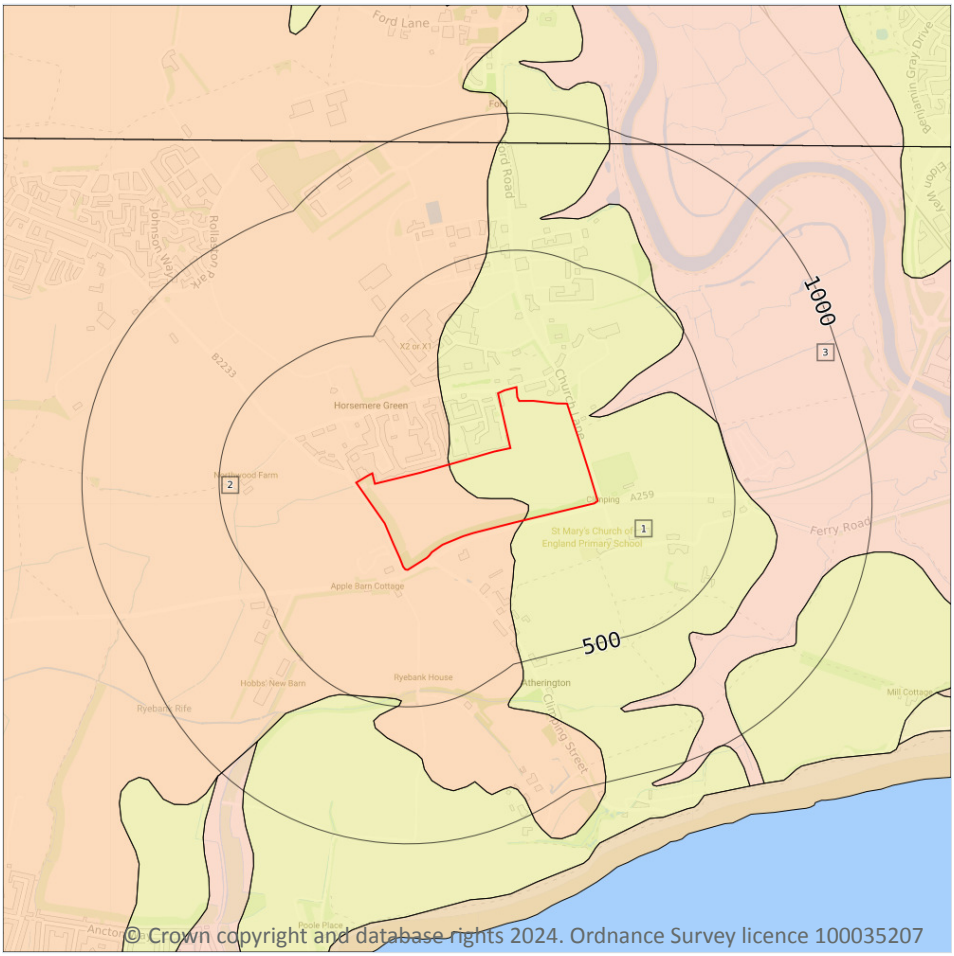
| Records within 50m | 0 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*



# Geology 1:50,000 scale - Superficial




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Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

## 2.4 Superficial geology (50k)

**Records within 500m** **3**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 18 >**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **RBD1-XSV** | **RAISED BEACH DEPOSITS, 1** | **SAND AND GRAVEL** |
| **2** | **On site** | **RTDU-XSZC** | **RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)** | **SAND, SILT AND CLAY** |
| 3 | 65m NE | RMD-XCZSV | RAISED MARINE DEPOSITS | CLAY, SILT, SAND AND GRAVEL |

*This data is sourced from the British Geological Survey.*

## 2.5 Superficial permeability (50k)

| Records within 50m | 4 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Intergranular** | **Very High** | **High** |
| **On site** | **Intergranular** | **Very High** | **High** |
| **On site** | **Intergranular** | **High** | **Low** |
| **On site** | **Intergranular** | **High** | **Low** |

*This data is sourced from the British Geological Survey.*

## 2.6 Landslip (50k)

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

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

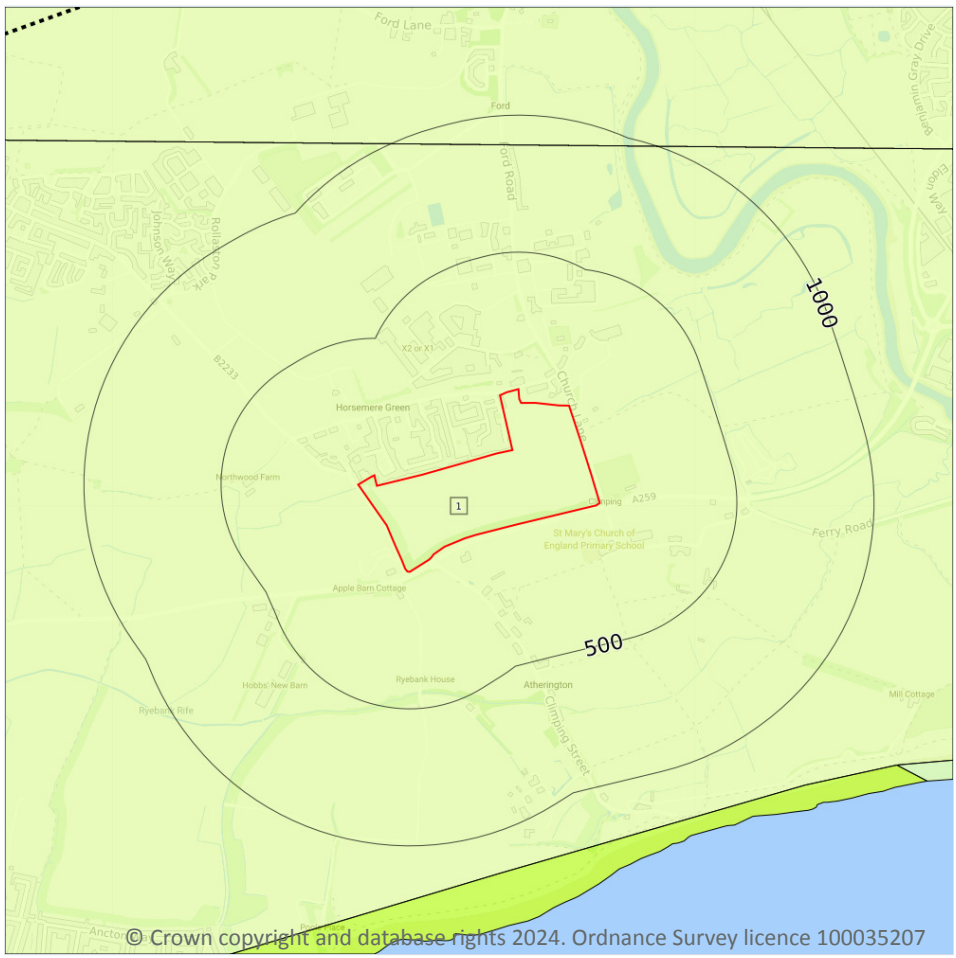
## 2.7 Landslip permeability (50k)

| Records within 50m | 0 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Bedrock




Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

## 2.8 Bedrock geology (50k)

| Records within 500m | 1 |
|---|---|

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 20 >**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **LPCK-CHLK** | **LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED) - CHALK** | **TURONIAN** |

*This data is sourced from the British Geological Survey.*

## 2.9 Bedrock permeability (50k)

| Records within 50m | 2 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Fracture** | **Very High** | **Very High** |
| **On site** | **Fracture** | **Very High** | **Very High** |

*This data is sourced from the British Geological Survey.*

## 2.10 Bedrock faults and other linear features (50k)

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

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

*This data is sourced from the British Geological Survey.*

# 3 Boreholes




Site Outline

Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

## 3.1 BGS Boreholes

| Records within 250m | 1 |
|---|---|

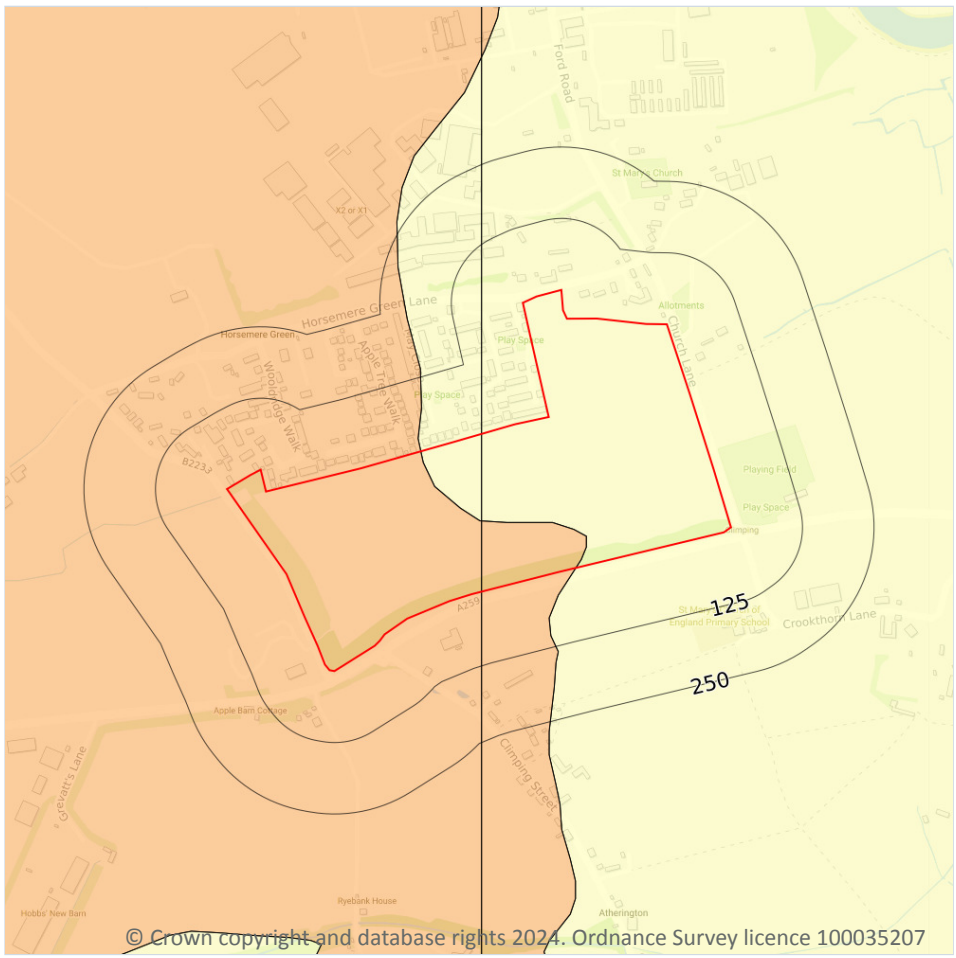
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 22 >**

| ID | Location | Grid reference | Name | Length | Confidential | Web link |
|---|---|---|---|---|---|---|
| 1 | 223m NE | 500529 102392 | PROPOSED LANDFILL SITE W.SUSSEX BH24 | 6.0 | N | 569845 ↗ |

*This data is sourced from the British Geological Survey.*

# 4 Natural ground subsidence - Shrink swell clays




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 4.1 Shrink swell clays

| Records within 50m | 2 |
|---|---|

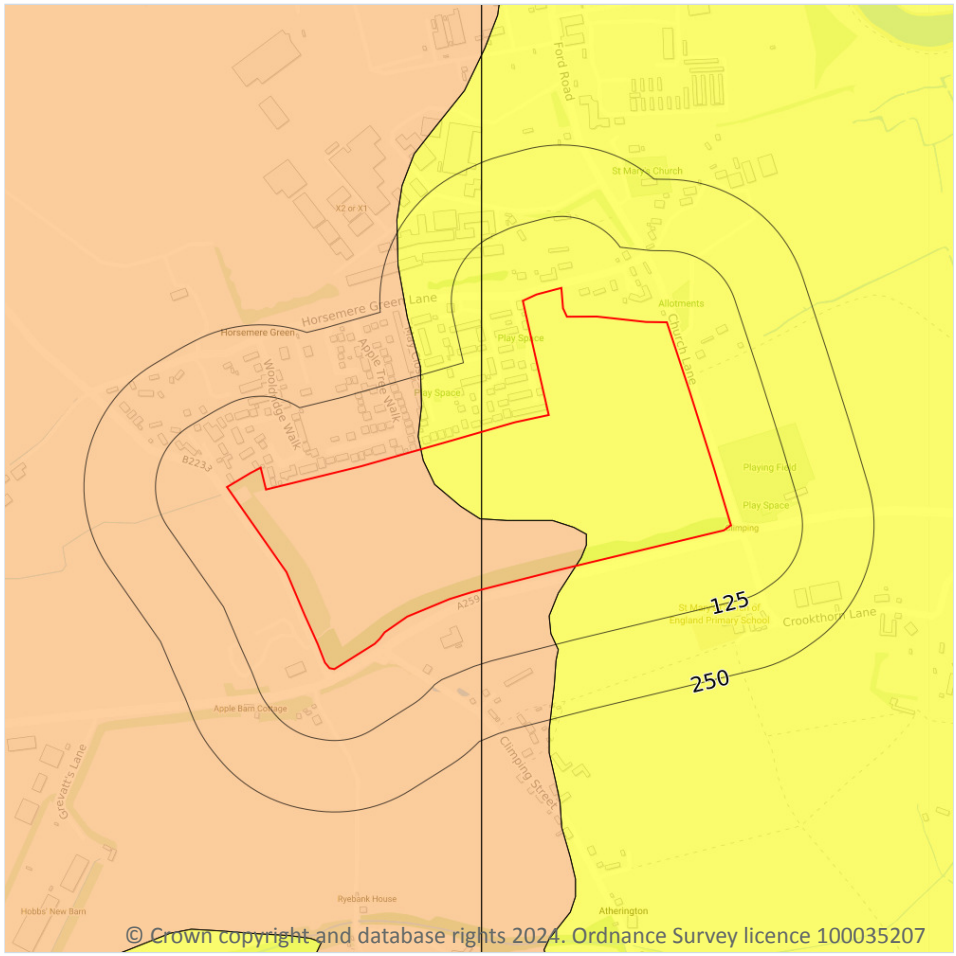
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 23 >**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Ground conditions predominantly non-plastic.** |
| **On site** | **Low** | **Ground conditions predominantly medium plasticity.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Running sands




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 4.2 Running sands

| Records within 50m | 2 |
|---|---|

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 24 >**

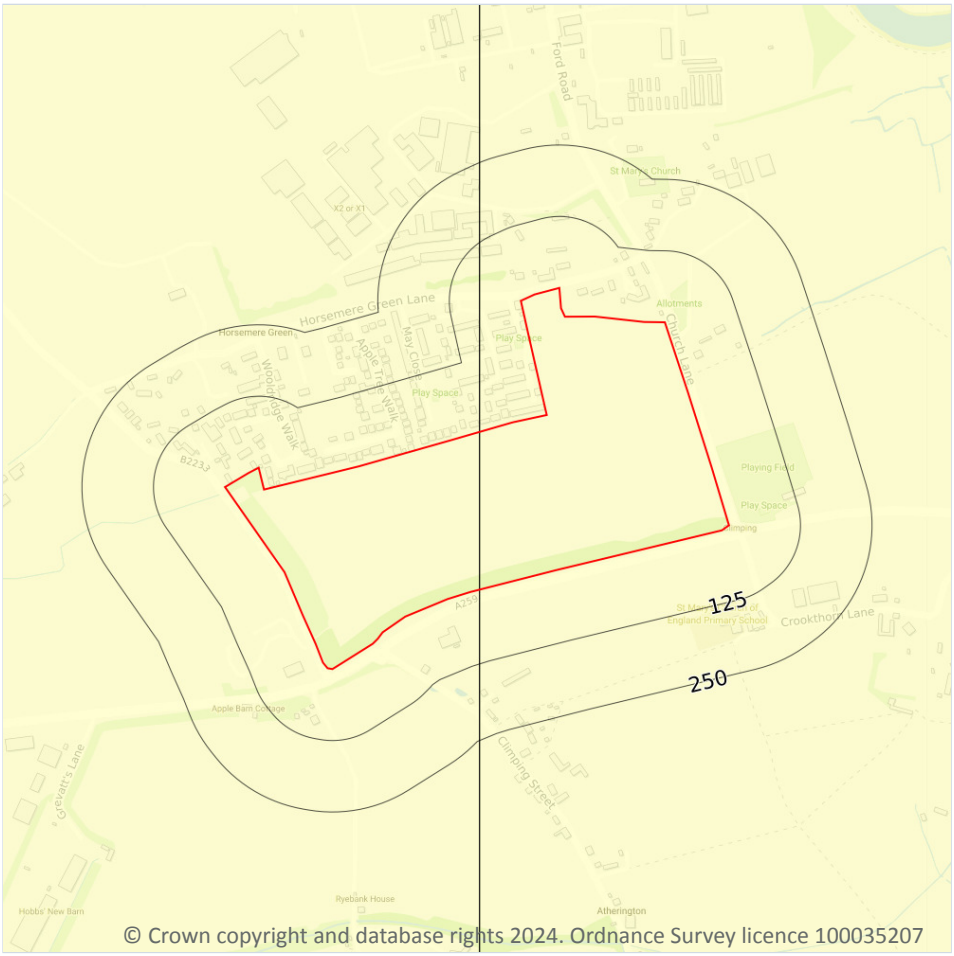
| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.** |

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Low** | **Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.** |

*This data is sourced from the British Geological Survey.*



# Natural ground subsidence - Compressible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 4.3 Compressible deposits

| Records within 50m | 1 |
|---|---|

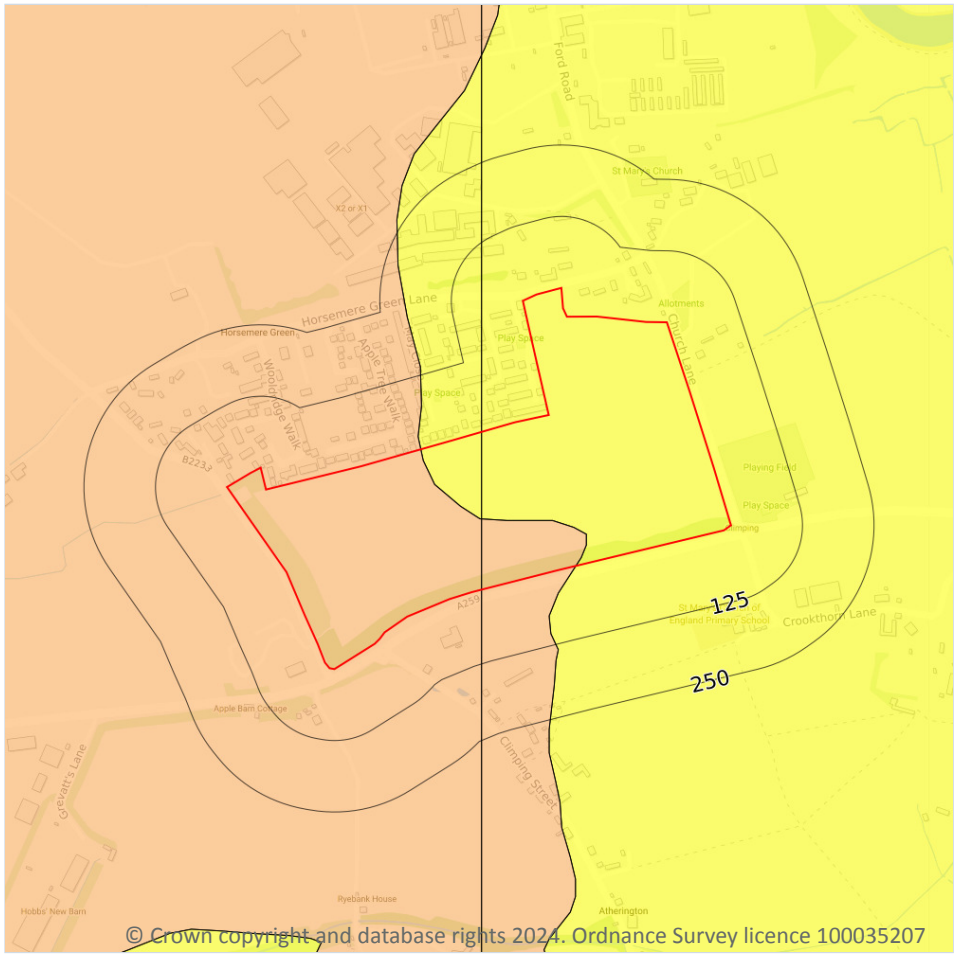
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 26 >**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Compressible strata are not thought to occur.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Collapsible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 4.4 Collapsible deposits

| Records within 50m | 2 |
|---|---|

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

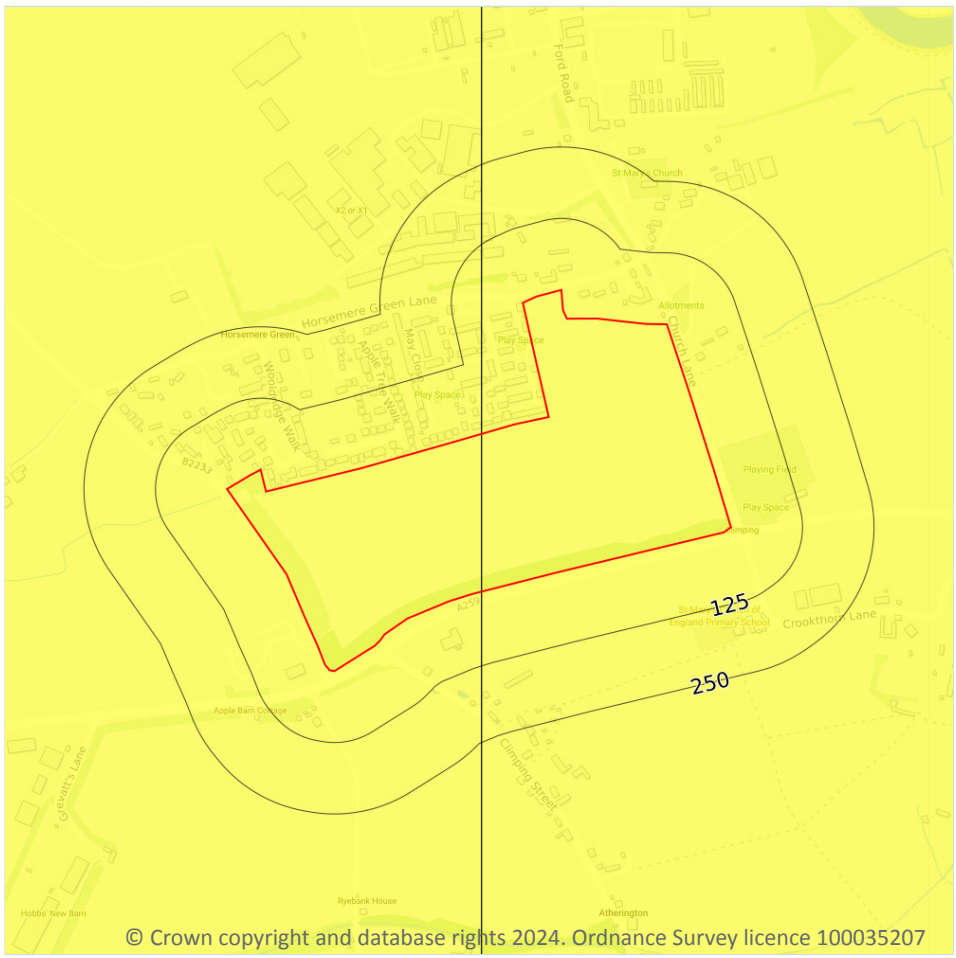
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 27 >**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Deposits with potential to collapse when loaded and saturated are unlikely to be present.** |
| **On site** | **Low** | **Deposits with potential to collapse when loaded and saturated are possibly present in places.** |

*This data is sourced from the British Geological Survey.*

[redacted]

# Natural ground subsidence - Landslides




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 4.5 Landslides

| Records within 50m | 1 |
|---|---|

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

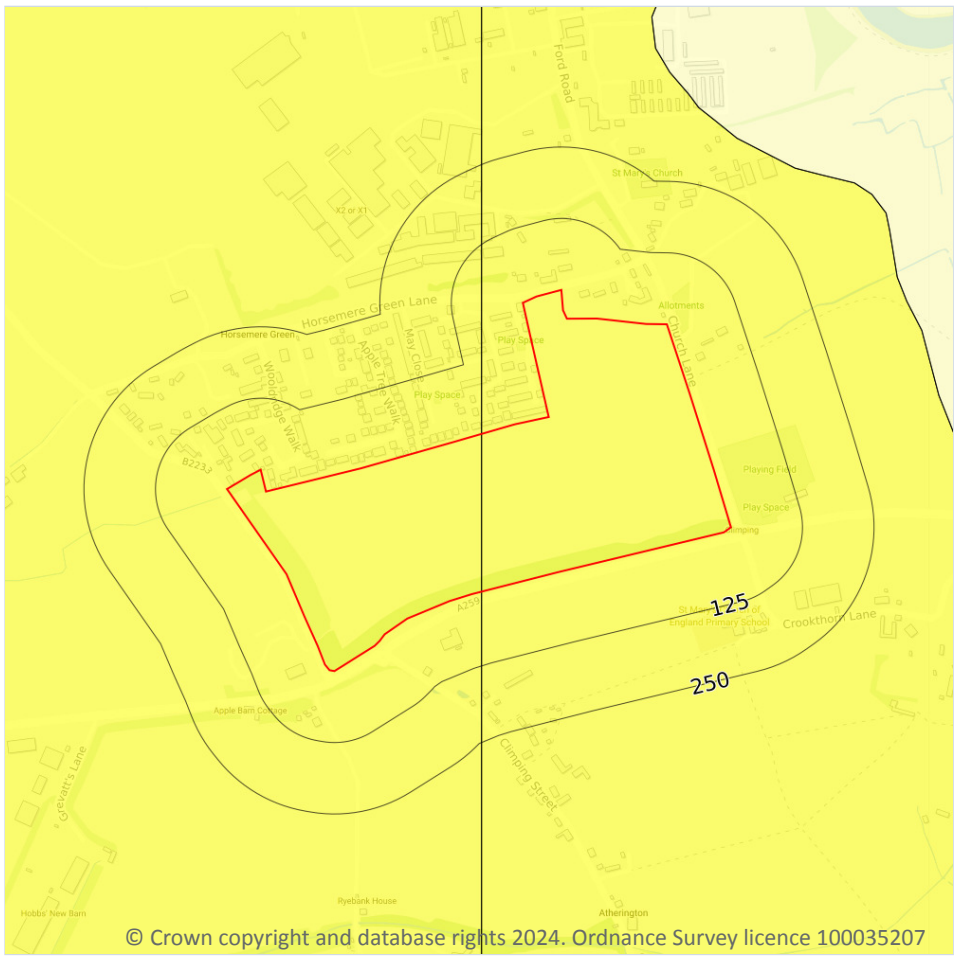
Features are displayed on the Natural ground subsidence - Landslides map on **page 28 >**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.** |

*This data is sourced from the British Geological Survey.*

[redacted]

# Natural ground subsidence - Ground dissolution of soluble rocks




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 4.6 Ground dissolution of soluble rocks

| Records within 50m | 1 |
|---|---|

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

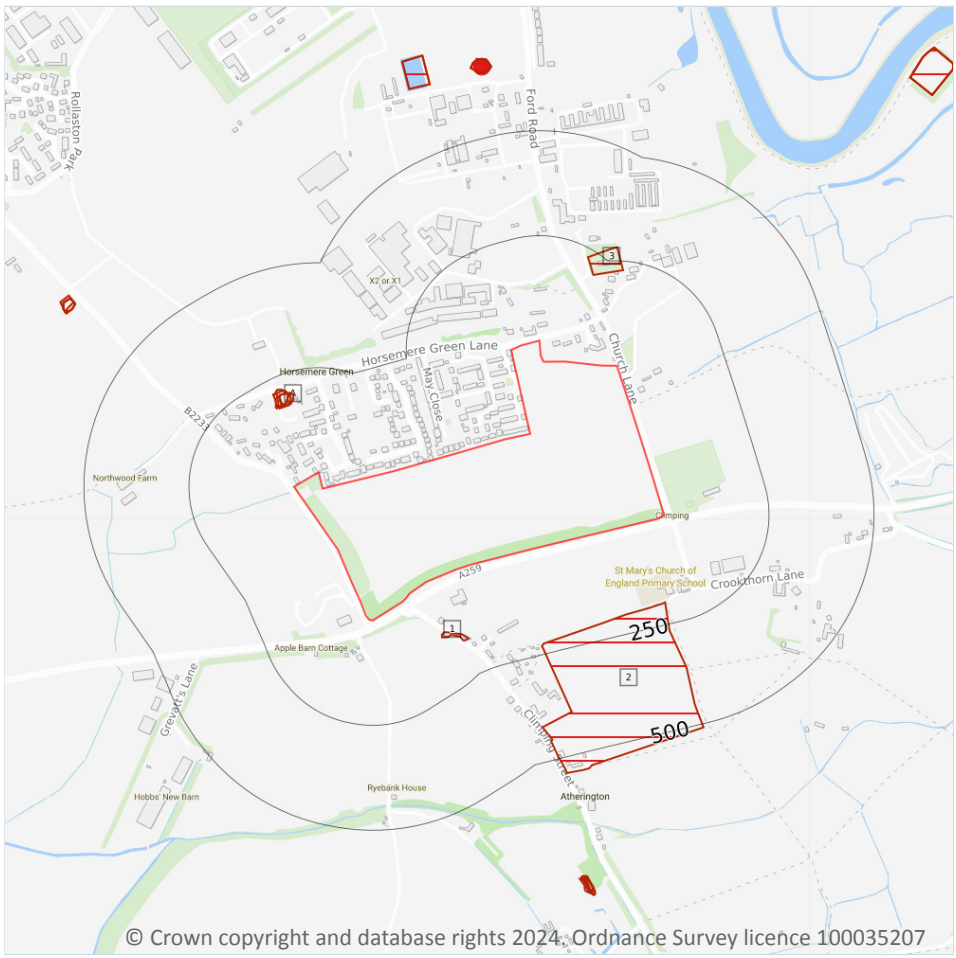
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 29 >**

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

[redacted]

*This data is sourced from the British Geological Survey.*

# 5 Mining and ground workings




Site Outline

Search buffers in metres (m)

BritPits

Surface ground workings

Underground workings

Underground mining extents

Historical mineral planning areas

TCA non-coal mining

Non Coal Mining

Sporadic underground mining of restricted extent possible

Localised small scale underground mining possible

Small scale mining possible

Underground mining known or likely within or in close proximity

Underground mining known within or in very close proximity

## 5.1 BritPits

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

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

*This data is sourced from the British Geological Survey.*

[redacted]

## 5.2 Surface ground workings

| Records within 250m | 9 |
|---|---|

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

Features are displayed on the Mining and ground workings map on **page 31 >**

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| 1 | 122m S | Ponds | 1876 | 1:10560 |
| A | 176m W | Pond | 1991 | 1:10000 |
| A | 176m W | Pond | 1978 | 1:10000 |
| A | 176m W | Pond | 1896 | 1:10560 |
| A | 180m W | Pond | 1950 | 1:10560 |
| A | 180m W | Pond | 1910 | 1:10560 |
| A | 181m W | Pond | 1876 | 1:10560 |
| 2 | 198m SE | Sewage Works | 1992 | 1:10000 |
| 3 | 202m NE | Grave Yard | 1876 | 1:10560 |

*This is data is sourced from Ordnance Survey/Groundsure.*

## 5.3 Underground workings

| Records within 1000m | 0 |
|---|---|

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

*This is data is sourced from Ordnance Survey/Groundsure.*

## 5.4 Underground mining extents

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

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

*This data is sourced from Groundsure.*

## 5.5 Historical Mineral Planning Areas

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

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

*This data is sourced from the British Geological Survey.*

## 5.6 Non-coal mining

| Records within 1000m | 0 |
|---|---|

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

*This data is sourced from the British Geological Survey.*

## 5.7 JPB mining areas

| Records on site | 0 |
|---|---|

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

*This data is sourced from Johnson Poole and Bloomer.*

## 5.8 The Coal Authority non-coal mining

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

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

*This data is sourced from The Coal Authority.*

## 5.9 Researched mining

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

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

*This data is sourced from Groundsure.*

## 5.10 Mining record office plans

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

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

*This data is sourced from Groundsure.*

## 5.11 BGS mine plans

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

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

*This data is sourced from Groundsure.*

## 5.12 Coal mining

| Records on site | 0 |
|---|---|

Areas which could be affected by past, current or future coal mining.

*This data is sourced from the Coal Authority.*

## 5.13 Brine areas

| Records on site | 0 |
|---|---|

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

*This data is sourced from the Cheshire Brine Subsidence Compensation Board.*

## 5.14 Gypsum areas

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by gypsum extraction.

*This data is sourced from British Gypsum.*

## 5.15 Tin mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by historical tin mining.

*This data is sourced from Groundsure.*

## 5.16 Clay mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by kaolin and ball clay extraction.

*This data is sourced from the Kaolin and Ball Clay Association (UK).*

# 6 Ground cavities and sinkholes

## 6.1 Natural cavities

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

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

*This data is sourced from Stantec UK Ltd.*

## 6.2 Mining cavities

| Records within 1000m | 0 |
|---|---|

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

*This data is sourced from Stantec UK Ltd.*

## 6.3 Reported recent incidents

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

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

*This data is sourced from Groundsure.*

## 6.4 Historical incidents

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

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

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

*This data is sourced from Groundsure.*

## 6.5 National karst database

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

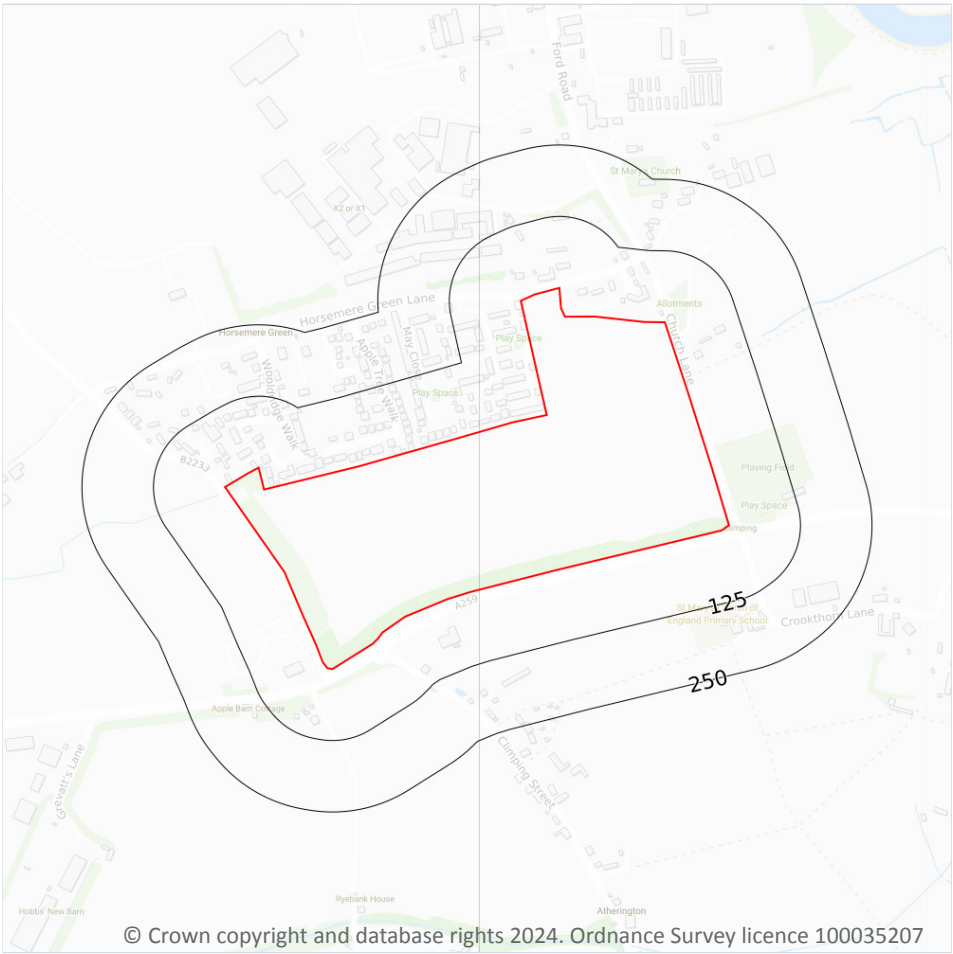
This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

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

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

*This data is sourced from the British Geological Survey.*

# 7 Radon




Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

## 7.1 Radon

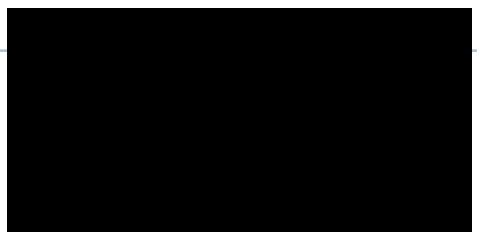
| Records on site | 1 |
|---|---|

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

Features are displayed on the Radon map on **page 38 >**

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

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



# 8 Soil chemistry

## 8.1 BGS Estimated Background Soil Chemistry

| Records within 50m | 7 |
|---|---|

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 $km^2$. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 $km^2$; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

| Location | Arsenic | Bioaccessible Arsenic | Lead | Bioaccessible Lead | Cadmium | Chromium | Nickel |
|---|---|---|---|---|---|---|---|
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |

*This data is sourced from the British Geological Survey.*

## 8.2 BGS Estimated Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per $km^2$).

*This data is sourced from the British Geological Survey.*

## 8.3 BGS Measured Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per $km^2$.

*This data is sourced from the British Geological Survey.*

# 9 Railway infrastructure and projects

## 9.1 Underground railways (London)

| Records within 250m | 0 |
|---|---|

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

*This data is sourced from publicly available information by Groundsure.*

## 9.2 Underground railways (Non-London)

| Records within 250m | 0 |
|---|---|

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

*This data is sourced from publicly available information by Groundsure.*

## 9.3 Railway tunnels

| Records within 250m | 0 |
|---|---|

Railway tunnels taken from contemporary Ordnance Survey mapping.

*This data is sourced from the Ordnance Survey.*

## 9.4 Historical railway and tunnel features

| Records within 250m | 0 |
|---|---|

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

*This data is sourced from Ordnance Survey/Groundsure.*

## 9.5 Royal Mail tunnels

| Records within 250m | 0 |
|---|---|

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.



*This data is sourced from Groundsure/the Postal Museum.*

## 9.6 Historical railways

| Records within 250m | 0 |
|---|---|

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

*This data is sourced from OpenStreetMap.*

## 9.7 Railways

| Records within 250m | 0 |
|---|---|

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

*This data is sourced from Ordnance Survey and OpenStreetMap.*

## 9.8 Crossrail 1

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

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

*This data is sourced from publicly available information by Groundsure.*

## 9.9 Crossrail 2

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

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

*This data is sourced from publicly available information by Groundsure.*

## 9.10 HS2

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

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

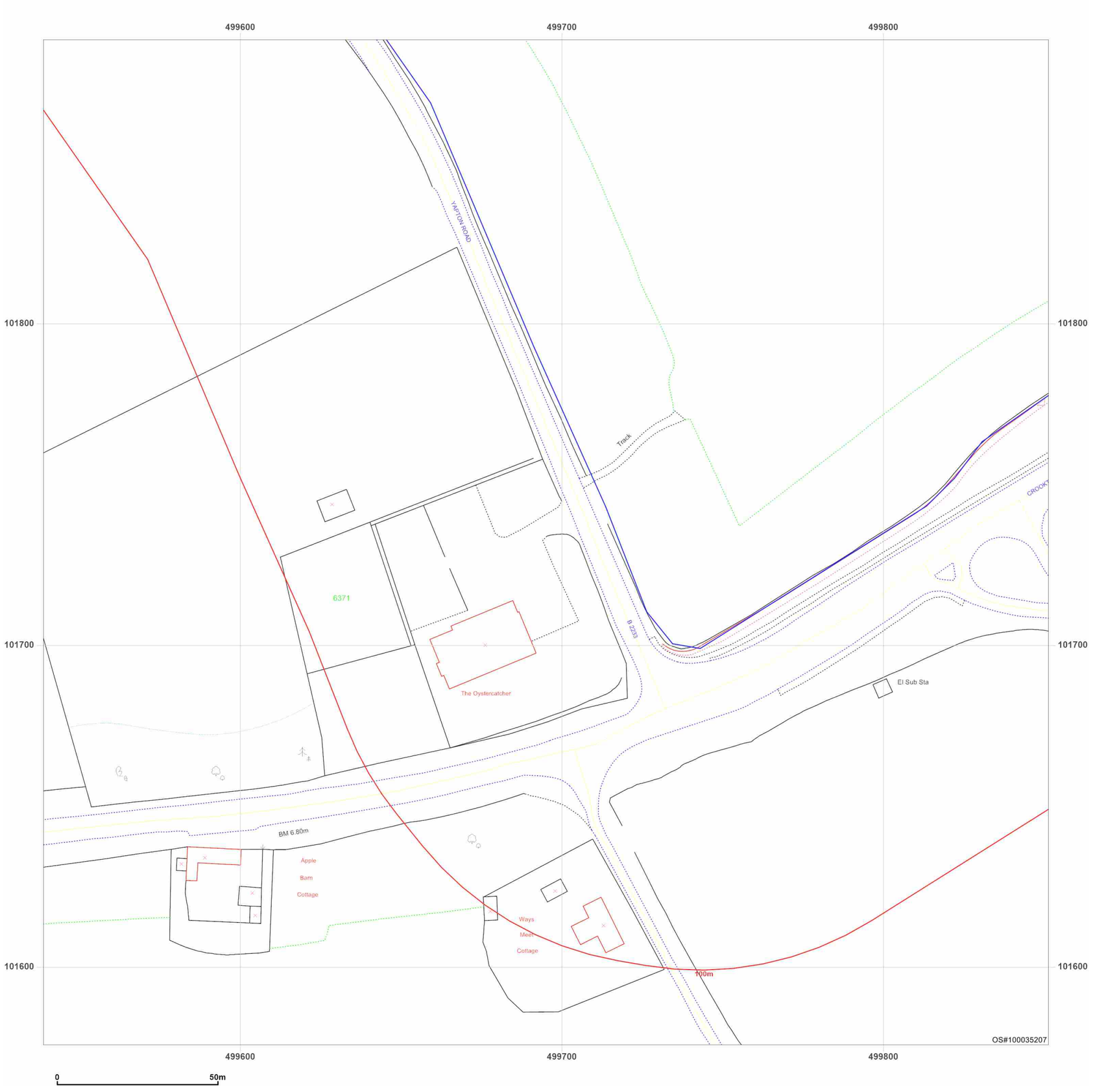
*This data is sourced from HS2 ltd.*

## Data providers

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

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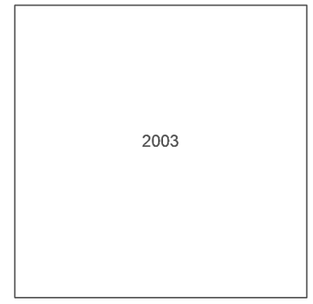
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Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_Landline_1_1
**Grid Ref:** 499695, 101732

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

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**Client Ref:** GWPR5903 Church Lane Climping West Sussex
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**Grid Ref:** 499695, 102032

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**Printed at:** 1:1,250

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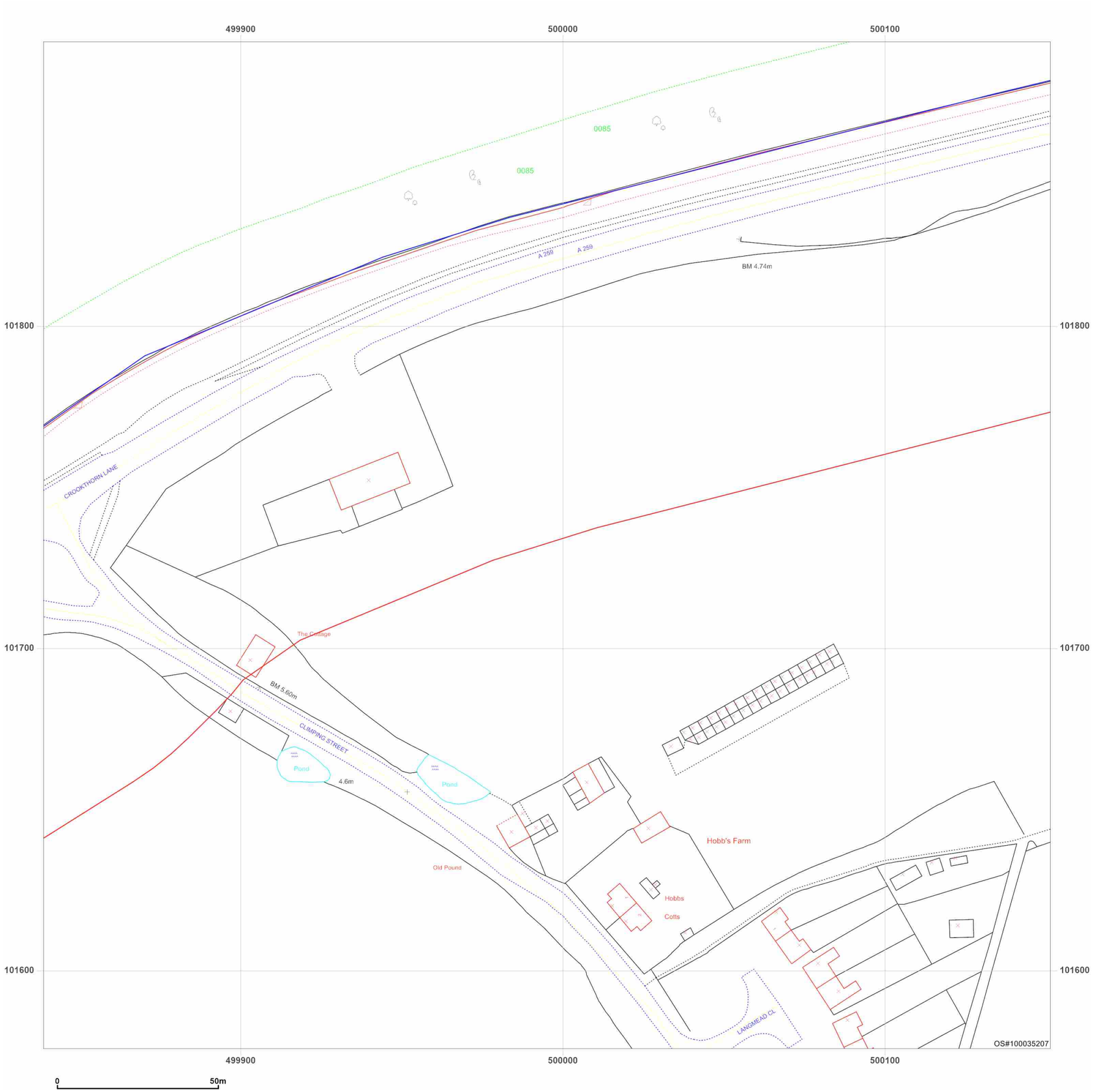

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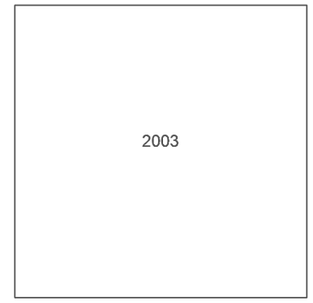
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Land adj. to Church Lane
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5GG

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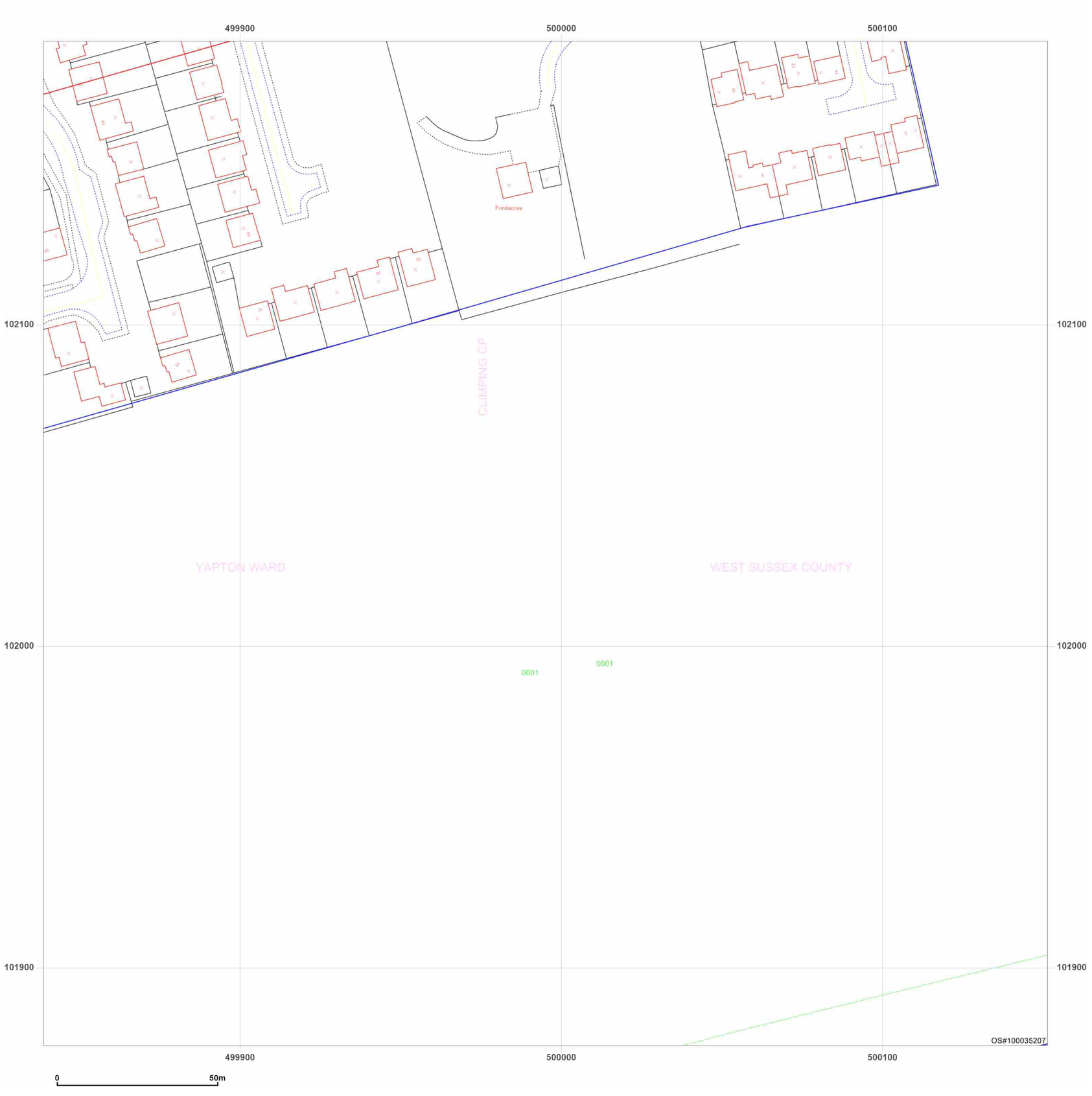

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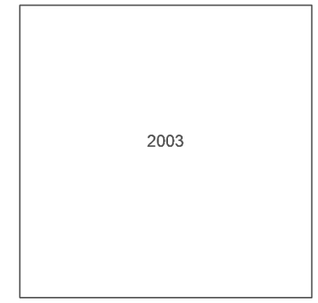
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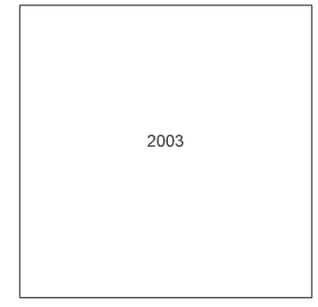
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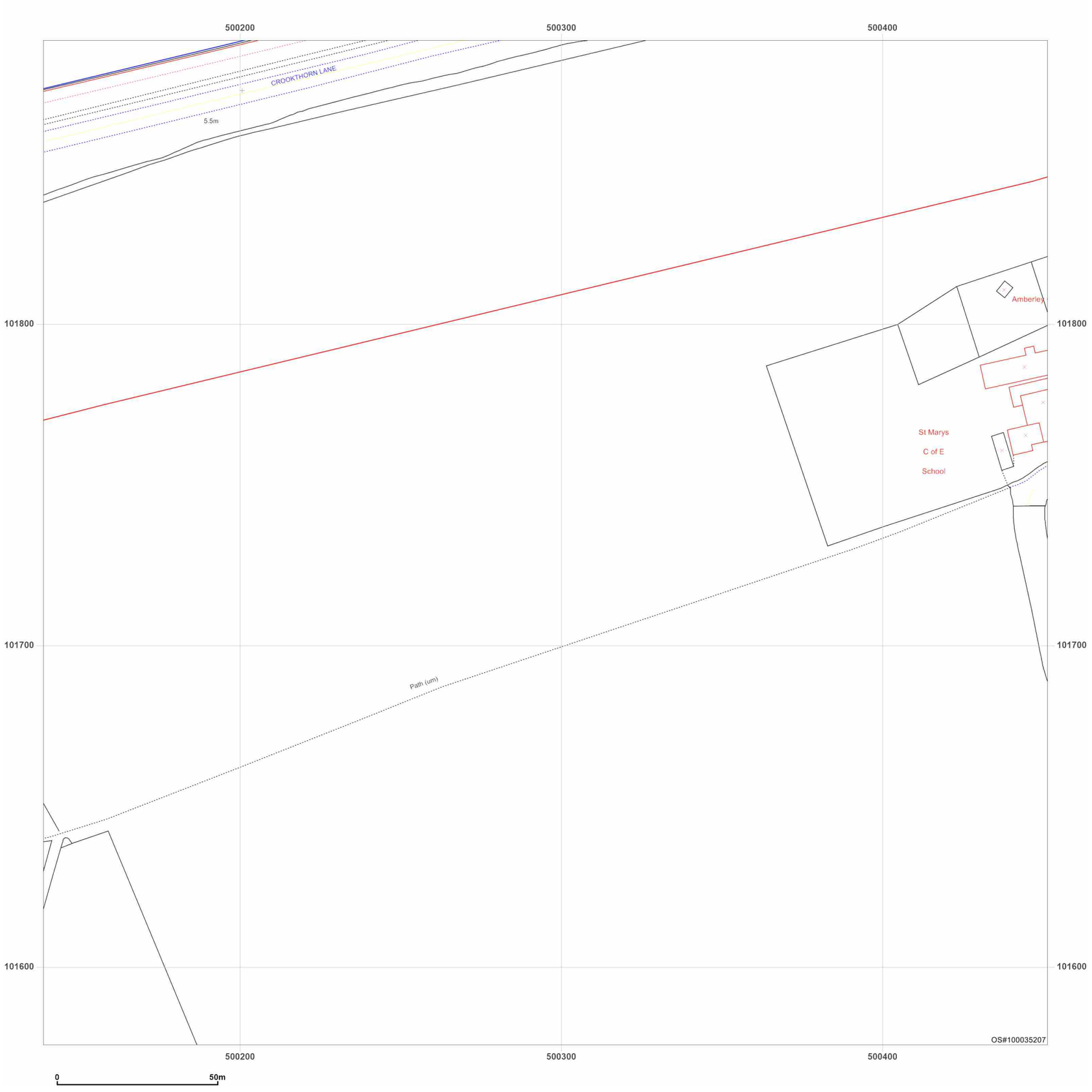

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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
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**Grid Ref:** 500295, 101732

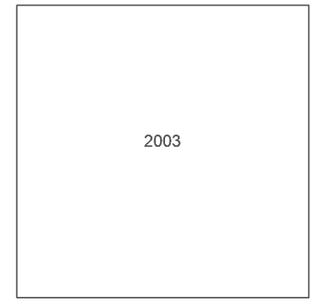
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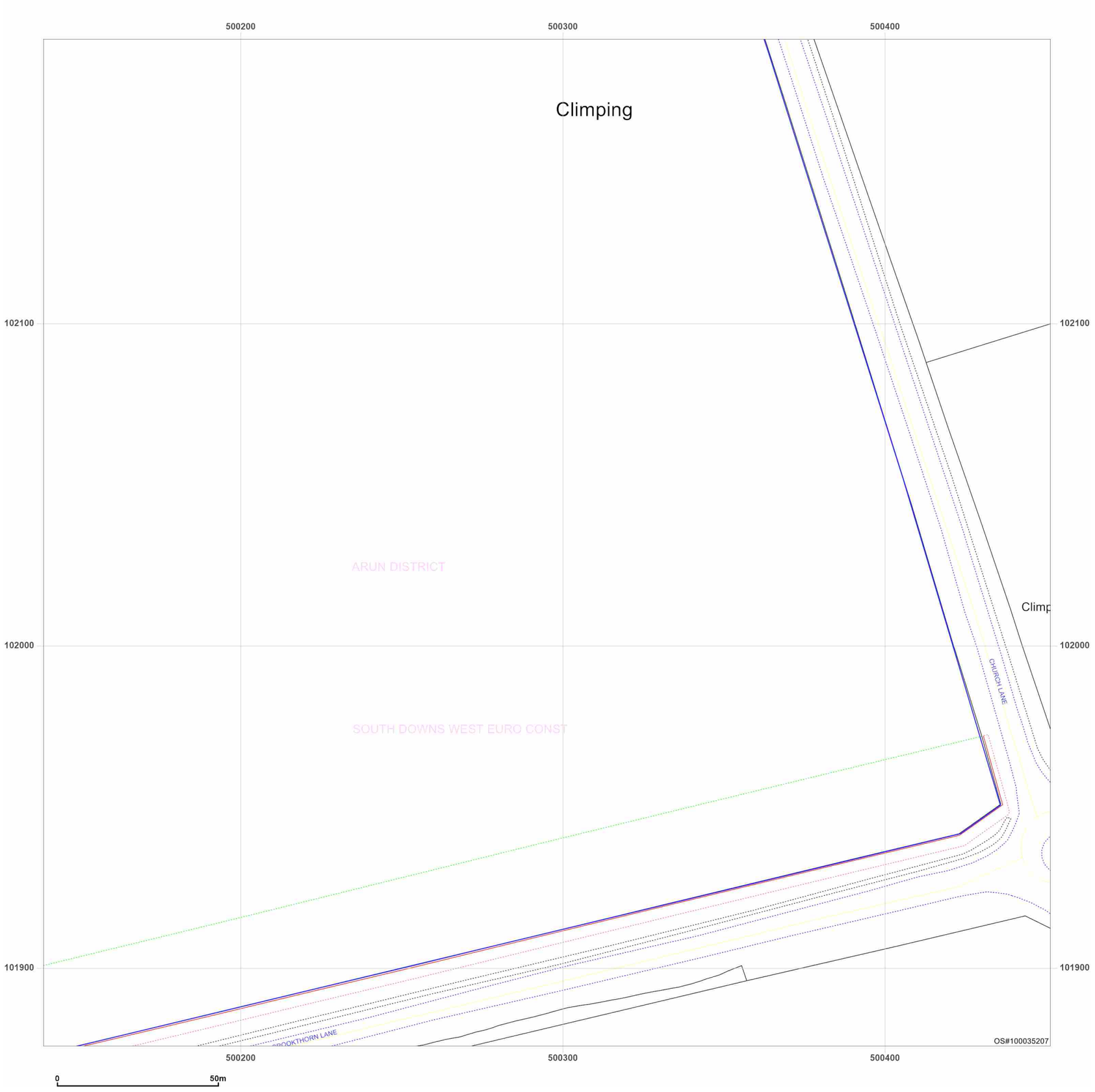

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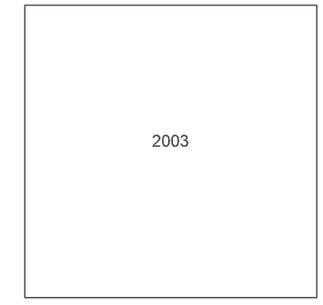
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5GG

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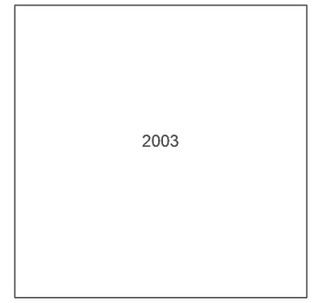
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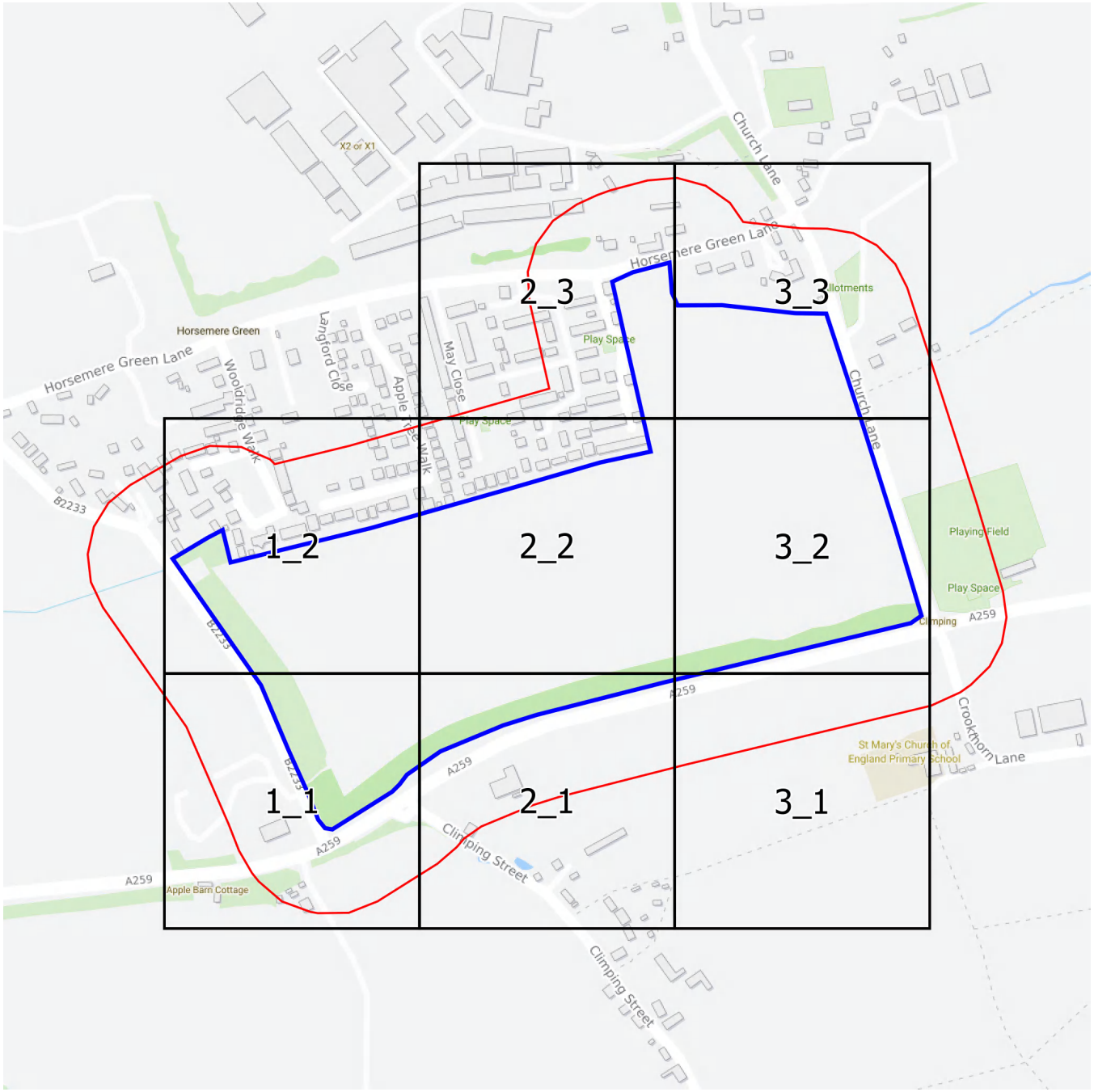

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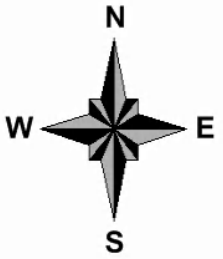
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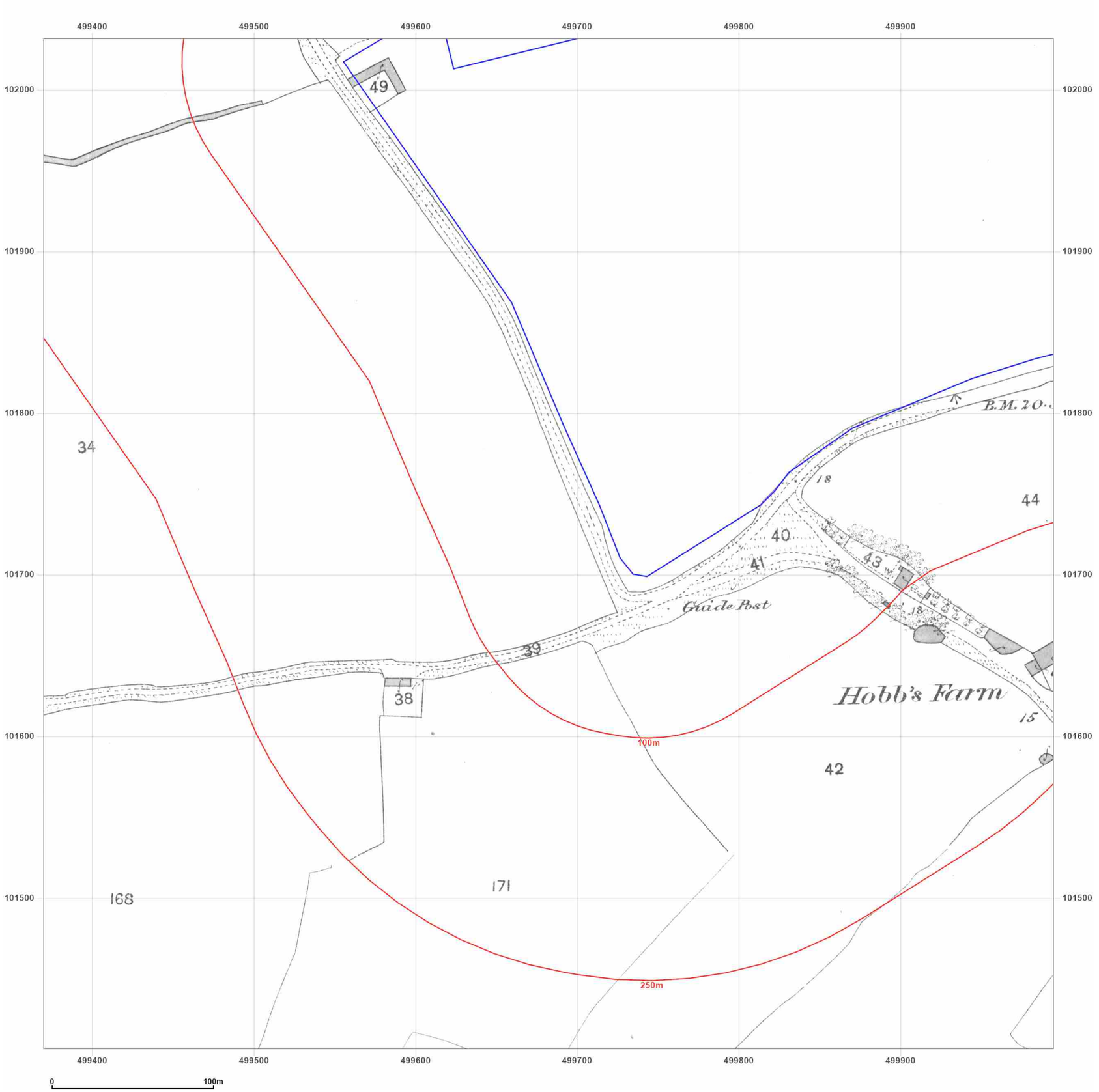
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## Landline Scale Grid Index






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**Site Details:**

Land adj. to Church Lane
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**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_1
**Grid Ref:** 499682, 101719

**Map Name:** County Series

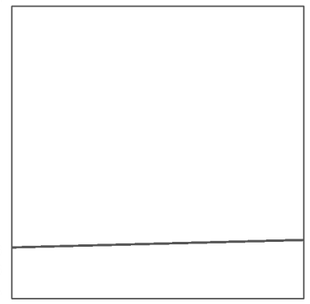
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**Scale:** 1:2,500

**Printed at:** 1:2,500

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



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Revised 1876
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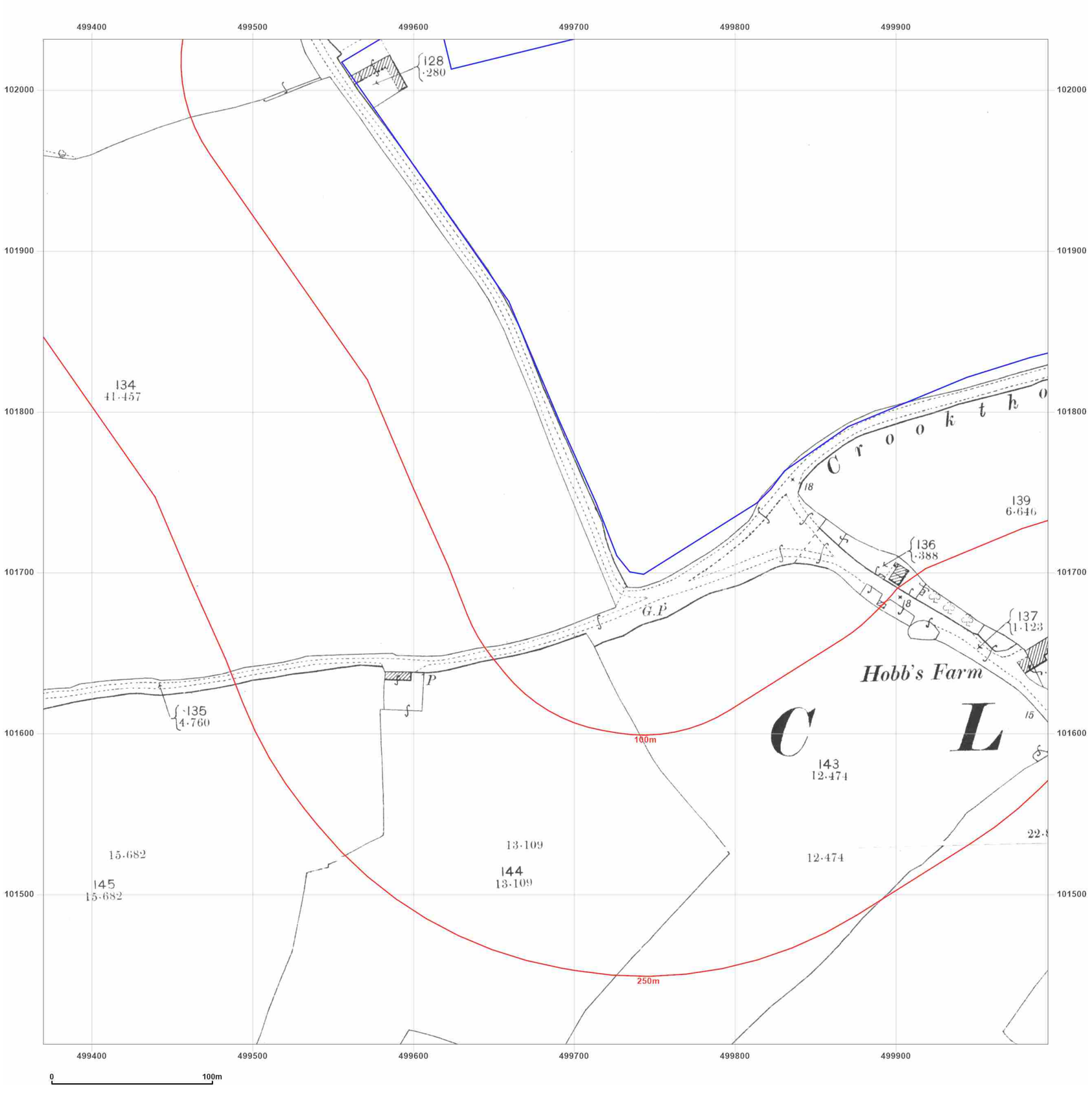
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**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_1
**Grid Ref:** 499682, 101719

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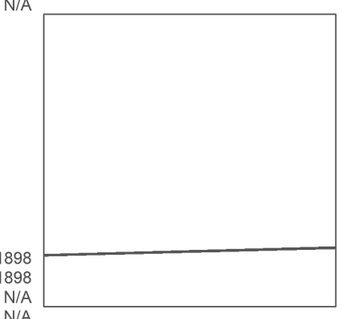
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**Printed at:** 1:2,500

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Revised 1898
Edition N/A
Copyright N/A
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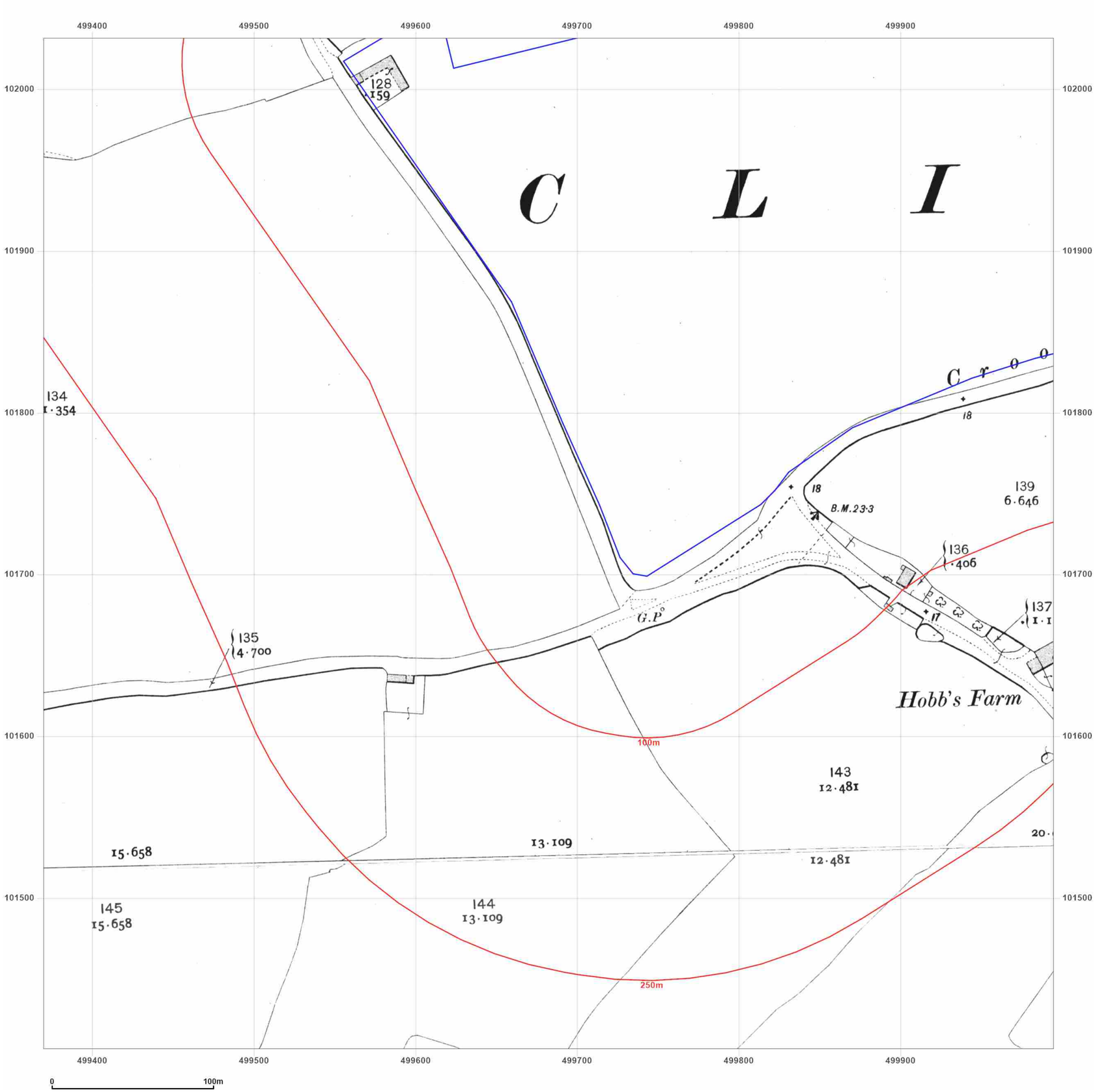
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**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_1
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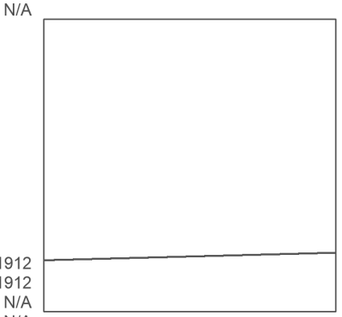
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**Printed at:** 1:2,500

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Edition N/A
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Levelled N/A

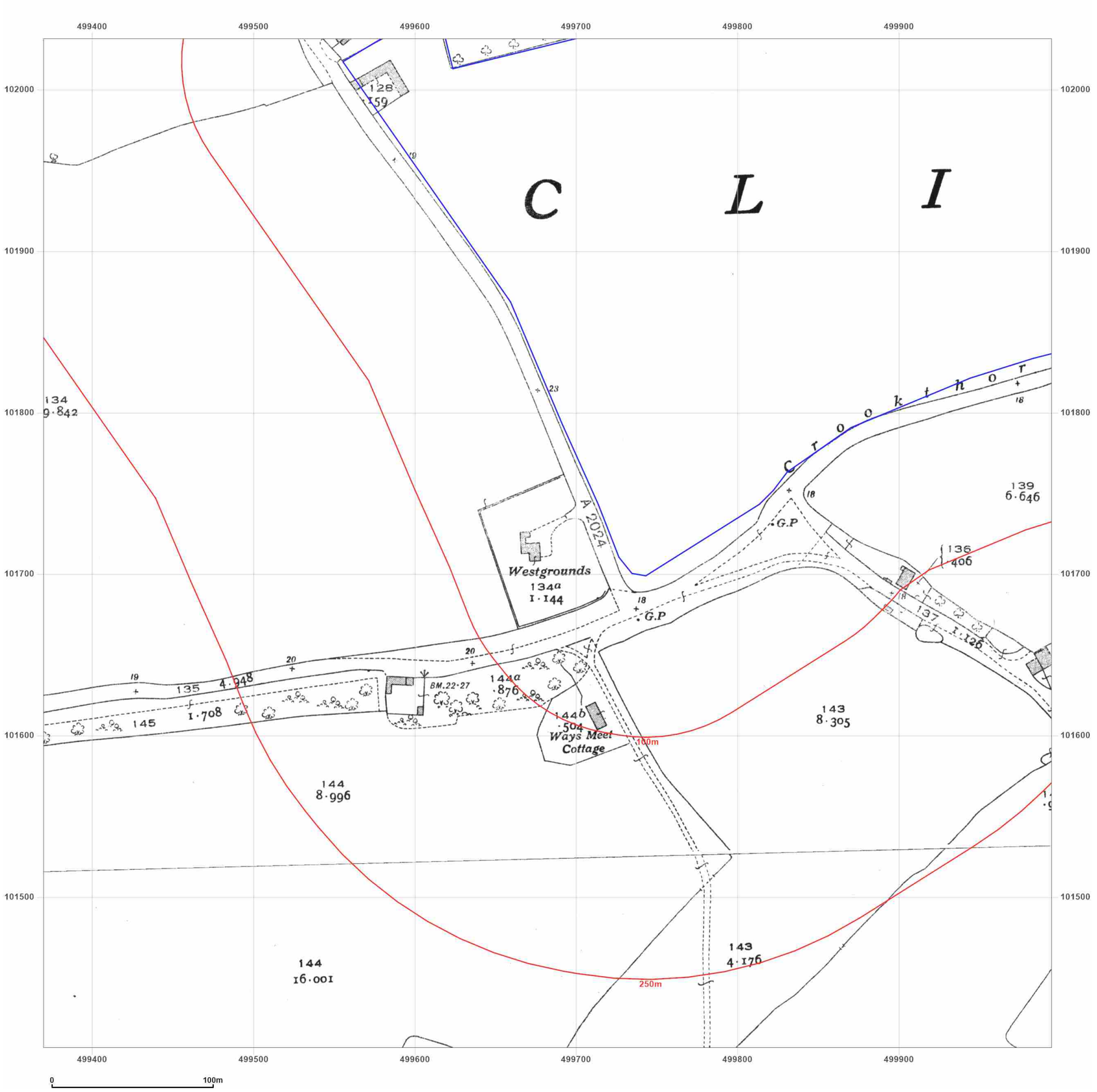
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_1
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**Map Name:** County Series

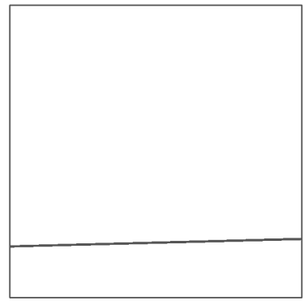
**Map date:** **1933-1937**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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

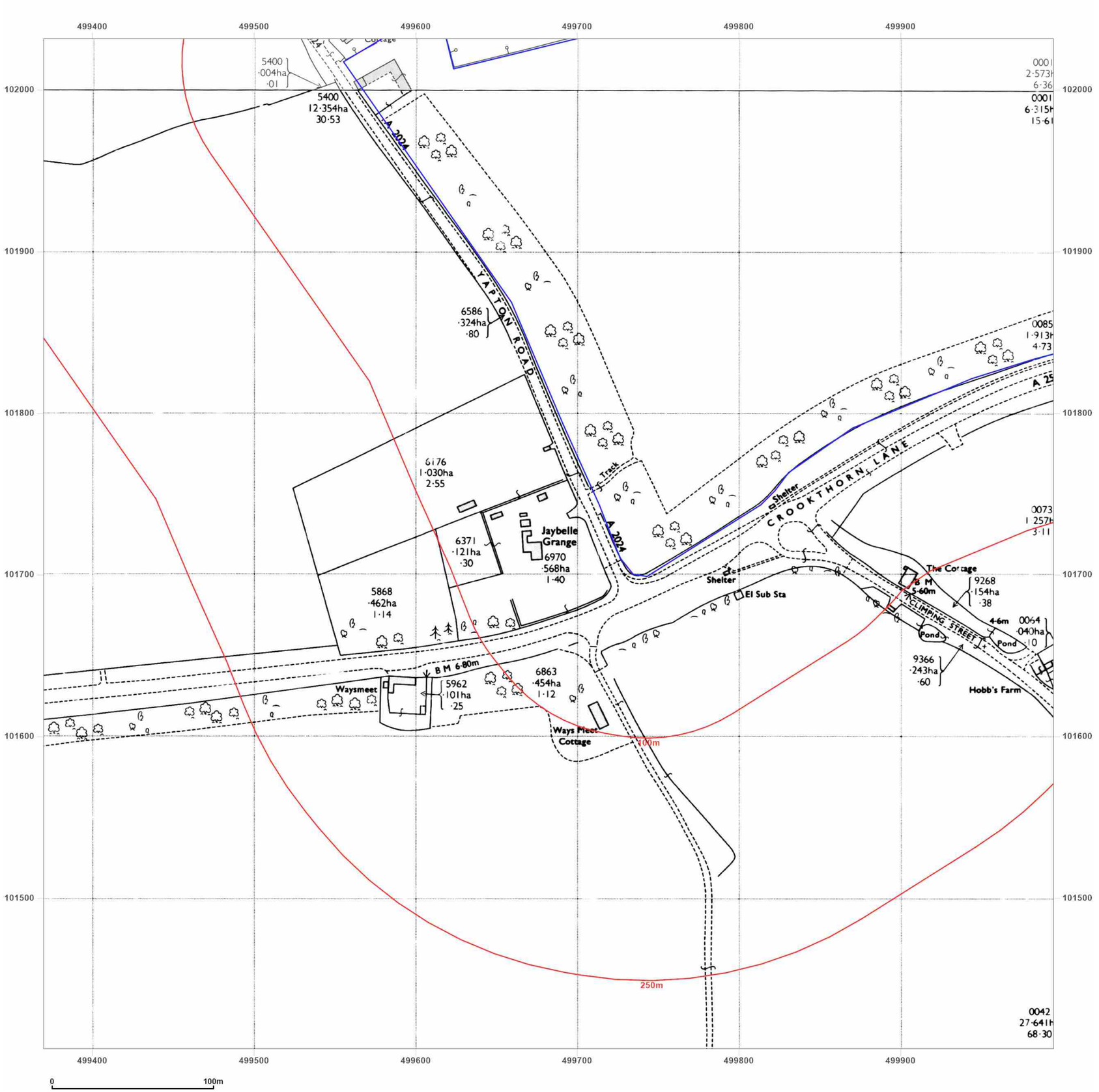
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_1
**Grid Ref:** 499682, 101719

**Map Name:** National Grid

**Map date:** **1973-1974**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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Edition N/A
Copyright 1975
Levelled 1950

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

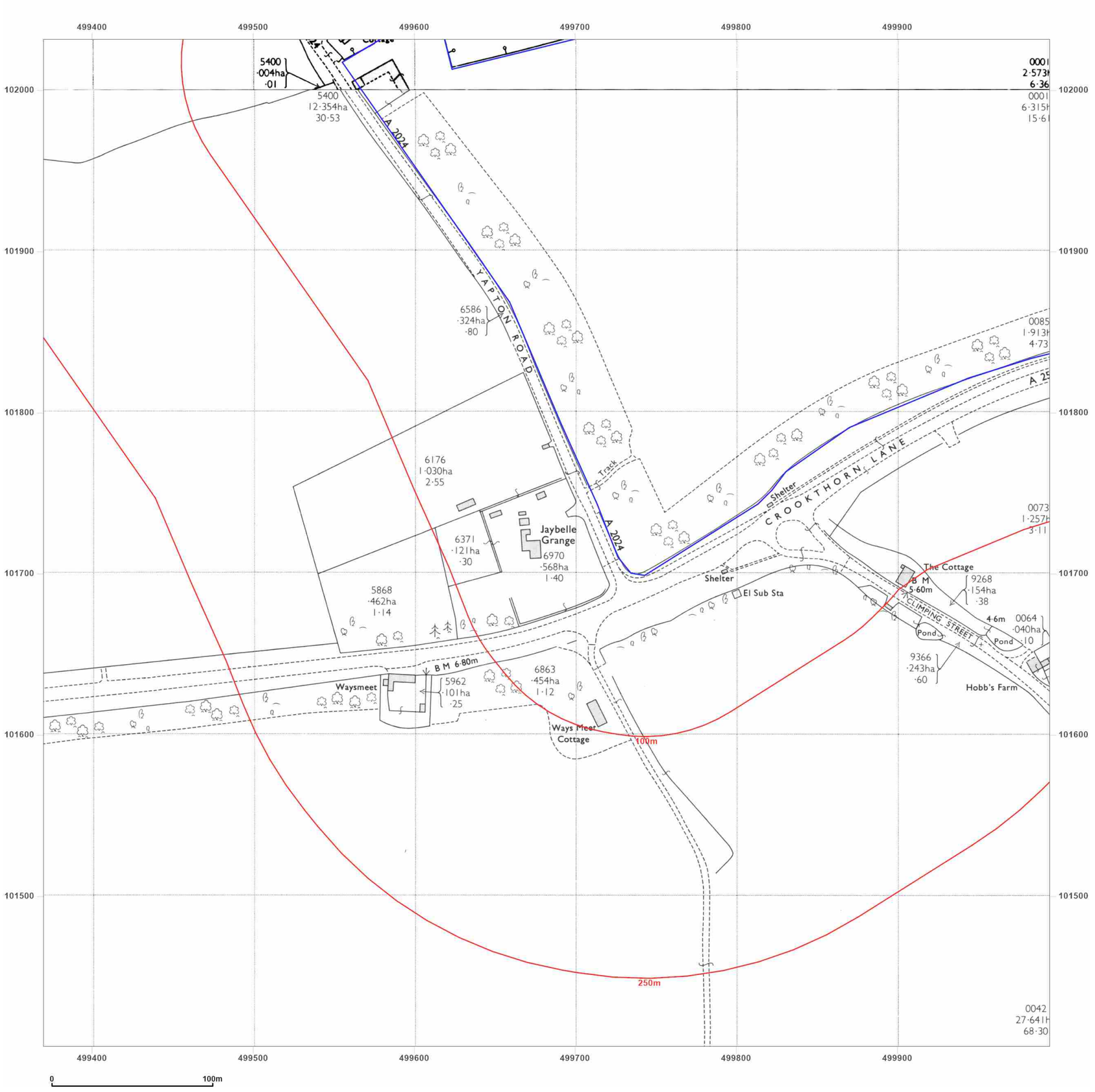
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_1
**Grid Ref:** 499682, 101719

**Map Name:** National Grid

**Map date:** **1974-1975**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
S

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

Surveyed 1974
Revised 1974
Edition N/A
Copyright 1974
Levelled 1966

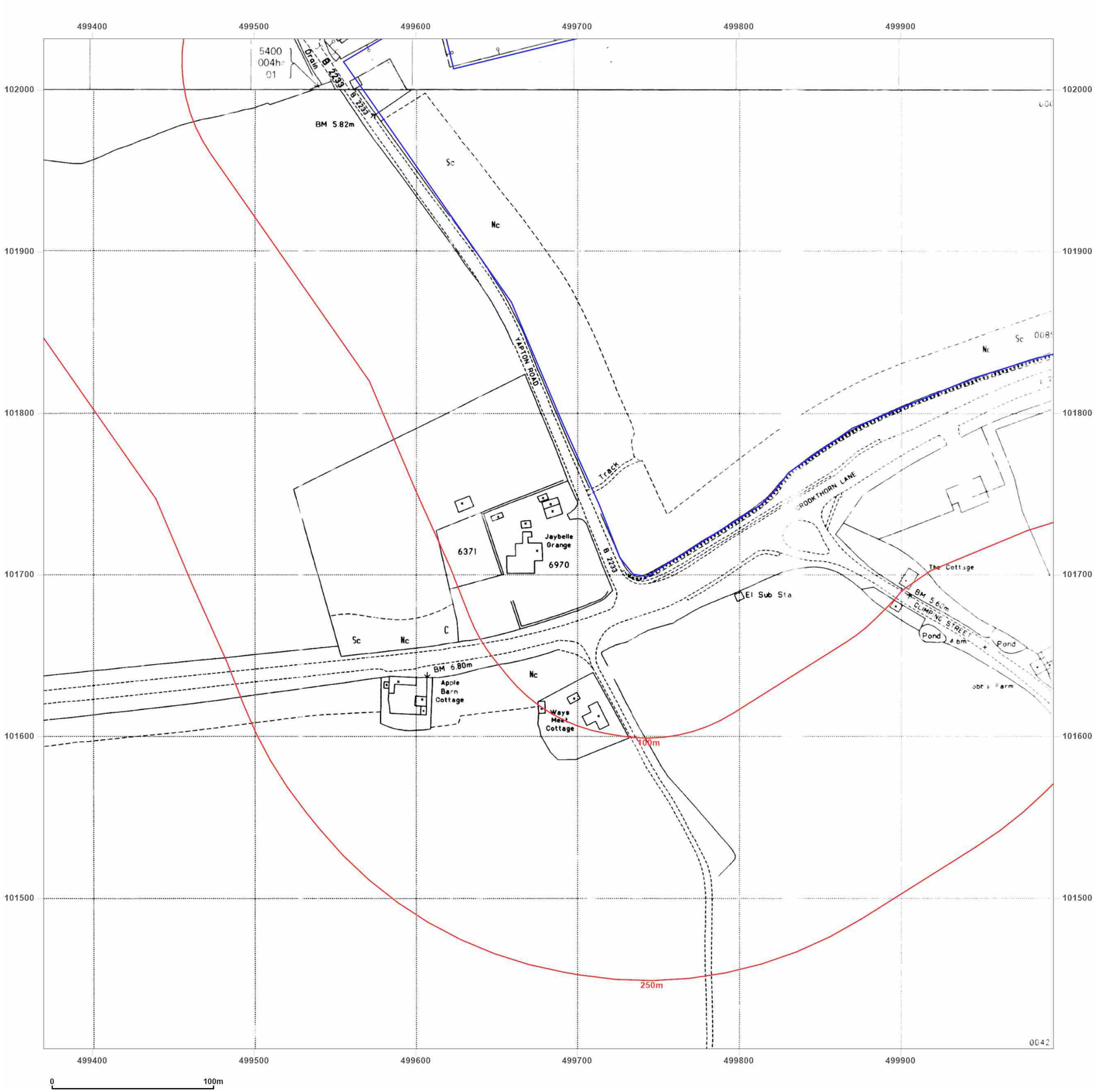
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_1
**Grid Ref:** 499682, 101719

**Map Name:** National Grid

**Map date:** **1991-1994**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
S

Surveyed 1975
Revised 1983
Edition N/A
Copyright 1991
Levelled 1975

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

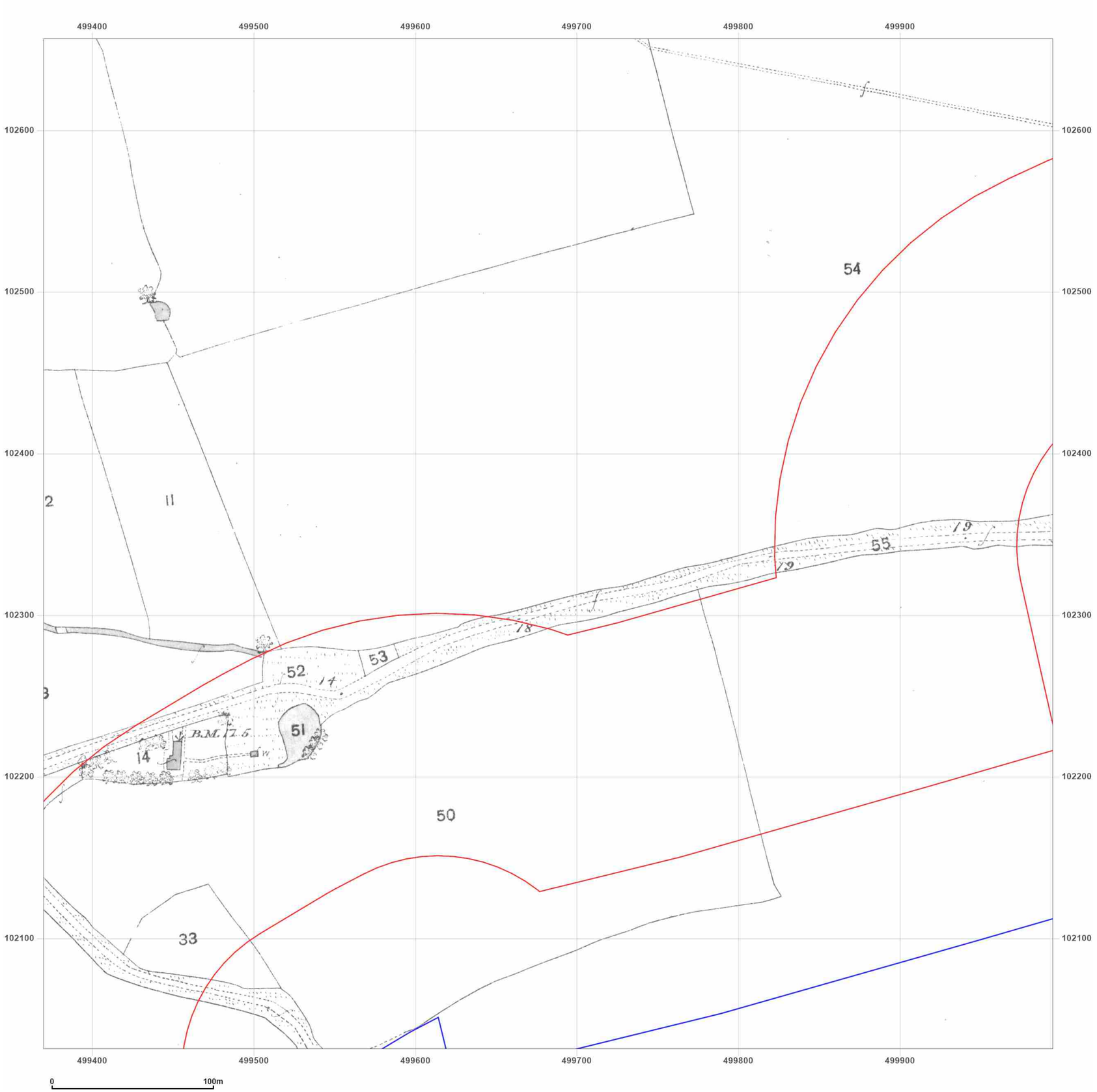
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** County Series

**Map date:** **1876**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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

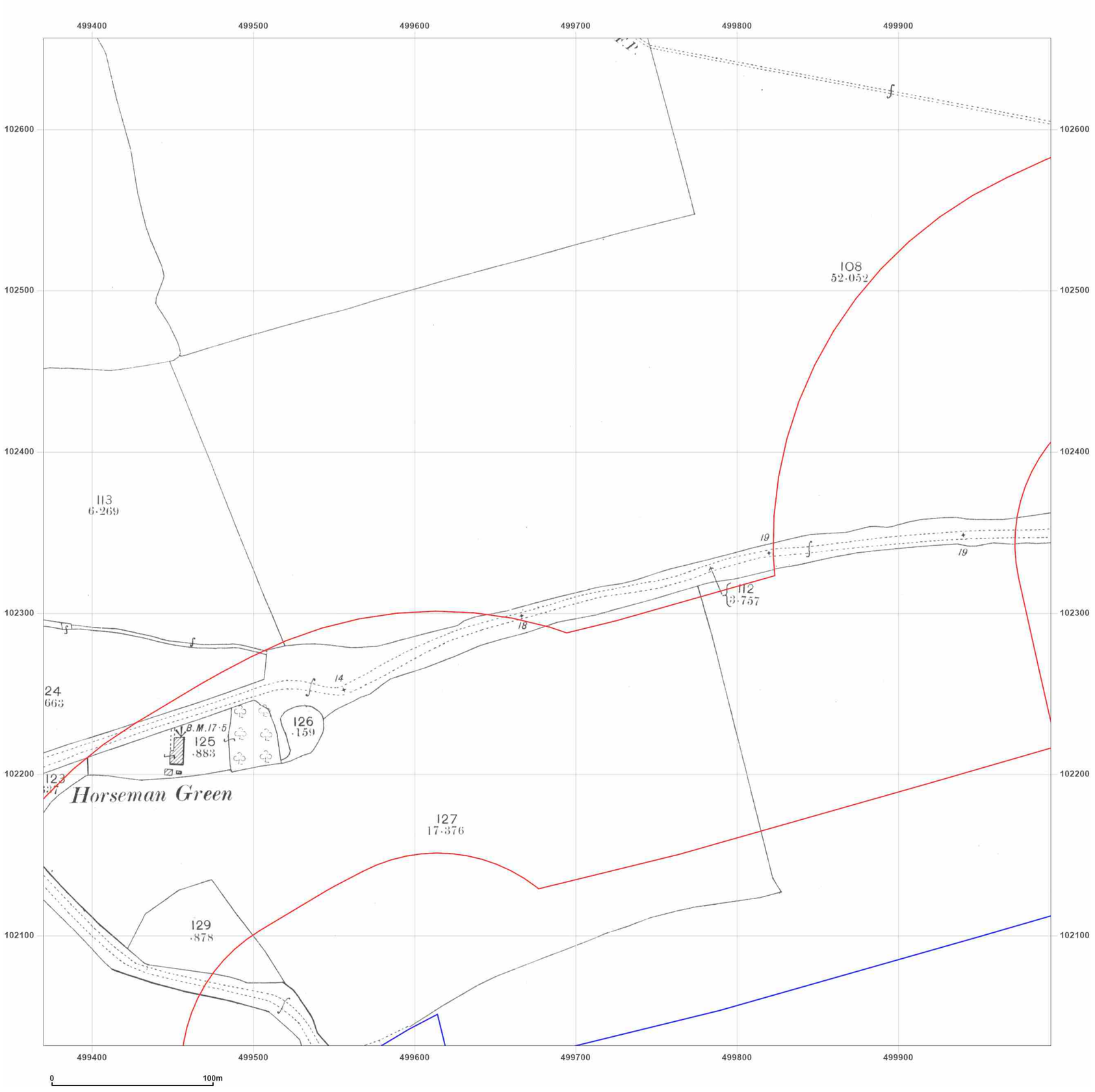
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** County Series

**Map date:** **1898**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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

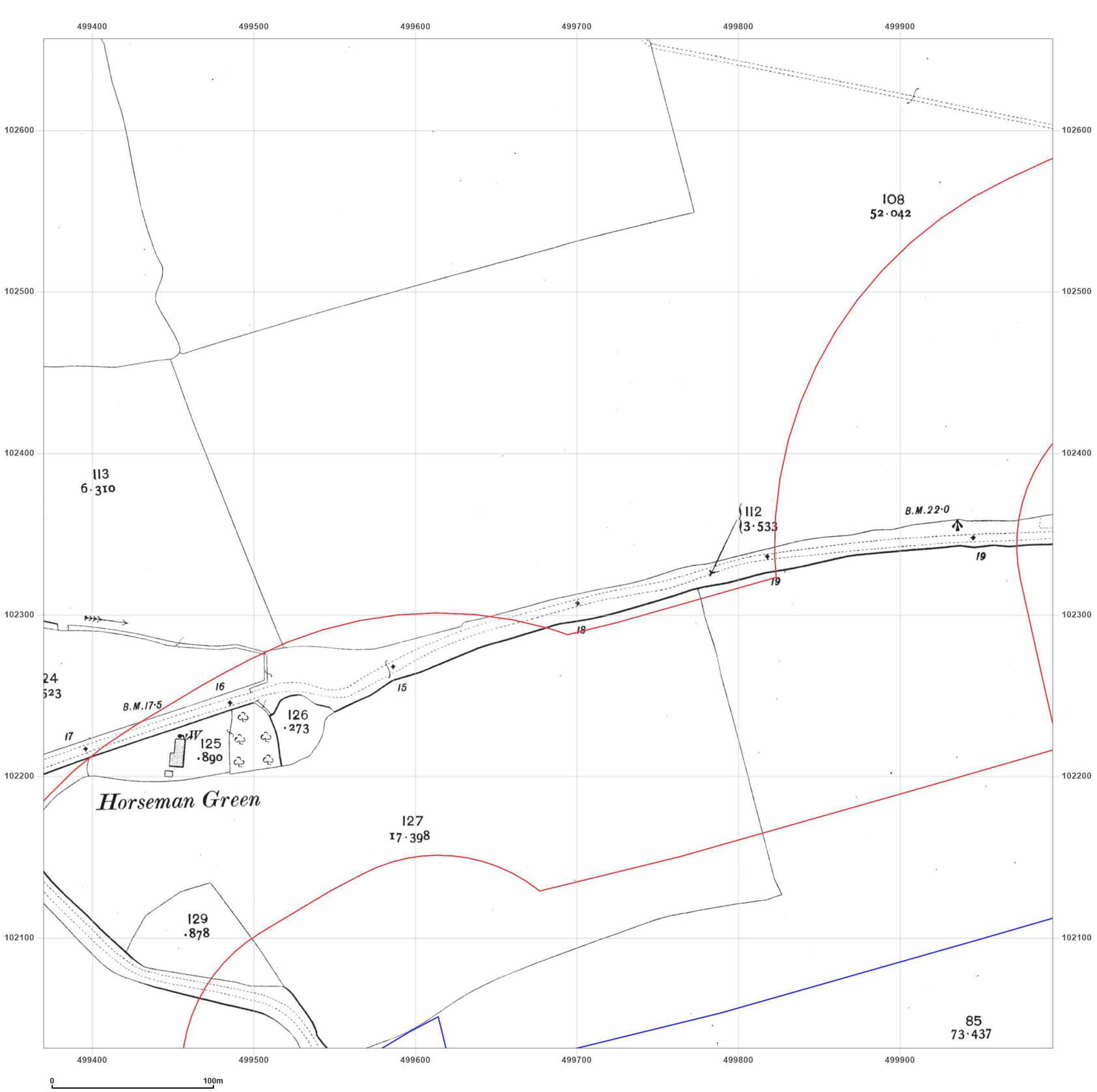
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**Site Details:**

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Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** County Series

**Map date:** **1912**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
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Surveyed 1912
Revised 1912
Edition N/A
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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** County Series

**Map date:** **1937**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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Surveyed 1937
Revised 1937
Edition N/A
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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** National Grid

**Map date:** **1973**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
S

Surveyed 1973
Revised 1973
Edition N/A
Copyright 1975
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**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** National Grid

**Map date:** **1975**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1975
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** National Grid

**Map date:** **1984**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
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Surveyed 1983
Revised 1983
Edition N/A
Copyright 1984
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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** National Grid

**Map date:** **1988**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
S

Surveyed 1973
Revised 1988
Edition N/A
Copyright N/A
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** National Grid

**Map date:** **1991**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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Surveyed 1975
Revised 1983
Edition N/A
Copyright 1991
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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_1_2
**Grid Ref:** 499682, 102344

**Map Name:** National Grid

**Map date:** **1994**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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

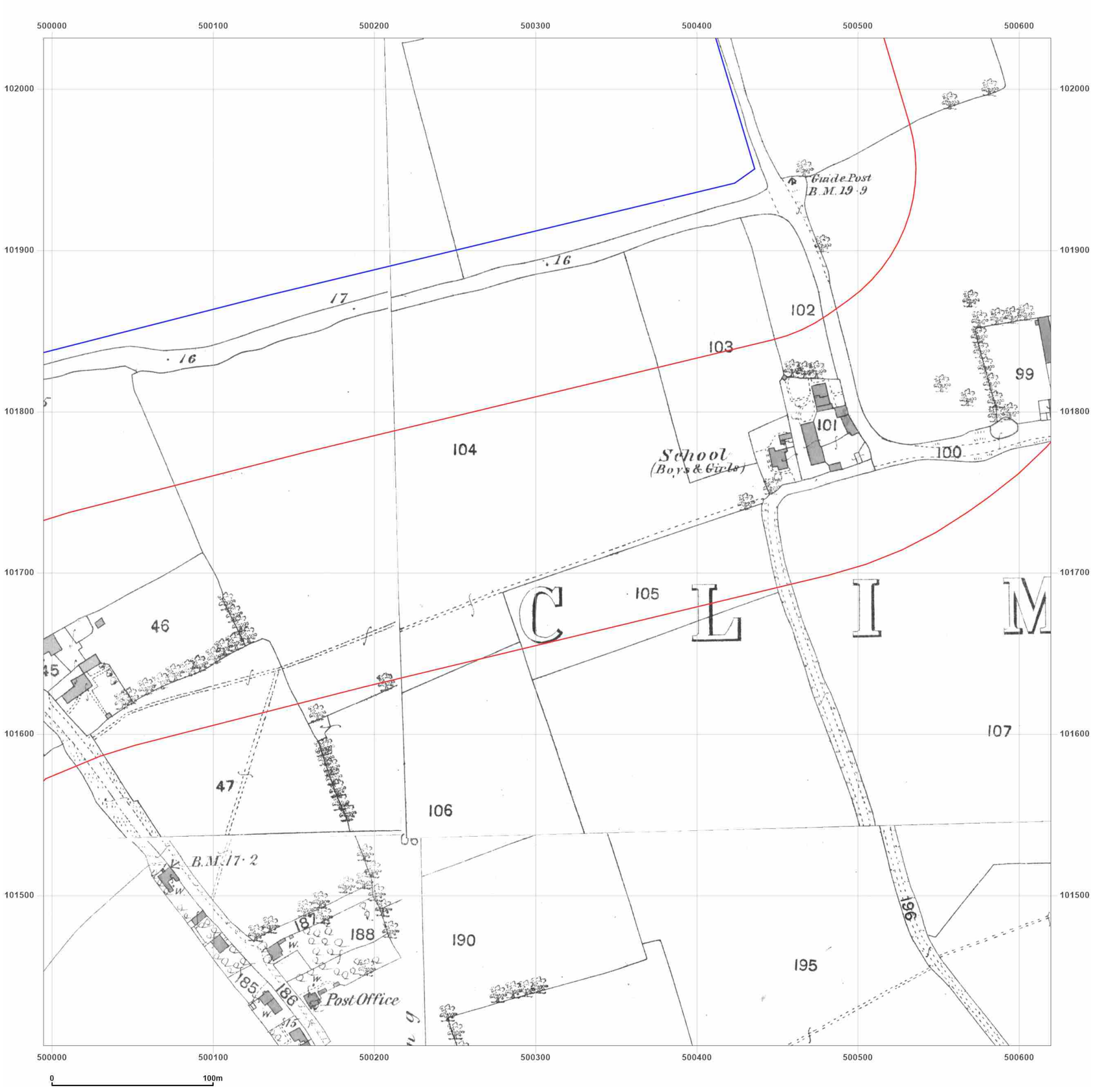
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

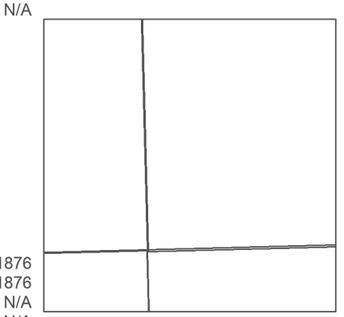
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**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_1
**Grid Ref:** 500307, 101719

**Map Name:** County Series
**Map date:** **1876-1879**
**Scale:** 1:2,500
**Printed at:** 1:2,500

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

Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
Levelled N/A



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

Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

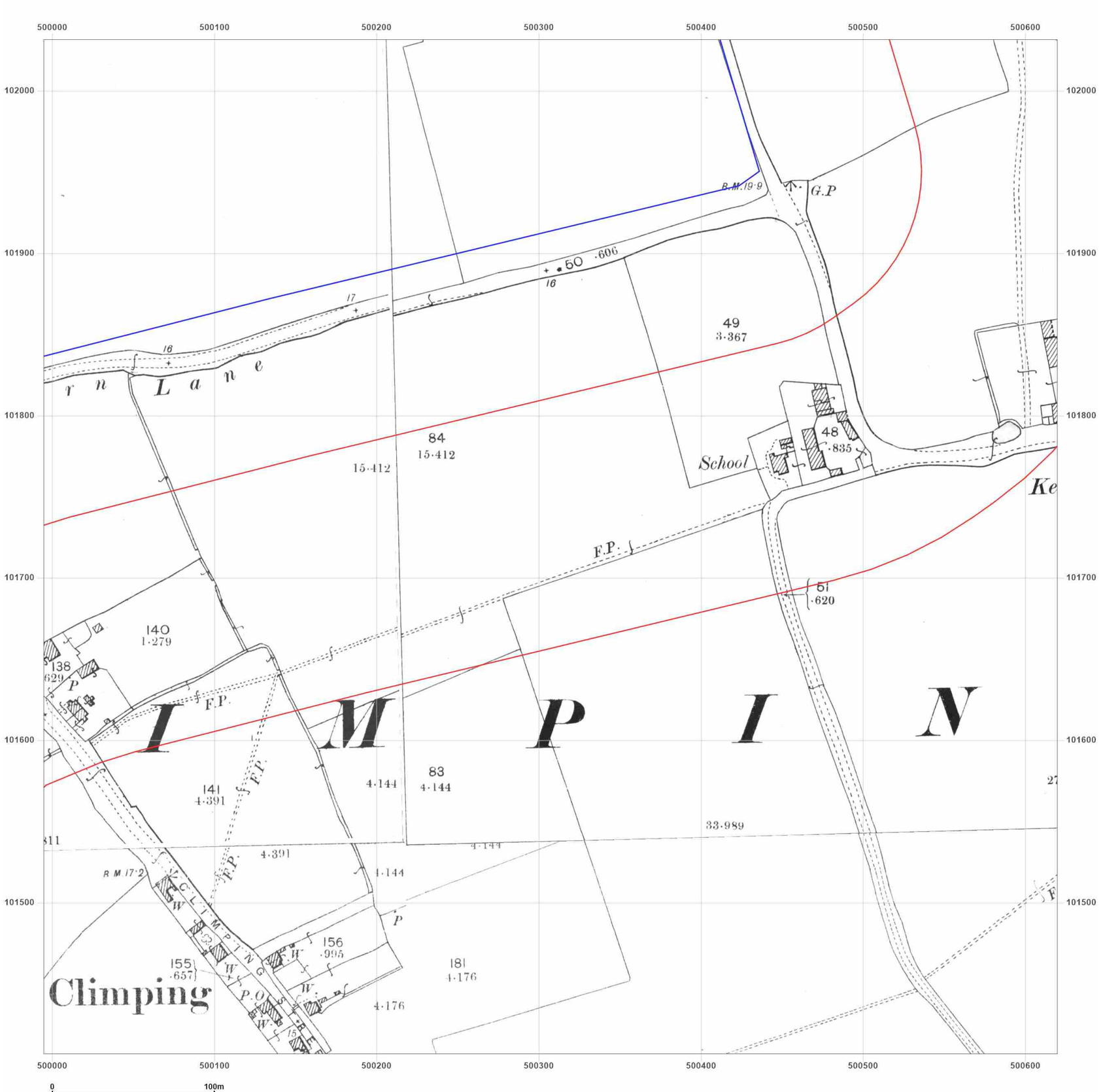
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**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_1
**Grid Ref:** 500307, 101719

**Map Name:** County Series

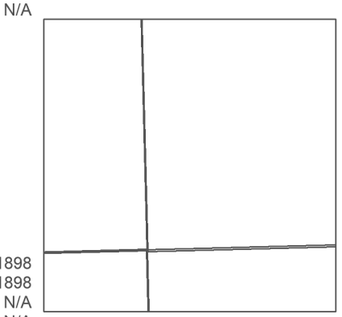
**Map date:** **1898**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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



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

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

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

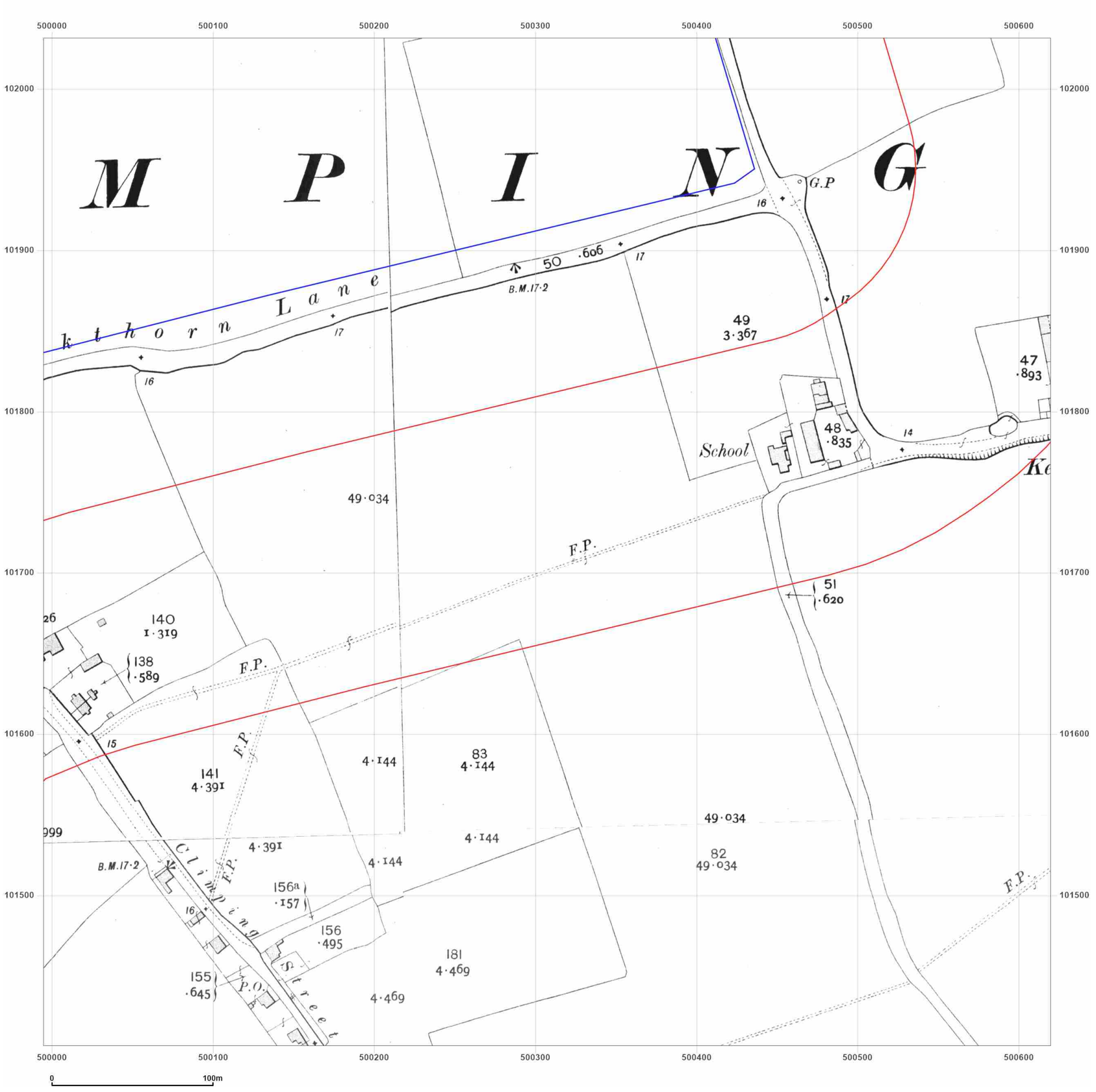
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_1
**Grid Ref:** 500307, 101719

**Map Name:** County Series

**Map date:** **1911-1912**

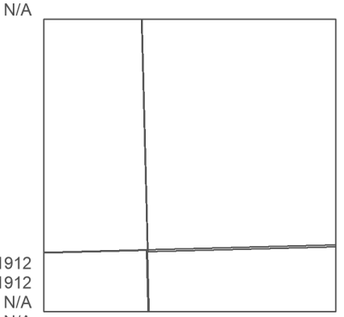
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**Printed at:** 1:2,500

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

Surveyed 1911
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A



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

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

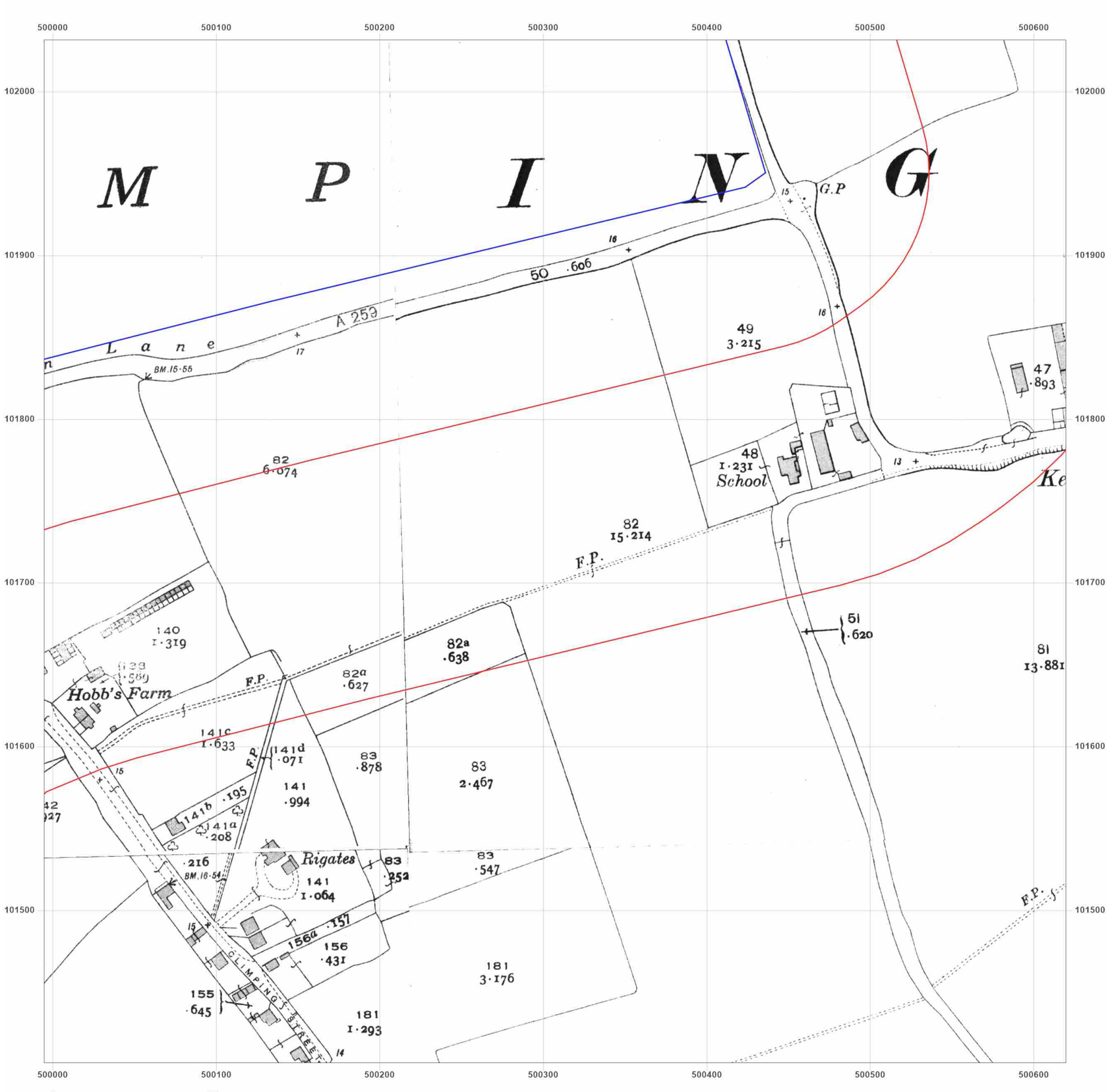
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_1
**Grid Ref:** 500307, 101719

**Map Name:** County Series

**Map date:** **1932-1937**

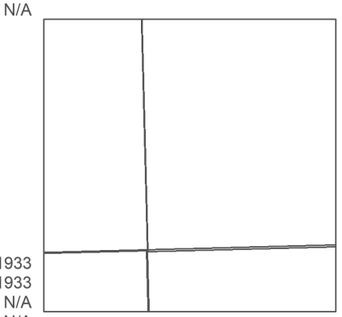
**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
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Surveyed 1937
Revised 1937
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



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

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

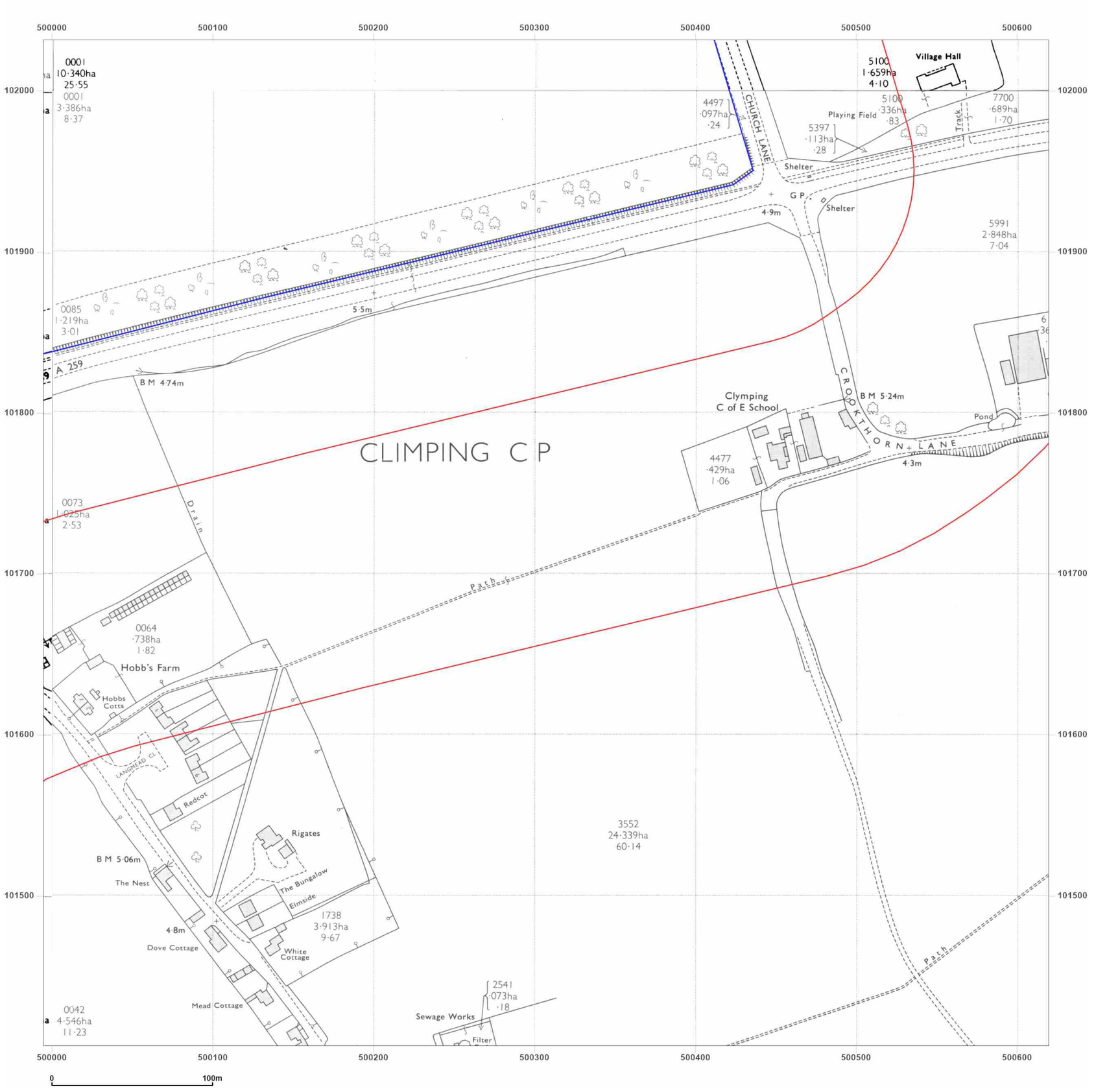
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_1
**Grid Ref:** 500307, 101719

**Map Name:** National Grid

**Map date:** **1972-1974**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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Surveyed 1973
Revised 1973
Edition N/A
Copyright 1975
Levelled 1950

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

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

Surveyed 1972
Revised 1972
Edition N/A
Copyright N/A
Levelled 1966

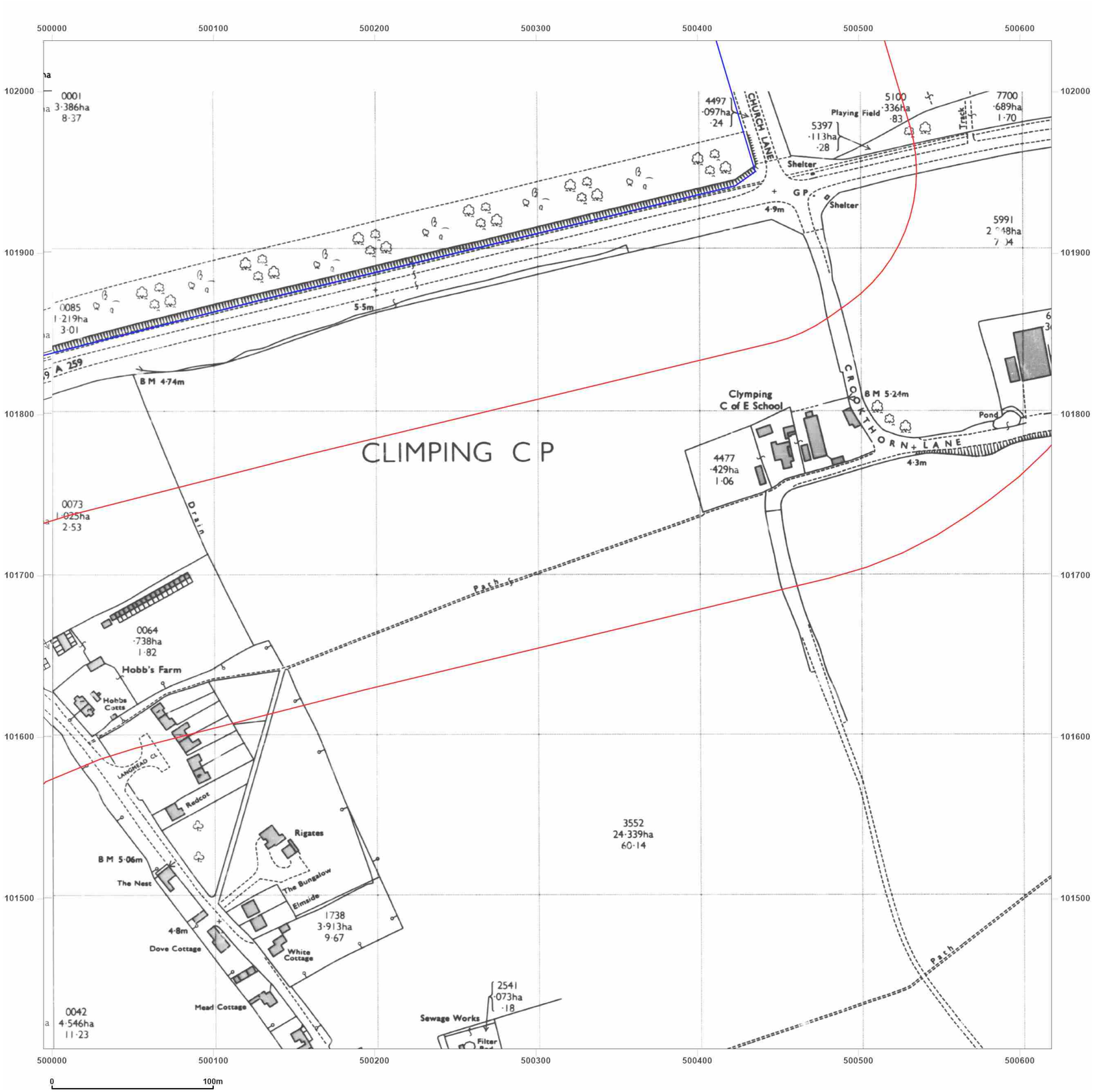
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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_1
**Grid Ref:** 500307, 101719

**Map Name:** National Grid

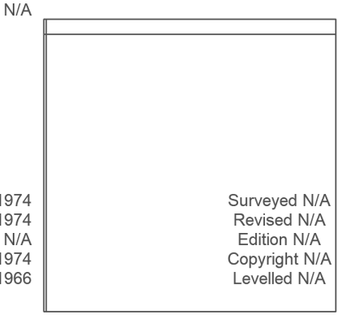
**Map date:** **1973-1975**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1975
Levelled N/A



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1974
Levelled 1966

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

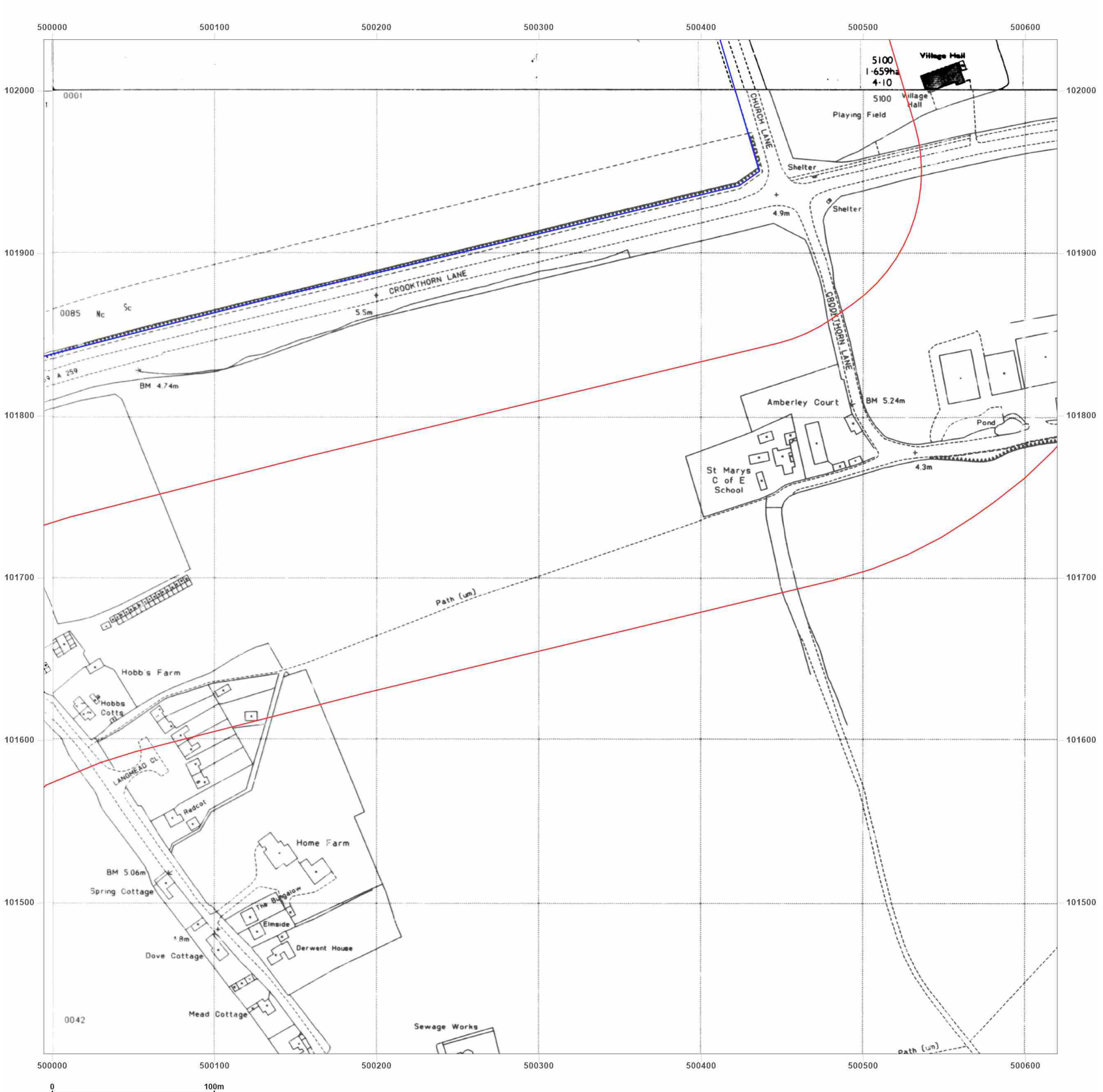
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**Site Details:**

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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_1
**Grid Ref:** 500307, 101719

**Map Name:** National Grid

**Map date:** **1989-1994**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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| | |
|---|---|
| Surveyed 1975<br>Revised 1983<br>Edition N/A<br>Copyright 1991<br>Levelled 1975 | Surveyed 1975<br>Revised 1989<br>Edition N/A<br>Copyright 1989<br>Levelled 1975 |
| Surveyed 1994<br>Revised N/A<br>Edition N/A<br>Copyright 1994<br>Levelled N/A | Surveyed 1994<br>Revised N/A<br>Edition N/A<br>Copyright 1994<br>Levelled N/A |

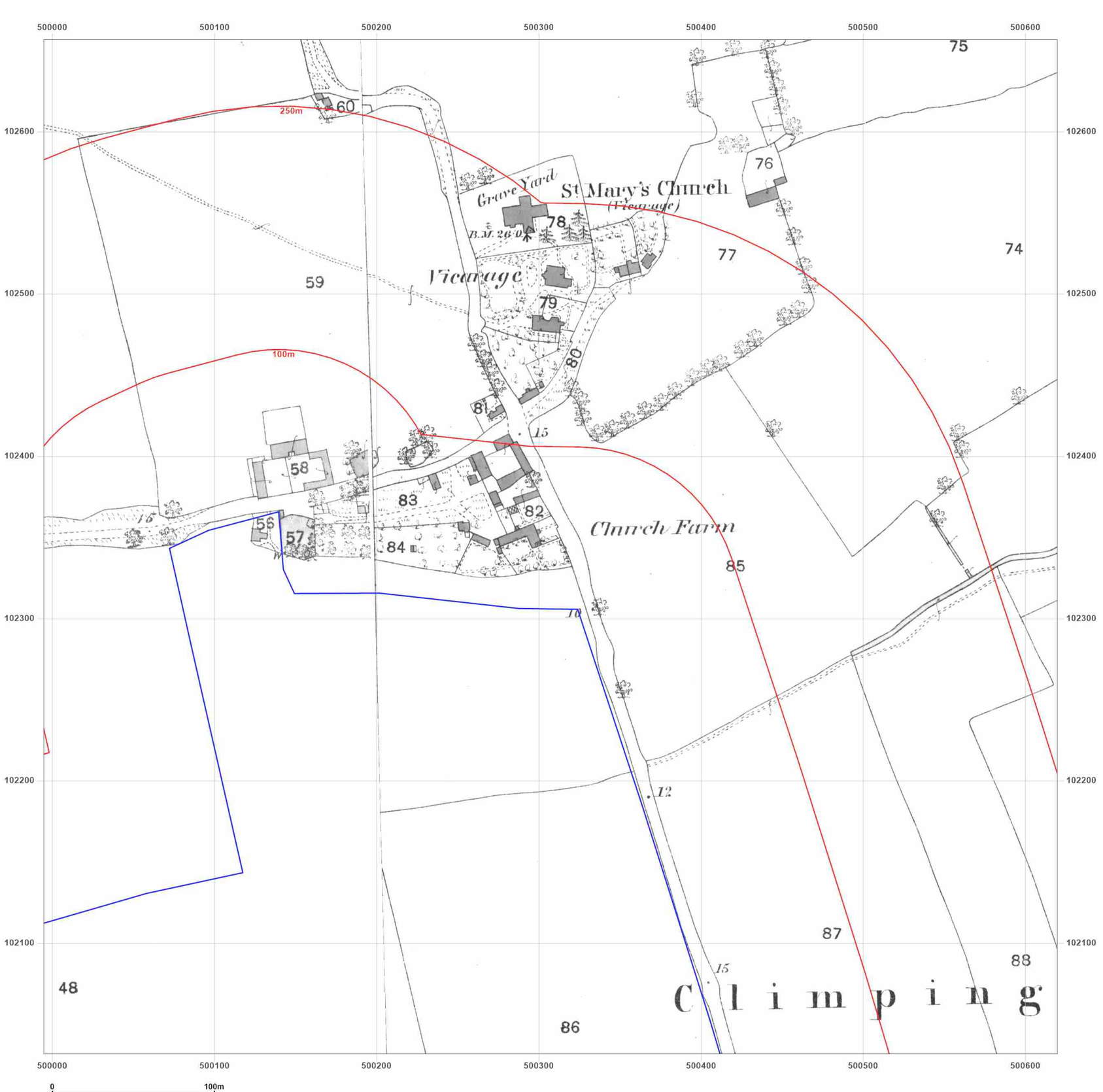
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

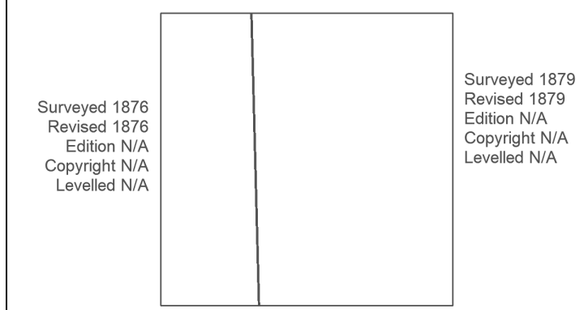
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**Map date:** **1876-1879**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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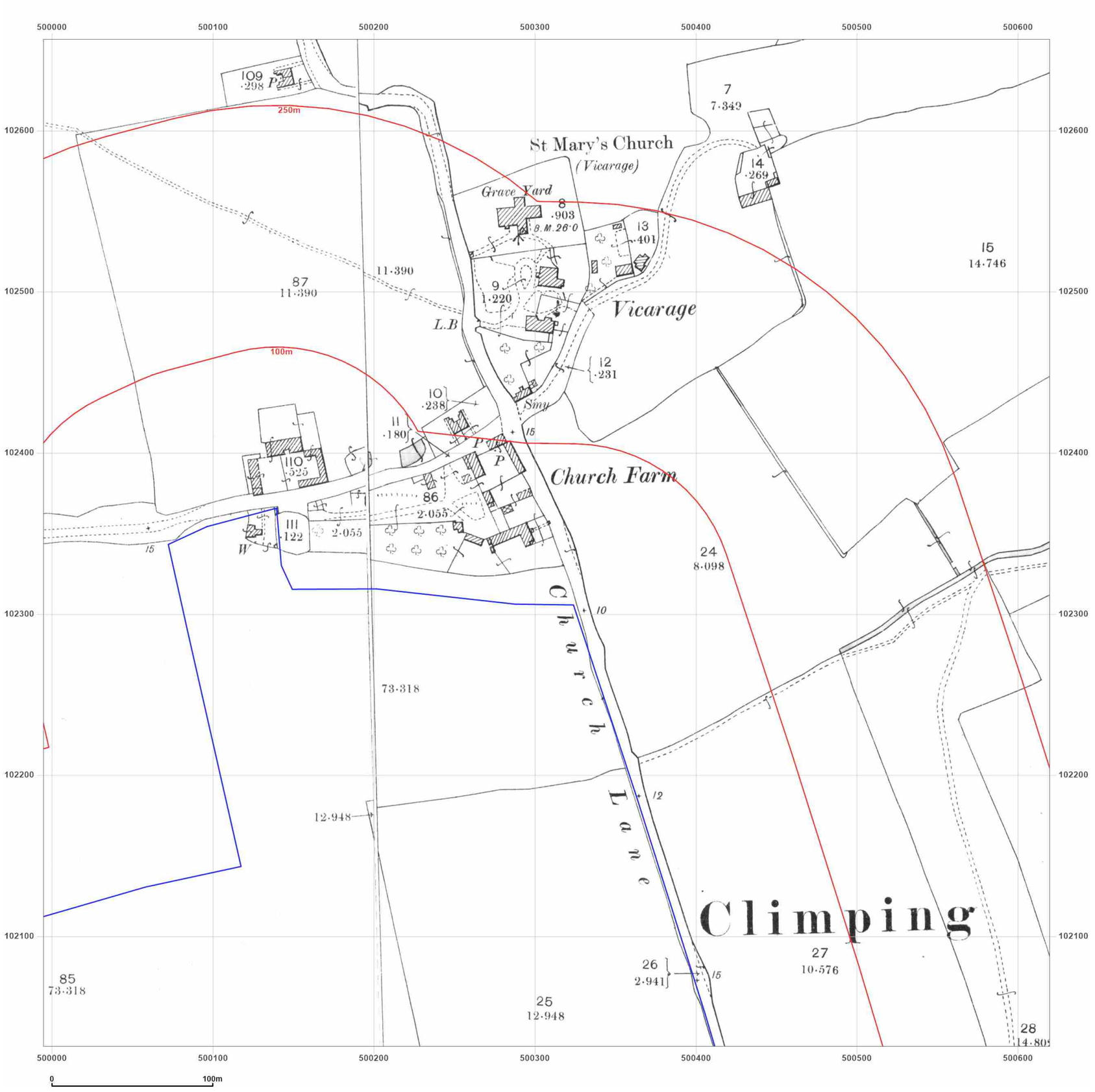

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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

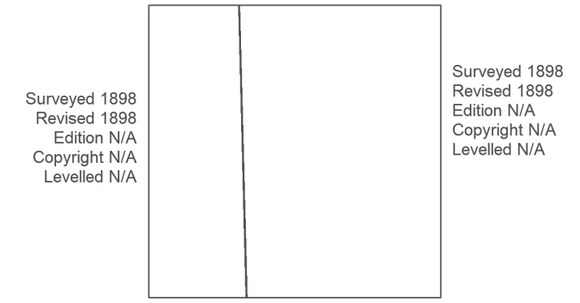
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**Map date:** **1898**

**Scale:** 1:2,500

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N
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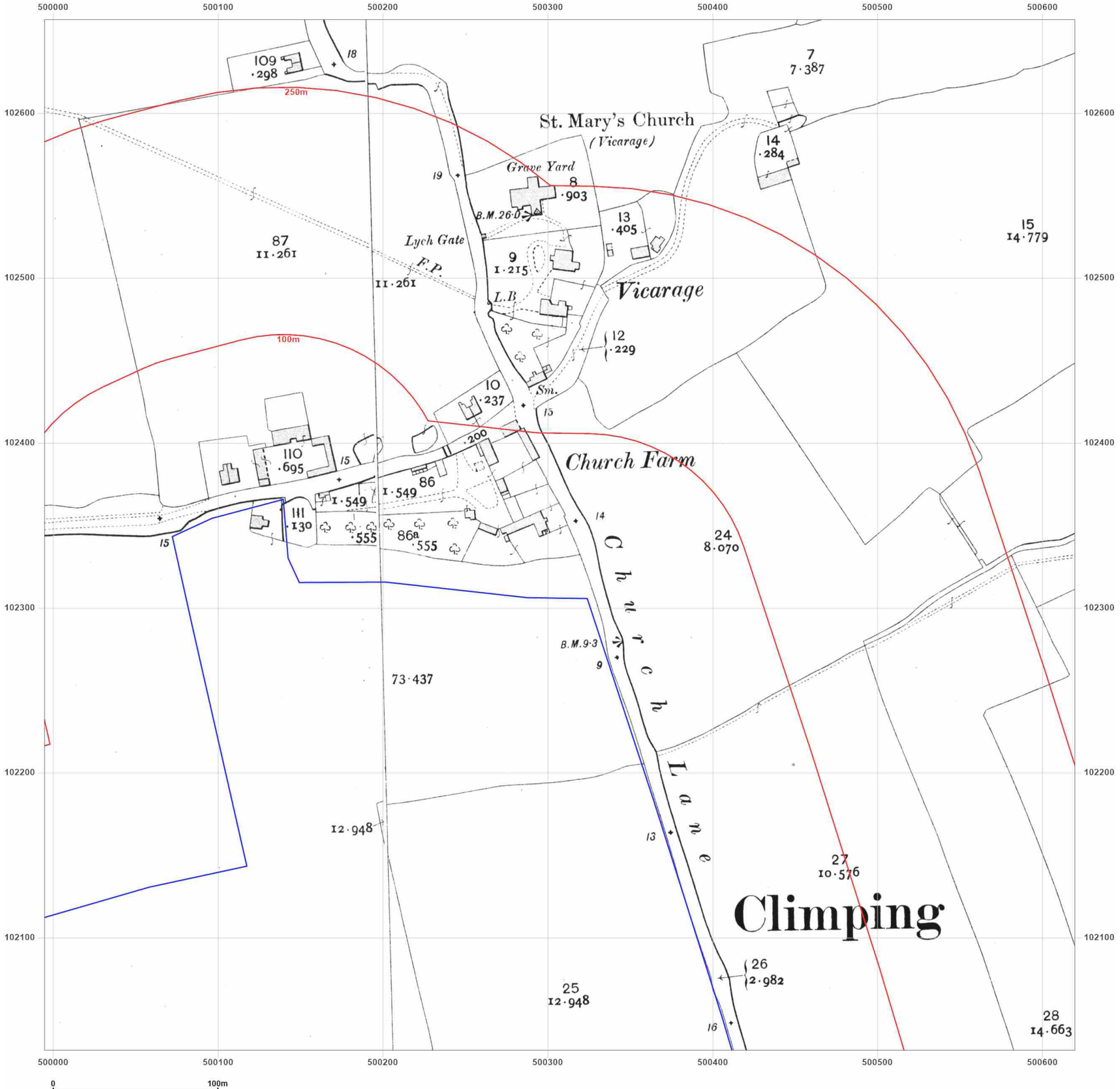

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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

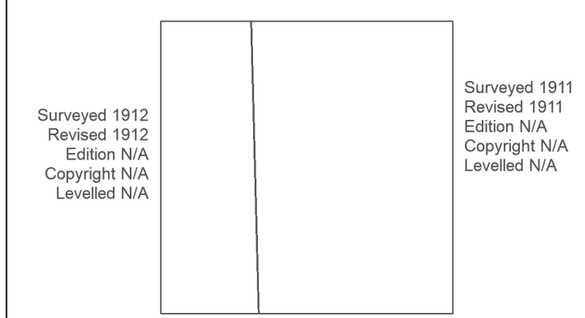
**Map Name:** County Series

**Map date:** **1911-1912**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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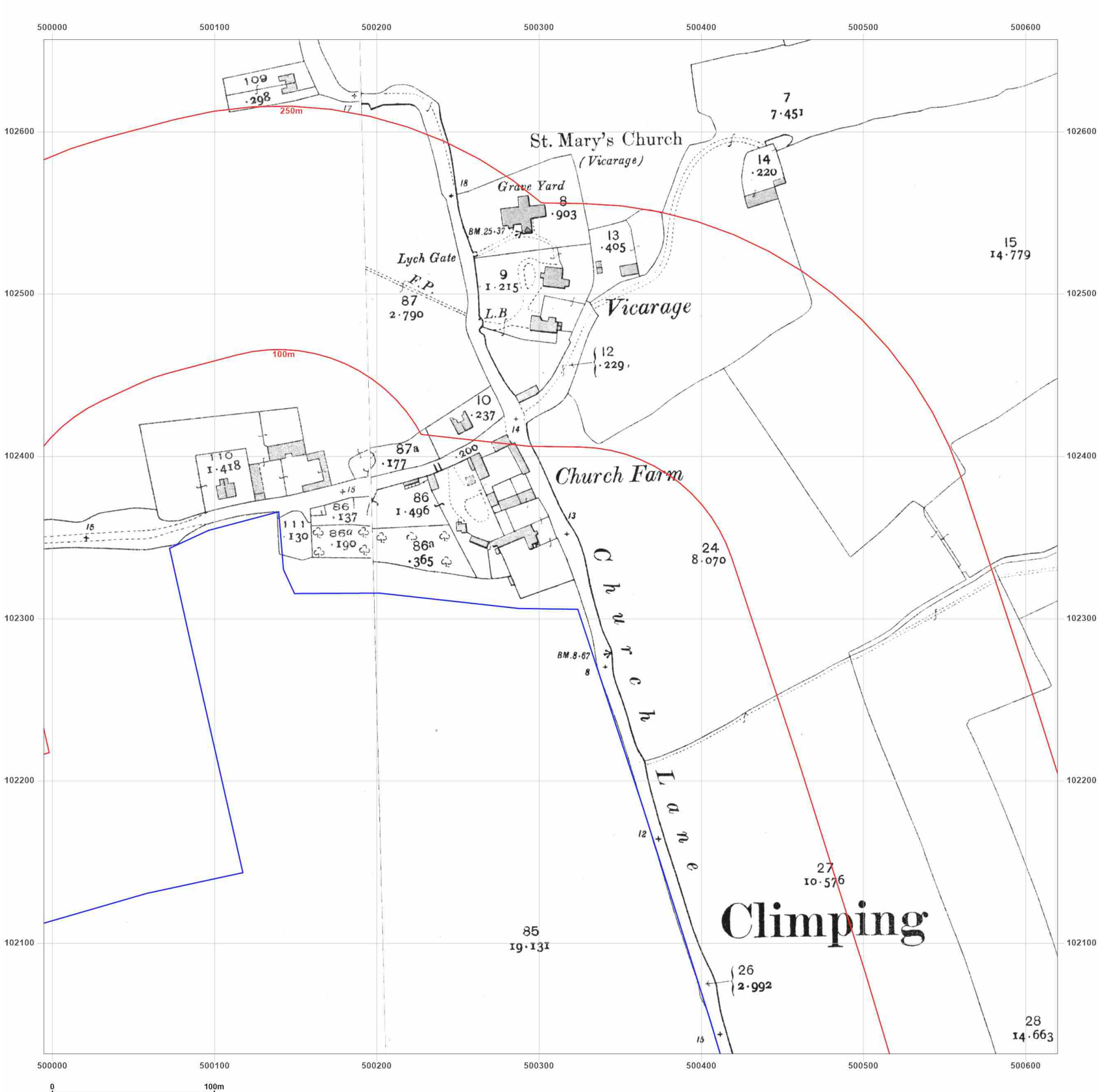

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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

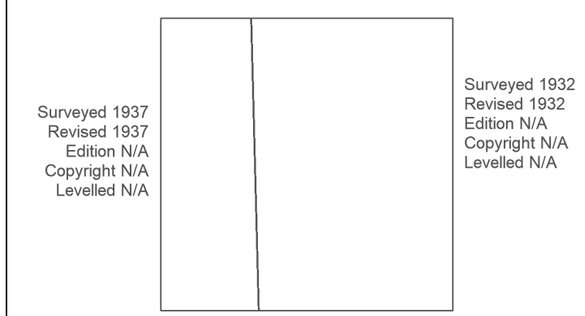
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**Map date:** **1932-1937**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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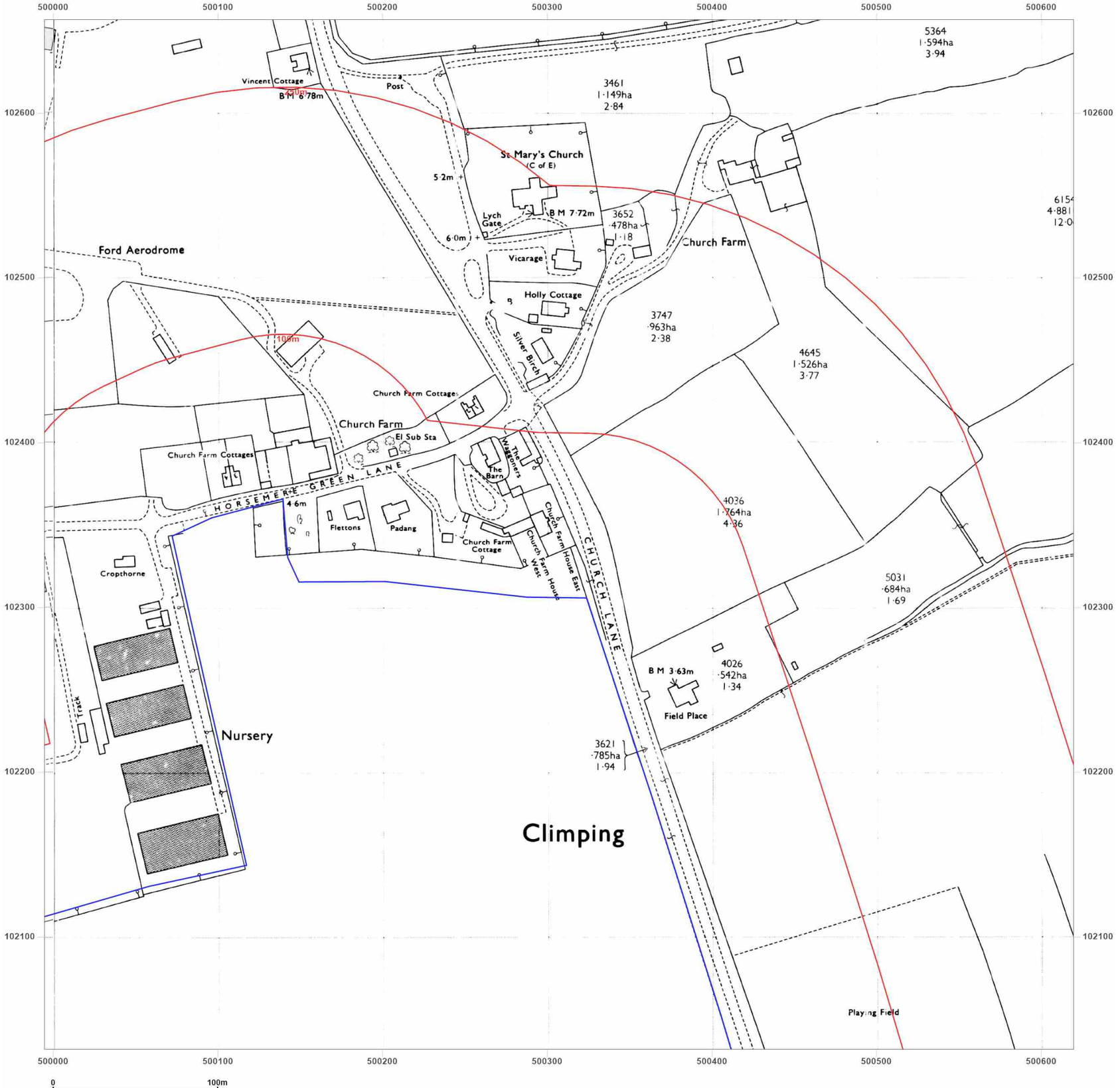

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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

**Map Name:** National Grid

**Map date:** **1973**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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| | |
|---|---|
| Surveyed 1973 | Surveyed N/A |
| Revised 1973 | Revised N/A |
| Edition N/A | Edition N/A |
| Copyright 1975 | Copyright N/A |
| Levelled 1950 | Levelled N/A |

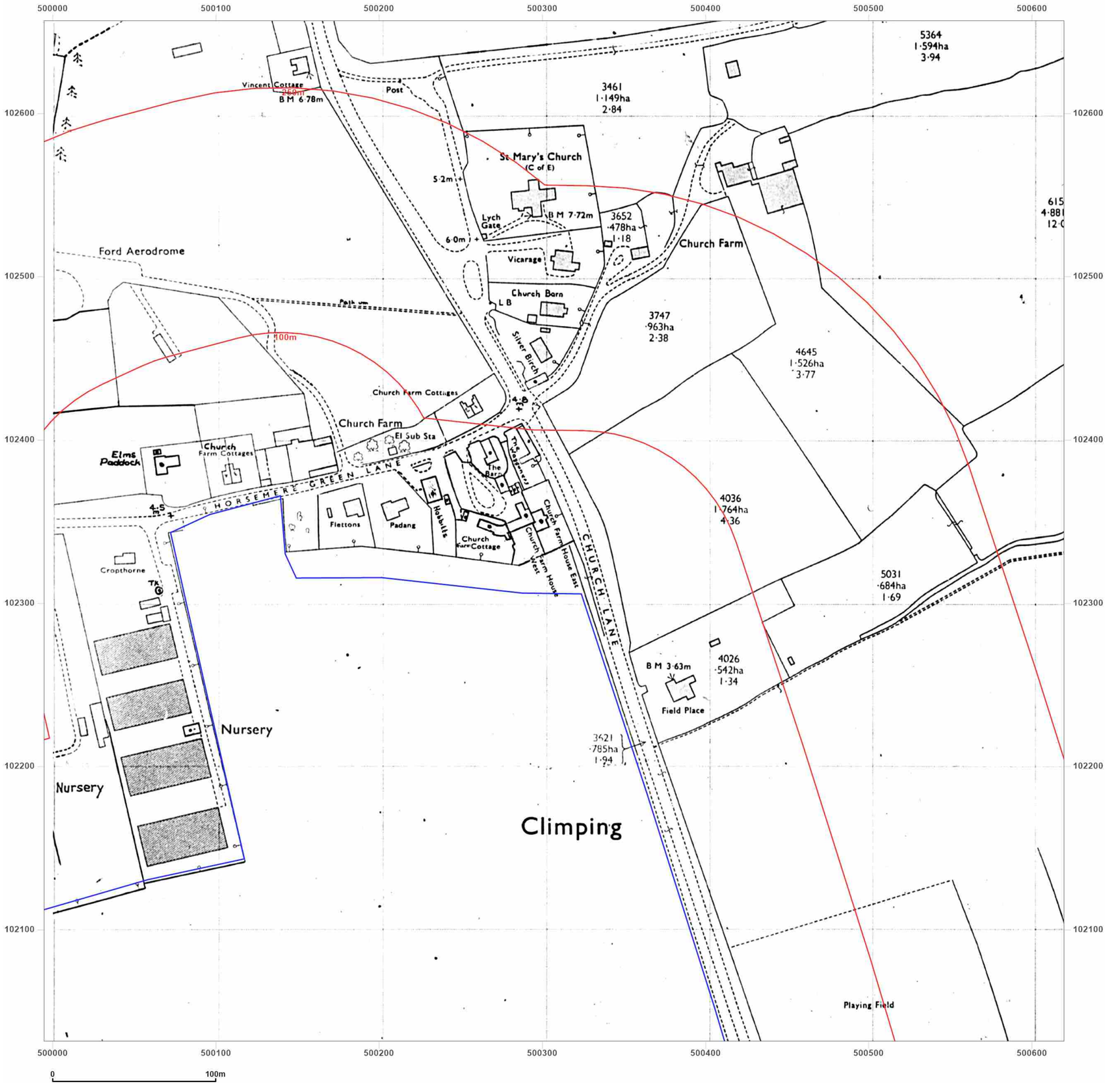
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

**Map Name:** National Grid

**Map date:** **1984**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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Surveyed 1975
Revised 1984
Edition N/A
Copyright 1984
Levelled 1975

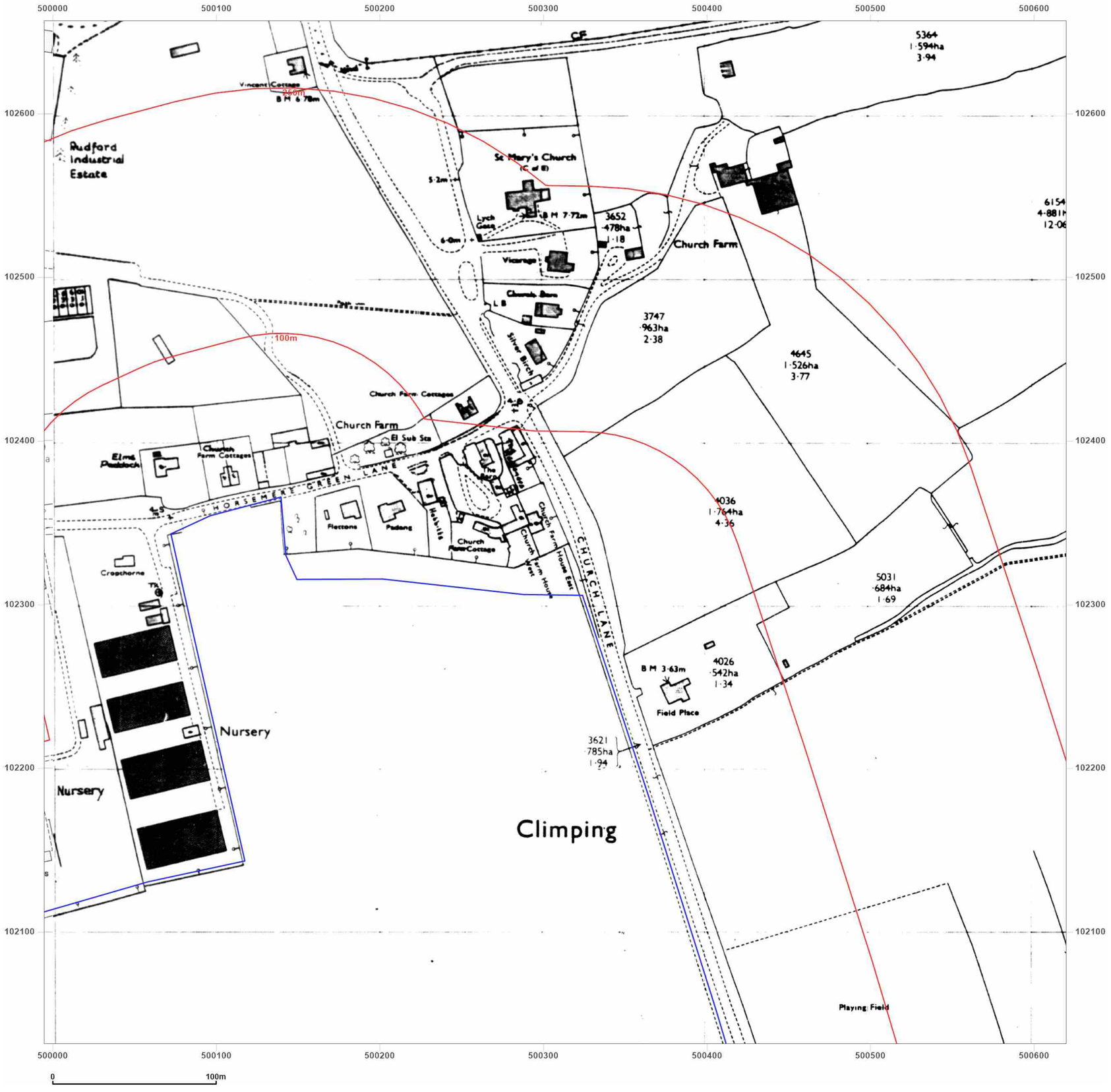
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**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

**Map Name:** National Grid

**Map date:** **1984**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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|---|---|
| Surveyed 1983 | Surveyed 1975 |
| Revised 1983 | Revised 1984 |
| Edition N/A | Edition N/A |
| Copyright 1984 | Copyright 1984 |
| Levelled 1975 | Levelled 1975 |

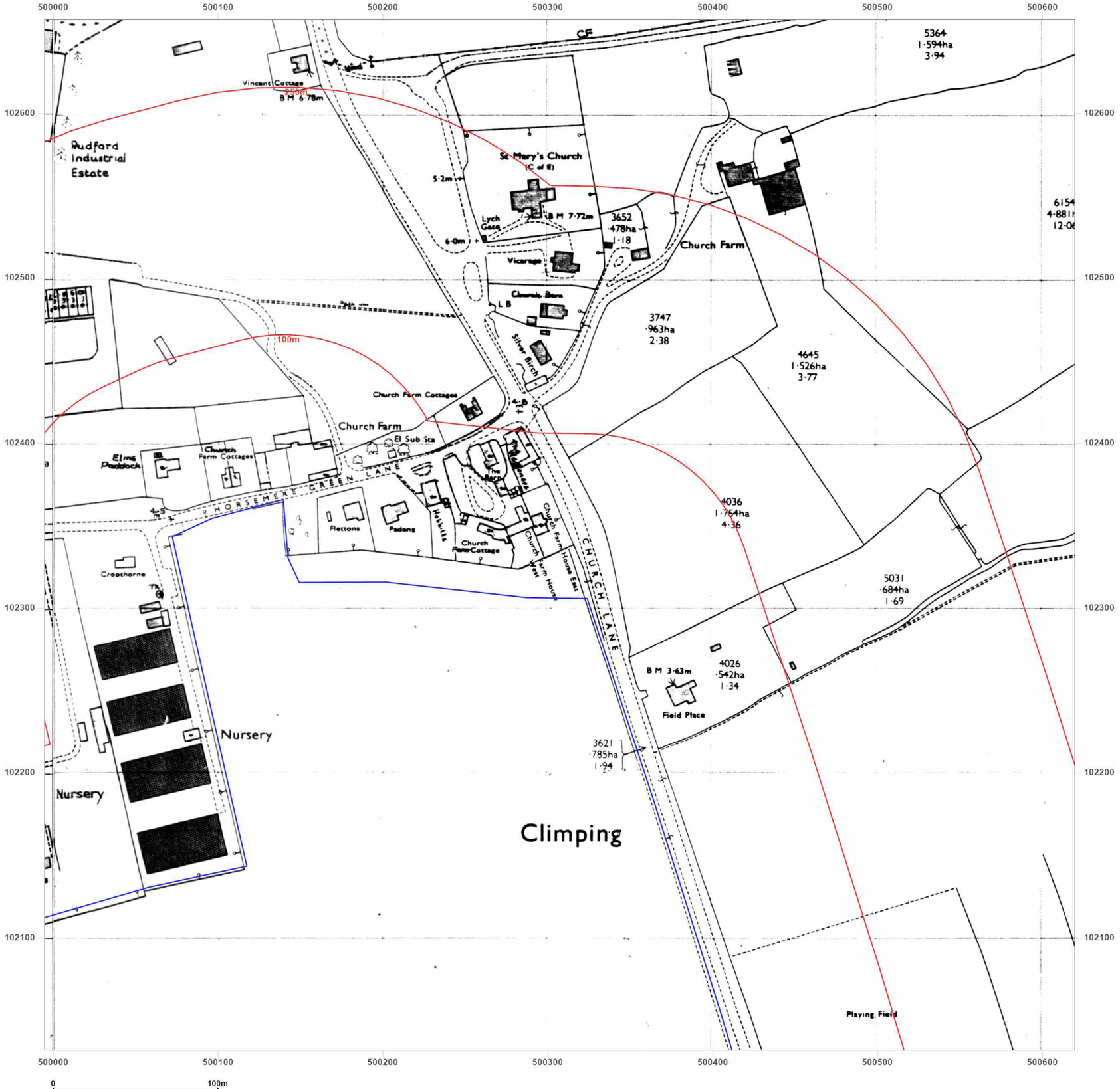
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**Site Details:**

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Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

**Map Name:** National Grid

**Map date:** **1988-1989**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
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| Surveyed 1973 | Surveyed 1975 |
|---|---|
| Revised 1988 | Revised 1989 |
| Edition N/A | Edition N/A |
| Copyright N/A | Copyright 1989 |
| Levelled 1975 | Levelled 1975 |

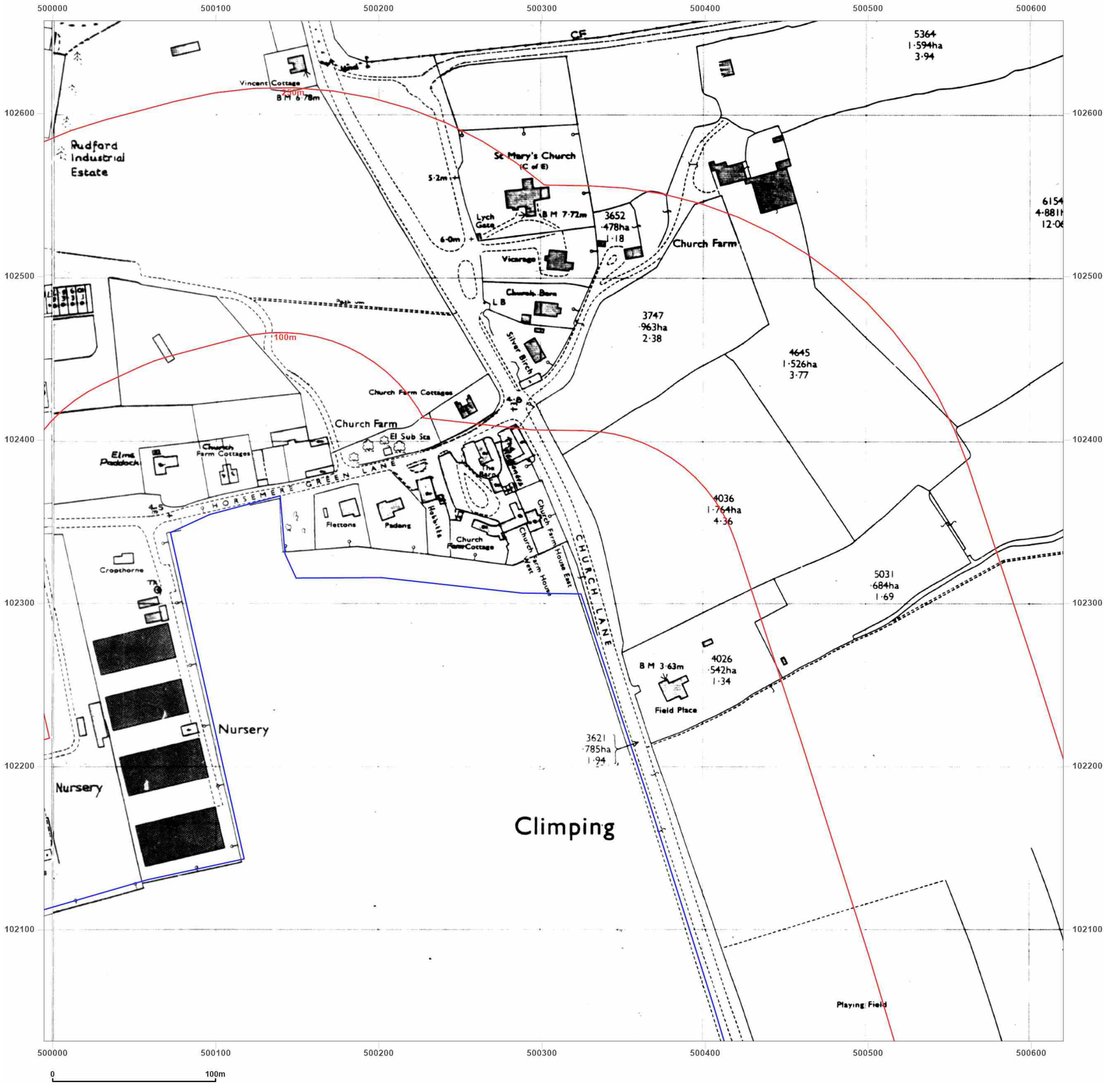
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

**Map Name:** National Grid

**Map date:** **1989-1991**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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| | |
|---|---|
| Surveyed 1975 | Surveyed 1975 |
| Revised 1983 | Revised 1989 |
| Edition N/A | Edition N/A |
| Copyright 1991 | Copyright 1989 |
| Levelled 1975 | Levelled 1975 |

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**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI_LS_2_2
**Grid Ref:** 500307, 102344

**Map Name:** National Grid

**Map date:** **1994**

**Scale:** 1:2,500

**Printed at:** 1:2,500

N
W E
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Surveyed 1994
Revised N/A
Edition N/A
Copyright 1994
Levelled N/A

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

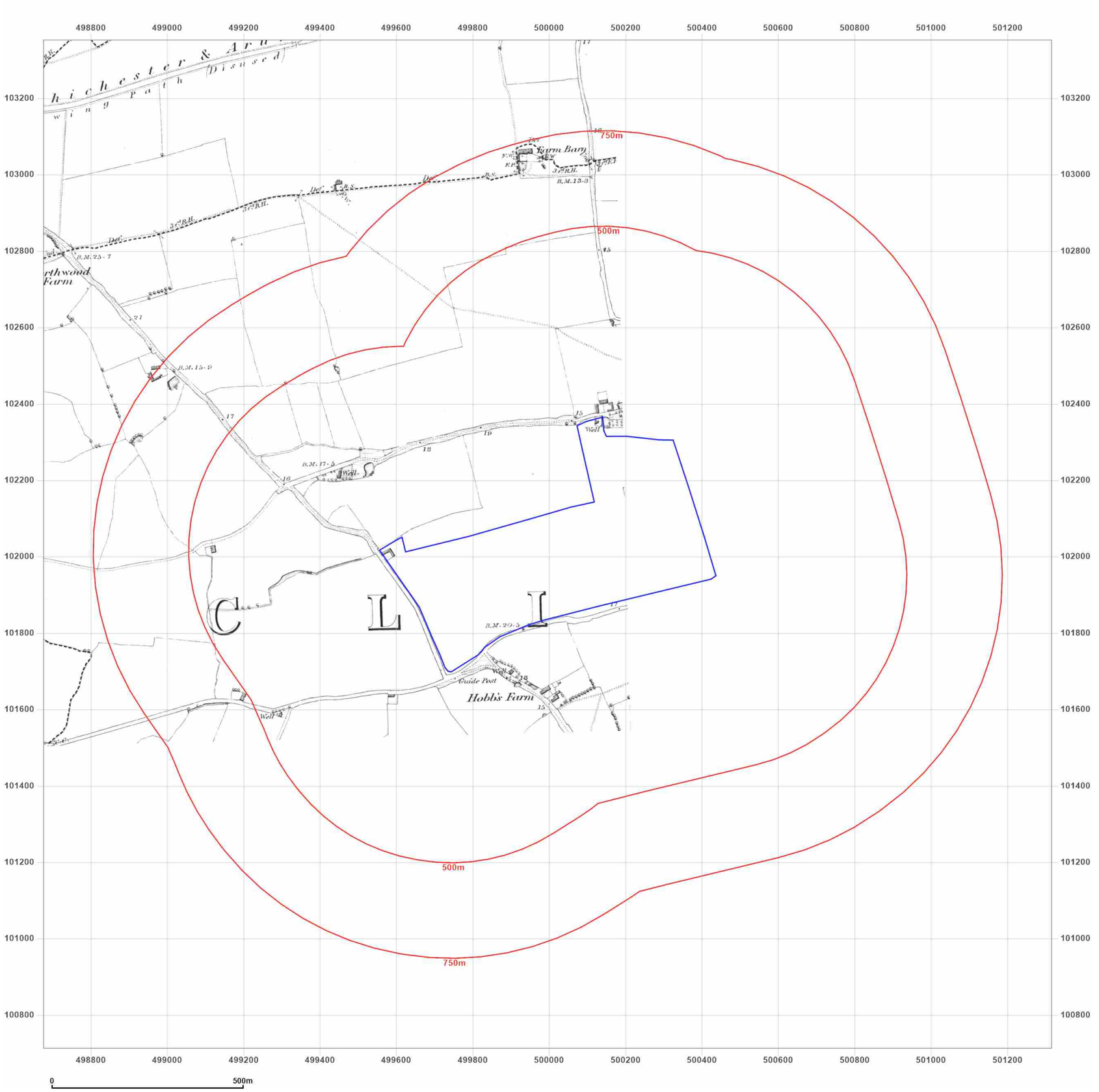
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** County Series

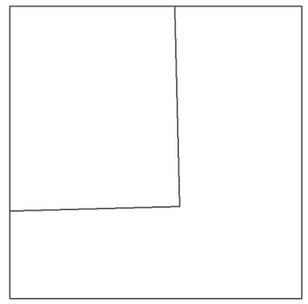
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**Scale:** 1:10,560

**Printed at:** 1:10,560

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



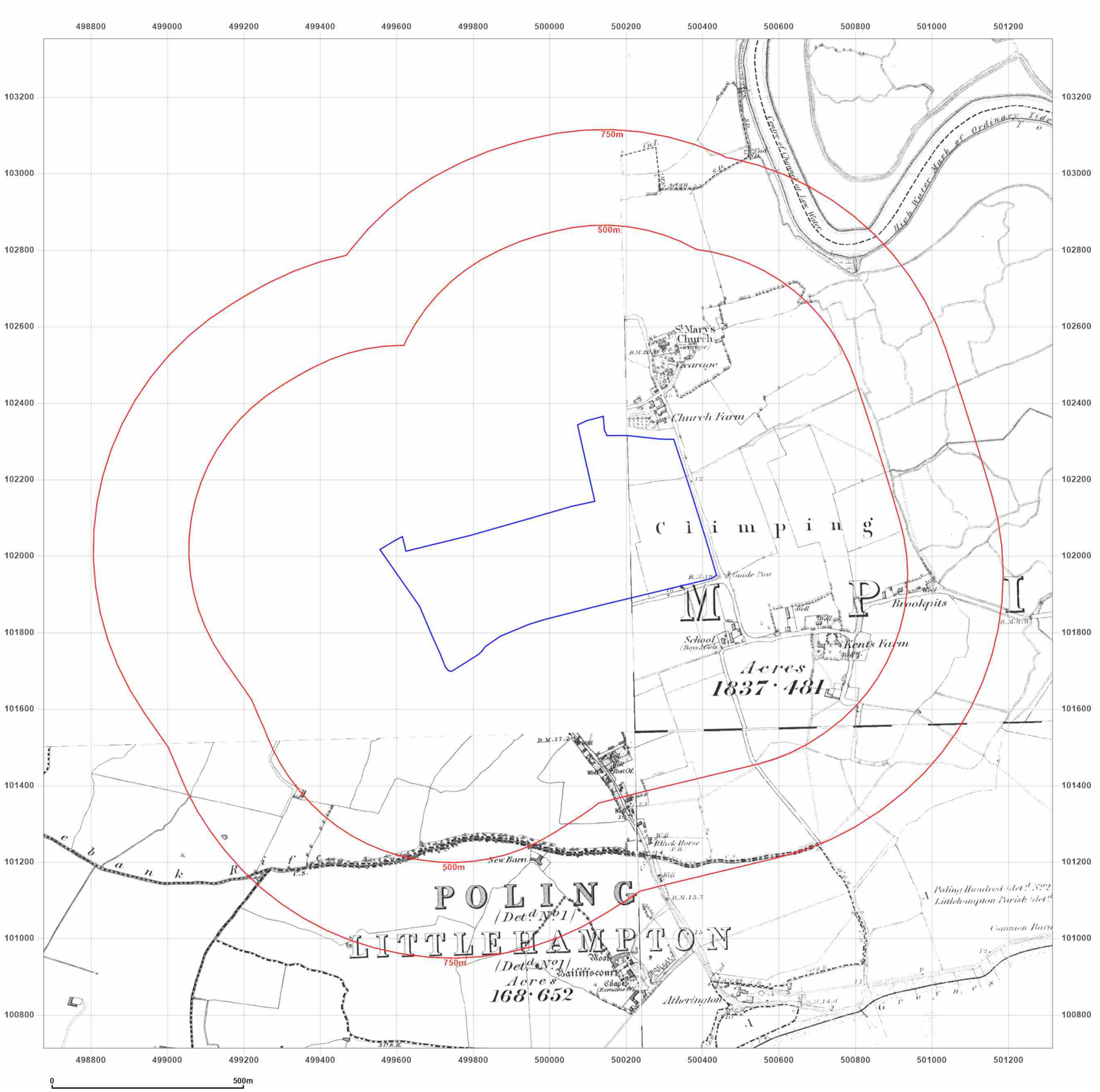
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17 5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
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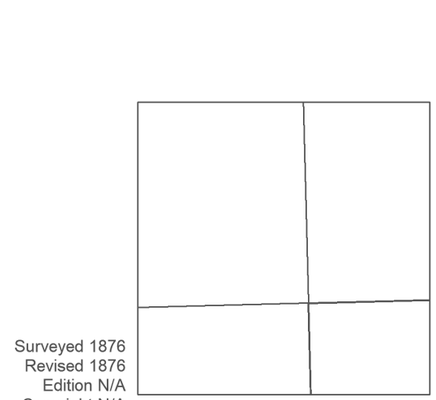
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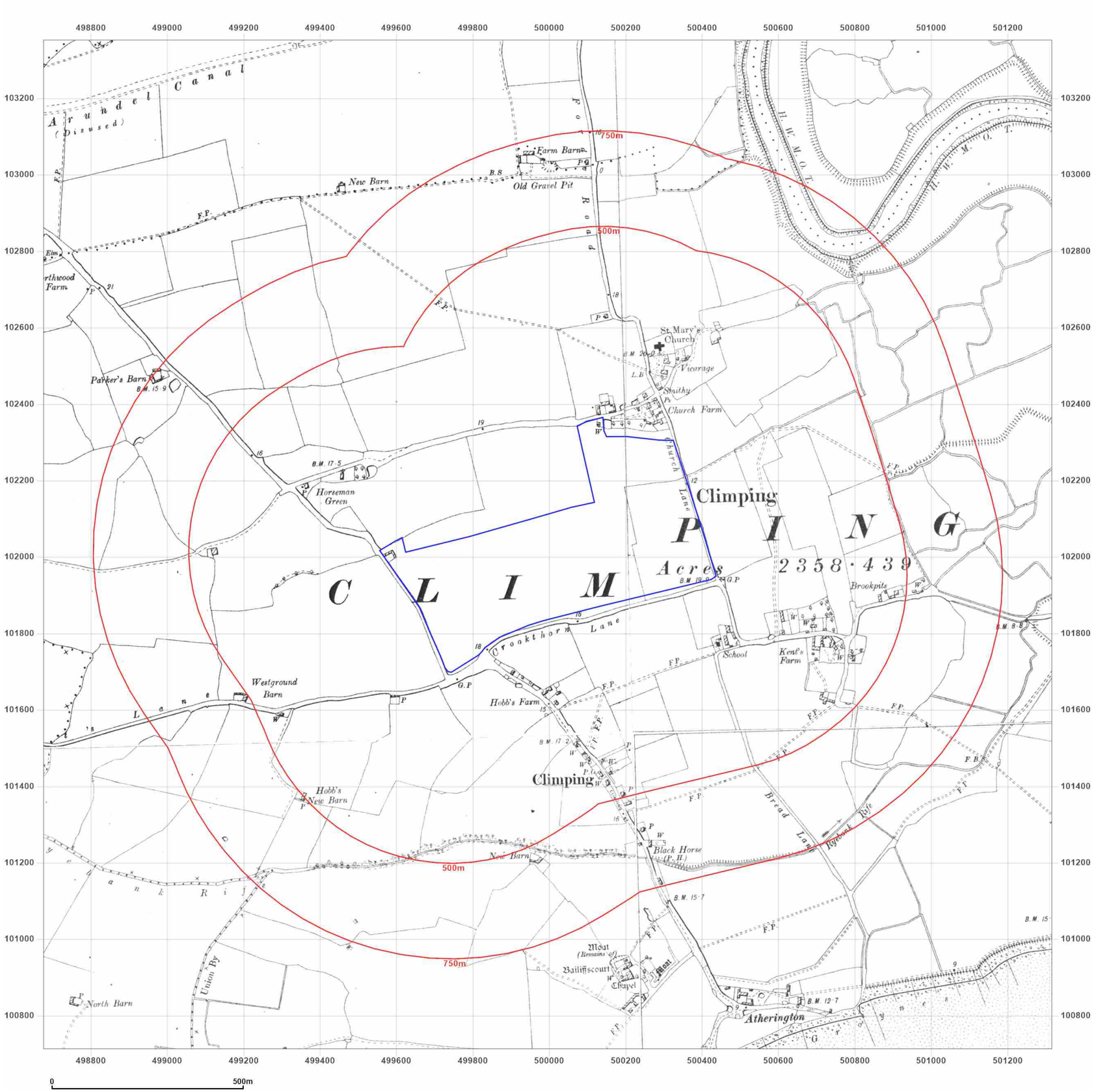

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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17 5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
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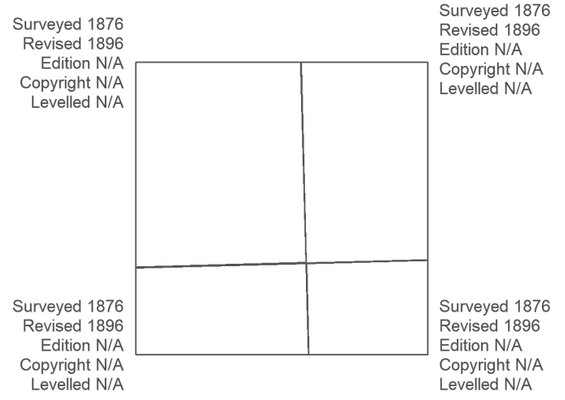
**Map Name:** County Series

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**Scale:** 1:10,560

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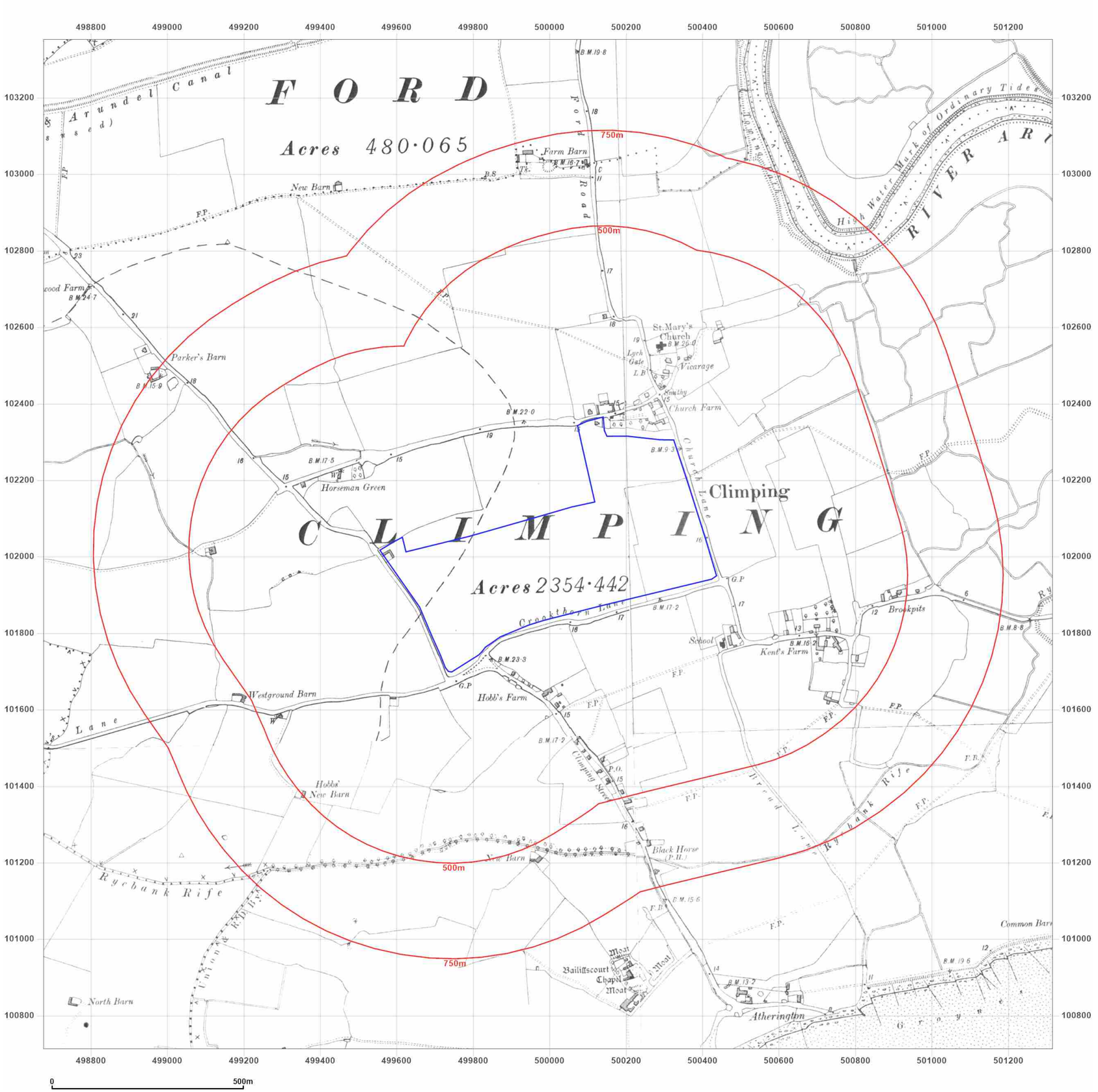

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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

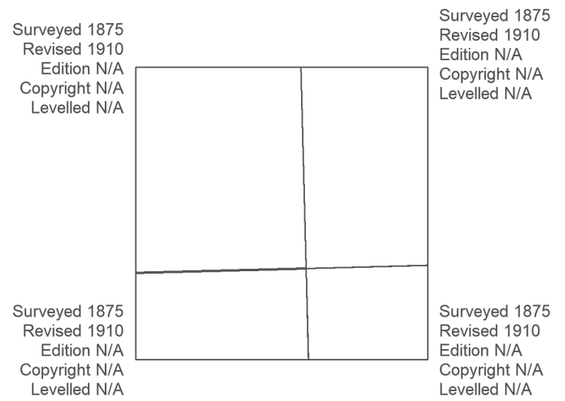
**Map Name:** County Series

**Map date:** **1910**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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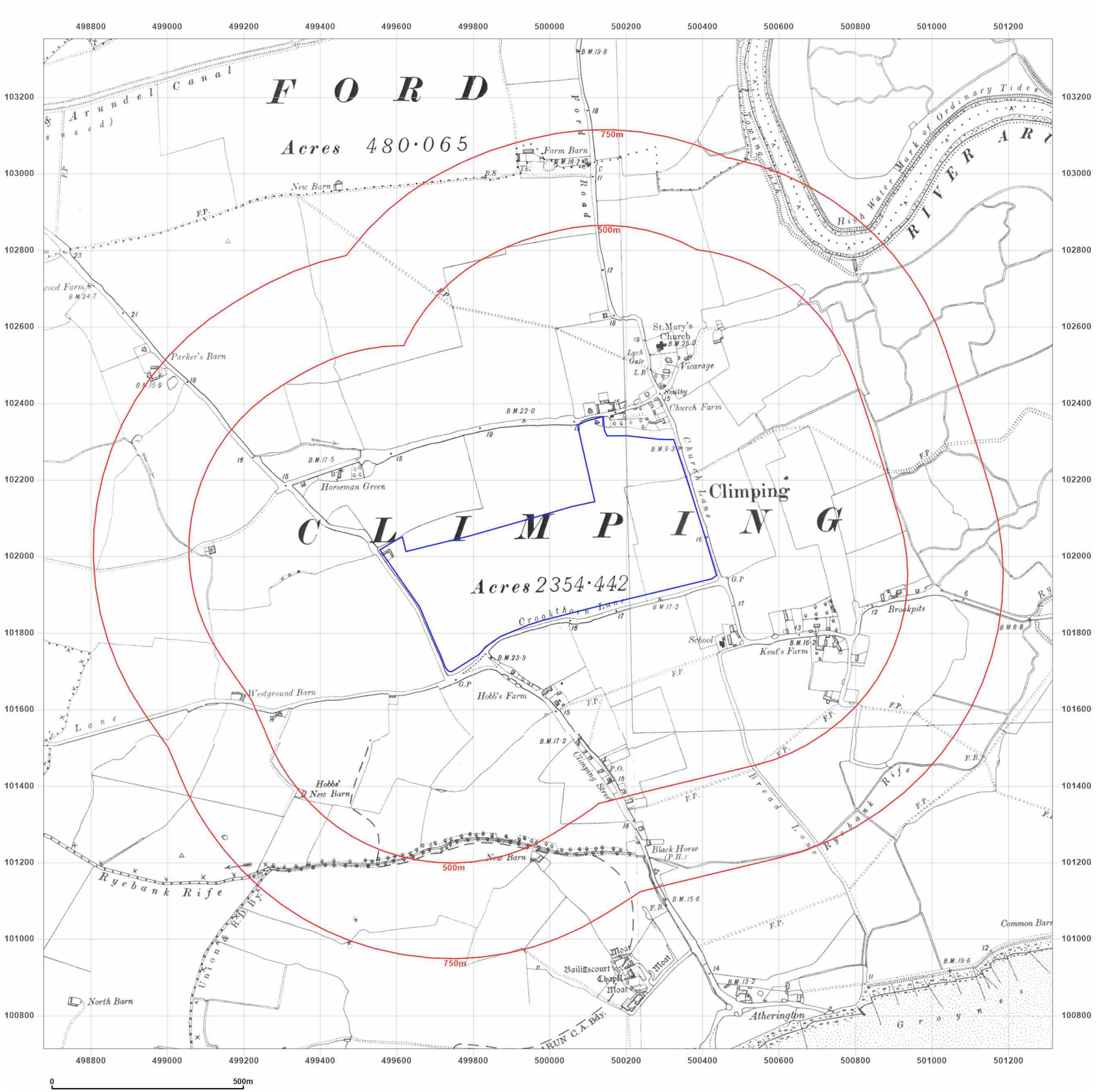

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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

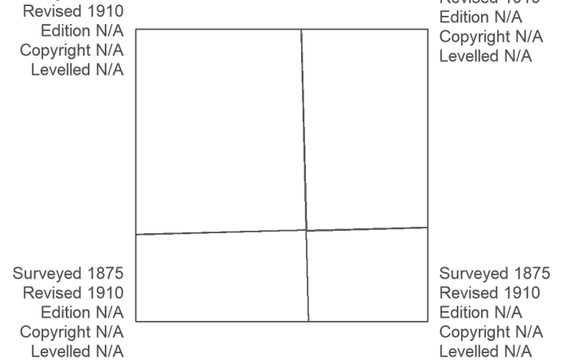
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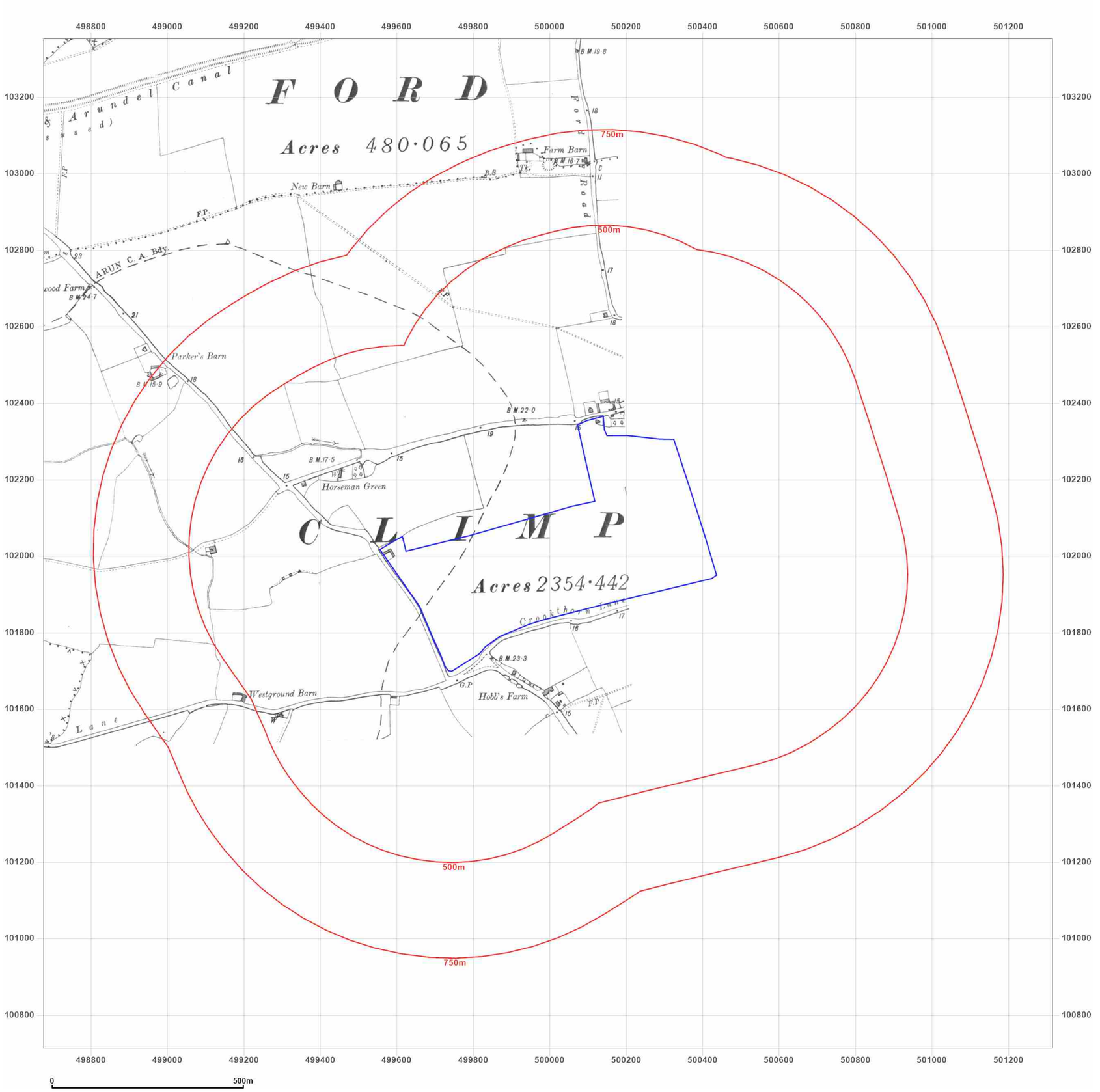

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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** County Series

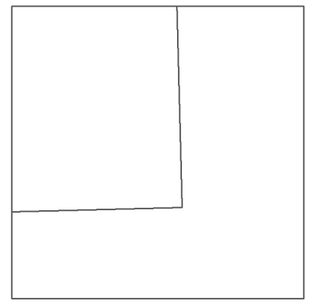
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**Printed at:** 1:10,560

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



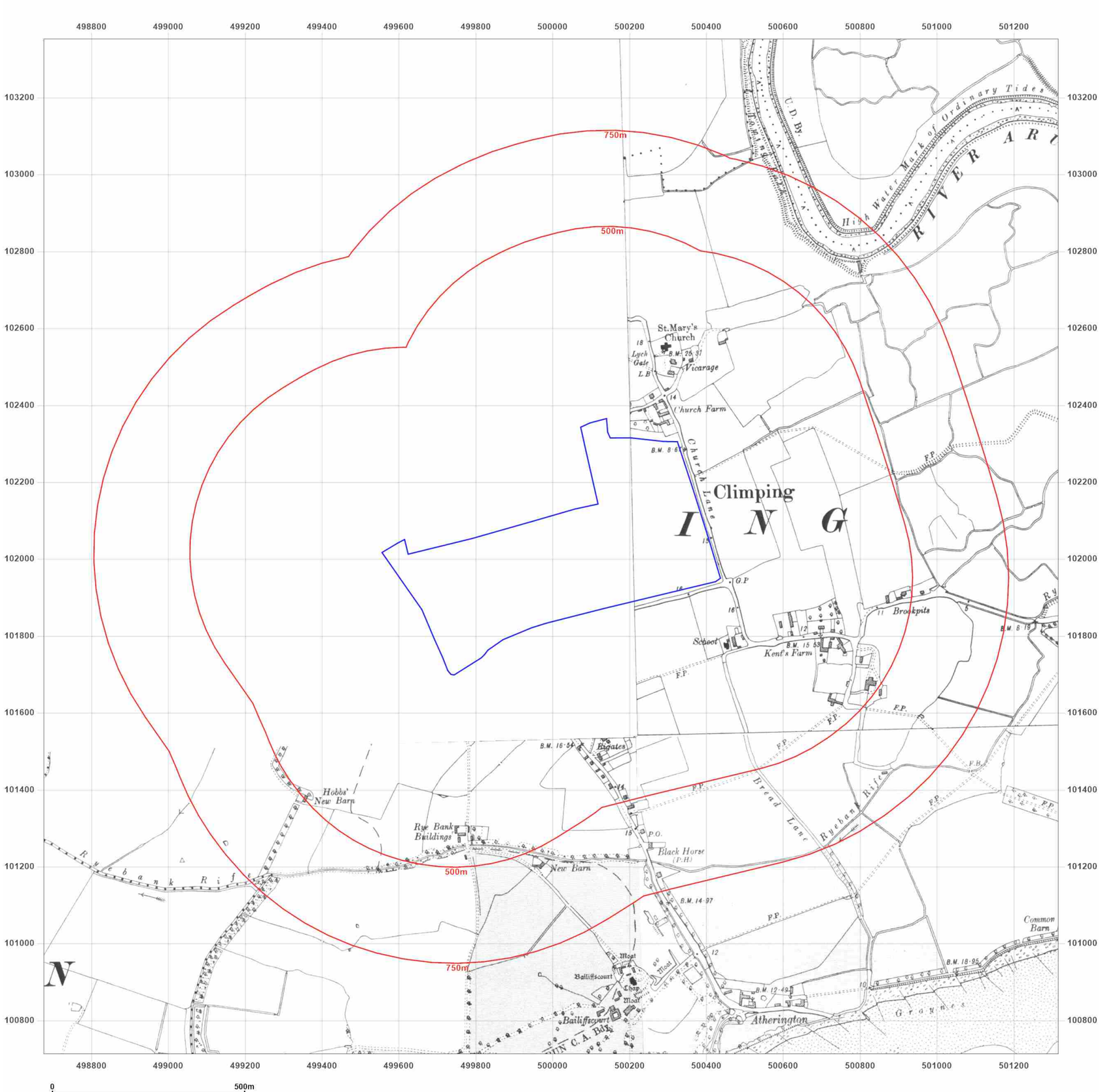
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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17 5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
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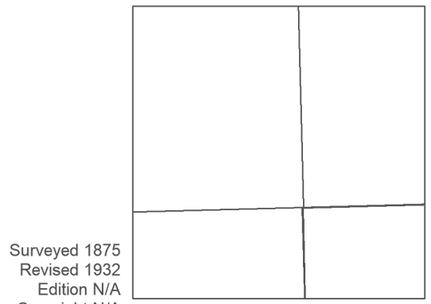
**Map Name:** County Series

**Map date:** **1932**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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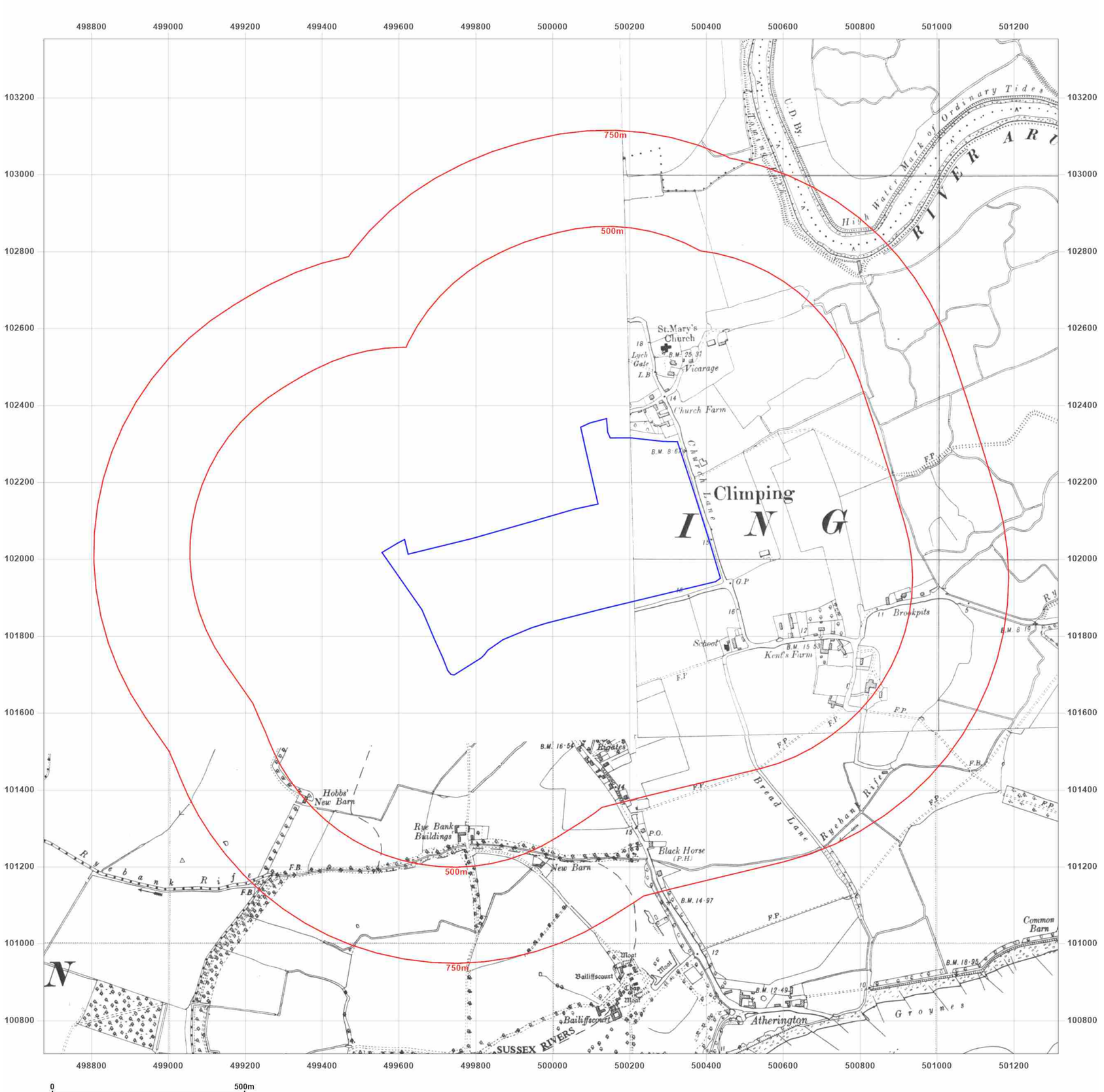

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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17 5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** County Series

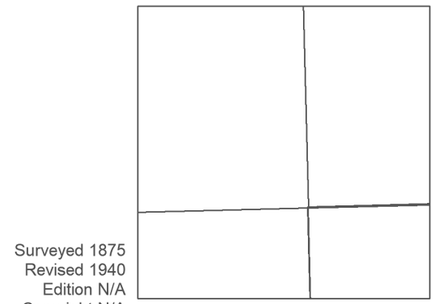
**Map date:** **1938-1940**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1875
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A



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

Surveyed 1875
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

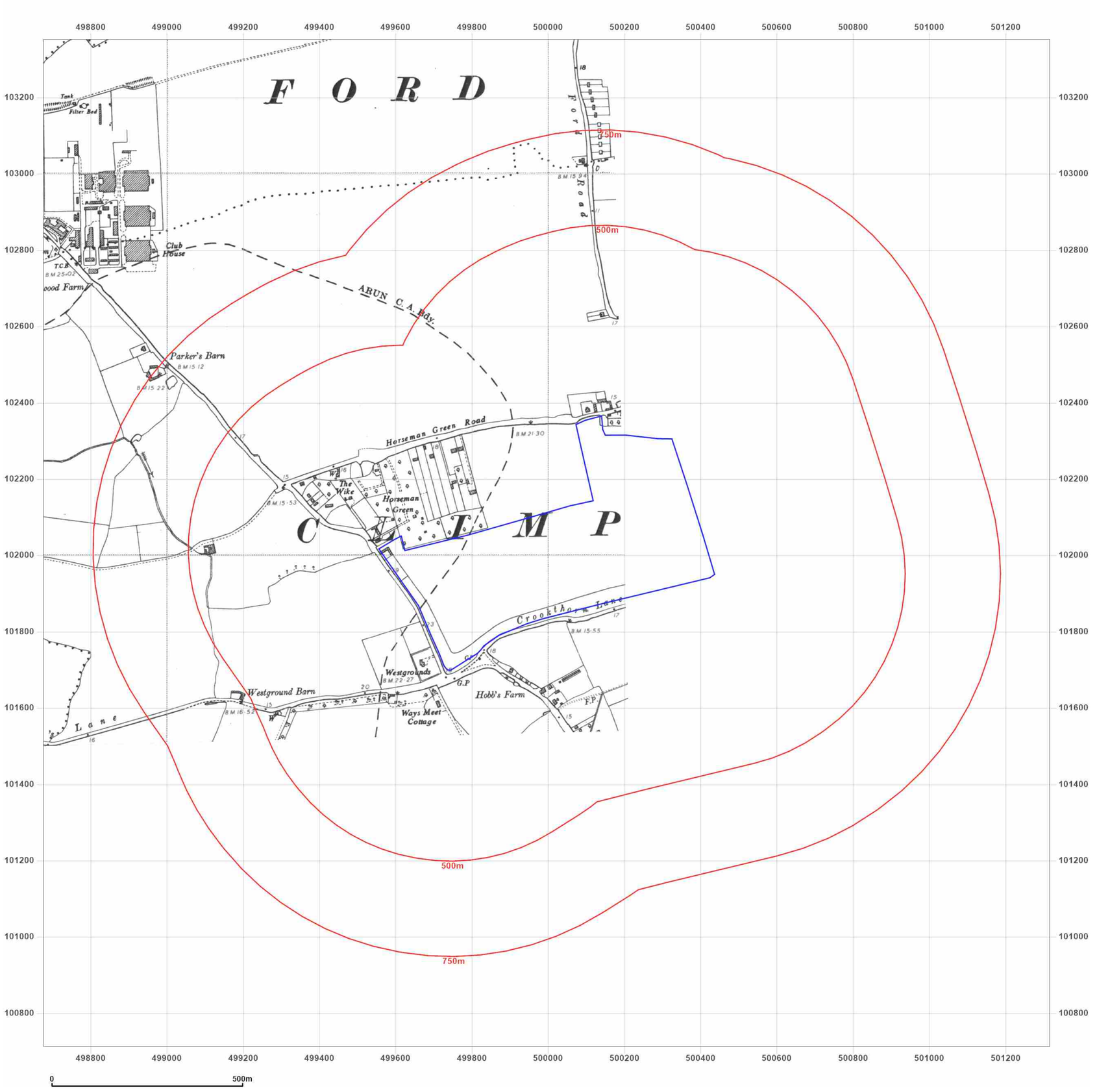
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# Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** County Series

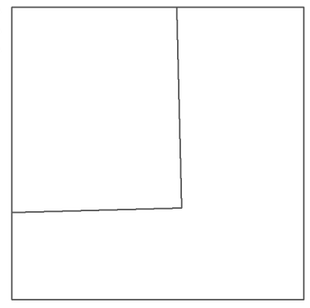
**Map date:** **1950**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1875
Revised 1950
Edition N/A
Copyright N/A
Levelled N/A



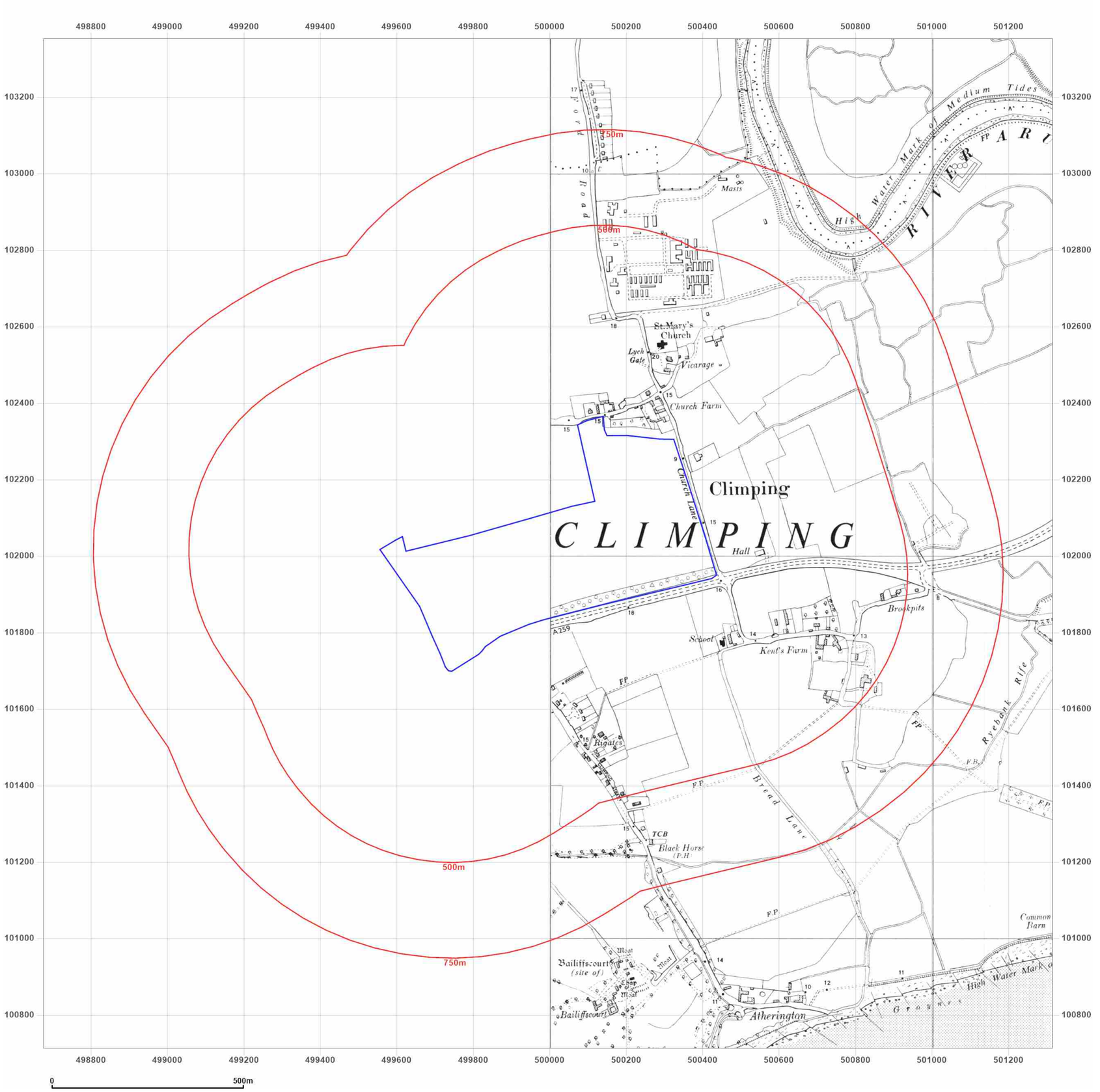
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17 5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** Provisional
**Map date:** **1957**
**Scale:** 1:10,560
**Printed at:** 1:10,560

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

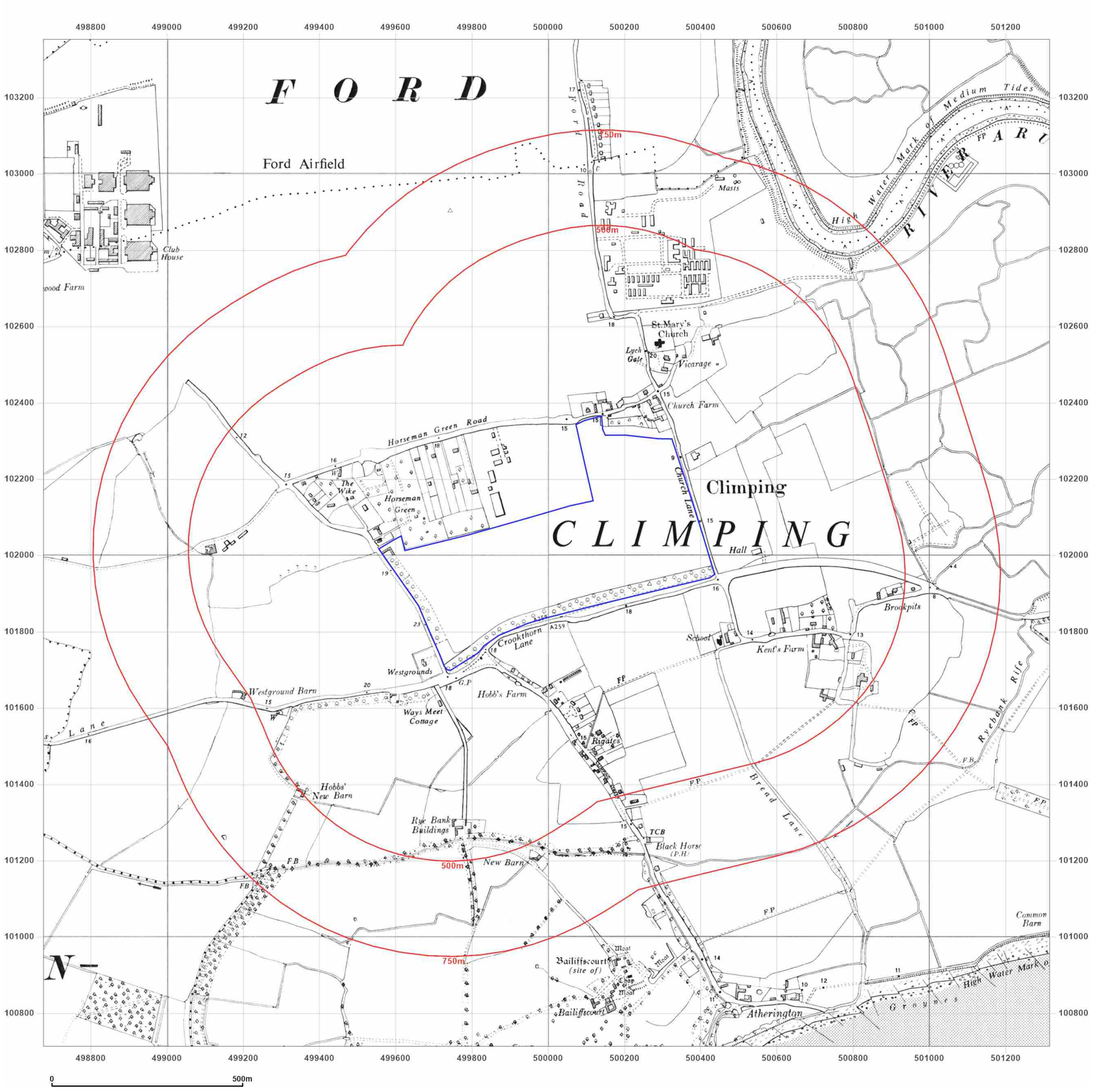
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17 5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** Provisional
**Map date:** **1957-1961**
**Scale:** 1:10,560
**Printed at:** 1:10,560

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

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

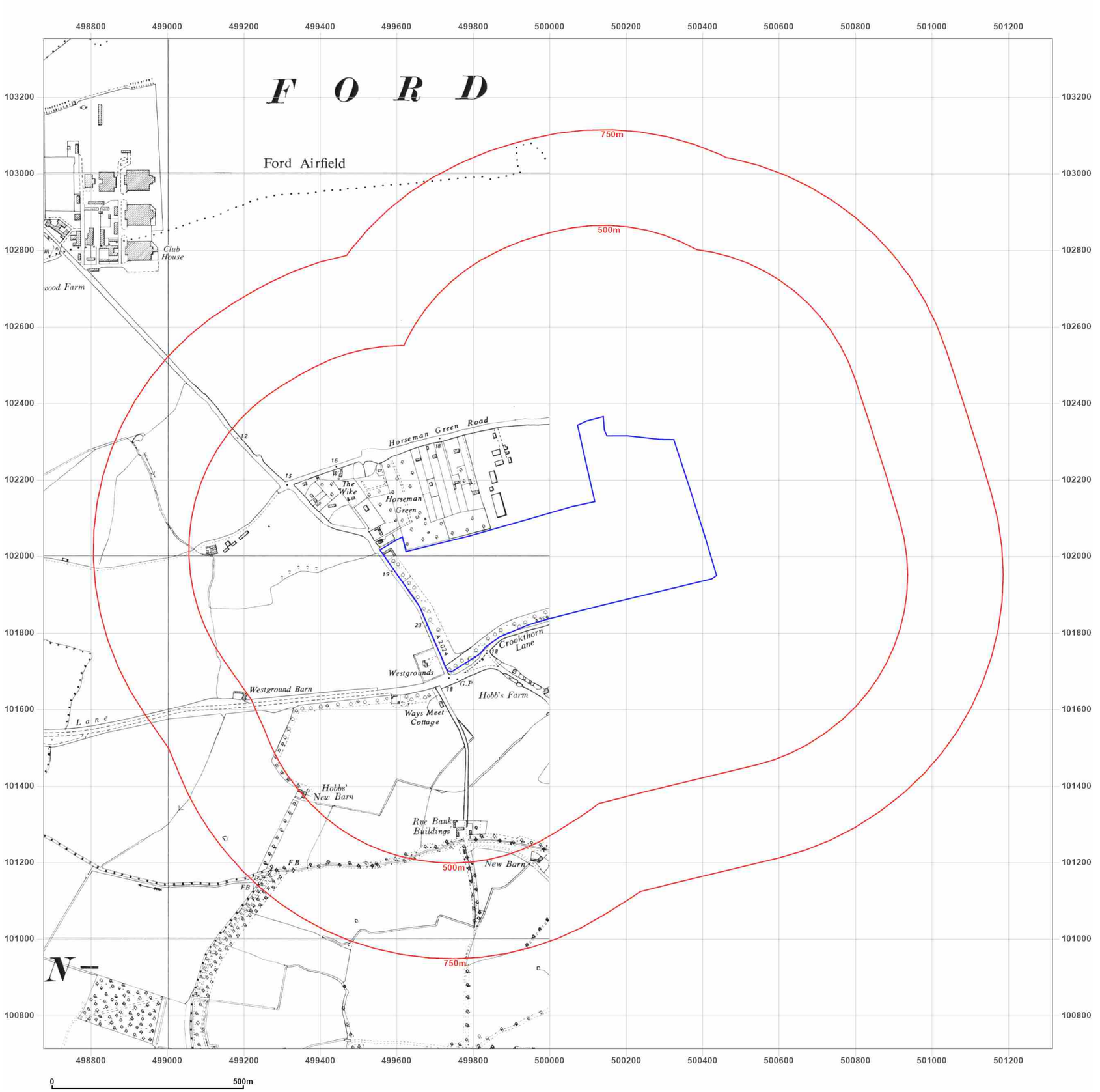
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** Provisional

**Map date:** **1966**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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Surveyed N/A
Revised 1966
Edition N/A
Copyright N/A
Levelled N/A

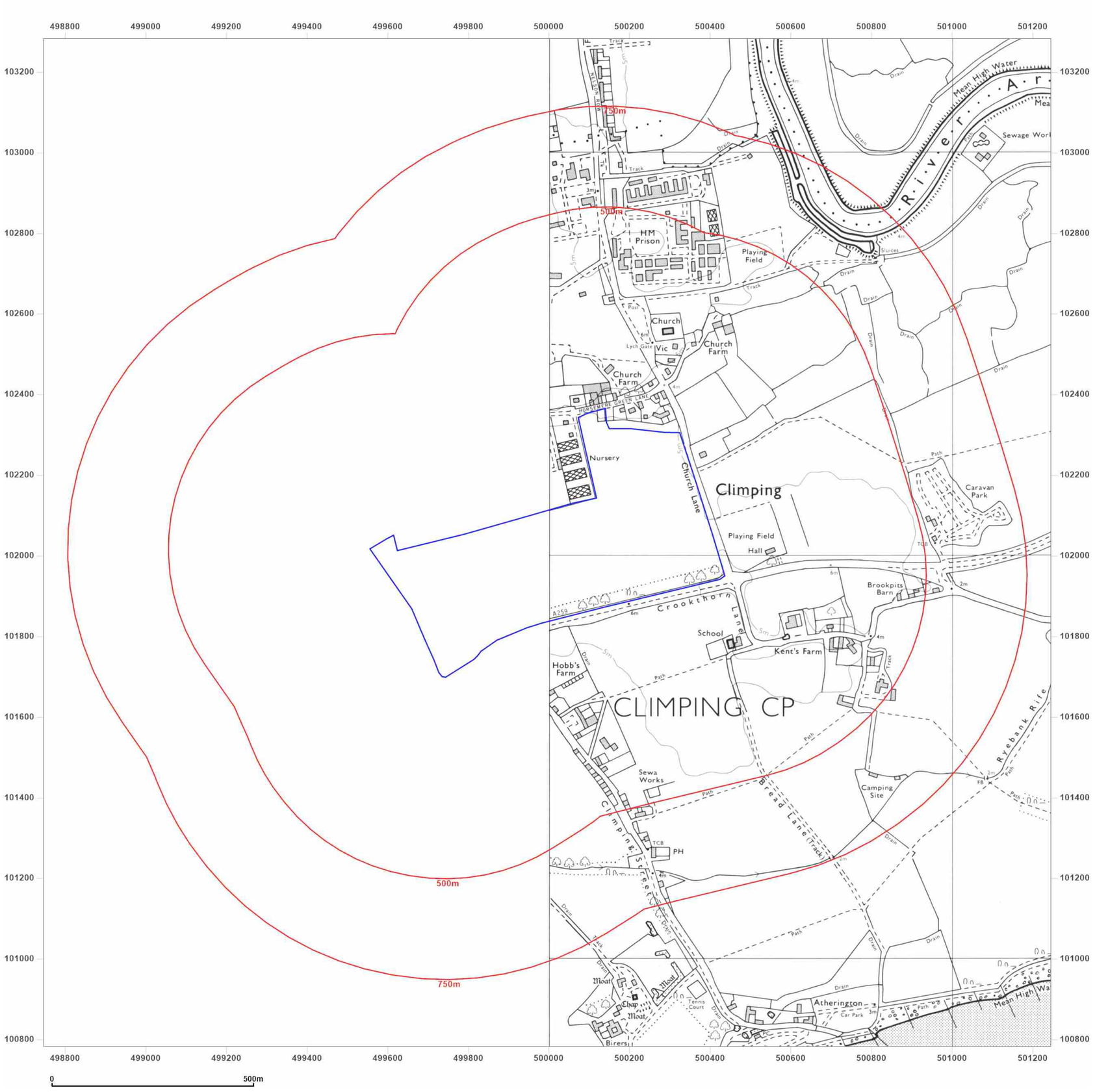
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# Groundsure INSIGHTS

**Site Details:**

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Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** National Grid

**Map date:** **1974**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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Surveyed 1973
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

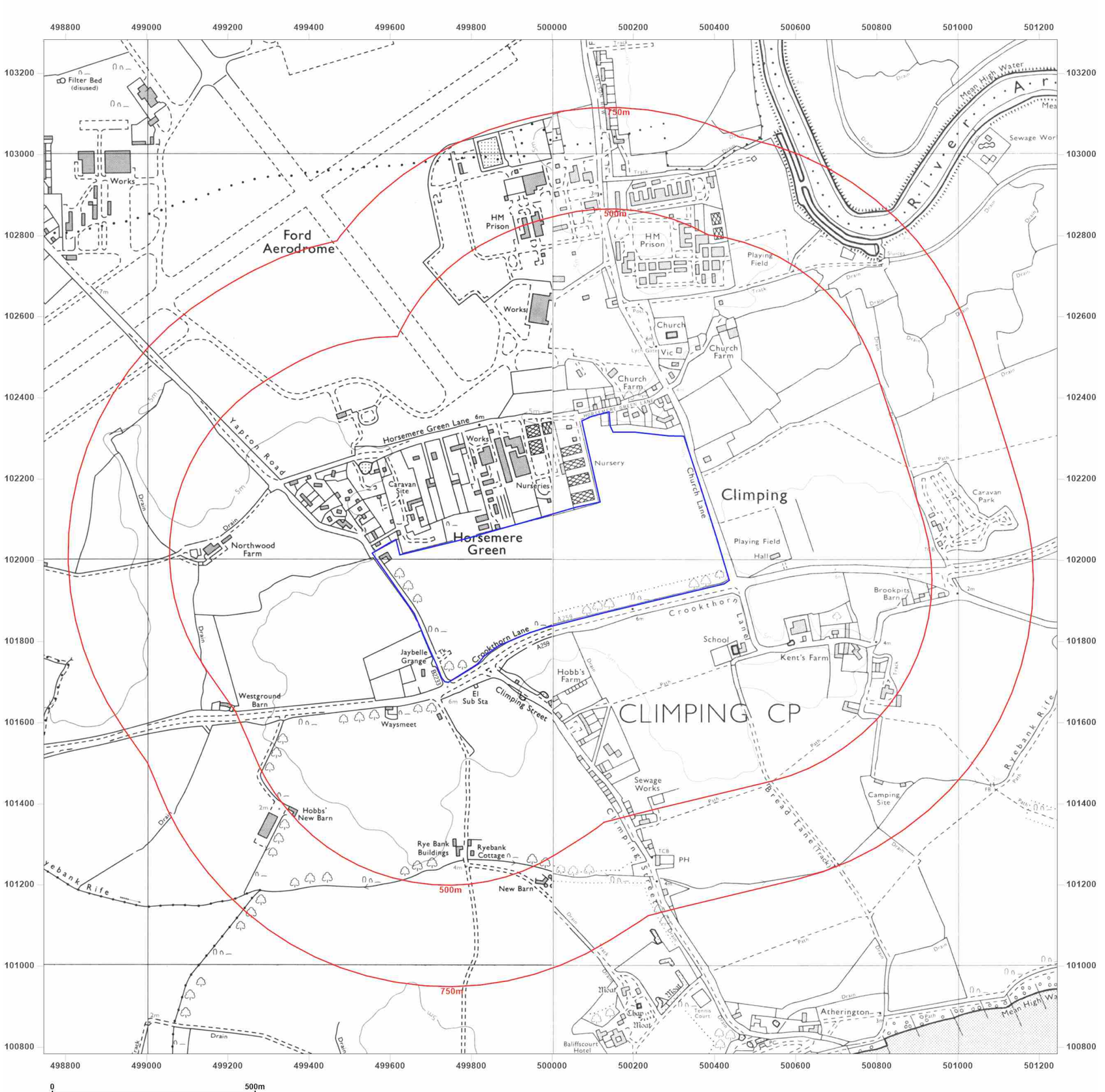
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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** National Grid

**Map date:** **1980-1981**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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Surveyed 1978
Revised 1979
Edition N/A
Copyright 1980
Levelled 1975

Surveyed 1981
Revised 1981
Edition N/A
Copyright N/A
Levelled N/A

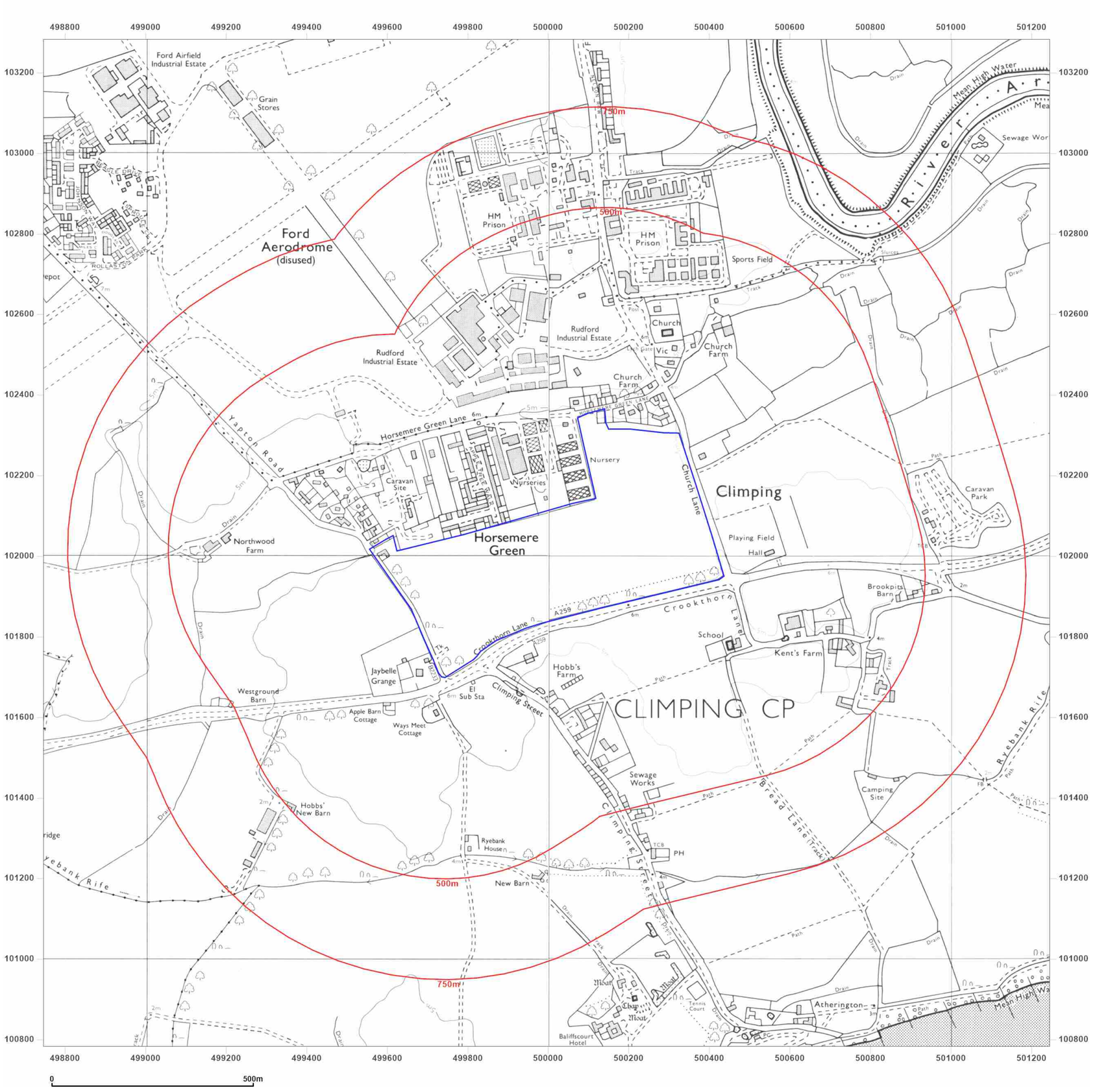
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**Site Details:**

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5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** National Grid

**Map date:** **1991-1992**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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

Surveyed 1981
Revised 1992
Edition N/A
Copyright N/A
Levelled N/A

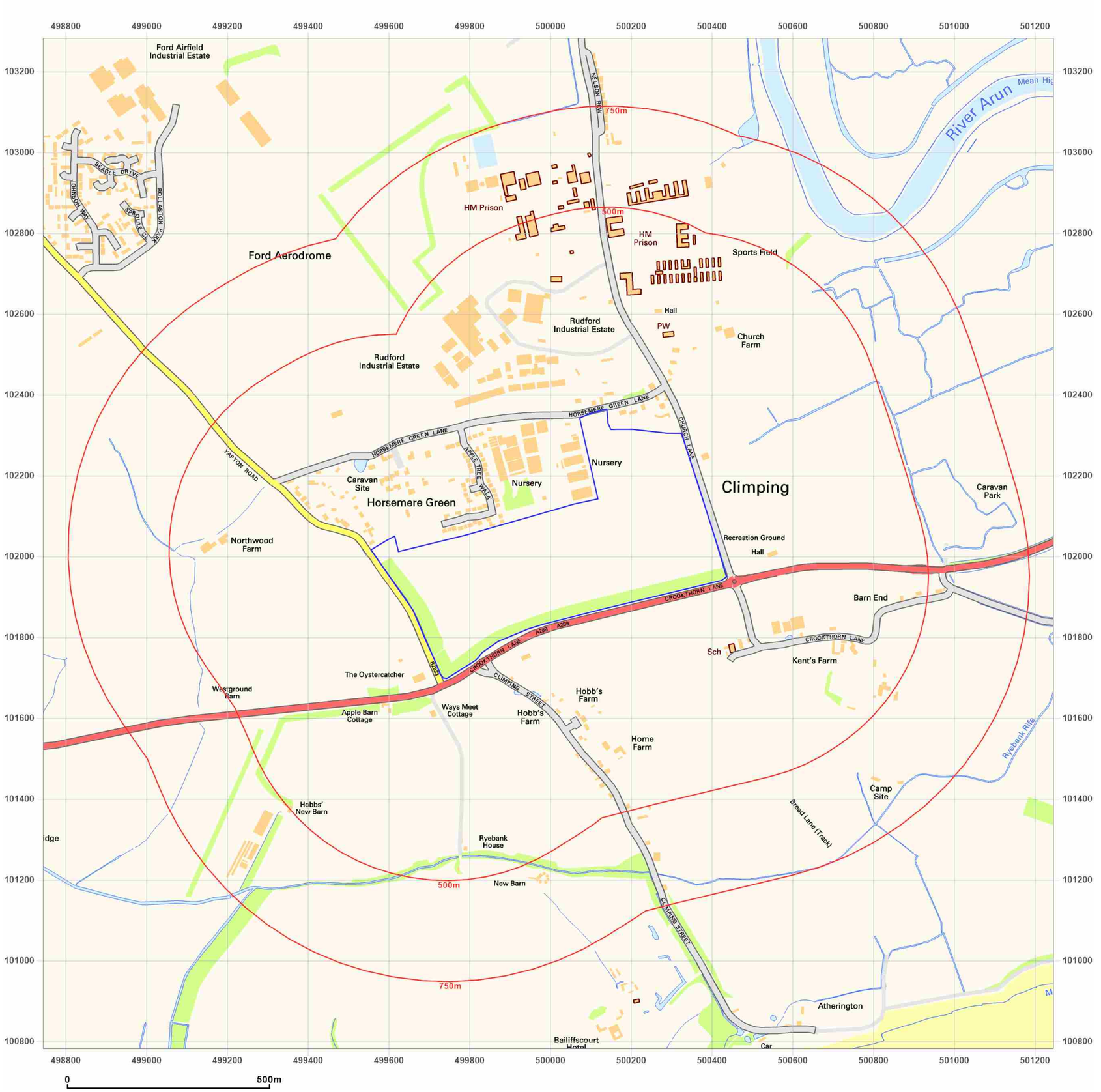
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**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** National Grid

**Map date:** **2001**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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2001

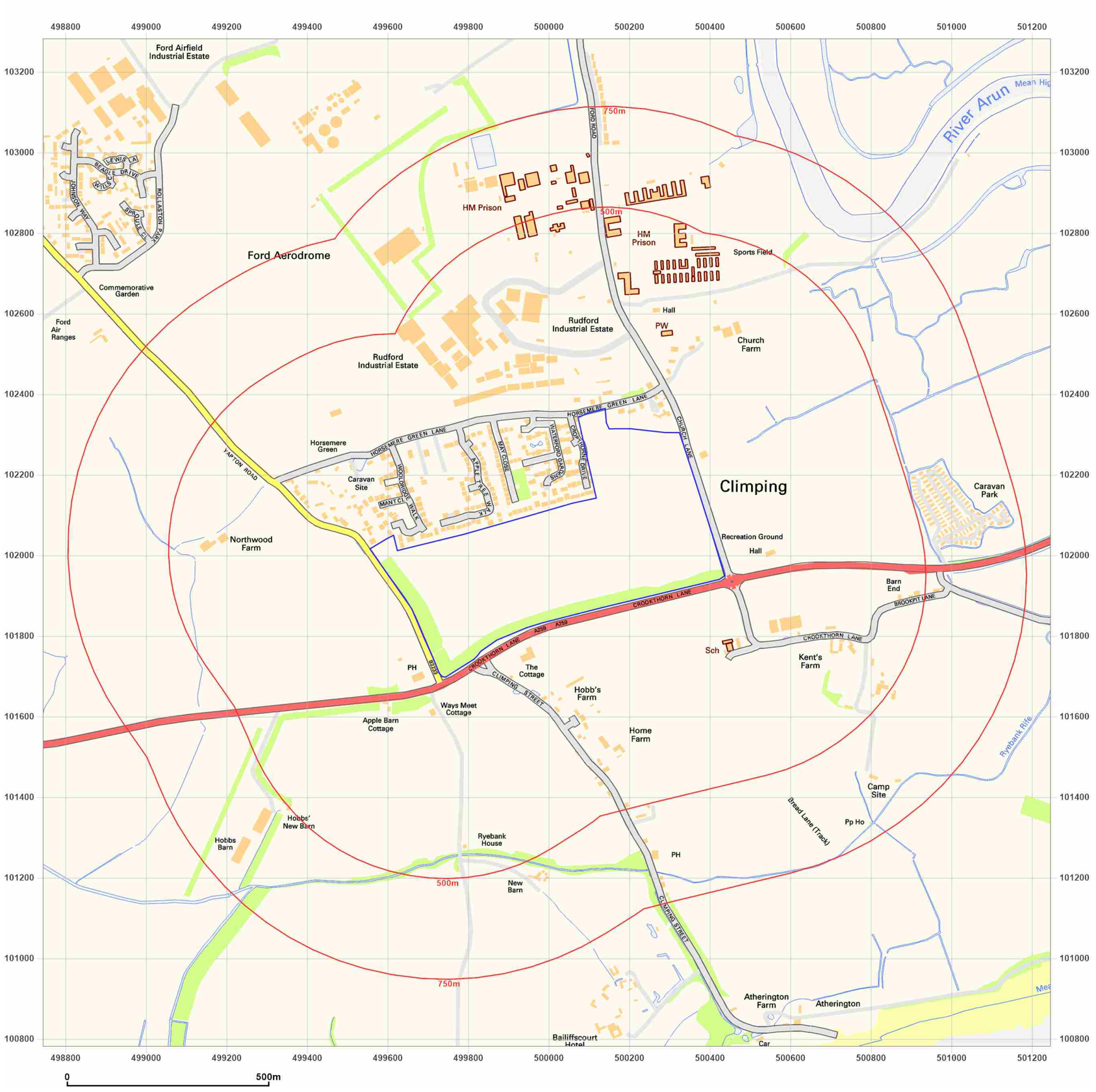
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17
5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** National Grid

**Map date:** **2010**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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2010

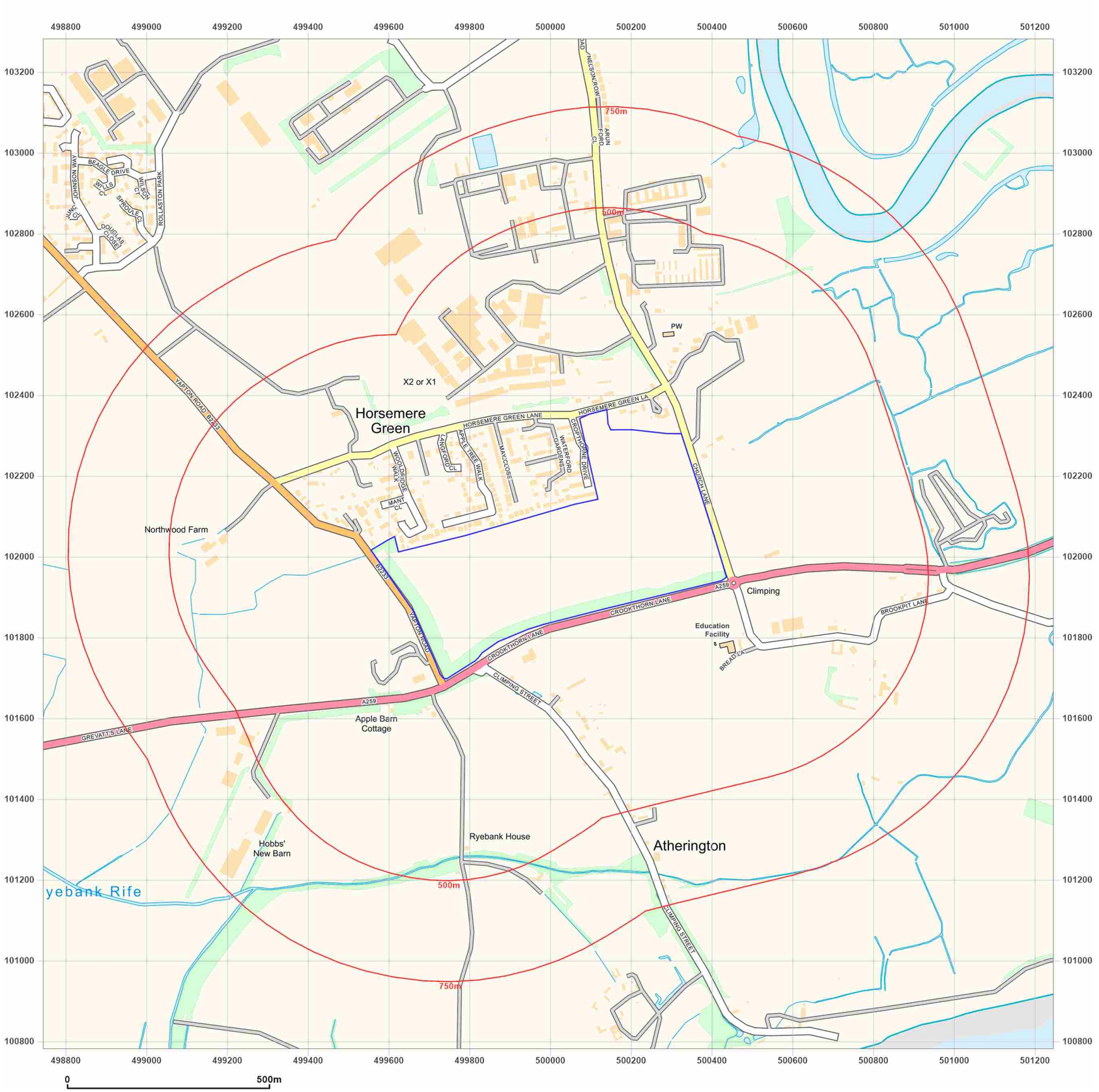
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Groundsure INSIGHTS

**Site Details:**

Land adj. to Church Lane
Climping West Sussex BN17 5GG

**Client Ref:** GWPR5903 Church Lane Climping West Sussex
**Report Ref:** GS-WWI-VIB-TO9-1WI
**Grid Ref:** 499995, 102032

**Map Name:** National Grid

**Map date:** **2024**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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# APPENDIX D:
# Trial Hole Logs

[redacted]

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE1 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Brown slightly gravelly silty fine SAND. Gravel is fine and medium sub-angular of flint. |
| | | 0.50 | D | | 0.70 | | | Greyish brown slightly gravelly silty fine SAND. Gravel is fine and medium sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | 1.50 | | | End of Borehole at 1.500m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE2 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Brown slightly gravelly silty fine SAND. Gravel is fine and medium sub-angular of flint. |
| | | 0.50 | D | | | | | Orangish brown clayey fine SAND. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | 1.00 | | | End of Borehole at 1.000m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

No Groundwater recorded.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE3 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. |
| | | 0.50 | D | | 0.50 | | | Brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | | | | | | | End of Borehole at 0.500m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

No Groundwater recorded.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE4 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. |
| | | 0.50 | D | | | | | Brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | ▼ | 1.00 | D | | 1.00 | | | End of Borehole at 1.000m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

Groundwater recorded at 1.00m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE5 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. |
| | | 0.50 | D | | | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.70 | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | 1.50 | | | End of Borehole at 1.500m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

Groundwater recorded at 1.40m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE6 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. |
| | ▼ | 0.50 | D | | 0.50 | | | Brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | | | | | | | End of Borehole at 0.500m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 0.50m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE7 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | ▼ | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is sub-angular of flint. |
| | | | | | 0.50 | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | | | | | | | End of Borehole at 0.500m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

Groundwater recorded at 0.50m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE8 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. |
| | | 0.50 | D | | 0.60 | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | ▼ | 1.00 | D | | | | | |
| | | 1.50 | D | | 1.50 | | | End of Borehole at 1.500m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.10m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE9 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. |
| | | 0.50 | D | | | | | Greyish brown slightly gravelly sandy CLAY. Sand is fine and medium. Gravel is sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.70 | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | ▼ | | | | | | | |
| | | 1.50 | D | | 1.50 | | | End of Borehole at 1.500m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.30m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE10 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. (TOPSOIL) |
| | | 0.50 | D | | | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. (RIVER TERRACE DEPOSISTS). |
| | | 0.80 | D | | 0.70 | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | 1.50 | | | End of Borehole at 1.500m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.40m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE11 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is sub-angular of flint. |
| | | 0.50 | D | | | | | Orangish brown gravelly clayey fine SAND. Gravel is fine to coarse sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | ▼ | 1.00 | D | | 1.00 | | | End of Borehole at 1.000m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

Groundwater recorded at 1.00m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 18/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BRE12 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. |
| | ▼ | 0.50 | D | | 0.50 | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | | | | | | | End of Borehole at 0.500m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 0.50m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 22/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR1 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. |
| | | 0.50 | B | | | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.80 | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

No Groundwater recorded.
Roots recorded to 0.50m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 20/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR2 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | | | | TOPSOIL: Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine and medium sub-angular of flint. |
| | | 0.50 | D | | 0.50 | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | 1.80 | D | | 1.80 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | | | | 2.20 | | | End of Borehole at 1.800m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

No Groundwater recorded.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 19/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR3 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | | | | TOPSOIL: Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | 0.50 | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

No Groundwater recorded.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 19/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR4 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. |
| | | 0.50 | D | | | | | Brown sandy gravelly CLAY. Sand is fine. Gravel is fine to medium sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.80 | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | ▼ | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.30m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 19/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR5 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. |
| | | 0.50 | B | | | | | Orangish brown sandy gravelly CLAY. Sand is fine. Gravel is fine to medium sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 19/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR6 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. |
| | | 0.50 | D | | | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

Remarks

Groundwater recorded at 1.40m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 19/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR7 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. |
| | | 0.50 | B | | | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.80 | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | ▼ | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.30m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 22/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR8 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. |
| | | 0.50 | D | | | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSISTS). |
| | | 0.80 | D | | 0.70 | | | Orangish brown sandy CLAY. (RIVER TERRACE DEPOSISTS). |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.10 | | | End of Borehole at 2.100m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.70m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 22/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR9 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | | | | TOPSOIL: Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular of flint. |
| | | 0.50 | B | | 0.50 | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

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| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.70m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR10 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. (TOPSOIL) |
| | | 0.50 | B | | | | | Brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded of flint. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.90 | | | |
| | | 1.00 | D | | | | | Light brown sandy gravelly CLAY. Gravel is fine and medium sub-angular to sub-rounded of flint. Sand is fine and medium. (RIVER TERRACE DEPOSITS). |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.10 | | | End of Borehole at 2.100m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.40m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR11 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.20 | | | Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. (TOPSOIL) |
| | | 0.50 | B | | | | | Brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | 1.00 | | | Orangish brown slightly gravelly fine SAND. Gravel is fine sub-rounded of flint. (RAISED BEACH DEPOSITS). |
| | ▼ | 1.50 | D | | 1.50 | | | Light brown slightly gravelly fine SAND. Gravel is fine sub-rounded of flint. (RAISED BEACH DEPOSITS). |
| | | 2.00 | D | | | | | |
| | | 2.20 | D | | 2.20 | | | End of Borehole at 2.200m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR12 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.20 | | | Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. (TOPSOIL) |
| | | 0.50 | D | | | | | Brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | 1.00 | | | Orangish brown slightly gravelly fine SAND. Gravel is fine sub-rounded of flint. (RAISED BEACH DEPOSITS). |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.10 | | | End of Borehole at 2.100m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.40m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR13 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular. Sand is fine. (TOPSOIL) |
| | | 0.50 | B | | | | | Brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.80 | | | Orangish brown slightly gravelly fine SAND. Gravel is fine and medium sub-rounded of flint. (RAISED BEACH DEPOSITS). |
| | ▼ | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | | | | |
| | | | | | 2.10 | | | End of Borehole at 2.100m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR14 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. (TOPSOIL) |
| | | 0.50 | D | | | | | Brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular of flint. Sand is fine. |
| | | 0.80 | D | | 0.80 | | | Orangish brown slightly gravelly fine SAND. Gravel is fine sub-rounded of flint. (RAISED BEACH DEPOSITS). |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | | | | |
| | | | | | 2.20 | | | End of Borehole at 2.200m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR15 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.80 | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | | | | |
| | | | | | 2.20 | | | End of Borehole at 2.200m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR16 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse sub-angular to sub-rounded flint. (RIVER TERRACE DEPSOITS). |
| | | 0.80 | D | | 0.90 | | | |
| | | 1.00 | D | | | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | | | | |
| | | | | | 2.20 | | | End of Borehole at 2.200m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR17 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.20 | | | Dark brown slightly gravelly sandy CLAY. Gravel is fine and medium sub-angular of flint. Sand is fine. (TOPSOIL) |
| | | 0.50 | B | | | | | Brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular of flint. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | ▼ | 1.00 | D | | 1.00 | | | Orangish brown clayey fine SAND. (RAISED BEACH DEPOSITS). |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.00m bgl.
Roots recorded to 0.30m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR18 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.80 | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | ▼ | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.10 | | | End of Borehole at 2.100m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.20m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 21/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR19 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.80 | | | Orangish brown sandy CLAY. Sand is fine. (RIVER TERRACE DEPSOIUTS). |
| | | 1.00 | D | | | | | |
| | ▼ | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.10 | | | End of Borehole at 2.100m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.50m bgl.
Roots recorded to 0.20m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 22/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR20 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | 0.90 | | | |
| | ▼ | 1.00 | D | | | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.20 | | | End of Borehole at 2.200m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 1.10m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 22/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR21 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | B | | 0.50 | | | Brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to coarse sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | ▼ | 0.80 | D | | | | | Orangish brown sandy CLAY. Sand is fine to medium. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | | 1.50 | D | | | | | |
| | | | | | 1.80 | | | End of Borehole at 1.800m |

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 0.80m bgl.
Roots recorded to 0.40m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 20/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR22 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Orange, brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | 1.00 | | | Orange, grey, brown, clayey SAND. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 1.50 | D | | | | | |
| | | | | | 1.80 | | | Orange, yellow, grey slightly clayey SAND. Sand fine. (RIVER TERRACE DEPOSITS). |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 0.55m bgl.
Roots recorded at 1.00m bgl.

# Trial Pit Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 20/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Equipment: |

| Location Number | Location Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| CBR23 | TP | | | 1:25 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine sub-angular flint. |
| | | 0.50 | B | | | | | Orange, brown very slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to coarse sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | 1.00 | | | Orange, grey slightly clayey gravelly SAND. Sand fine to medium. Gravel is fine to coarse sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | End of Borehole at 2.000m |

1 2 3 4 5

| Dimensions | | Trench Support and Comment | | | Pumping Data | | |
|---|---|---|---|---|---|---|---|
| Pit Length | Pit Width | Pit Stability | Shoring Used | Remarks | Date | Rate | Remarks |
| | | | | | | | |

## Remarks

Groundwater recorded at 0.50m bgl.
Roots recorded at 2.00m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 19/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS1 | WS | | | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown gravelly CLAY. Gravel is fine to coarse sub-angular flint. |
| | | 0.50 | D | | 0.60 | | | Dark brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | Dark brown sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 1.00 | D | | | | | |
| | | 1.00 | SPT | N=6 (2,1/1,1,2,2) | 1.20 | | | Brown very sandy Clay. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | Light greyish brown slightly gravelly very wet Sand. Sand is fine. Gravel is fine to (RIVER TERRACE DEPOSITS). |
| | | 2.00 | SPT | N=11 (2,3/2,4,2,3) | | | | |
| | ▼ | 2.50 | D | | | | | |
| | | 3.00 | D | | | | | |
| | | 3.00 | SPT | N=8 (2,2/2,2,2,2) | | | | |
| | | 3.50 | D | | | | | |
| | | 4.00 | D | | | | | |
| | | 4.00 | SPT | N=8 (2,2/2,3,1,2) | | | | |
| | | 4.50 | D | | | | | |
| | | 5.00 | D | | 5.00 | | | End of Borehole at 5.000m |
| | | 5.00 | SPT | N=5 (2,2/2,1,1,1) | | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded to 2.80m bgl.
Roots recorded to 0.60m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 27/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS2 | WS | | | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown sandy gravely clay. Sand is fine. Gravel is fine to coarse sub-angular flint. |
| | | 0.50 | D | | | | | Dark brown sandy gravely CLAY. Sand is fine. Gravel is fine to coarse sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.00 | SPT | N=14 (3,2/3,3,4,4) | | | | |
| | | 1.50 | D | | 1.50 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 2.00 | D | | | | | |
| | | 2.00 | SPT | N=5 (0,2/1,2,1,1) | | | | |
| | ▼ | 2.50 | D | | | | | |
| | | 3.00 | D | | | | | |
| | | 3.00 | SPT | N=5 (2,1/2,1,1,1) | | | | |
| | | 3.50 | D | | | | | |
| | | 4.00 | D | | | | | |
| | | 4.00 | SPT | N=26 (4,3/2,3,12,9) | | | | |
| | | 4.50 | D | | | | | |
| | | 5.00 | D | | 5.00 | | | End of Borehole at 5.000m |
| | | 5.00 | SPT | N=46 (13,10/12,10,12,12) | | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded to 2.80m bgl.
Roots recorded to 0.80m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 27/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS3 | WS | | | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown sandy gravely CLAY. Sand is fine. Gravel is fine to coarse sub-angular. |
| | | 0.50 | D | | | | | Dark brown sandy gravely Clay. Sand is fine. Gravel is fine to coarse sub-angular. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.00 | SPT | N=8 (0,0/2,2,2,2) | | | | |
| | | 1.50 | D | | | | | |
| | | | | | 1.70 | | | Yellowish white gravely CLAY. Sand is fine. Gravels are fine to coarse sub-angular flint and chalk. (RIVER TERRACE DEPOSITS). |
| | | 2.00 | D | | 2.00 | | | Brown very sandy CLAY. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 2.00 | SPT | N=13 (3,2/2,3,4,4) | | | | |
| | | 2.50 | D | | | | | |
| | | 3.00 | D | | 3.00 | | | End of Borehole at 3.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

Remarks

No Groundwater recorded.
Roots recorded to 1.00m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 28/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS4 | WS | | | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown sandy gravely CLAY. Sand is fine. Gravel is fine to coarse sub-angular flint. |
| | | 0.50 | D | | | | | Dark brown sandy gravely CLAY. Sand is fine to medium. Gravel is fine to medium to coarse sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.00 | SPT | N=10 (2,2/2,2,3,3) | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | Dark brown slightly gravelly SAND. Sand is fine. Gravel is fine to sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | | 2.00 | SPT | N=0 (0,0/0,0,0,0) | | | | |
| | | 2.50 | D | | | | | |
| | ▼ | 3.00 | D | | 3.00 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 3.00 | SPT | N=6 (2,3/2,2,1,1) | | | | |
| | | 3.50 | D | | | | | |
| | | 4.00 | D | | | | | |
| | | 4.00 | SPT | N=4 (1,2/1,1,1,1) | | | | |
| | | 4.50 | D | | | | | |
| | | 5.00 | D | | 5.00 | | | End of Borehole at 5.000m |
| | | 5.00 | SPT | N=43 (20,11/15,12,8,8) | | | | |

1 2 3 4 5 6 7 8 9 10

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded to 3.00m bgl.
Roots recorded to 0.80m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 28/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS5 | WS | | | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Dark brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.00 | SPT | N=5 (0,0/0,1,2,2) | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 2.00 | SPT | N=2 (0,0/0,0,1,1) | | | | |
| | ▼ | 2.50 | D | | | | | |
| | | 3.00 | D | | | | | |
| | | 3.00 | SPT | N=17 (2,4/3,3,5,6) | | | | |
| | | 4.00 | SPT | N=33 (4,5/5,8,10,10) | 4.00 | | | End of Borehole at 4.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded to 2.50m bgl.
Roots recorded to 1.00m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane, Climping | Client: Foreman Homes | Date: 28/03/2024 |
| Location: West Sussex, BN17 5GG | Contractor: G&W | |
| Project No. : GWPR5921 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| WS7 | WS | | | 1:50 | Sheet 1 of 1 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.20 | D | | 0.20 | | | TOPSOIL: Dark brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Dark brown sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.00 | SPT | N=6 (0,0/0,1,2,3) | | | | |
| | | 1.50 | D | | | | | |
| | | 2.00 | D | | 2.00 | | | Brownish yellow SAND. Sand is fine. (RIVER TERRACE DEPOSITS). |
| | | 2.00 | SPT | N=26 (3,3/4,6,8,8) | | | | |
| | | 2.50 | D | | | | | |
| | ▼ | 3.00 | D | | | | | |
| | | 3.00 | SPT | N=38 (5,6/9,9,10,10) | | | | |
| | | 3.50 | D | | | | | |
| | | 4.00 | D | | 4.00 | | | |
| | | 4.00 | SPT | N=47 (6,8/11,12,12,12) | | | | |
| | | 4.50 | D | | | | | |
| | | 5.00 | D | | | | | End of Borehole at 5.000m |
| | | 5.00 | SPT | 50 (9,15/50 for 225mm) | | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded to 3.00m bgl.
Roots recorded to 0.20m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH1 | CP | | | 1:50 | Sheet 1 of 2 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.20 | SPT | N=5 (1,1/1,1,1,2) | | | | |
| | | 1.70 | D | | | | | |
| | | 2.20 | SPT | N=7 (2,1/2,2,1,2) | | | | |
| | | 2.70 | D | | | | | |
| | | 3.20 | SPT | N=9 (2,2/2,2,2,3) | | | | |
| | | 3.70 | D | | 3.70 | | | Brown, grey, yellow, gravelly clayey SAND. Sand is fine to medium. Gravel is fine to medium sub-angular to chalk and flint. (RIVER TERRACE DEPOSITS). |
| | | 4.20 | SPT | N=12 (1,3/2,3,3,4) | | | | |
| | | 4.70 | D | | | | | |
| | | 5.20 | SPT | N=6 (2,1/1,1,2,2) | 5.20 | | | Structureless CHALK, comprising off white, brown cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 5.90 | D | | | | | |
| | | 6.50 | SPT | N=10 (2,2/2,2,2,4) | | | | |
| | | 7.20 | D | | | | | |
| | | 8.00 | SPT | N=23 (4,4/5,5,6,7) | 8.00 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 8.70 | D | | | | | |
| | | 9.50 | SPT | N=16 (3,3/3,4,4,5) | | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 6.10m bgl.
Roots recorded to 0.50m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH1 | CP | | | 1:50 | Sheet 2 of 2 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 10.20 | D | | | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 11.00 | SPT | N=17 (2,2/4,3,4,6) | | | | |
| | | 11.70 | D | | | | | |
| | | 12.50 | SPT | N=26 (3,4/6,6,7,7) | | | | |
| | | 13.20 | D | | | | | |
| | | 14.00 | SPT | N=28 (4,4/6,7,7,8) | | | | |
| | | 14.70 | D | | | | | |
| | | 15.50 | SPT | N=30 (5,5/5,8,8,9) | | | | |
| | | 17.00 | SPT | N=34 (7,7/8,8,9,9) | | | | |
| | | 17.20 | D | | | | | |
| | | 17.70 | D | | | | | |
| | | 18.50 | SPT | N=37 (8,8/8,9,9,11) | | | | |
| | | 19.20 | D | | | | | |
| | | 20.00 | SPT | N=37 (4,6/7,8,10,12) | 20.00 | | | End of Borehole at 20.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 6.10m bgl.
Roots recorded to 0.50m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH2 | CP | | | 1:50 | Sheet 1 of 2 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.20 | SPT | N=3 (1,0/1,0,1,1) | | | | |
| | | 1.70 | D | | | | | |
| | | 2.20 | SPT | N=6 (1,1/1,1,2,2) | | | | |
| | | 2.70 | D | | | | | |
| | | 3.20 | SPT | N=8 (1,1/2,2,2,2) | | | | |
| | | 3.70 | D | | | | | |
| | ▼ | 4.20 | SPT | N=12 (2,2/3,3,3,3) | | | | |
| | ▽ | 4.70 | D | | 4.60 | | | Brown, grey, yellow, gravelly clayey SAND. Sand is fine to coarse. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPSOITS). |
| | | 5.20 | SPT | N=13 (2,2/3,3,4,3) | | | | |
| | | 5.90 | D | | | | | |
| | | 6.70 | SPT | N=42 (10,12/18,11,7,6) | 6.70 | | | |
| | | | | | 6.80 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 7.40 | D | | | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 8.20 | SPT | N=13 (2,2/3,3,3,4) | | | | |
| | | 8.90 | D | | | | | |
| | | 9.70 | SPT | N=16 (3,3/3,4,4,5) | | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 4.60m bgl.
Roots recorded to 1.20m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH2 | CP | | | 1:50 | Sheet 2 of 2 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 10.40 | D | | | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 11.20 | SPT | N=17 (4,4/3,4,4,6) | | | | |
| | | 11.90 | D | | | | | |
| | | 12.70 | SPT | N=22 (4,4/5,5,6,6) | | | | |
| | | 13.40 | D | | 13.40 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | | | | 13.70 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 14.20 | SPT | N=21 (3,4/4,4,6,7) | | | | |
| | | 14.90 | D | | | | | |
| | | 15.70 | SPT | 50 (10,13/50 for 150mm) | 15.60 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | | | | 15.90 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 16.40 | D | | | | | |
| | | 17.20 | SPT | N=36 (6,8/8,8,9,11) | | | | |
| | | 17.90 | D | | | | | |
| | | 18.70 | SPT | N=40 (8,8/7,10,10,13) | | | | |
| | | 19.40 | D | | | | | |
| | | 20.00 | SPT | N=41 (6,6/9,9,11,12) | 20.00 | | | End of Borehole at 20.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 4.60m bgl.
Roots recorded to 1.20m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH3 | CP | | | 1:50 | Sheet 1 of 3 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Light to mid brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular to sub-rounded flint. |
| | | 0.50 | D | | | | | Light to mid brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular to sub-rounded flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.20 | SPT | N=5 (1,0/1,1,1,2) | | | | |
| | | 1.70 | D | | | | | |
| | | 2.20 | SPT | N=6 (1,1/1,2,2,1) | | | | |
| | | 2.70 | D | | | | | |
| | | 3.20 | SPT | N=9 (2,1/2,2,3,2) | | | | |
| | | 3.70 | D | | 3.70 | | | Light brown, grey, cream, gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to coarse sub-angular to sub-rounded flint and chalk. (RIVER TERRACE DEPOSITS). |
| | | 4.20 | SPT | N=9 (3,1/2,2,2,3) | 4.40 | | | Structureless CHALK, comprising off white, brown cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 4.70 | D | | | | | |
| | ▼ | 5.20 | SPT | N=6 (1,1/1,1,2,2) | | | | |
| | | 5.90 | D | | 5.90 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 6.50 | SPT | N=9 (2,3/2,2,2,3) | | | | |
| | | 7.20 | D | | | | | |
| | | 8.00 | SPT | N=10 (3,2/2,2,3,3) | | | | |
| | | 8.70 | D | | | | | |
| | | 9.50 | SPT | N=15 (3,4/4,4,4,3) | 9.50 | | | Dark grey cobbles of sub-angular to angular FLINT. |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 5.30m bgl.
Roots recorded to 0.80m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH3 | CP | | | 1:50 | Sheet 2 of 3 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 10.20 | D | | 10.20 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 11.00 | SPT | N=29 (5,6/7,7,7,8) | | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 11.70 | D | | | | | |
| | | 12.50 | SPT | N=23 (3,4/4,6,6,7) | | | | |
| | | 13.20 | D | | | | | |
| | | 14.00 | SPT | N=33 (5,6/7,8,8,10) | | | | |
| | | 14.70 | D | | | | | |
| | | 17.00 | SPT | 40 (8,10/40 for 225mm) | 17.00 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 17.20 | D | | 17.40 | | | |
| | | 17.70 | D | | | | | Structureless CHALK, comprising off white, cream, brown sandy GRAVEL. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. Clasts are weak medium dense. (Class Dc in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 18.50 | SPT | N=44 (7,9/9,11,11,13) | | | | |
| | | 19.20 | D | | | | | |
| | | | | | 20.00 | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 5.30m bgl.
Roots recorded to 0.80m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH3 | CP | | | 1:50 | Sheet 3 of 3 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 20.00 | SPT | N=46 (8,8/11,11,12,12) | | | | End of Borehole at 20.000m |

21
22
23
24
25
26
27
28
29
30

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

Remarks

Groundwater recorded at 5.30m bgl.
Roots recorded to 0.80m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH4 | CP | | | 1:50 | Sheet 1 of 2 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.40 | | | TOPSOIL: Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown, grey, yellow, gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to coarse sub-angular to sub-rounded chalk and flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.20 | SPT | N=6 (1,1/1,1,2,2) | | | | |
| | | 1.70 | D | | | | | |
| | | 2.20 | SPT | N=8 (1,1/2,1,2,3) | | | | |
| | | 2.70 | D | | | | | |
| | ▼ | 3.20 | SPT | N=6 (1,1/1,1,2,2) | 3.20 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 3.70 | D | | | | | |
| | | 4.20 | SPT | N=9 (2,2/2,2,2,3) | | | | |
| | | 4.70 | D | | | | | |
| | | 5.20 | SPT | N=10 (2,1/2,2,2,4) | | | | |
| | | 5.90 | D | | | | | |
| | | 6.50 | SPT | N=10 (2,2/2,2,3,3) | | | | |
| | | 7.20 | D | | | | | |
| | | 8.00 | SPT | N=17 (4,3/4,4,4,5) | | | | |
| | | 8.70 | D | | | | | |
| | | 9.50 | SPT | 44 (10,10/44 for 225mm) | 9.60 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | | | | 9.90 | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 3.30m bgl.
Roots recorded to 1.00m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH4 | CP | | | 1:50 | Sheet 2 of 2 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 10.20 | D | | | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 11.00 | SPT | N=18 (3,3/4,4,4,6) | | | | |
| | | 11.70 | D | | | | | |
| | | 12.50 | SPT | N=20 (3,5/3,5,6,6) | | | | |
| | | 13.20 | D | | | | | |
| | | 14.00 | SPT | N=25 (4,4/6,6,6,7) | | | | |
| | | | | | 14.20 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | | | | 14.50 | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 14.70 | D | | | | | |
| | | 15.50 | SPT | N=29 (5,5/7,7,7,8) | | | | |
| | | 17.00 | SPT | N=35 (6,7/8,8,9,10) | | | | |
| | | 17.20 | D | | | | | |
| | | 17.70 | D | | | | | |
| | | 18.50 | SPT | N=37 (4,8/8,9,9,11) | | | | |
| | | 19.20 | D | | | | | |
| | | 20.00 | SPT | N=42 (6,7/9,9,11,13) | 20.00 | | | End of Borehole at 20.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 3.30m bgl.
Roots recorded to 1.00m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH5 | CP | | | 1:50 | Sheet 1 of 2 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown, grey gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.20 | SPT | N=5 (1,0/1,1,1,2) | | | | |
| | | 1.70 | D | | | | | |
| | | 2.20 | SPT | N=7 (2,1/2,2,1,2) | 2.20 | | | Brown, grey, yellow, gravelly very sandy CLAY. Sand is fine to coarse. Gravel is fine to medium sub-angular-sub-rounded flint and chalk. (RIVER TERRACE DEPOSITS). |
| | | 2.70 | D | | | | | |
| | | 3.20 | SPT | N=7 (2,4/2,2,1,2) | | | | |
| | | 3.70 | D | | | | | |
| | | 4.20 | SPT | N=10 (4,3/3,2,2,3) | | | | |
| | | 4.70 | D | | 4.70 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 5.20 | SPT | N=9 (2,2/3,2,2,2) | | | | |
| | ▼ | 5.90 | D | | | | | |
| | | 6.70 | SPT | N=9 (2,2/2,2,3,2) | | | | |
| | | 7.40 | D | | | | | |
| | | 8.20 | SPT | 50 (11,14/50 for 225mm) | 8.40 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 8.90 | D | | 8.60 | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK |
| | | 9.70 | SPT | N=22 (12,13/6,4,6,6) | | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 6.40m bgl.
Roots recorded to 0.40m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH5 | CP | | | 1:50 | Sheet 2 of 2 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 10.40 | D | | | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 11.20 | SPT | N=50 (8,6/11,13,17,9) | 11.30 | | | |
| | | | | | 11.60 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 11.90 | D | | | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 12.70 | SPT | N=18 (2,3/3,4,4,7) | | | | |
| | | 13.40 | D | | | | | |
| | | 14.20 | SPT | N=25 (6,5/6,6,6,7) | | | | |
| | | 14.90 | D | | | | | |
| | | 15.70 | SPT | 45 (8,12/45 for 225mm) | 15.90 | | | |
| | | | | | | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 16.40 | D | | 16.30 | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 17.20 | SPT | N=39 (8,8/8,9,11,11) | | | | |
| | | 17.90 | D | | | | | |
| | | 18.70 | SPT | N=41 (7,9/9,10,10,12) | | | | |
| | | 19.40 | D | | | | | |
| | | 20.00 | SPT | N=44 (8,8/8,11,11,14) | 20.00 | | | End of Borehole at 20.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 6.40m bgl.
Roots recorded to 0.40m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH6 | CP | | | 1:50 | Sheet 1 of 2 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown, grey gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.20 | SPT | N=4 (1,0/1,1,1,1) | | | | |
| | | 1.70 | D | | | | | |
| | | 2.20 | SPT | N=8 (2,1/2,2,2,2) | | | | |
| | | 2.70 | D | | | | | |
| | | 3.20 | SPT | N=8 (2,1/2,1,2,3) | | | | |
| | | 3.70 | D | | | | | |
| | | 4.20 | SPT | N=8 (2,1/2,2,2,2) | | | | |
| | | 4.70 | D | | 4.70 | | | Brown, grey, yellow, gravelly clayey SAND. Sand is fine to coarse. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPSOITS). |
| | | 5.20 | SPT | N=7 (2,2/2,1,2,2) | | | | |
| | | 5.90 | D | | 6.10 | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 6.50 | SPT | N=9 (2,3/2,2,2,3) | | | | |
| | | 7.20 | D | | | | | |
| | | 8.00 | SPT | N=22 (4,6/8,6,4,4) | | | | |
| | | 8.70 | D | | | | | |
| | | 9.50 | SPT | N=12 (3,2/2,3,3,4) | | | | |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 4.60m and 6.60m bgl.
Roots recorded to 1.00m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH6 | CP | | | 1:50 | Sheet 2 of 2 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 10.20 | D | | | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 11.00 | SPT | N=16 (4,4/3,4,4,5) | | | | |
| | | 11.70 | D | | | | | |
| | | 12.50 | SPT | N=24 (3,6/5,6,6,7) | | | | |
| | | 13.20 | D | | | | | |
| | | 14.00 | SPT | N=28 (4,4/6,7,7,8) | | | | |
| | | 14.70 | D | | | | | |
| | | 15.50 | SPT | N=27 (6,6/7,7,6,7) | | | | |
| | | 17.00 | SPT | 44 (10,10/44 for 225mm) | 17.00 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 17.20 | D | | 17.30 | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 17.70 | D | | | | | |
| | | 18.50 | SPT | N=46 (9,9/11,11,12,12) | | | | |
| | | 19.20 | D | | | | | |
| | | 20.00 | SPT | N=41 (8,8/9,9,10,13) | 20.00 | | | End of Borehole at 20.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 4.60m and 6.60m bgl.
Roots recorded to 1.00m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH7 | CP | | | 1:50 | Sheet 1 of 2 |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | D | | 0.30 | | | TOPSOIL: Brown, grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. |
| | | 0.50 | D | | | | | Brown, grey gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium sub-angular flint. (RIVER TERRACE DEPOSITS). |
| | | 0.80 | D | | | | | |
| | | 1.00 | D | | | | | |
| | | 1.20 | SPT | N=4 (1,0/1,1,1,1) | | | | |
| | | 1.70 | D | | | | | |
| | | 2.20 | SPT | N=7 (2,1/2,1,2,2) | | | | |
| | | 2.70 | D | | | | | |
| | | 3.20 | SPT | N=9 (2,1/2,2,2,3) | | | | |
| | | 3.70 | D | | | | | |
| | | 4.20 | SPT | N=7 (1,1/1,2,2,2) | | | | |
| | | 4.70 | D | | | | | |
| | | 5.20 | SPT | N=7 (1,1/1,1,2,3) | 5.20 | | | Structureless CHALK, comprising off white, cream, brown gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular fine to coarse chalk. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 5.90 | D | | | | | |
| | | 6.50 | SPT | N=10 (2,2/2,3,2,3) | | | | |
| | | 7.20 | D | | | | | |
| | | 8.00 | SPT | N=12 (2,2/2,3,3,4) | | | | |
| | | 8.70 | D | | | | | |
| | | 9.50 | SPT | N=9 (2,1/2,2,2,3) | 9.50 | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 5.60m bgl.
Roots recorded to 1.70m bgl.

# Percussion Drilling Log

| | | |
|---|---|---|
| Project Name: Land adj. to Church Lane | Client: Foreman Homes | Date: 21/05/2024 - 06/06/2024 |
| Location: Climping West Sussex BN17 5GG | Contractor: LAS | |
| Project No. : GWPR6003 | Crew Name: | Drilling Equipment: |

| Borehole Number | Hole Type | Level | Logged By | Scale | Page Number |
|---|---|---|---|---|---|
| BH7 | CP | | | 1:50 | Sheet 2 of 2 |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 10.20 | D | | | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 11.00 | SPT | N=13 (2,2/2,3,3,5) | | | | |
| | | 11.70 | D | | | | | |
| | | 12.50 | SPT | N=21 (4,4/5,5,5,6) | | | | |
| | | 13.20 | D | | | | | |
| | | 14.00 | SPT | N=32 (12,15/10,8,7,7) | 14.10 | | | |
| | | | | | 14.40 | | | Dark grey cobbles of sub-angular to angular FLINT. |
| | | 14.70 | D | | | | | Structureless CHALK, comprising off white, cream, gravelly sandy SILT. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint. Black specs recorded within chalk fragments. (Class Dm in accordance with CIRIA 574). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK AND PORSTDOWN CHALK FORMATION). |
| | | 15.50 | SPT | N=30 (6,6/7,7,8,8) | | | | |
| | | 17.00 | SPT | N=33 (3,5/7,8,8,10) | | | | |
| | | 17.20 | D | | | | | |
| | | 17.70 | D | | | | | |
| | | 18.50 | SPT | N=34 (6,6/7,8,8,11) | | | | |
| | | 19.20 | D | | | | | |
| | | 20.00 | SPT | N=38 (7,7/8,9,9,12) | 20.00 | | | End of Borehole at 20.000m |

| Hole Diameter | | Casing Diameter | | Chiselling | | | | Inclination and Orientation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth Base | Diameter | Depth Base | Diameter | Depth Top | Depth Base | Duration | Tool | Depth Top | Depth Base | Inclination | Orientation |
| | | | | | | | | | | | |

## Remarks

Groundwater recorded at 5.60m bgl.
Roots recorded to 1.70m bgl.

# APPENDIX E:
# CPT Testing Report

[redacted]

IN SITU
SITE INVESTIGATION



STATIC CONE PENETRATION TEST

# FACTUAL REPORT

CLIENT: Ground and Water Limited

PROJECT: Church Lane, Climping,
West Sussex BN17 5GG

| | |
|---|---|
| **Project** | **Church Lane, Climping, West Sussex, BN17 5GG** |
| **Project No.** | **1240182** |
| **Client** | **Ground and Water Limited** |
| **Address** | **Unit 2, The Long Barn, Norton Farm, Selborne, GU34 3NB** |

**Attention: Francis Williams**

Dear Francis,

We have pleasure in providing a digital copy of our report and data in AGS format for the above project.

We hope that you are satisfied with the performance of our staff, equipment and reporting on this project. If you should have any queries about any aspect of the works carried out, please do not hesitate to contact us. We look forward to being of service to you in the future.

Yours faithfully,

**In Situ Site Investigation Limited**

[redacted]

**Darren Ward**

**Director**

**Report Issue**

| Issue | Date | Prepared | [redacted] | Checked | [redacted] | Approved | [redacted] |
|---|---|---|---|---|---|---|---|
| 02 | 12/04/2024 | Chloe Donovan | | Darren Ward | | Darren Ward | |

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# 1.0 INTRODUCTION

In Situ Site Investigation Limited (In Situ) was engaged in a geotechnical site investigation at Church Lane at the request of Ground and Water Ltd. The site investigation consisted of completing 33 Static Piezocone Penetration Tests (CPTU), and 33 Magnetometer Tests to provide information on the soil conditions and derived geotechnical parameters at:

Church Lane,
Climping,
West Sussex
BN17 5GG

All test locations were provided by the client. A site map is included in the end of Appendix A of this report (if provided by the client). The tests were stopped when they reached the target depth as per the client's technical specifications or for other technical reasons, as detailed in the *Project Summary Table* in *Appendix A.1* and on each CPTU log included in Appendix B of this report.

The fieldwork was carried out from 13th March 2024 to 15th March 2024 as per the client's request.

The work on site and the final factual reporting have been undertaken in accordance with the international technical standard *ISO 22476-1:2022(E)*.

# 2.0 FIELDWORK

## 2.1 CONE PENETRATION TESTS

The fieldwork activity is summarised in Table 2.1.

| Table 2.1 Fieldwork Summary | |
|---|---|
| **CPT Operator/s** | Darren Holder & Ryan Robinson |
| **Date Started** | 13th March 2024 |
| **Date Finished** | 15th March 2024 |
| **In Situ S.I. Project Manager** | Darren Ward |

### *2.1.1 Rig Information*

Details of CPTU rig used in this project are shown in Table 2.2. Full data sheet for the rig is presented in *Appendix A.2*.

| Table 2.2 Rig Summary | |
|---|---|
| **Rig Name** | **Rig Description** |
| CPT017 | 20 Tonne Track Mounted CPT Rig |

### *2.1.2 CPTU Cone*

Details of electric CPTU cone (Type TE2) used in this project conforming to the requirements of Application Class 2 of *ISO 22476-1:2022*, are shown in Table 2.3.

| Table 2.3 Cone Summary | | |
|---|---|---|
| **Number** | **Cross-section area** | **Filter position** |
| S15-CFIP.1186 | 15cm$^2$ | $u_2$ |
| S15-CFIP.1983 | 15cm$^2$ | $u_2$ |

A full datasheet of the cone used is shown in *Appendix A.3*.

The cone's measured parameters are shown in Table 2.4.

| **Table 2.4 Completed Fieldwork Summary** |
|---|
| 33 CPTU to a maximum depth of 6.71m. Each test measured Cone Resistance, $q_c$, Sleeve Friction, $f_s$, Porewater Pressure in the shoulder position, $u_2$, Inclination in X and Y axes. 33 MAG tests to a maximum depth of 6.71m. Each MAG test measured Magnetic Field X (nT), Magnetic Field Y (nT) and Magnetic Field Z (nT). |
| *Provision of factual report with estimated soil type, derived geotechnical parameters & AGS data* file. |

### *2.1.3 CPTU Cone Calibration*

The cone resistance and sleeve friction are recorded by calibrated load cells in the cone. The CPTU load cells and pressure transducers are regularly calibrated in line with *ISO 22476-1:2022(E)* standard by the cone manufacturer. The cone calibration certificate for the cone used at this site are presented in *Appendix A.4*.

### *2.1.4 CPTU Cone Saturation*

The pore water pressure is recorded using a calibrated pressure transducer located in the piezocone. To ensure pore water pressure measurements are not affected by the presence of air in the measuring transducer, a de-airing procedure is carried out prior to each test. The cone and filter are saturated using a glycerine fluid with a viscosity of 10,000 CST.

### *2.1.5 Test Procedure*

The tests are carried out in accordance with the *International Standard for Electrical Cone and Piezocone Penetration Test ISO 22476-1:2022(E)*.

The final depths of the tests were determined by either completion to the specified test depth or when the maximal safe capacity of the equipment was reached. A schedule of the tests performed is shown in *Appendix A.1*, which has been compiled from the operators' daily progress reports.

The data is transmitted from the digital CPTU through an umbilical cable that runs through the push rods to the data acquisition system. Results are displayed instantaneously on the computer logging screen. The results are recorded on the computer hard disc.

The rate of penetration is kept constant at 20 mm/s ± 5 mm/s except when penetrating very dense or hard strata. Before each test is carried out zero values are taken of the cone to check if it is within calibration. At the end of each test, zero values are taken again to see if there has been any drift during the test. These values are inspected during the post processing stage. This is a quality check on the data and the testing procedure. Individual test zero values are shown on their corresponding test results in *Appendix B*.

### 2.1.6 *In Situ Pore Pressure ($u_0$)*

The in situ or hydrostatic pore pressure is required for the calculation of several derived parameters included in this report. For this report, the groundwater level is assumed at 0.5m below ground surface, for calculation purposes. The in situ pore pressure, $u_0$ values are presented on the pore pressure plot, on *CPT Log 01,* which is included in *Appendix B*.

## 2.2 POSITIONING

Positioning and surveying of all investigated locations was the responsibility of the client. The site map and position of the tests are presented in Appendix A.9.

# 3.0 CONE PENETRATION MEASURED PARAMETERS

All measured parameters of tests carried with the CPTU cone are shown in *Appendix B* and all the information about data processing and results are given in sections *3.1*, *3.2* and *3.3*.

## 3.1 DATA PROCESSING

The measured parameters, cone end resistance, $q_c$, sleeve friction, $f_s$, porewater pressure measurements with filter in shoulder position, $u_2$ and inclination for *x* and *y* axis, $I_x$, $I_y$, were recorded for every *10 mm* of penetration keeping a constant speed of *20 mm/s ± 5 mm/s*, which may slightly change when the cone is penetrating hard strata.

The measured data from the site works is processed and presented using specialised CPT software. The interpretations on the CPTU results were carried out following the recommendations of *ISO 22476-1:2022(E)*, *Lunne et al. (1997)* and *Robertson (2015)*. Measured parameters, mentioned in *Sections 3.2* and *3.3*, were used to derive all the geotechnical parameters, which are presented in *Chapter 4.0*. The soil behaviour type method used on this report is *Robertson et al. (1986)*, shown in *Figure 3.2*.

### *3.1.1 Zero Measurements*

Before and after each CPTU test, zero measurements are recorded for each channel of the cone. The zero measurements are presented on the logs in *Appendix B*. This is a routine quality check carried out on site.

## 3.2 MEASURED PARAMETERS

### *3.2.1 Cone Resistance ($q_c$)*

Cone resistance, $q_c$, is measured as the total force acting on the cone, divided by the projected area of the cone. The results are presented in *MPa*, on *CPT Log 01*, in *Appendix B*, scale *0-20 MPa* with a minor scale printing on the same graph at *0-4 MPa*.

### *3.2.2 Sleeve Friction ($f_s$)*

Sleeve friction, $f_s$, is measured as the total frictional force acting on the friction sleeve divided by its surface area. The results are presented in *kPa*, on *CPT Log 01*, in *Appendix B*, using a scale of *0-500 kPa*.

### 3.2.3 Porewater pressure ($u_2$)

The pore pressure, $u_2$, is measured during the test. If the material is free draining and saturation is maintained it will normally measure hydrostatic pore pressure. In materials that are not free draining, it will record the total pore pressure (hydrostatic plus any excess pore pressures generated) created by the cone penetration through this material.

The filter element can be mounted in one of three positions. For all tests carried out in this project the filter was mounted in the $u_2$ position (see *Figure 3.1*).

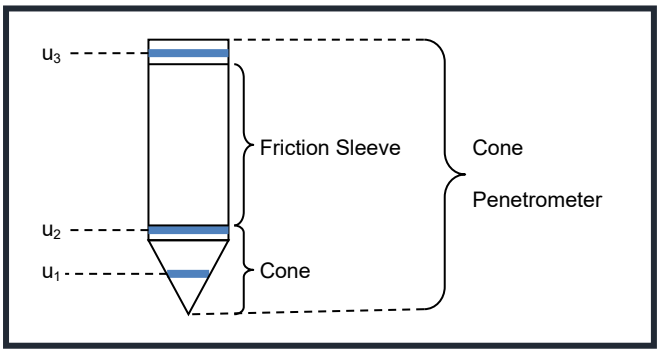



***Figure 3.1:*** *Diagram showing pore pressure filter locations (after Lunne et al., 1997)*

### 3.2.4 Inclination ($I_x$, $I_y$)

The CPT rig was set up to obtain a thrust direction as near as possible to vertical. The CPTU cones have inclinometers incorporated to measure the non-verticality of the test. For test depths less than *15 m*, significant non-verticality is unusual, provided the initial thrust direction is vertical.

## 3.3 ESTIMATED SOIL BEHAVIOUR TYPE

### 3.3.1 Friction Ratio ($R_f$)

The friction ratio, $R_f$ is the ratio between the sleeve friction and the cone resistance (Lunne *et al.,* 1997).

$$Fricton\ Ratio\ (R_f) = \left(\frac{Sleeve\ Friction\ (f_s)}{Cone\ Resistance\ (q_c)}\right) \times 100$$

### 3.3.2 Estimated Soil Behaviour Type (SBT)

The estimation of soil behaviour type, *SBT*, using measurements of cone resistance and sleeve friction is based upon the variations of the friction ratio and cone resistance. The friction

ratio varies depending upon whether the soil is cohesive or granular. The cone resistance varies depending on the strength and densities of the soil.

The interpretation used in this report is *Robertson et al. (1986)*, which is shown in Figure 3.2. The results are presented on *CPT Log 01*, in *Appendix B*.

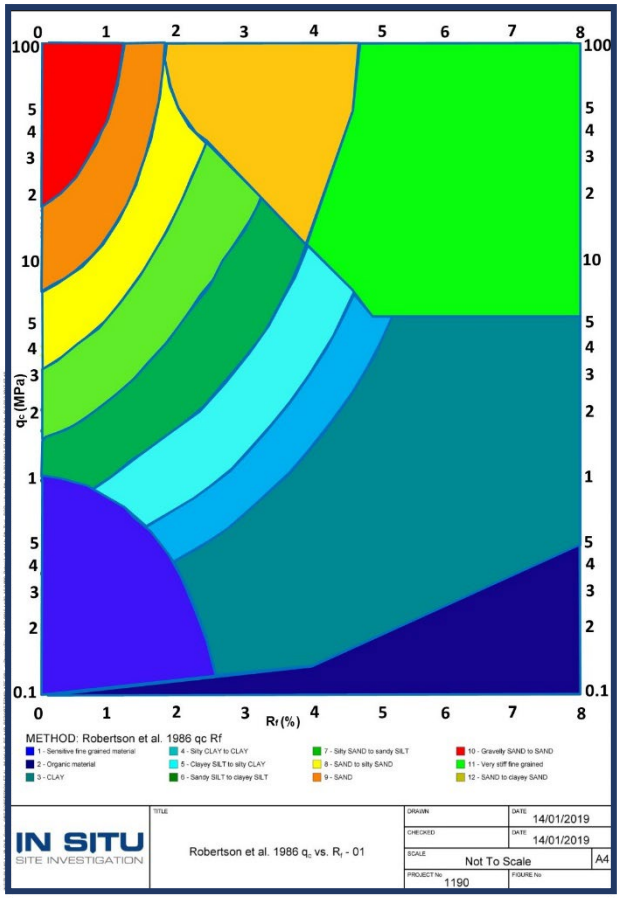



***Figure 3.2:*** *Robertson et al., 1986 soil behaviour type chart.*

### *3.3.3 Pore Pressure Ratio ($B_q$)*

Pore pressure ratio, $B_q$ is the ratio between the measured pore pressure generated during penetration and the corrected cone resistance minus the total overburden stress.

Pore pressure ratio as defined by *Senneset and Janbu (1985)* is defined as:

$$B_q = \frac{u_2 - u_0}{q_t - \sigma_{vo}}$$

where

| | |
|---|---|
| $u_2$ | is pore pressure measured between the cone and the friction sleeve |
| $u_0$ | is equilibrium pore pressure |
| $\sigma_{vo}$ | is total overburden stress |
| $q_t$ | is cone resistance corrected for unequal end area effects |

## 3.4 APPLIED CORRECTIONS

### 3.4.1 Corrected Cone Resistance ($q_t$)

For each penetration test, the measured cone resistance, $q_c$, can be corrected for the ‘‘unequal area effect’’ due to the influence of the ambient pore water pressure acting on the cone.

The correction has been applied using the following equation by Lunne et *al.,* 1997:

$$q_t = q_c + [u_2.(1 - \alpha)]$$

where

$\alpha$ is the cone area ratio

The cone area ratio used for this project is stated on both the cone calibration certificate and the data footer. This value is geometrically measured.

### 3.4.2 Depth Correction

All tests in the report have been corrected for depth difference caused by inclination. This has been calculated using the method described in *ISO 22476-1:2022*.

To calculate the corrected depth the following formula is used:

$$z = \int_0^l C_{inc} \cdot dl$$

where

*z* is penetration depth, in *m*
*l* is penetration length, in *m*
$C_{inc}$ is correction factor for the effect of the inclination of the CPTU relative to the vertical axis.

The equation for calculating the correction factor for the influence of the inclination for a bi-axial inclinometer is:

$$C_{inc} = \frac{1}{\sqrt{(1 + tan^2\beta_1 + tan^2\beta_2}}$$

where

$\beta_1$ is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane, in degrees
$\beta_2$ is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane that is perpendicular to the plane of angle $\beta_1$, in degrees

# 4.0 GEOTECHNICAL DERIVED PARAMETERS

A number of empirical correlations can be used to derive geotechnical parameters from CPTU data. This report includes only the parameters which are described in this chapter. The results of all correlations used to obtain the geotechnical derived parameters are presented on *CPT Log 02* and *CPT Log 03* in *Appendix B*.

**Please, note that each empirical correlation is derived for a certain type of soil, and may not be appropriate for all the soil types encountered on this project.**

## 4.1 SOIL BEHAVIOUR TYPE INDEX ($I_c$)

The soil behaviour type index, $I_c$, was derived by *Jefferies and Davies (1991)*, and was created to simplify the application of CPTU SBT chart shown in *Chapter 3*, *Figure 3.2*. This approach has been modified for use with the *Robertson (1990)* normalised CPT soil classification chart, *Figure 4.1*. The normalised cone parameters $Q_t$ and $F_r$ (for definitions see *Appendix A5* Symbol List) can be combined into one Soil Behaviour Type Index, $I_c$, *(Lunne et al., 1997)*.

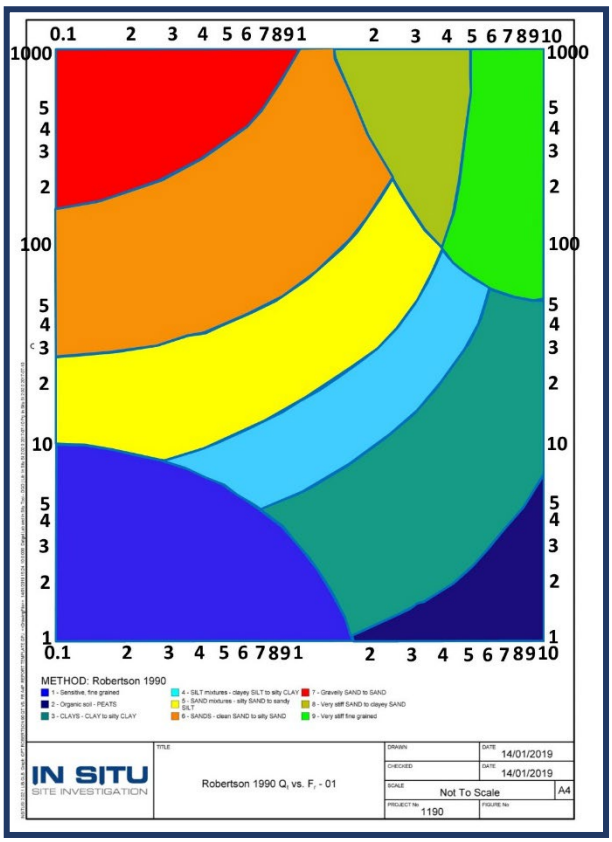



***Figure 4.1:*** *Robertson 1990 soil behaviour type chart.*

The soil behaviour type index, $I_c$, can then be defined using *Robertson (2010)* formula, given below:

$$I_c = ((3.47 - logQ_t)^2 + (logF_r + 1.22)^2)^{0.5}$$

where

$Q_t$ is the normalized cone resistance which represents the simple normalization with a stress exponent (n) of *1.0*, which applies well to clay-like soils

$F_R$ is the normalized friction ratio, in *%*

The boundaries of soil behaviour type are then given in terms of the index, $I_c$, presented in *Table 4.1* below.

The soils behaviour type index does not apply to zones *1*, *8* and *9*. The profiles of $I_c$ provide a simple guide to the continuous variation of soil behaviour type in a given soil profile based on CPTU results, with a reliability greater than *80%* compared with soil samples *(Robertson, 2015).*

| Zone | Soil Behaviour Type | $I_c$ |
|---|---|---|
| 1 | Sensitive fine grained | N/A |
| 2 | Organic Soils – clay | >3.6 |
| 3 | Clays – silty clay to clay | 2.95 – 3.6 |
| 4 | Silt mixtures – clayey silt to silty clay | 2.60 – 2.95 |
| 5 | Sand mixtures – silty sand to sandy silt | 2.05 – 2.6 |
| 6 | Sands – clean sand to silty sand | 1.31 – 2.05 |
| 7 | Gravelly sand to dense sand | <1.31 |
| 8 | Very stiff sand to clayey sand* | N/A |
| 9 | Very stiff fine grained * | N/A |

** Heavily over consolidated or cemented*

***Table 4.1:*** *Normalized CPTU Soil Behaviour Type ($SBT_n$) Index values, $I_c$.(Robertson, 2010)*

## 4.2 N VALUE OF STANDARD PENETRATION TEST (SPT) ($N_{60}$)

The derived *N* value of *SPT, $N_{60}$*, is strongly and directly related to the cone resistance, $q_c$.

In this report the $N_{60}$ value is derived using the following correlations, developed by *Robertson and Wride (1998)*, *Jefferies and Davies (1998)* and Robertson (2012):

1) *Robertson & Wride (1998)*

$$N_{60} = \frac{q_c}{8.5 \cdot p_a \left(1 - \frac{I_C}{4.6}\right)}$$

2) *Jefferies and Davies (1993)*

$$N_{60} = \frac{q_c}{0.85 \cdot \left(1 - \frac{I_C}{4.75}\right)}$$

3) *Robertson (2012)*

$$N_{60} = \frac{\frac{q_c}{p_a}}{10^{1.1268 - 0.2817 I_C}}$$

where

| | |
|---|---|
| $q_c$ | is the cone resistance |
| $p_a$ | is the atmospheric pressure equal to *100 kPa* |
| $I_c$ | is the soil behaviour type index calculated as given in *section 4.1* |

It is suggested that these methods provide a better estimation of the $N_{60}$ value than the actual measured *N*, due to the poor repeatability of SPT test. However, in fine grained soil with high sensitivity these methods may overestimate $N_{60}$ *(Jefferies and Davies, 1991).* The third method suggested by *Robertson (2012)* provides improved estimates of $N_{60}$ for insensitive clays.

## 4.3 RELATIVE DENSITY ($D_r$)

Relative density, $D_r$, is an intermediate parameter for coarse grained soils, widely used to describe sand deposits. All the research on deriving the relative density from CPTU tests results are carried out for ***clean predominantly quartz sands***. The studies have shown that CPTU resistance in granular soils is controlled by sand relative density, in situ effective stresses and compressibility. The more compressible sands tend to give lower penetration resistance for a given relative density then less compressible sands.

In this report relative density is calculated using the methods suggested by *Baldi et al., (1986)*, *Jamiolkowski et al., (2001)* and *Kulhawy and Mayne (1990)* as shown in the equations below:

1) Baldi et al., (1986)

$$D_r = \frac{1}{C_2} \cdot ln\left(\frac{q_c \cdot Wehr}{C_1 \cdot (\sigma'_{v0})^{0.55}}\right) \cdot 100$$

where

$C_1$ is a consolidation coefficient which is *157* for normally consolidated soils and *181* for over consolidated soils

$C_2$ is a consolidation coefficient which is *2.41* for normally consolidated soils and *2.46* for over consolidated soils

Wehr is a correction coefficient for calcareous soils

2) Jamiolkowski et al., (2001)

$$D_r = 100 \cdot \left[0.268 \cdot ln\left(\frac{q_t/\sigma_{atm}}{\sqrt{\sigma'_{v0}/\sigma_{atm}}}\right) + C_1\right]$$

where

$C_1$ is a compressibility coefficient which is *-0.675* for average compressible soils, *≤1.0* for high compressible soils and carbonate or calcareous sands and *≥-2.0* for low compressible soils

$q_t$ is corrected cone resistance

$\sigma_{atm}$ is the atmospheric pressure

3) Kulhawy and Mayne, (1990)

$$D_r = \left[\frac{q_{c1}}{305 \cdot C_1 \cdot OCR^{0.18} \cdot \left(1.2 + 0.05 \cdot log(t/100)\right)}\right]^{0.5} \cdot 100$$

where

$q_{c1}$ is the cone resistance corrected for initial vertical effective stress and atmospheric pressure, calculated by the following formula

$$q_{c1} = \frac{q_c}{\sqrt{\sigma'_{v0} \cdot \sigma_{atm}}}$$

where

$q_c$ is the cone resistance in *kPa*

$\sigma'_{v0}$ is the initial vertical effective stress in *kPa*

$C_1$ is a compressibility coefficient which is *-0.91* for low compressible sands, *1.0* for medium compressible sands and *1.09* for high compressible sands

t is time in years

## 4.4 FRICTION ANGLE (φ')

Friction angle, *φ'*, is used to express the shear strength of uncemented, coarse grained soils. In this report friction angle is derived by the correlations of *Mayne and Campanella (2005)*, *Robertson and Campanella (1983)* and *Kulhawy and Mayne (1990)*.

1) Mayne and Campanella, (2005)

$$\varphi' = 29.5^0 \cdot B_q^{0.121} \cdot \left[0.256 + 0.336 \cdot B_q + logQ_t\right]$$

where

$B_q$ is the pore pressure ratio, calculated as in Session 3.3

$Q_t$ is the normalized cone resistance

2) Robertson and Campanella, (1983)

$$\varphi' = \tan^{-1}\left(0.1 + 0.38 \cdot log\left(\frac{q_t}{\sigma'_{v0}}\right)\right)$$

where

$q_c$ is the cone resistance in *kPa*

$\sigma'_{v0}$ is the initial vertical effective stress in *kPa*

3) Kulhawy and Mayne, (1990)

$$\varphi' = 17.6^0 + 11.0^0 \cdot log(q_{t1})$$

where

$q_{t1}$ is the corrected cone resistance corrected for initial vertical effective stress and atmospheric pressure, calculated by the following formula

$$q_{t1} = \frac{q_t}{\sqrt{\sigma'_{v0} \cdot \sigma_{atm}}}$$

The method suggested by *Mayne and Campanella (2005)* will not provide reliable results for heavily over consolidated soils, fissured geomaterials and highly cemented or structures clays. This approach gives reliable results when pore pressure is positive and varies $0.1 < B_q < 1.0$. The correlation suggested by *Robertson and Campanella (1983)* estimates the peak friction angle for uncemented, unaged, moderately compressible, predominately quartz sands. For sands of higher compressibility, the method will tend to predict low friction angles. The method suggested by *Kulhawy and Mayne (1990)* is an alternate relationship for clean, rounded, uncemented, quartz sands.

## 4.5 FINES CONTENT (*FC*)

The fines content, *FC*, in this report is estimated using two different methods, one from *Robertson and Wride (1998)* and the other, *Suzuki et al. (1998)* as presented below:

1) Robertson and Wride (1998)

$$I_C < 1.26: FC = 0$$
$$1.26 \leq I_C \leq 3.5: FC(\%) = 1.75I_C^{3.25} - 3.7$$
$$3.5 < I_C: FC = 100\%$$

2) Suzuki et al. (1998)

$$FC(\%) = 2.8I_C^{2.6}$$

where

$I_c$ is the soil behaviour type index, calculated as in section 4.1

## 4.6 UNDRAINED SHEAR STRENGTH ($s_u$)

Estimation of undrained shear strength, $s_u$, from CPTU tests using corrected cone resistance is carried out using the following correlation from *Lunne et al. (1981)*:

$$S_u = \frac{(q_t - \sigma_{v0})}{N_{kt}}$$

where

$N_{kt}$ is the empirical cone factor, which varies from *10* (*6* for very soft sensitive fine grained soils) to *20*. In this report 3 values are considered: *15*, *17.5* and *20*. $N_{kt}$ tends to increase with increasing plasticity and decrease with increasing soil sensitivity. It decreases as $B_q$ increases. (*Lunne et al., 1997*)
$\sigma_{vo}$ = total overburden stress.

This report only presents the undrained shear strength data on soils with soil behaviour type index, $I_c$ values greater than *2.60*.

The value of undrained shear strength, $s_u$ to be used in analysis depends on the design problem. In general, the simple shear in the direction of loading often represents the average undrained strength. For larger, moderate to high risk projects, where high quality field and laboratory data may be available, site specific correlations should be developed based on appropriate and reliable values of $s_u$.

## 4.7 SENSITIVITY ($S_t$)

The sensitivity, $S_t$ of clays is defined as the ratio of undisturbed peak undrained shear strength to totally remoulded undrained shear strength.

In this report $S_t$ is calculated using two correlations developed by *Schmertmann (1978)* and *Mayne (2007)*.

1) Schmertmann (1978)

$$S_t = \frac{s_u}{s_{u(rem)}} = \frac{q_t - \sigma_v}{N_{kt}} \left(\frac{1}{f_s}\right)$$

where

$s_{u(rem)}$ is the remoulded undrained shear strength. It can be assumed equal to the sleeve resistance, $f_s$.

2) Mayne (2007)

$$S_t = \frac{0.073 \cdot (q_t - \sigma_{v0})}{f_s}$$

For relatively sensitive clays, $S_t > 10$, the value of $f_s$ can be very low and not very accurate, hence the estimate of sensitivity should be used as a guide only.

## 4.8 SOIL UNIT WEIGHT (γ)

Soil unit weight, $\gamma$ in this report is calculated by using one method for sands, considered under dry conditions and two methods for clays, considered under saturated conditions. These relationships are developed by *Mayne (2007)* and the equations are presented below:

Dry unit weight for sands:

$$\gamma_{dry} = 1.89 \cdot log(q_{t1}) + 11.82$$

Saturated unit weight for clays method 1

$$\gamma_{sat} = 8.32 \cdot log(V_S) - 1.61 \cdot log(z)$$

Saturated unit for clays method 2

$$\gamma_{sat} = 2.60 \cdot log(f_s) + 15 \cdot G_s - 26.5$$

where

$q_{t1}$ is the corrected cone resistance corrected for initial vertical effective stress and atmospheric pressure, calculated by the following formula:

$$q_{t1} = \frac{q_t}{\sqrt{\sigma'_{v0} \cdot \sigma_{atm}}}$$

z is the depth

$V_s$ is the shear wave velocity, calculated as $V_S = 118.8 \cdot log\left(f_s\right) + 18.5$

$G_s$ is the specific gravity of solids, typically between *2.40* and *2.90*

# 5.0 MAGNETOMETER TESTS MEASUREMENTS

All measured parameters of MAG tests carried with the combined CPTU and MAG cone are shown in *Appendix B*.

## 5.1 DATA PROCESSING

The measured parameters, Magnetic Field X (nT), Magnetic Field Y (nT) and Magnetic Field Z (nT) were recorded for every *10 mm* of penetration.

The measured magnetometer data from the site works is processed and presented using specialised CPT software. During processing the three measured components are combined to give the total magnetic field strength.

### *5.1.1 Zero Measurements and Data quality*

Before and after each MAG test, zero measurements are recorded for each magnetic channel of the cone. The zero measurements are presented on the logs in *Appendix B*. This is a routine quality check carried out on site.

The quality of the data was typically good. The summary of MAG tests is presented in *Appendix A.1*

## 5.2 MEASURED AND DERIVED PARAMETERS

### *5.2.1 Magnetic Field X, Magnetic Field Y and Magnetic Field Z*

The measured parameters, Magnetic Field X, Magnetic Field Y and Magnetic Field Z are measured on site. The results are presented in *nT*, on *MAG Log*, in *Appendix B*, scale *-100000 to 100000 nT*.

### *5.2.2 Total Magnetic Field*

Total Magnetic Field is calculated based on each measured Magnetic Field, using the formula below:

$$Magnetic\ Field\ Total = \sqrt{MAGX^2 + MAGY^2 + MAGZ^2}$$

where

| | |
|---|---|
| *MAGX* | is the Magnetic Field measured in X direction |
| *MAGY* | is the Magnetic Field measured in Y direction |
| *MAGZ* | is the Magnetic Field measured in Z direction |

The results are presented in *nT*, on *MAG Log*, in *Appendix B*, using a scale of *0-100000 nT*.

### *5.2.3 Magnetic Field Gradient*

Magnetic Field Gradient is calculated as the difference between two consecutive values of Total Magnetic Field.

The results are presented in *nT/cm*, on *MAG Log*, in *Appendix B*, using a scale of *-500 to 500 nT/cm*.

# 6.0 CHALK

In order to provide an estimate of the Chalk Grade Classification as defined by Ward et al. (1968) and Wakeling (1969) a modified correlation originally derived by Power (1982) has been used. This is presented in figure 6.1 and has been used to give the degree of weathering quoted on the soil type estimates on the cone penetration graphs.

It should be noted that the correlation is approximate and that Chalk at different locations can differ from that described by Ward et al. at one particular site (Mundford in Norfolk). The descriptions in figure 6.1 are typical, and do not necessarily relate to this site. Simplified descriptions are therefore presented on the logs. It should also be noted that the Chalk grade classification was derived to describe the chalk mass. Localised variations in the cone resistance do not necessarily represent changes in Classification. Peaks may represent flints or local indurated zones.

| GRADE | TYPICAL BRIEF DESCRIPTION (After Wakeling,1969) | FRICTION RATIO (%) | CONEEND RESISTANCE(MPa) |
|---|---|---|---|
| | | (modifiedfromPower,1982) | |
| 6 | Extremely soft structureless CHALK containing small lumps of intact chalk. | - | Below 5 |
| 5 | Structureless remoulded CHALK containing lumps of intact chalk. | 0.75 – 1.00 | 5-10 |
| 4 | Rubbly partly-weathered CHALK with bedding and jointing. Joints10-60mm apart and open to 20mm and often infilled with soft remoulded chalk and fragments. | 1.00 – 1.25 | 10-15 |
| 3 | Rubbly to blocky unweathered CHALK. Joints 60-200mm apart and open to 20mm and often infilled with fragments. | 1.25 – 1.50 | 15-20 |
| 2 | Blocky medium-hard CHALK. Joints more than 200mm apart and closed. | 1.50 – 2.00 | More than 20 |
| 1 | As for grade2 but hard and brittle. | No penetration- | No penetration |

**Figure 6.1:** Chalk classification table modified from Power (1992).

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# APPENDIX A

## APPENDIX A1 – Project Summary Sheet

*Piezocone Tests Summary Sheet*

| HOLE ID | Final Depth (m) | Date of Test | Cone Used | Test Remarks |
|---|---|---|---|---|
| DP104 | 5.99 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP105 | 5.99 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP106 | 5.99 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP107 | 6.00 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP108 | 4.81 | 13/03/2024 | S15-CFIP.1983 | Test refused on total pressure. |
| DP109 | 6.00 | 13/03/2024 | S15-CFIP.1983 | Test completed at target depth. |
| DP110 | 6.00 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP111 | 6.57 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP117 | 5.33 | 15/03/2024 | S15-CFIP.1186 | Test refused on tip resistance. |
| DP118 | 6.00 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP119 | 5.99 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP120 | 5.98 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP121 | 5.99 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP122 | 6.01 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP128 | 6.00 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP129 | 6.00 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP130 | 6.00 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP131 | 4.05 | 14/03/2024 | S15-CFIP.1186 | Test refused on total pressure. |
| DP132 | 6.00 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP133 | 5.99 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP137 | 6.00 | 15/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP138 | 5.12 | 15/03/2024 | S15-CFIP.1186 | Test refused on tip resistance. |
| DP141 | 5.98 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP143 | 5.99 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP144 | 6.00 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP148 | 6.00 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP149 | 6.01 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP150 | 5.99 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |

| | | | | |
|---|---|---|---|---|
| DP151 | 6.00 | 13/03/2024 | S15-CFIP.1983 | Test completed at target depth. |
| DP152 | 6.06 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP153 | 5.98 | 14/03/2024 | S15-CFIP.1186 | Test completed at target depth. |
| DP154 | 6.71 | 13/03/2024 | S15-CFIP.1983 | Test completed at target depth. |
| DP155 | 6.00 | 13/03/2024 | S15-CFIP.1983 | Test completed at target depth. |

*Piezocone Test Coordinates*

| HOLE ID | Eastings | Northings | Elevation |
|---|---|---|---|
| DP104 | 499852.18 | 102054.49 | 6.64 |
| DP105 | 499925.76 | 102077.70 | 6.16 |
| DP106 | 500013.27 | 102089.59 | 5.94 |
| DP107 | 500058.95 | 102112.87 | 5.83 |
| DP108 | 500161.58 | 102170.69 | 5.39 |
| DP109 | 500203.43 | 102180.64 | 5.58 |
| DP110 | 500265.93 | 102197.83 | 5.41 |
| DP111 | 500326.62 | 102218.87 | 4.70 |
| DP117 | 500018.54 | 102025.96 | 5.95 |
| DP118 | 500086.00 | 102041.64 | 6.01 |
| DP119 | 500155.62 | 102060.39 | 5.82 |
| DP120 | 500223.38 | 102079.19 | 5.31 |
| DP121 | 500285.87 | 102096.21 | 5.32 |
| DP122 | 500348.96 | 102145.73 | 4.90 |
| DP128 | 500036.08 | 101955.81 | 6.03 |
| DP129 | 500103.30 | 101973.78 | 5.90 |
| DP130 | 500169.99 | 102019.03 | 5.86 |
| DP131 | 500231.47 | 102043.11 | 5.45 |
| DP132 | 500299.44 | 102053.38 | 5.48 |
| DP133 | 500370.56 | 102077.63 | 5.21 |
| DP137 | 499914.53 | 101842.98 | 6.30 |
| DP138 | 499982.47 | 101869.55 | 5.98 |
| DP141 | 500185.44 | 101952.28 | 5.57 |
| DP143 | 500323.00 | 101984.73 | 5.68 |

| | | | |
|---|---|---|---|
| DP144 | 500394.42 | 102005.63 | 5.80 |
| DP148 | 500187.27 | 102241.31 | 4.80 |
| DP149 | 500244.26 | 102263.60 | 5.03 |
| DP150 | 500309.62 | 102280.76 | 4.17 |
| DP152 | 500164.23 | 102301.41 | 5.19 |
| DP153 | 500233.91 | 102304.41 | 4.94 |
| DP154 | 500119.88 | 102321.94 | 5.41 |
| DP155 | 500132.62 | 102333.86 | 5.44 |

*MAG Tests Summary Sheet*

| HOLE ID | Final Depth (m) | Date of Test | MAG Status | Test Remarks |
|---|---|---|---|---|
| DP104 | 5.99 | 15/03/2024 | Clear 5.4m onwards | Test completed at target depth. |
| DP105 | 5.99 | 15/03/2024 | Clear 4.0m onwards | Test completed at target depth. |
| DP106 | 5.99 | 15/03/2024 | Clear 3.6m onwards | Test completed at target depth. |
| DP107 | 6.00 | 15/03/2024 | Clear 2.4m onwards | Test completed at target depth. |
| DP108 | 4.81 | 13/03/2024 | Clear 3.0m onwards | Test refused on total pressure. |
| DP109 | 6.00 | 13/03/2024 | Clear 5.0m onwards | Test completed at target depth. |
| DP110 | 6.00 | 14/03/2024 | Clear 3.4m onwards | Test completed at target depth. |
| DP111 | 6.57 | 14/03/2024 | Clear 5.6m onwards | Test completed at target depth. |
| DP117 | 5.33 | 15/03/2024 | Clear 3.4m onwards | Test refused on tip resistance. |
| DP118 | 6.00 | 15/03/2024 | Clear 4.0m onwards | Test completed at target depth. |
| DP119 | 5.99 | 15/03/2024 | Clear 3.8m onwards | Test completed at target depth. |
| DP120 | 5.98 | 14/03/2024 | Clear 5.2m onwards | Test completed at target depth. |
| DP121 | 5.99 | 14/03/2024 | Clear 1.0m onwards | Test completed at target depth. |
| DP122 | 6.01 | 14/03/2024 | Clear 4.0m onwards | Test completed at target depth. |
| DP128 | 6.00 | 15/03/2024 | Clear 4.4m onwards | Test completed at target depth. |
| DP129 | 6.00 | 15/03/2024 | Clear 2.0m onwards | Test completed at target depth. |
| DP130 | 6.00 | 14/03/2024 | Clear 3.0m onwards | Test completed at target depth. |
| DP131 | 4.05 | 14/03/2024 | Clear 3.4m onwards | Test refused on total pressure. |
| DP132 | 6.00 | 14/03/2024 | Clear 4.0m onwards | Test completed at target depth. |
| DP133 | 5.99 | 14/03/2024 | Clear 4.4m onwards | Test completed at target depth. |
| DP137 | 6.00 | 15/03/2024 | Clear 4.2m onwards | Test completed at target depth. |
| DP138 | 5.12 | 15/03/2024 | Clear 2.4m onwards | Test refused on tip resistance. |
| DP141 | 5.98 | 14/03/2024 | Clear 2.6m onwards | Test completed at target depth. |
| DP143 | 5.99 | 14/03/2024 | Clear 3.2m onwards | Test completed at target depth. |
| DP144 | 6.00 | 14/03/2024 | Clear 5.2m onwards | Test completed at target depth. |
| DP148 | 6.00 | 14/03/2024 | Clear 3.2m onwards | Test completed at target depth. |
| DP149 | 6.01 | 14/03/2024 | Clear 1.0m onwards | Test completed at target depth. |
| DP150 | 5.99 | 14/03/2024 | Clear 5.0m onwards | Test completed at target depth. |
| DP151 | 6.00 | 13/03/2024 | Clear 2.0m onwards | Test completed at target depth. |
| DP152 | 6.06 | 14/03/2024 | Clear 3.0m onwards | Test completed at target depth. |

| | | | | |
|---|---|---|---|---|
| DP153 | 5.98 | 14/03/2024 | Clear 4.6m onwards | Test completed at target depth. |
| DP154 | 6.71 | 13/03/2024 | Clear 2.2m onwards | Test completed at target depth. |
| DP155 | 6.00 | 13/03/2024 | Clear 3.0m onwards | Test completed at target depth. |

| KEY for MAG Status | |
|---|---|
| Clear | Clear of UXO. |
| Clear 1.0m onwards | Disturbance of magnetic field to depth shown due to artificial ground but otherwise clear. |
| Obstruction | Buried obstruction or refused test due to geology. Change location, then re-test. |
| Low risk 2.3m | Low risk anomaly at depth shown. Unlikely to be UXB, and clear below. |
| Suspected existing pile | Disturbance of magnetic field at depth of 0-7.0m, clear below. |
| Anomaly x metres | Significant magnetic anomaly at depth shown. |

# APPENDIX A2 – CPT Rig Datasheet

## RIGS

### 20 TONNE CPT TRACK MOUNTED RIG (CPT017)

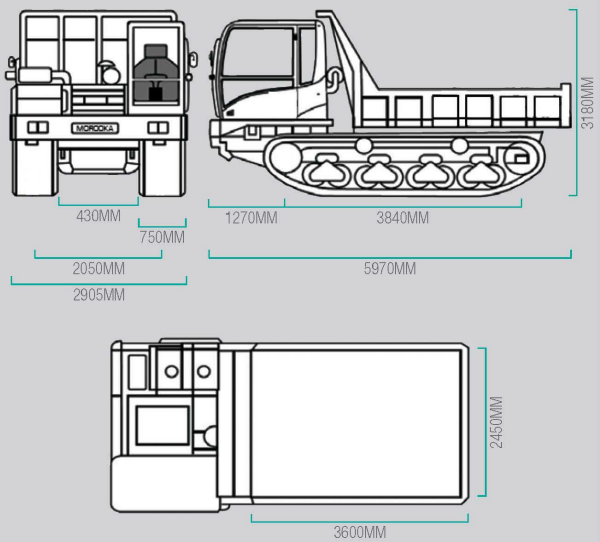
We have a variety of rigs giving us the capacity to meet our clients' needs and specifications for each individual project.

This rubber tracked rig weighs 20 tonnes and is able to push up to a depth of 40 metres, depending on the ground conditions. It has low ground bearing pressure and is ideal for soft, boggy sites which are inaccessible for our wheeled rigs.

### CPT RIG DETAILS

| | |
|---|---|
| DRIVE SYSTEM | RUBBER TRACKED |
| TOTAL WEIGHT | 20 TONNES |
| GROUND BEARING PRESSURE | 35kPA |
| CPT RAM THRUST CAPACITY | 20 TONNES |
| MAXIMUM PENETRATION | 30-40M DEPENDING ON THE GROUND CONDITIONS. |
| PERFORMANCE RATES | 100-150M OF TESTING A DAY, DEPENDING ON ACCESS TO POSITIONS. |
| TYPICAL SITES FOR THIS RIG | SOFT, BOGGY SITES. THE RIG HAS LOW GROUND BEARING PRESSURE. |

### CPT RIG DIMENSIONS





Shrewsbury



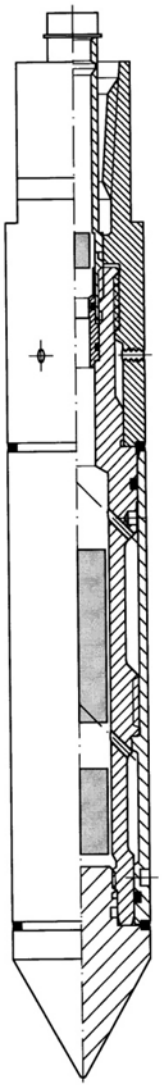
Heading North on our low loader


Falkirk, Scotland

IN SITU SITE INVESTIGATION INSITUSI.COM

## APPENDIX A3 – Cone Datasheet

GeoPoint Systems bv
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Tel. : +31 71 301 92 51
Fax : +31 71 301 92 52
E-mail : info@geopoint.nl
ING bank : 68.23.01.396
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BTW nr. : NL806331677801



# SPECIFICATIONS S15 SERIES ELECTRICAL CONES

The electronic subtraction cones have been developed to address the durability problems inherent in other cone designs. The unit consists of a single element temperature compensated strain gauge transducer for measuring both cone resistance and local sleeve friction. This design is therefore more robust than a compression type cone. The cone support electronics package is located directly behind the transducer. The precision strain gauge amplifiers and power supply eliminate the effects of cable resistance on the measurements. A standard subtraction cone is capable of measuring simultaneously the following channels: Tip, Local friction, Pore pressure, Temperature and Inclination.

### GENERAL SPECIFICATIONS

| | |
|---|---|
| Cone Tip Section Area | 1,500 mm2 |
| Friction Sleeve Surface | 22,500 mm2 |
| Total Length | 325 mm |
| Weight | 4200 g |
| Power Supply | ± 15 VDC, 100 mA. |
| Output | 0 – 10 VDC* |
| Working Temperature | 0 - 60˚C |
| Storage Temperature | - 40 to + 85˚C |
| Connector | Lemo 10 pins (others on request) |

### TIP RESISTANCE

| | |
|---|---|
| Range | 100/150* kN |
| Accuracy | 0.25 % FS |
| Maximum Load | 150 % of range |
| Cone Area Ratio | 0.75 |

### LOCAL SLEEVE FRICTION

| | |
|---|---|
| Range | 100/150* kN |
| Accuracy | 0.50 % FS |
| Maximum Load | 150 % |
| Sleeve Area Ratio | 1.0 (EA) |

### PORE PRESSURE

| | |
|---|---|
| Range | 1/2/5/10* MPa |
| Accuracy | 0.5 % FS |
| Maximum Load | 150 % of range |

### INCLINATION

| | |
|---|---|
| Range | 25 ˚ (biaxial) |
| Accuracy | < 2 ˚ |

All our equipment complies with the ISSMGE, ASTM, DIN and NEN Standards.

**Other output and voltage ranges available on request. Loadcells may be calibrated for lower ranges.*

## APPENDIX A4 – Cone Calibration Certificate

Eijkelkamp GeoPoint
SoilSolutions

Rijkstraatweg 22F
2171 AL Sassenheim
The Netherlands
[redacted]

# Cone Calibration Certificate

| | | |
|---|---|---|
| Certificate: | **GS-1186-020** | |
| Instrument Type: | Magnetometer 250 µT(analog) | |
| Model: | S15-CFIIPM | |
| Serial number: | 1186 | |
| Calibration date: | 21-09-2023 | |
| Client: | In Situ | |
| Calibrated by: | R.Wesselink | |
| **Calibration instruments** | | |
| Manufacturer: | Hottinger Baldwin Messtechnik GmbH | |
| NMi certificate | 2461165.00501 | |
| **Calibration conditions** | | |
| Ambient temperature: | 22.7 | °C |
| Atmospheric pressure: | 999 | mBar |
| **Cone specifications** | | |
| Cone base area: | 1500 | mm2 |
| Load tip resistance (nom.): | 50 | kN |
| Friction sleeve area: | 22500 | mm2 |
| Load tip + local friction (nom.): | 50 | kN |
| Load friction sleeve (nom.): | 22.5 | kN |
| Load pore pressure (nom.): | 2 | MPa |
| Inclination (nom.): | +/- 20 | ° |
| Temperature compensation (all channels): | 0...+40 | °C |
| Maximum overload capacity (all channels): | 50 | % |
| Cone area ratio (a): | 0.79 | |
| Max. Inaccuracy, relative to measurement value: | 1.0 | % |

| | Tip: | | Sleeve: | | Pore Pressure: | | Inclinometer: | | |
|---|---|---|---|---|---|---|---|---|---|
| | qc in kN | mV | fs in kN | mV | MPa | mV | Degrees | X (mV) | Y (mV) |
| **Zero points:** | | 0212 | | 0205 | | 0258 | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2486 | 2406 |
| | 5 | 0302 | 5 | 0309 | 0.4 | 1348 | -20 | 0481 | 0305 |
| | 10 | 0603 | 10 | 0619 | 0.8 | 2694 | 20 | 4468 | 4451 |
| | 15 | 0904 | 15 | 0927 | 1.2 | 4033 | | | |
| | 20 | 1208 | 20 | 1238 | 1.6 | 5370 | | | |
| | 25 | 1509 | 25 | 1550 | 2.0 | 6699 | | | |
| | 30 | 1812 | 30 | 1859 | | | | | |
| | 35 | 2113 | 35 | 2168 | | | | | |
| | 40 | 2414 | 40 | 2478 | | | | | |
| | 45 | 2716 | 45 | 2788 | | | | | |
| | 50 | 3018 | 50 | 3097 | | | | | |

| | |
|---|---|
| Max. error, abs. qc: | 35 kPa |
| Max. error, abs. fs: | 5 kPa |
| Max. error, abs. u2: | 10 kPa |
| Max. error, abs. I: | 1 ° |

This calibration is compliant with Eijkelkamp GeoPoint SoilSolutions internal quality system, internal calibration procedures and meets the requirements of NEN2649, NEN-EN-ISO 22476-1, NORSOK G-001, ISSMEF and ASTM using calibration equipment traceable to (Inter-)National Standards.

**Approved by:** R. Mosterd
**Date:** 21-09-2023
[redacted]

Eijkelkamp GeoPoint SoilSolutions
V.A.T. NO. NL 8584.21.422.B01
Trade Reg. Arnhem no. 70686149
IBAN NL43 RABO 0326 7904 38
BIC: RABONL2U

Eijkelkamp GeoPoint
SoilSolutions

Rijkstraatweg 22F
2171 AL Sassenheim
The Netherlands

[redacted]

# Cone Calibration Certificate

| | | |
|---|---|---|
| Certificate: | **GS-1983-009** | |
| Instrument Type: | Magnetometer 250 µT(analog) | |
| Model: | S15-CFIIPM | |
| Serial number: | 1983 | |
| Calibration date: | 31-10-2023 | |
| Client: | In Situ | |
| Calibrated by: | R.van Loon | |
| **Calibration instruments** | | |
| Manufacturer: | Hottinger Baldwin Messtechnik GmbH | |
| NMi certificate | 2461165.00501 | |
| **Calibration conditions** | | |
| Ambient temperature: | 20.6 | °C |
| Atmospheric pressure: | 1002 | mBar |
| **Cone specifications** | | |
| Cone base area: | 1500 | mm2 |
| Load tip resistance (nom.): | 50 | kN |
| Friction sleeve area: | 22500 | mm2 |
| Load tip + local friction (nom.): | 50 | kN |
| Load friction sleeve (nom.): | 22.5 | kN |
| Load pore pressure (nom.): | 2 | MPa |
| Inclination (nom.): | +/- 20 | ° |
| Temperature compensation (all channels): | 0...+40 | °C |
| Maximum overload capacity (all channels): | 50 | % |
| Cone area ratio (a): | 0.79 | |
| Max. Inaccuracy, relative to measurement value: | 1.0 | % |

| | Tip: | | Sleeve: | | Pore Pressure: | | Inclinometer: | | |
|---|---|---|---|---|---|---|---|---|---|
| | qc in kN | mV | fs in kN | mV | MPa | mV | Degrees | X (mV) | Y (mV) |
| Zero points: | | 0272 | | 0213 | | 0224 | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2396 | 2549 |
| | 5 | 0289 | 5 | 0303 | 0.4 | 1551 | -20 | 0388 | 0622 |
| | 10 | 0580 | 10 | 0607 | 0.8 | 3096 | 20 | 4390 | 4520 |
| | 15 | 0871 | 15 | 0910 | 1.2 | 4633 | | | |
| | 20 | 1159 | 20 | 1214 | 1.6 | 6164 | | | |
| | 25 | 1451 | 25 | 1517 | 2.0 | 7685 | | | |
| | 30 | 1742 | 30 | 1821 | | | | | |
| | 35 | 2031 | 35 | 2121 | | | | | |
| | 40 | 2321 | 40 | 2424 | | | | | |
| | 45 | 2614 | 45 | 2722 | | | | | |
| | 50 | 2903 | 50 | 3020 | | | | | |

| | |
|---|---|
| Max. error, abs. qc: | 35 kPa |
| Max. error, abs. fs: | 5 kPa |
| Max. error, abs. u2: | 10 kPa |
| Max. error, abs. I: | 1 ° |

This calibration is compliant with Eijkelkamp GeoPoint SoilSolutions internal quality system, internal calibration procedures and meets the requirements of NEN2649, NEN-EN-ISO 22476-1, NORSOK G-001, ISSMFE and ASTM using calibration equipment traceable to (Inter-)National Standards.

**Approved by:**
**Date:**

[redacted]

Eijkelkamp GeoPoint SoilSolutions
V.A.T. NO. NL 8584.21.422.B01
Trade Reg. Arnhem no. 70686149
IBAN NL43 RABO 0326 7904 38
BIC: RABONL2U

## APPENDIX A5 – Symbol List

### *English*

| | |
|---|---|
| a | is area ratio of the cone ($= {}^{A_n}/_{A_c}$) |
| A | is area |
| $A_c$ | is projected area of the cone |
| $A_n$ | is cross sectional area of load cell or shaft |
| $A_s$ | is area of friction sleeve |
| $A_{sb}$ | is bottom end area of friction sleeve |
| $A_{st}$ | is top end area of friction sleeve |
| $B_q$ | is pore pressure parameter ($= {}^{(u_2 - u_0)}/_{(q_t - \sigma_{v0})}$) |
| $c_h$ | is horizontal coefficient of consolidation |
| $c_v$ | is vertical coefficient of consolidation |
| D | is diameter |
| $D_r$ | is relative density ($= \frac{e_{max} - e}{e_{max} - e_{min}} x100\%$) |
| e | is void ratio |
| $e_{max}$ | is maximum void ratio |
| $e_{min}$ | is minimum void ratio |
| E | is Young's modulus |
| $f_s$ | is unit sleeve friction resistance |
| $f_t$ | is sleeve friction corrected for pore pressure effects |
| $F_s$ | is total force acting on friction sleeve |
| $F_R$ | is normalized friction ratio ($= {}^{f_s}/_{(q_t - \sigma_{v0})}$) |
| FoS | is factor of safety |
| FC | is fines content |
| g | is acceleration due to gravity |
| $G_0$ | is initial or maximum shear modulus, shear stiffness |
| $I_c$ | is soil behavior type index |
| $I_r$ | is rigidity index ($= {}^{G}/_{s_u}$) |
| $I_p$ | is plasticity index |
| k | is coefficient of permeability |
| $k_h$ | is coefficient of permeability in horizontal direction |
| $k_v$ | is coefficient of permeability in vertical direction |
| $K_0$ | is coefficient of earth pressure at rest ($= {}^{\sigma'_{h0}}/_{\sigma'_{v0}}$) |
| L | is length |
| $m_v$ | is coefficient of volume change |
| M | is constrained deformation modulus |
| M7.5 | is earthquake magnitude of 7.5 Richter scale |
| N | is number of blows of SPT |
| $N_{60}$ | is SPT energy ratio |
| $N_k$ | is cone factor |
| $N_{ke}$ | is cone factor |
| $N_{kt}$ | is cone factor |
| $N_{\Delta u}$ | is cone factor |
| $p_a$ | is reference stress ($= 100\ kPa$) |
| $q_c$ | is measured cone resistance |
| $q_e$ | is effective cone resistance ($= q_t - u_2$) |
| $q_n$ | is net cone resistance ($= q_t - \sigma_{v0}$) |
| $q_t$ | is corrected cone resistance ($= q_c - (1 - a)u_2$) |
| $Q_c$ | is total force acting on the cone |
| $Q_t$ | is normalized cone resistance ($= {}^{q_t - \sigma_{v0}}/_{\sigma'_{v0}}$) |

$R_f$ is friction ratio ($= \left({}^{f_t}/_{q_t}\right) x100\%$ or alternatively $= \left({}^{f_t}/_{q_t}\right) x100\%$)
$s_u$ is undrained shear strength
$s_{ur}$ is remoulded undrained shear strength
$S_t$ is sensitivity
t is time
$t_{50}$ is time for 50% dissipation of excess pore water pressure
$T_{50}$ is time factor at $U = 50\ \%$
u is pore water pressure
$u_0$ is in situ pore pressure
$u_1$ is pore pressure measured on the cone
$u_2$ is pore pressure measured behind the cone
$u_3$ is pore pressure measured behind sleeve friction
Δu is excess pore water pressure
U is normalized excess pore pressure
$V_s$ is shear wave velocity
z is depth

### *Greek*

α is constant
α is cone roughness
β is constant
$\beta_1$ is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane, in degrees
$\beta_2$ is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane that is perpendicular to the plane of angle $\beta_1$, in degrees
γ is unit weight of soil
$\gamma_w$ unit weight of water
Δ is change
Δu is excess pore pressure ($= u - u_0$)
μ is Poisson's ratio
ρ is density
ψ is state parameter
σ, σ' is normal stress (total, effective)
$\sigma_h$, $\sigma_h$' is horizontal stress (total, effective)
$\sigma_v$, $\sigma_v$' is horizontal stress (total, effective)
$\sigma_{v0}$,$\sigma_{v0}$' is overburden stress (total, effective)
$\tau_{av}$ is average cyclic shear stress
$\tau_{cy}$ is cyclic shear stress
φ' is effective friction angle

## APPENDIX A6 – Abbreviations

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| CPTU | Cone Penetration Test with Pore Pressure Measurement (Piezocone Test) |
| CRR | Cyclic Resistance Ratio |
| CSR | Cyclic Stress Ratio |
| GWT | Ground Water Table |
| NC | Normally Consolidated |
| OC | Over consolidated |
| OCR | Over consolidation Ratio |
| PL | Limit Pressure |
| SCPT | Seismic Cone Penetration |
| SDMT | Seismic Dilatometer Marchetti |
| SPT | Standard Penetration Test |
| TC | Technical Committee |

## APPENDIX A7 – Glossary

**CPT**
Cone Penetration Test.

**Cone**
The part of the cone penetrometer on which the end bearing is developed.

**Cone Penetrometer**
The assembly containing the *cone*, *friction sleeve*, any other sensors and measuring systems, as well as the connections to the *push-rods.*

**Cone resistance, $q_c$**
The total force acting on the cone, $Q_c$, divided by the projected area of the cone, $A_c$. $q_c = {Q_c}/{A_c}$

**Corrected cone resistance, $q_t$**
The *cone resistance*, $q_c$ corrected for pore water pressure effects.

**Corrected sleeve friction, $f_t$**
The *sleeve friction* corrected for pore water pressure effects on the ends of the *friction sleeve*.

**Data acquisition system**
The system used to measure and record the measurements made by the *cone penetrometer*.

**Dissipation Test**
A test when the decay of the pore water pressure is monitored during a pause in penetration.

**Filter element**
The porous element inserted into the cone penetrometer to allow transmission of the pore water pressure to the pore pressure sensor, while maintaining the correct profile of the *cone penetrometer*.

**Friction ratio, $R_f$**
The ratio, expressed as a percentage of the *sleeve friction*, $f_s$, to the *cone resistance*, $q_c$, both measured at the same depth.

**Friction reducer**
A local enlargement on the push-rod surface, placed at a distance above the cone penetrometer, and provided to reduce the friction on the *push-rods*.

**Friction sleeve**
The section of the *cone penetrometer* upon which the *sleeve friction* is measured.

**Normalized cone resistance, $Q_c$ or $Q_t$**
The *cone resistance* expressed in a non-dimensional form and taking account of stress changes *in situ*, $Q_c = {(q_c - \sigma_{v0})}/{\sigma'_{v0}}$, or when the *corrected cone resistance* is used $Q_t = {(q_t - \sigma_{v0})}/{\sigma'_{v0}}$. where $\sigma_{v0}$ and $\sigma'_{v0}$ are the total and effective vertical stress respectively.

**Net cone resistance, $q_n$**
The *corrected cone resistance* minus the vertical total stress. $q_n = q_t - \sigma_{v0}$

**Normalized friction ratio, $F_r$**
The *sleeve friction* normalized by the *net cone resistance*.

**Piezocone**
A *cone penetrometer* containing a pore pressure sensor.

**Pore pressure, *u***
The pore pressure generated during penetration and measured by a pore pressure sensor, $u_1$ when measured on the cone, $u_2$ when measured just behind the cone and $u_3$ when measured just behind the friction sleeve.

**Pore pressure ratio, $B_q$**
The *net pore pressure* normalized with respect to the *net cone resistance*.

**Push-rods**
The thick-walled tubes or rods used for advancing the cone penetrometer.

**Rig machine**
The equipment which pushes the cone penetrometer and rods into the ground.

**Sleeve friction, $f_s$**
The total frictional force acting on the *friction sleeve*, $F_s$, divided by its *surface area*, $A_s$. $f_s = {F_s}/{A_s}$

# APPENDIX A8 – Soils Description Tables

## GRANULAR SOILS (Sands and Gravels)

| Description | Relative Density $D_r$ (%) | SPT N value, $N_{SPT}$ |
|---|---|---|
| Very Loose | 0 – 15 | 0 - 4 |
| Loose | 15 – 35 | 4 - 10 |
| Medium Dense | 35 – 65 | 10 - 30 |
| Dense | 65 – 85 | 30 - 50 |
| Very Dense | >85 | >50 |

## COHESIVE SOILS (Clays and Silts)

| Term based on measurement | Undrained Shear Strength Classification, $s_u$ (kPa) |
|---|---|
| Extremely low | <10 |
| Very low | 10 - 20 |
| Low | 20 - 40 |
| Medium | 40 - 75 |
| High | 75 - 150 |
| Very high | 150 - 300 |
| Extremely high | >300 |

## APPENDIX A9 – Site Map



# APPENDIX B

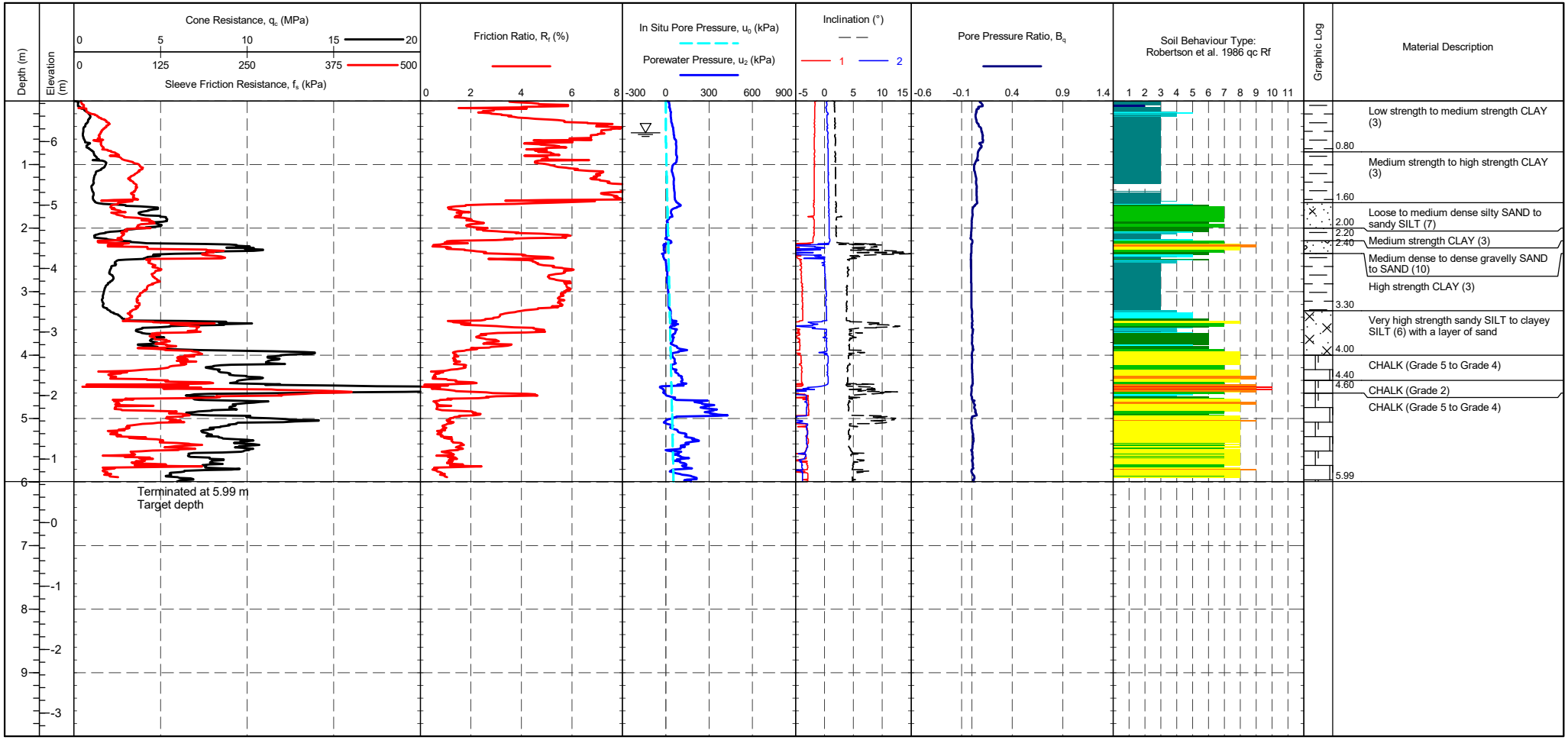
# Cone Penetration Measured Parameters and Geotechnical Derived Parameters

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP104**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499852.182 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102054.485 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.637 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 217 mV | -0.044 MPa |
| Sleeve | 213 mV | 206 mV | -0.005 kPa |
| Pore Pressure 2 | 260 mV | 225 mV | -0.01 kPa |
| X-Y Inclinometer | 2335 mV | 2336 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

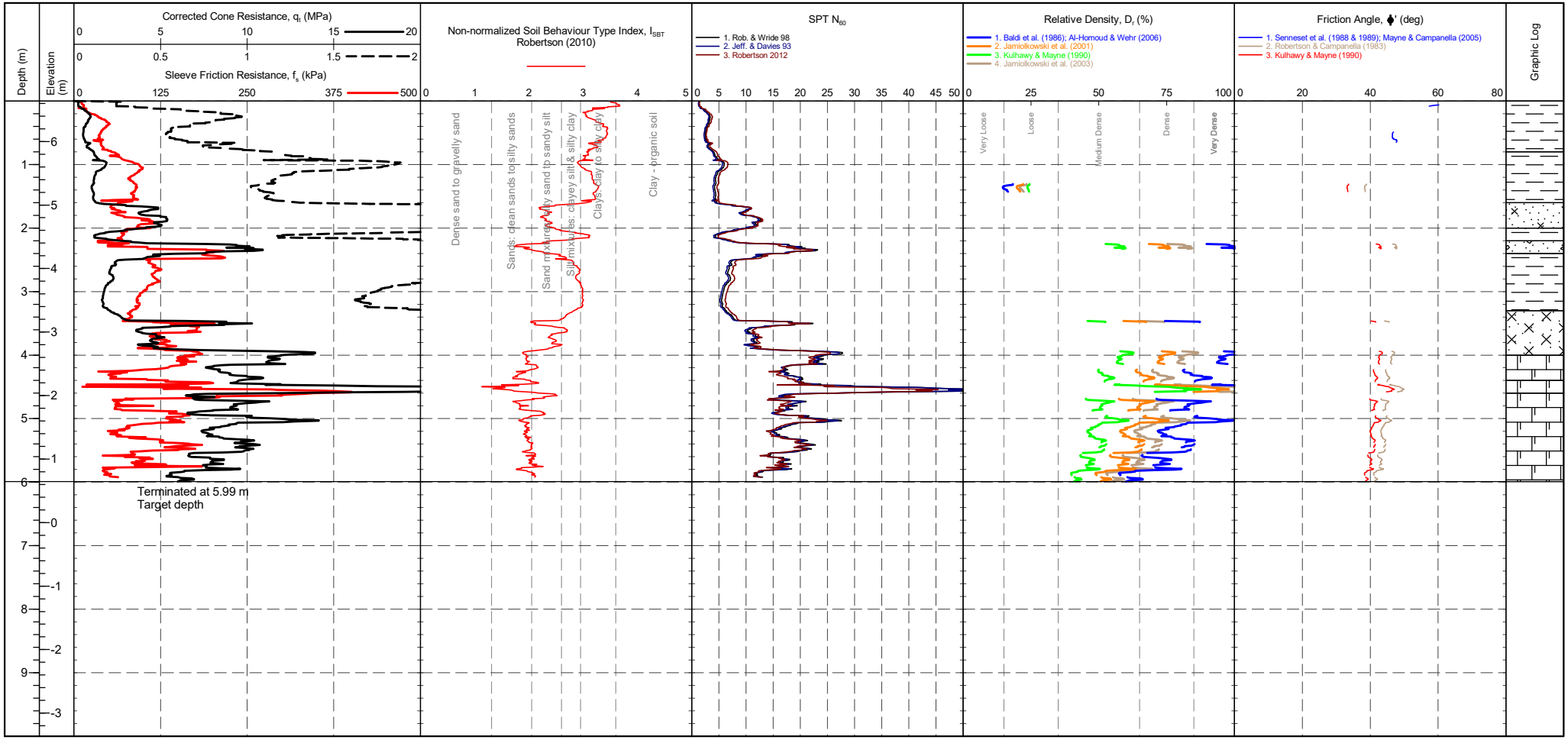
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP104**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 499852.182 m<br>NORTHING : 102054.485 m<br>ELEVATION : 6.637 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 221 mV | 217 mV |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 213 mV | 206 mV |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 260 mV | 225 mV |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2335 mV | 2336 mV |

| Transducer | Difference |
|---|---|
| Tip | -0.044 MPa |
| Sleeve | -0.005 kPa |
| Pore Pressure 2 | -0.01 kPa |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

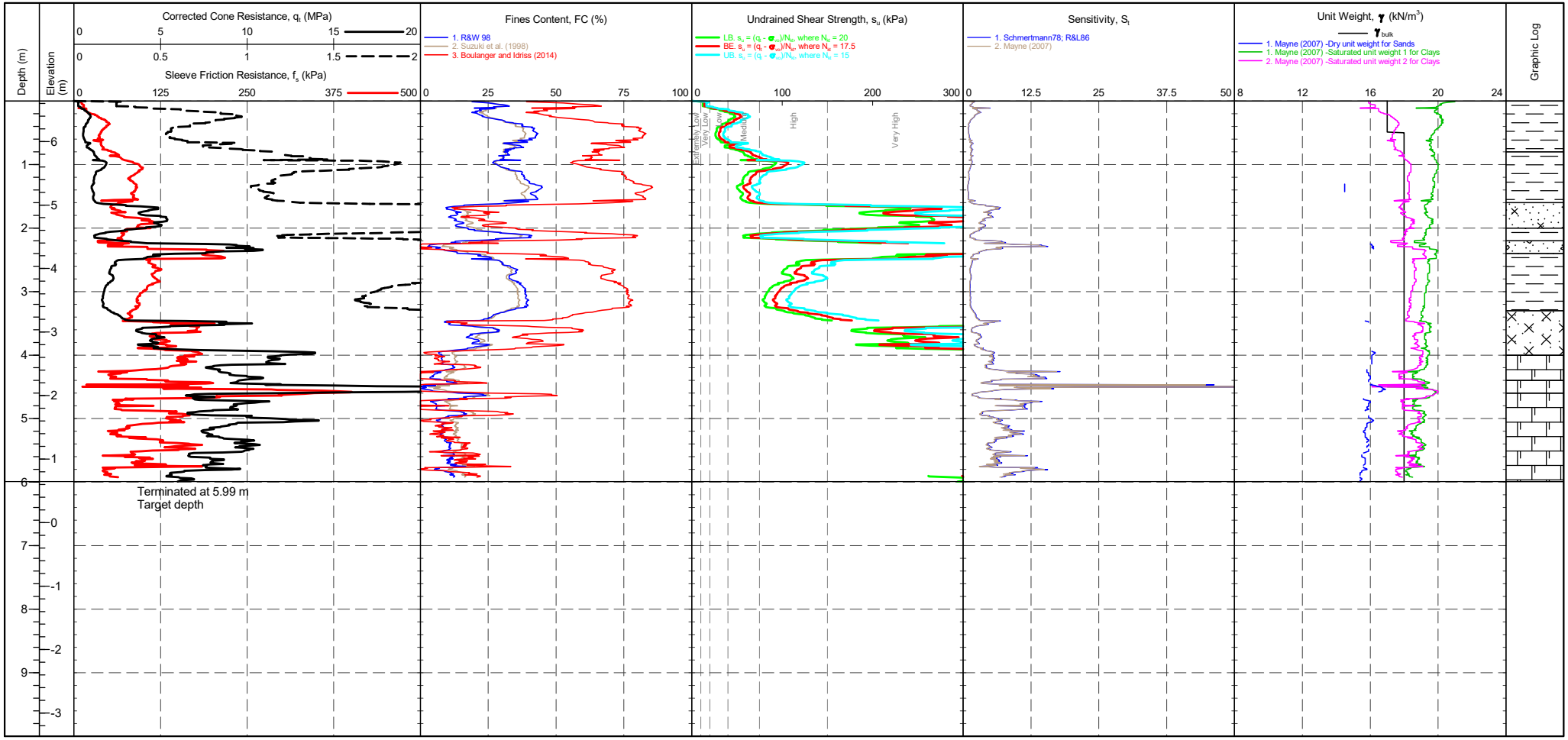
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP104**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499852.182 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102054.485 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.637 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



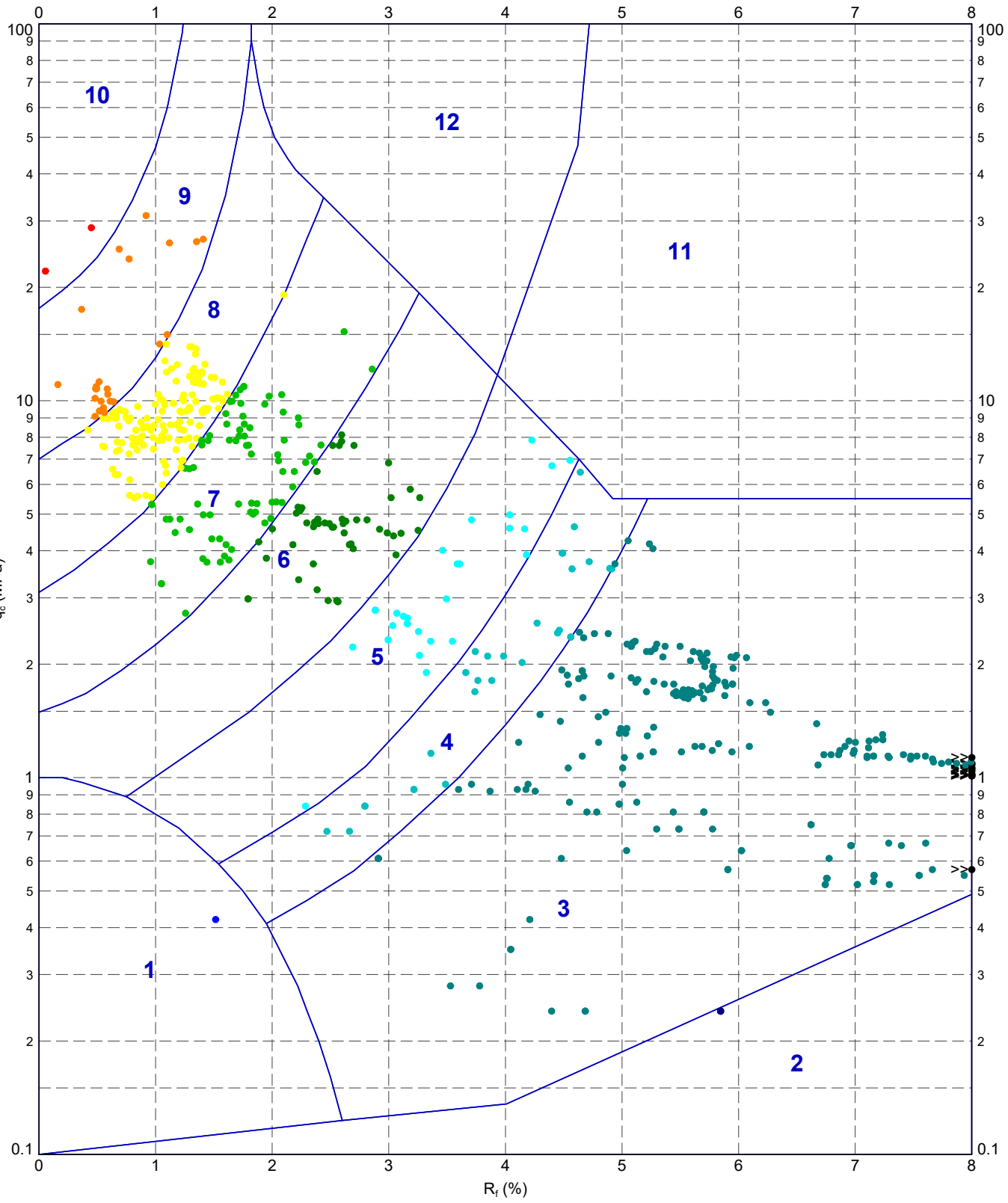

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 221 mV | 217 mV | -0.044 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 213 mV | 206 mV | -0.005 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 260 mV | 225 mV | -0.01 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2335 mV | 2336 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP104

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

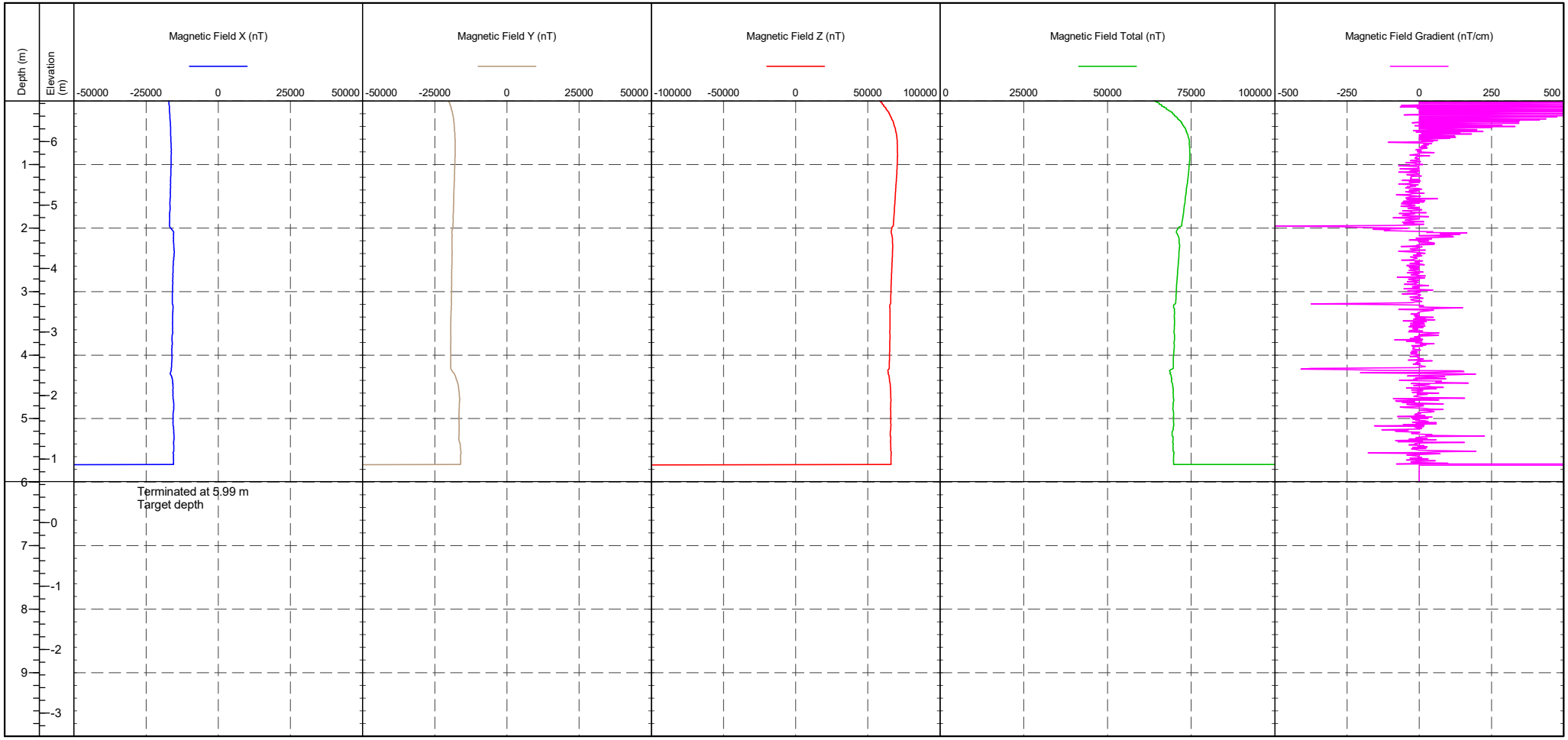
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:27 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP104**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499852.182 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102054.485 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.637 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



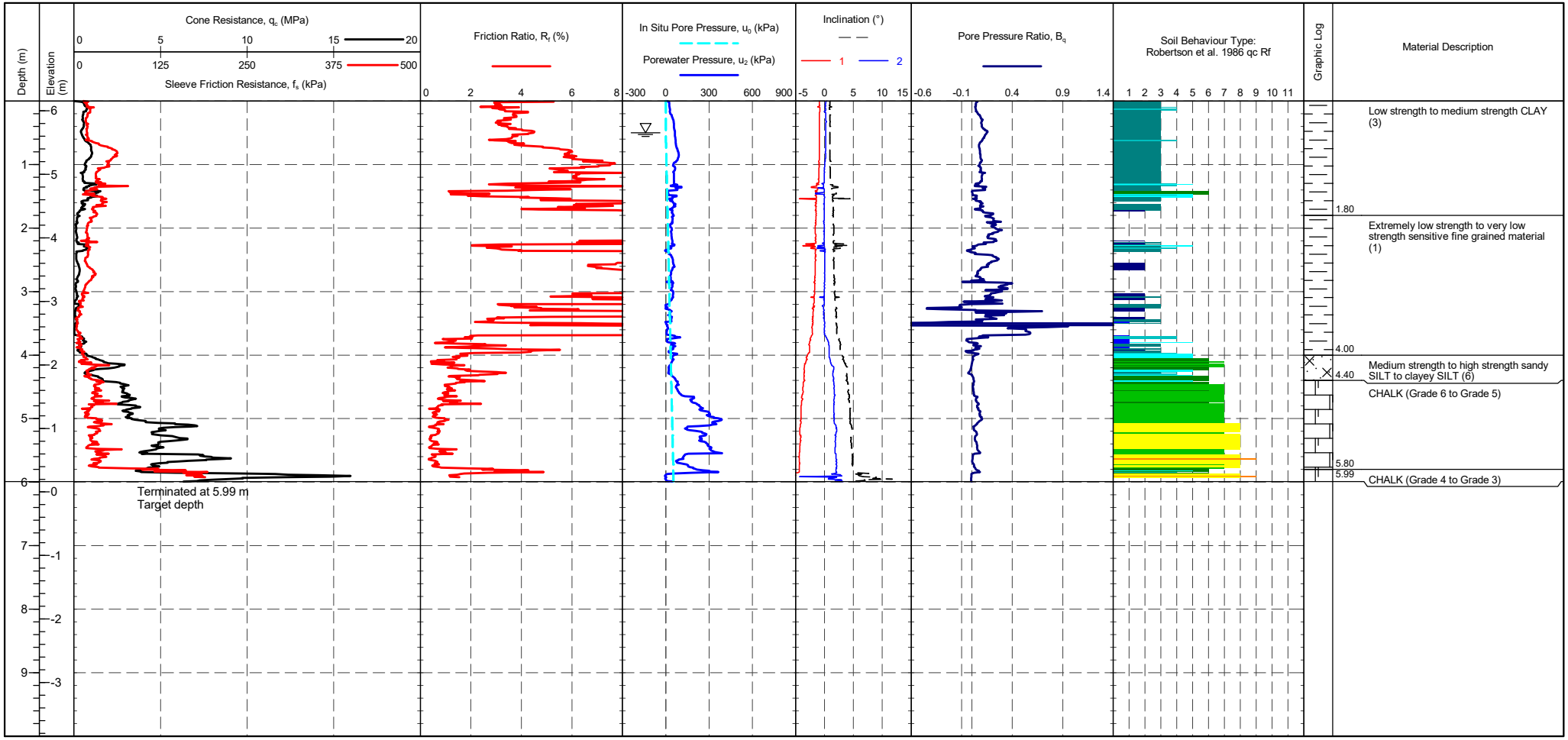

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 221 mV | 217 mV | -0.044 MPa |
| | | | | Sleeve | 213 mV | 206 mV | -0.005 kPa |
| | | | | Pore Pressure 2 | 260 mV | 225 mV | -0.01 kPa |
| | | | | X-Y Inclinometer | 2335 mV | 2336 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP105**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499925.761 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102077.699 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.155 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 219 mV | 218 mV | -0.011 MPa |
| Sleeve | 208 mV | 209 mV | 0.001 kPa |
| Pore Pressure 2 | 243 mV | 273 mV | 0.009 kPa |
| X-Y Inclinometer | 2395 mV | 2386 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

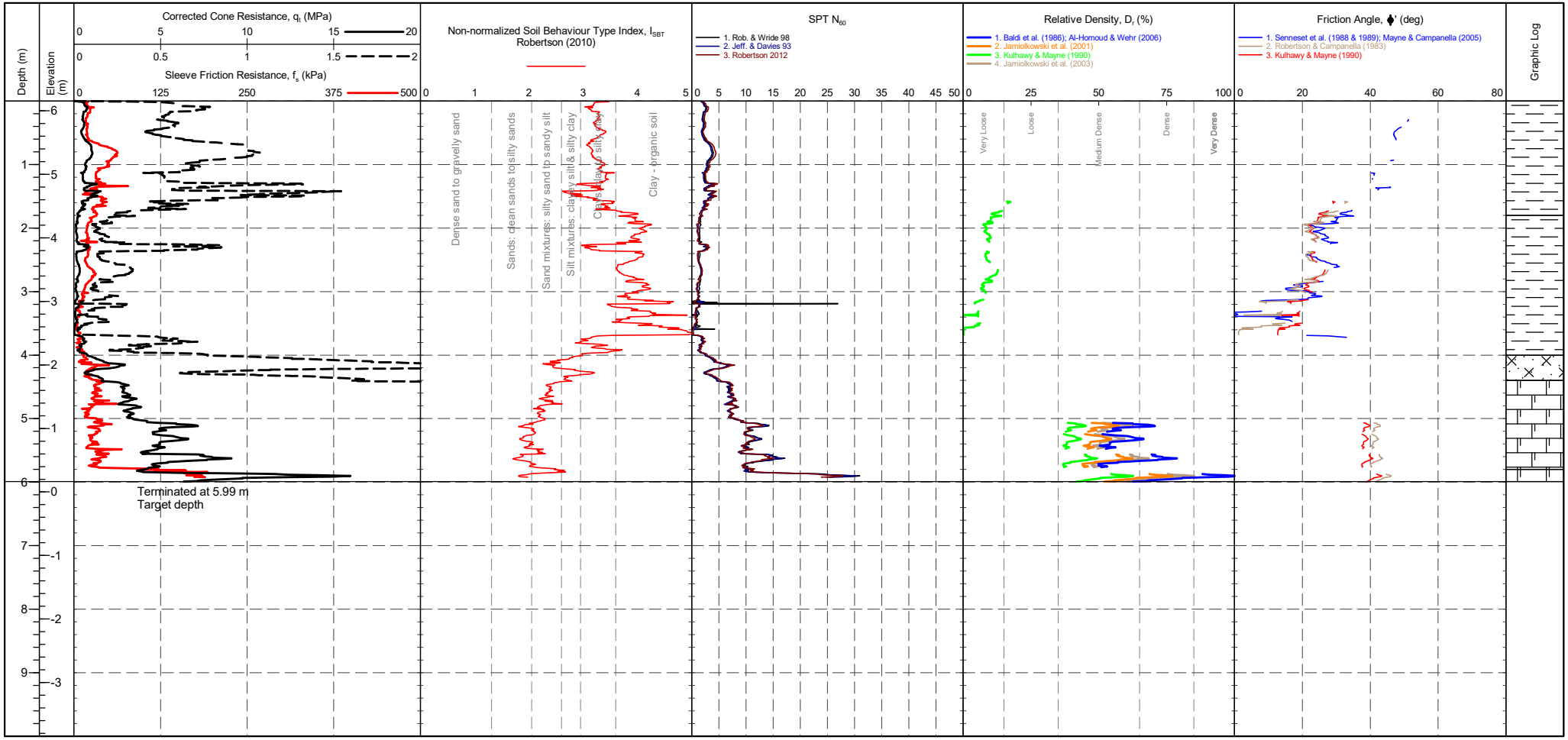
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP105**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 499925.761 m<br>NORTHING : 102077.699 m<br>ELEVATION : 6.155 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 219 mV | 218 mV | -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 208 mV | 209 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 243 mV | 273 mV | 0.009 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2395 mV | 2386 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

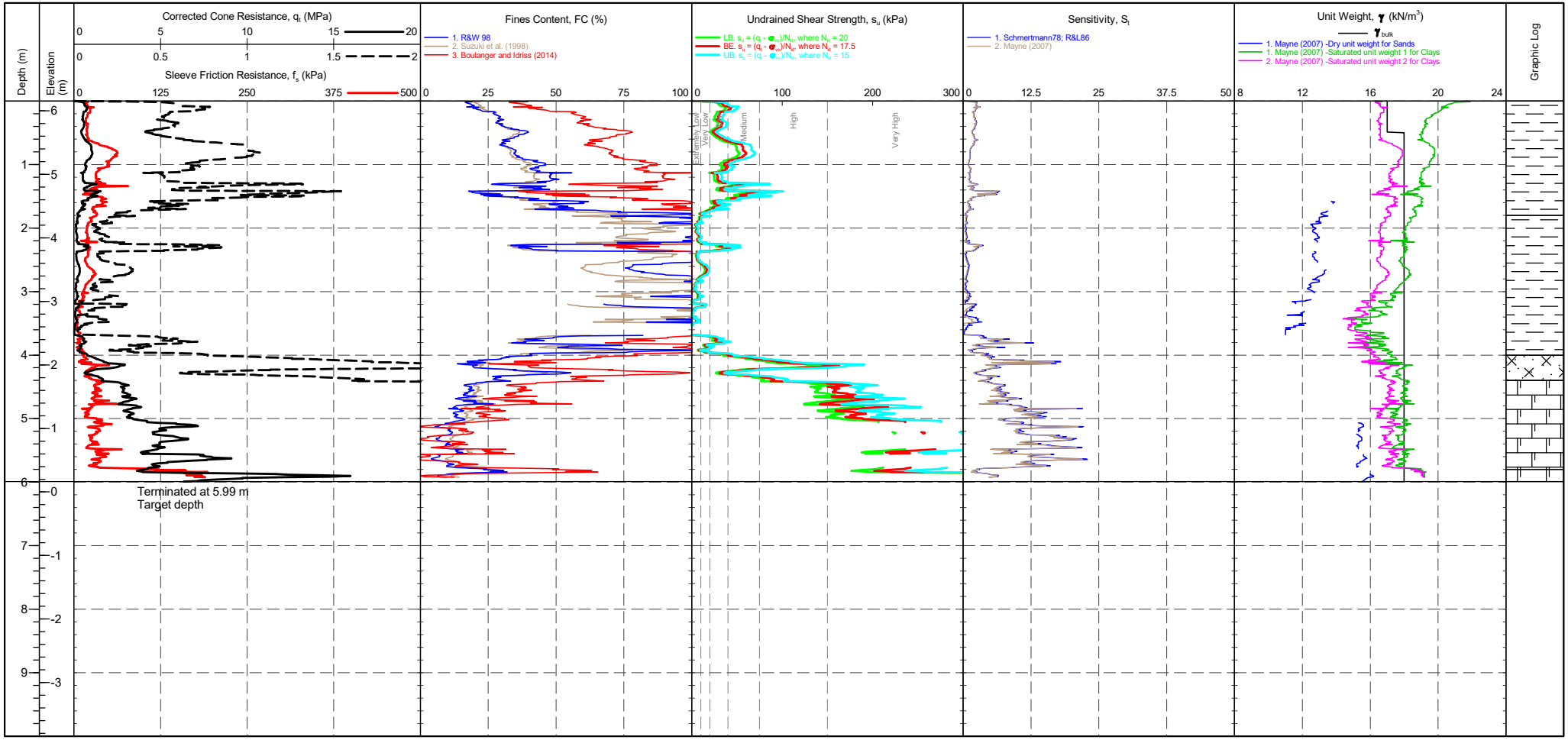
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP105**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499925.761 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102077.699 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.155 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



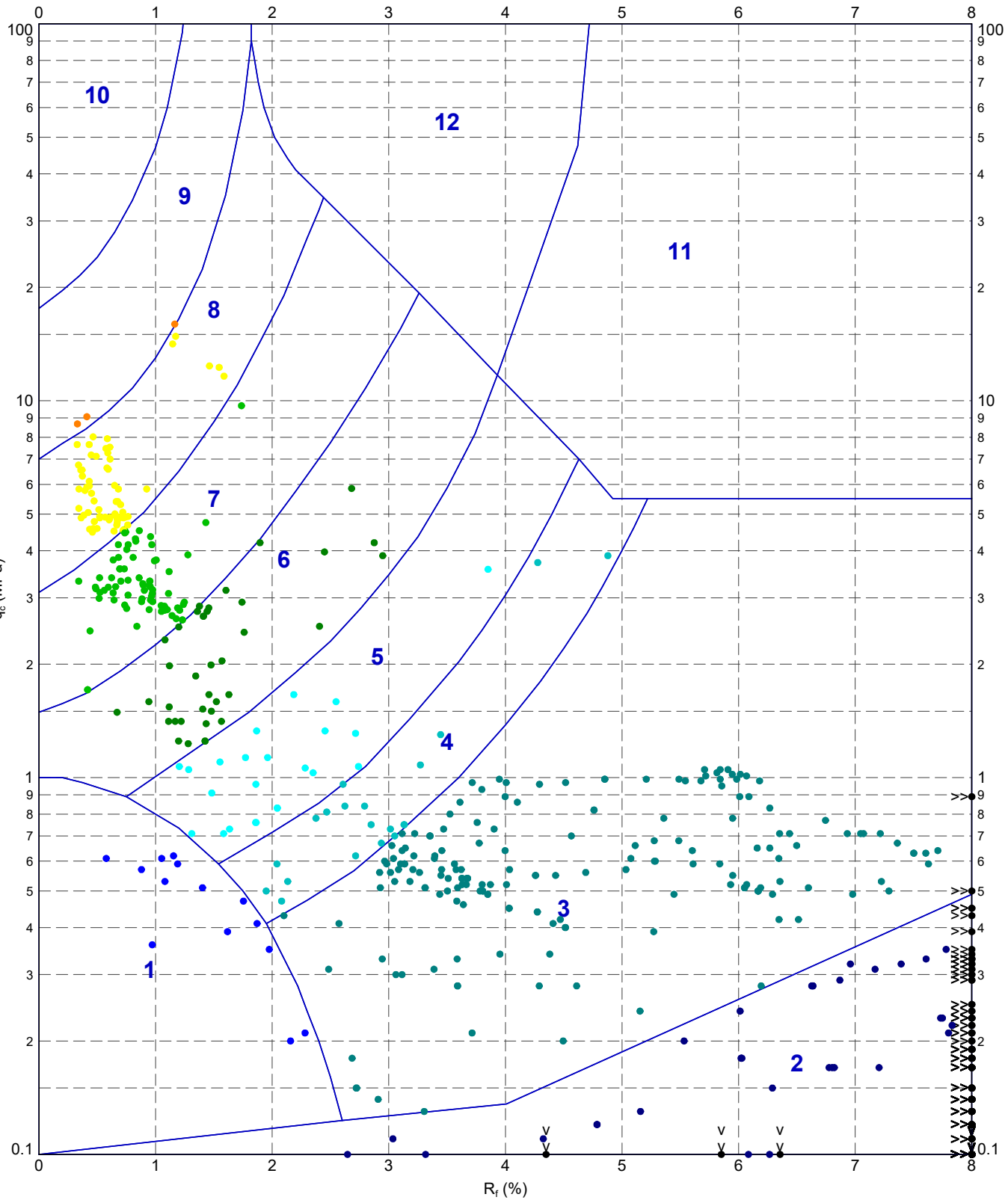

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 219 mV | 218 mV | -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 208 mV | 209 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 243 mV | 273 mV | 0.009 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2395 mV | 2386 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP105

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

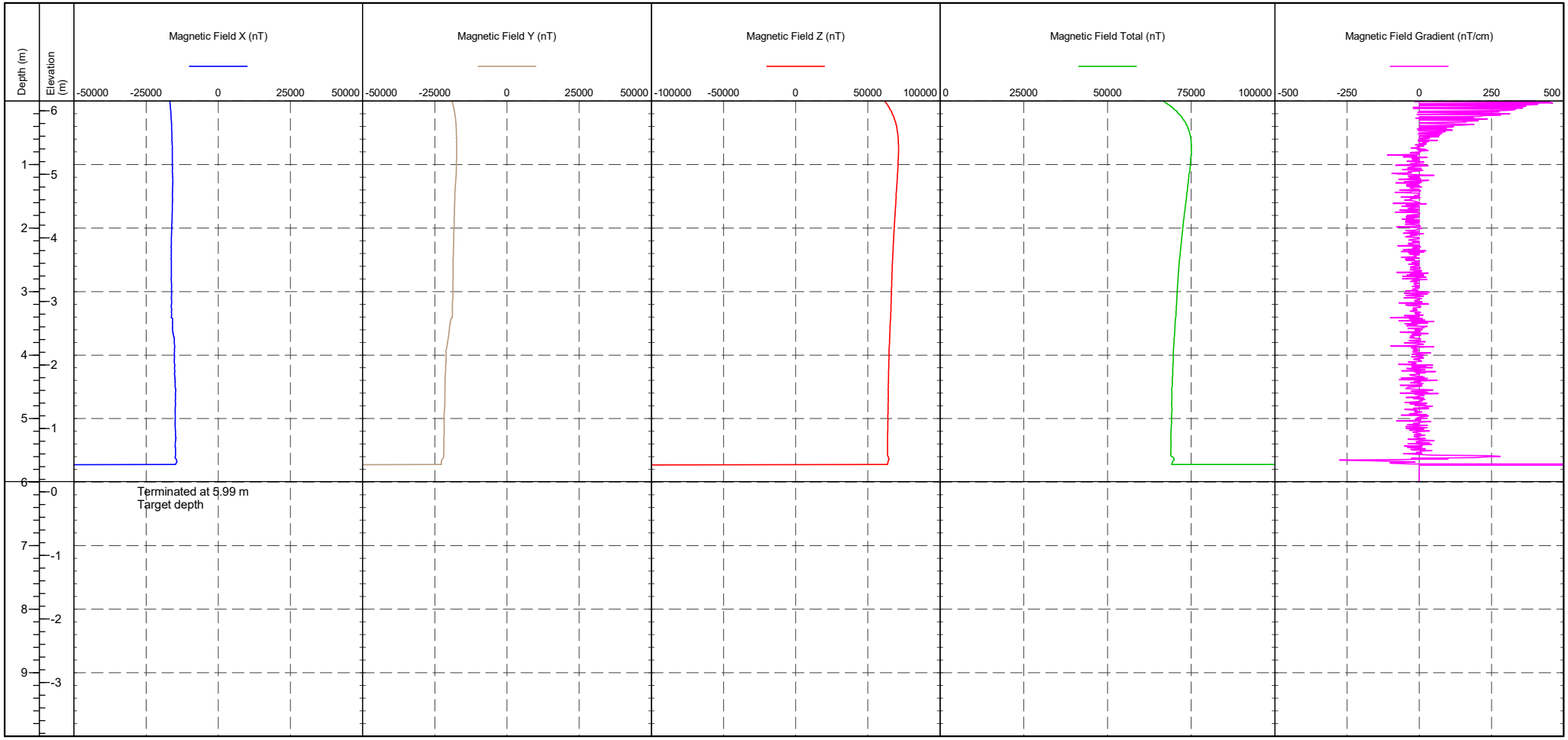
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:28 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP105**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499925.761 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102077.699 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.155 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



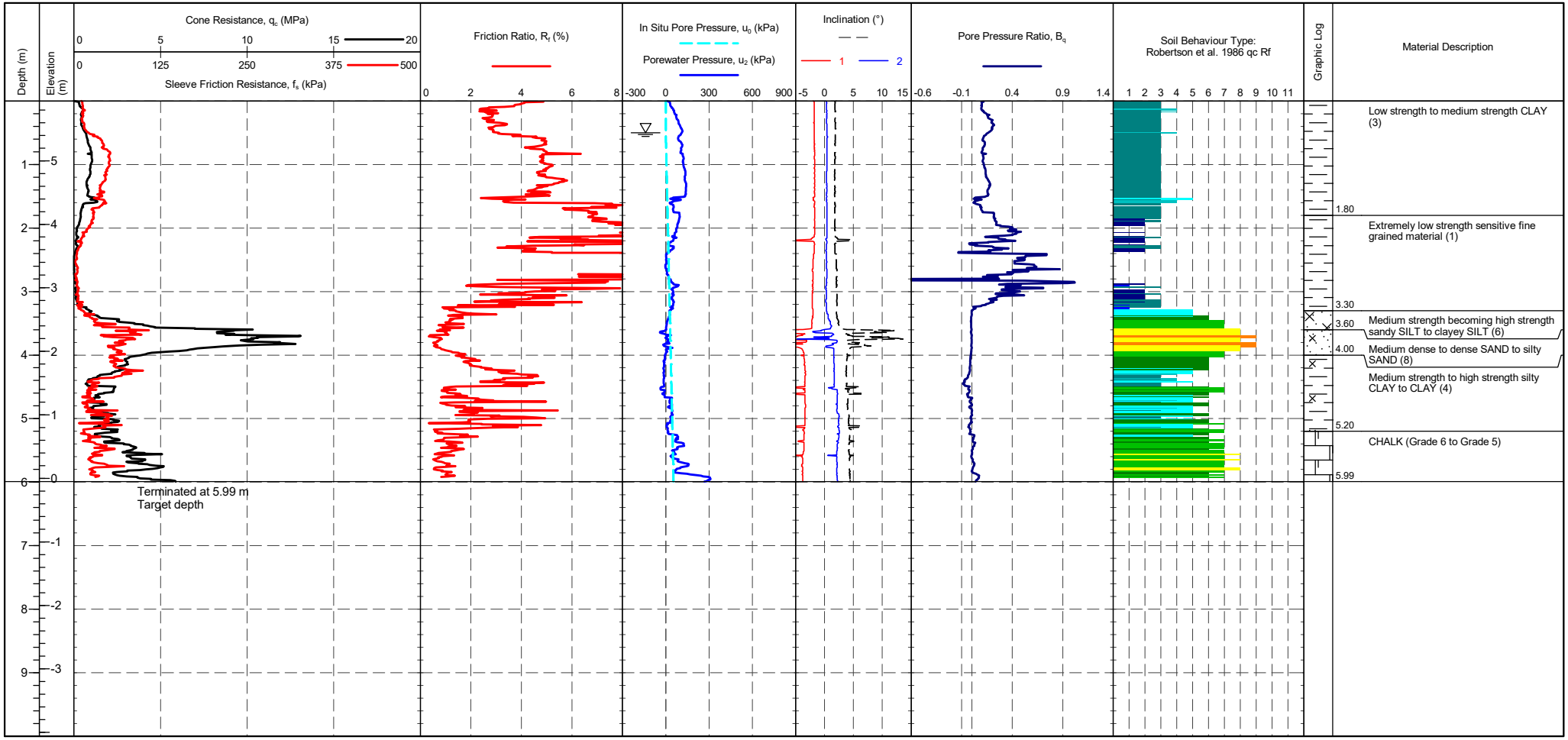

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 219 mV | 218 mV | -0.011 MPa |
| | | | | Sleeve | 208 mV | 209 mV | 0.001 kPa |
| | | | | Pore Pressure 2 | 243 mV | 273 mV | 0.009 kPa |
| | | | | X-Y Inclinometer | 2395 mV | 2386 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP106**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500013.265 m<br>NORTHING : 102089.586 m<br>ELEVATION : 5.941 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



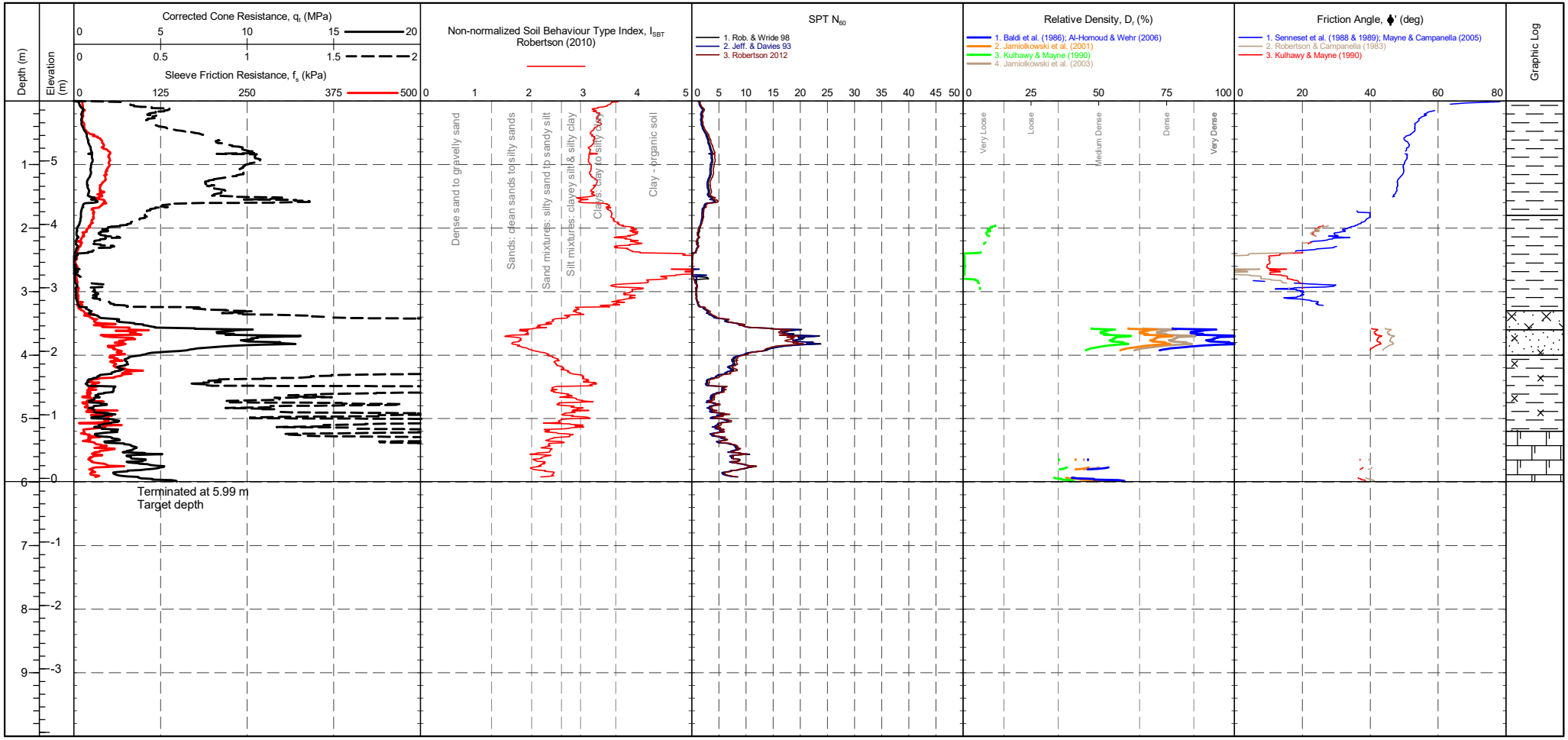

| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1186<br>CALIBRATION DATE : 09/08/2021<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes | CPTU ZERO VALUES<br>Transducer: Pre / Post / Difference<br>Tip: 219 mV / 219 mV / 0 MPa<br>Sleeve: 210 mV / 211 mV / 0.001 kPa<br>Pore Pressure 2: 269 mV / 271 mV / 0.001 kPa<br>X-Y Inclinometer: 2286 mV / 2284 mV | METHOD: Robertson et al. 1986 qc Rf<br>1 - Sensitive fine grained material<br>2 - Organic material<br>3 - CLAY<br>4 - Silty CLAY to CLAY<br>5 - Clayey SILT to silty CLAY<br>6 - Sandy SILT to clayey SILT<br>7 - Silty SAND to sandy SILT<br>8 - SAND to silty SAND<br>9 - SAND<br>10 - Gravelly SAND to SAND<br>11 - Very stiff fine grained<br>12 - SAND to clayey SAND<br>Groundwater Level<br>Dissipation Test |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP106**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500013.265 m<br>NORTHING : 102089.586 m<br>ELEVATION : 5.941 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 219 mV | 219 mV | 0 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 210 mV | 211 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 269 mV | 271 mV | 0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2286 mV | 2284 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

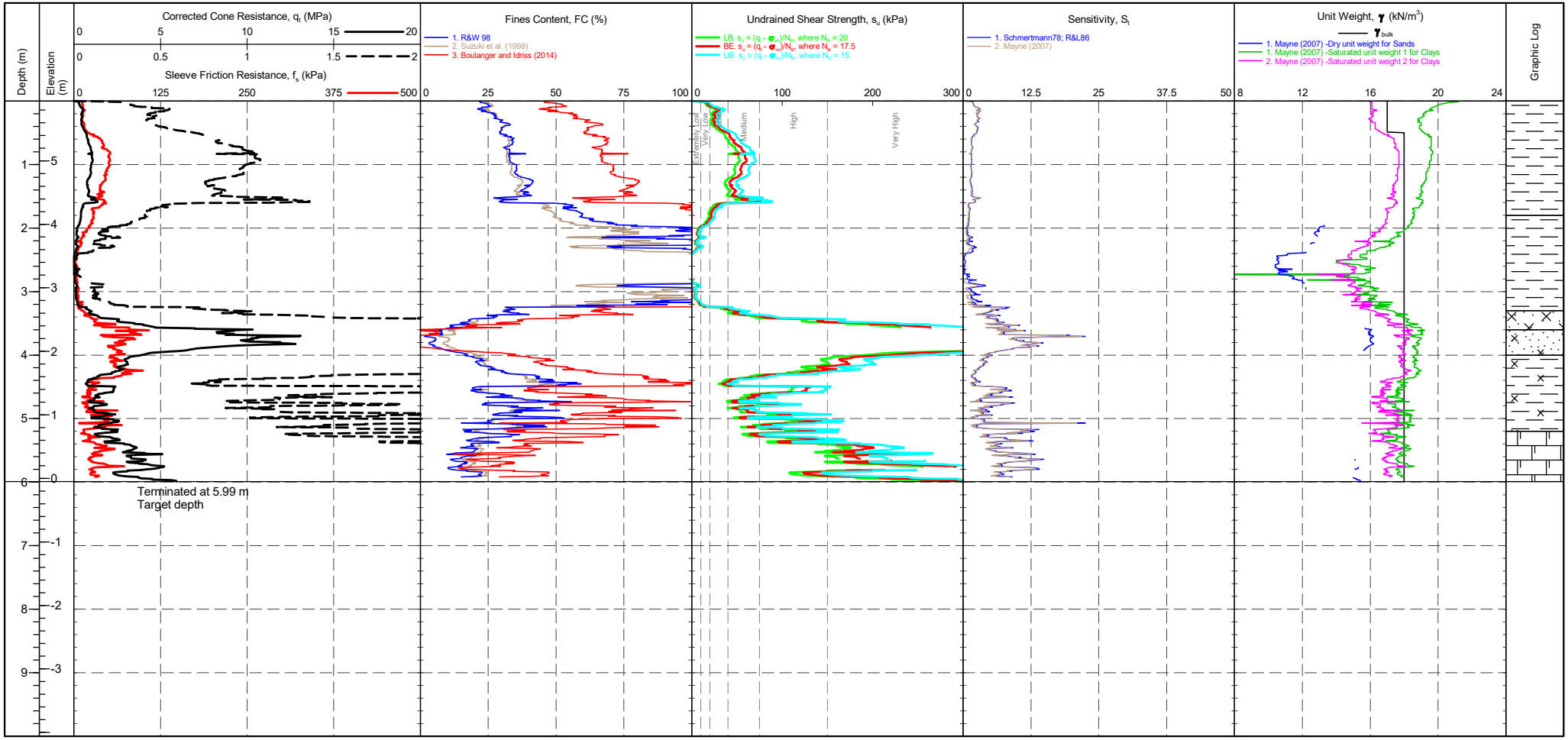
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP106**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500013.265 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102089.586 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.941 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



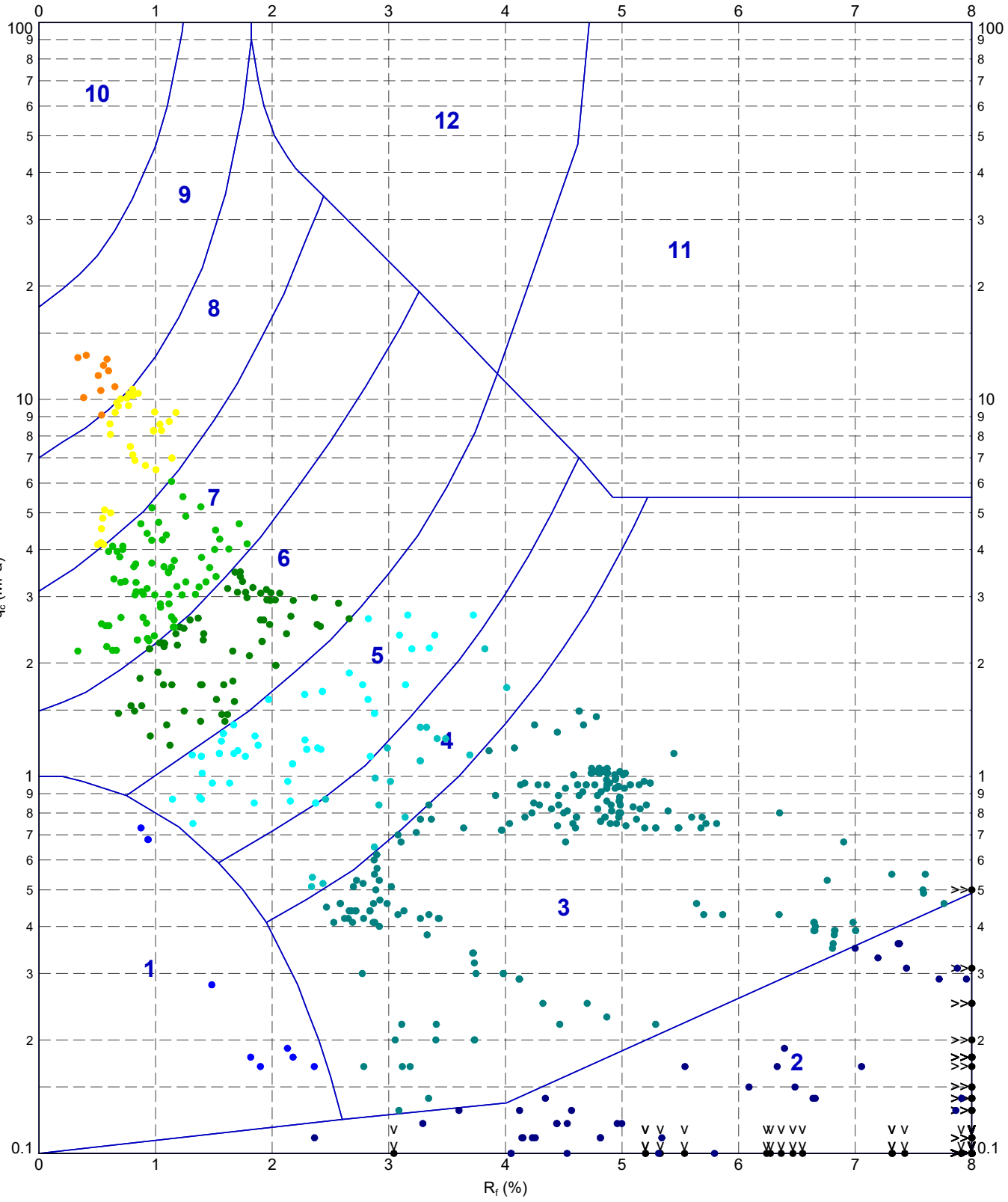

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 219 mV | 219 mV | 0 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 210 mV | 211 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 269 mV | 271 mV | 0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2286 mV | 2284 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP106

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

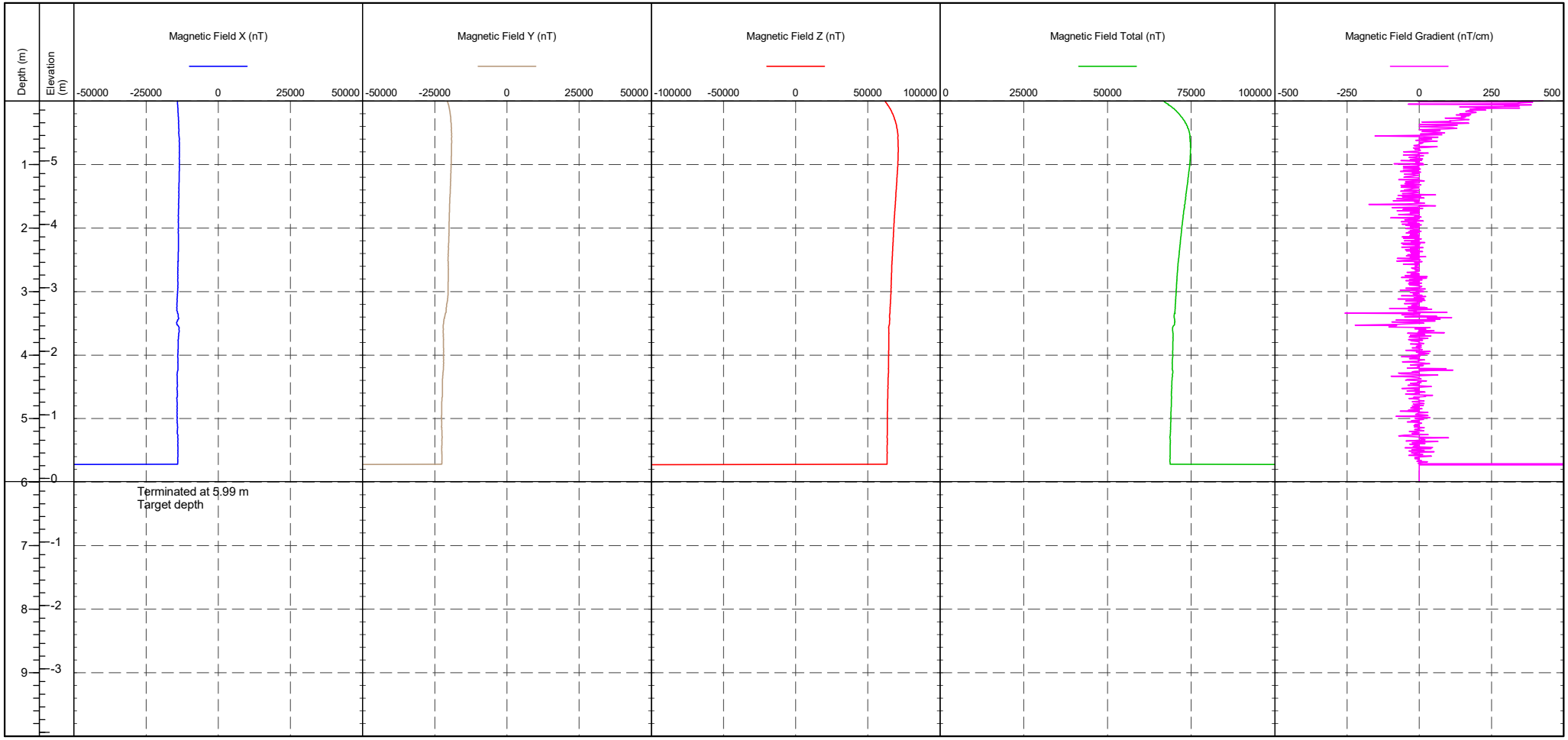
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:29 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP106**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500013.265 m<br>NORTHING : 102089.586 m<br>ELEVATION : 5.941 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



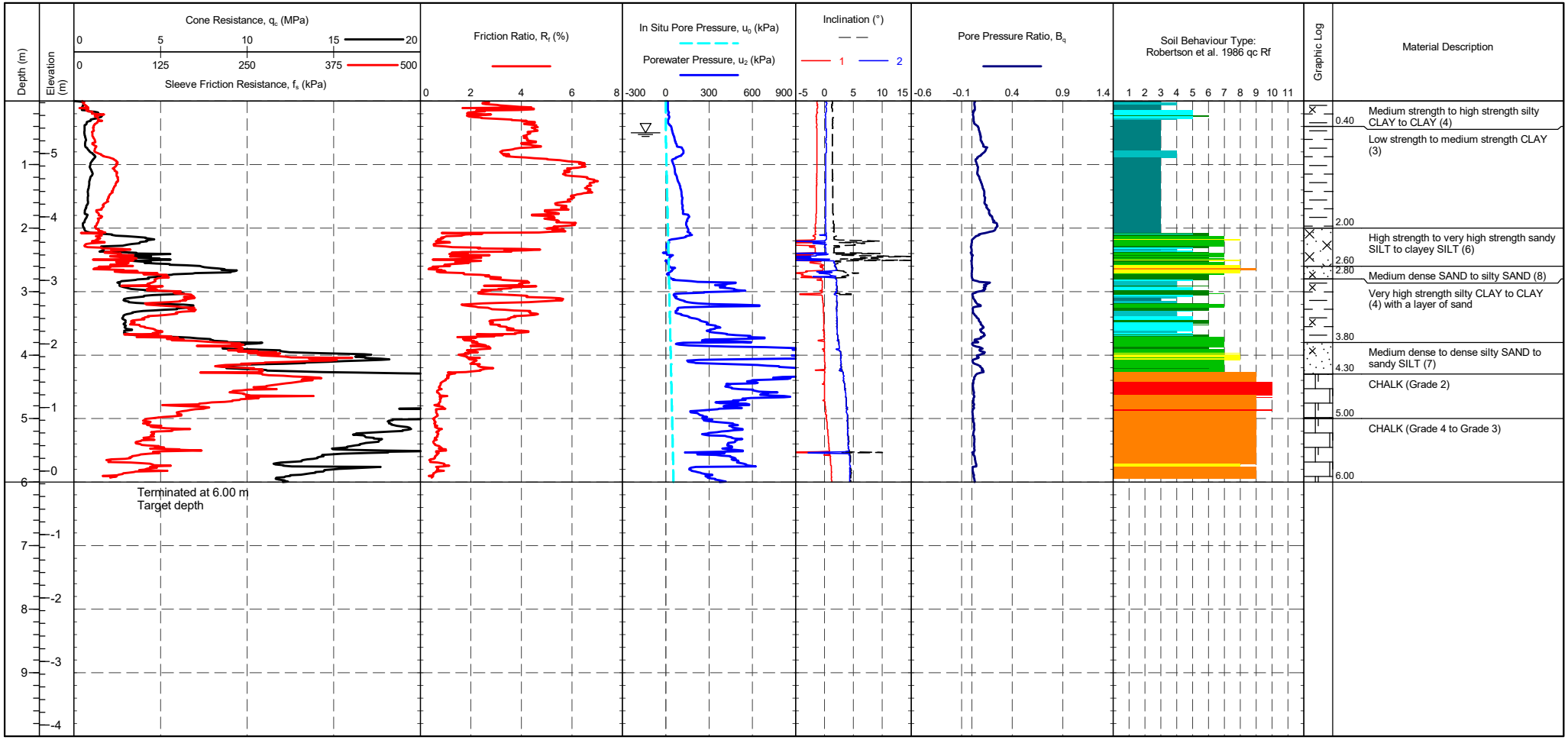

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 219 mV | 219 mV | 0 MPa |
| | | | | Sleeve | 210 mV | 211 mV | 0.001 kPa |
| | | | | Pore Pressure 2 | 269 mV | 271 mV | 0.001 kPa |
| | | | | X-Y Inclinometer | 2286 mV | 2284 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP107**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500058.948 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102112.874 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.825 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 220 mV | 219 mV | -0.011 MPa |
| Sleeve | 211 mV | 212 mV | 0.001 kPa |
| Pore Pressure 2 | 266 mV | 315 mV | 0.015 kPa |
| X-Y Inclinometer | 2381 mV | 2365 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

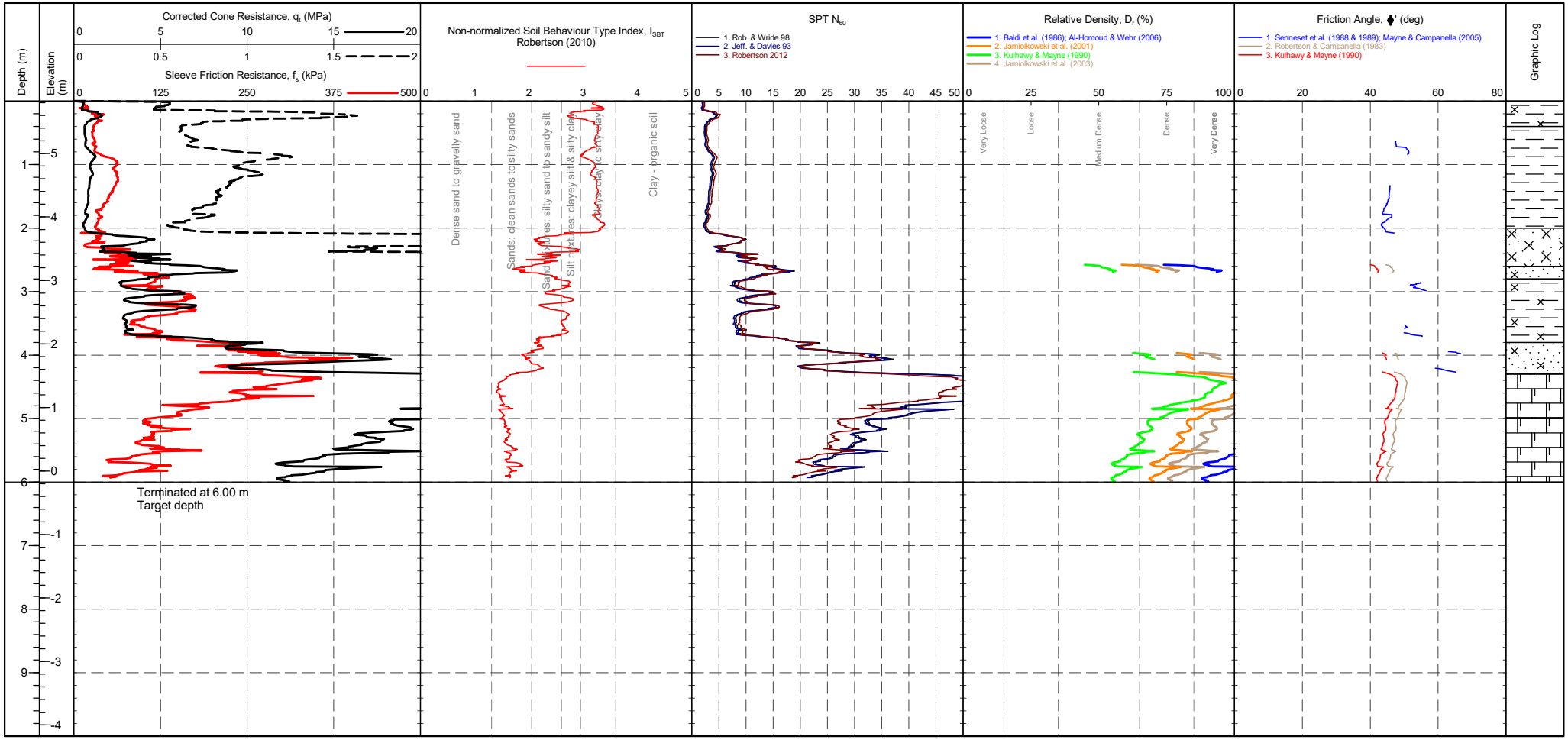
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP107**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500058.948 m<br>NORTHING : 102112.874 m<br>ELEVATION : 5.825 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 220 mV | 219 mV | -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 211 mV | 212 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 266 mV | 315 mV | 0.015 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2381 mV | 2365 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

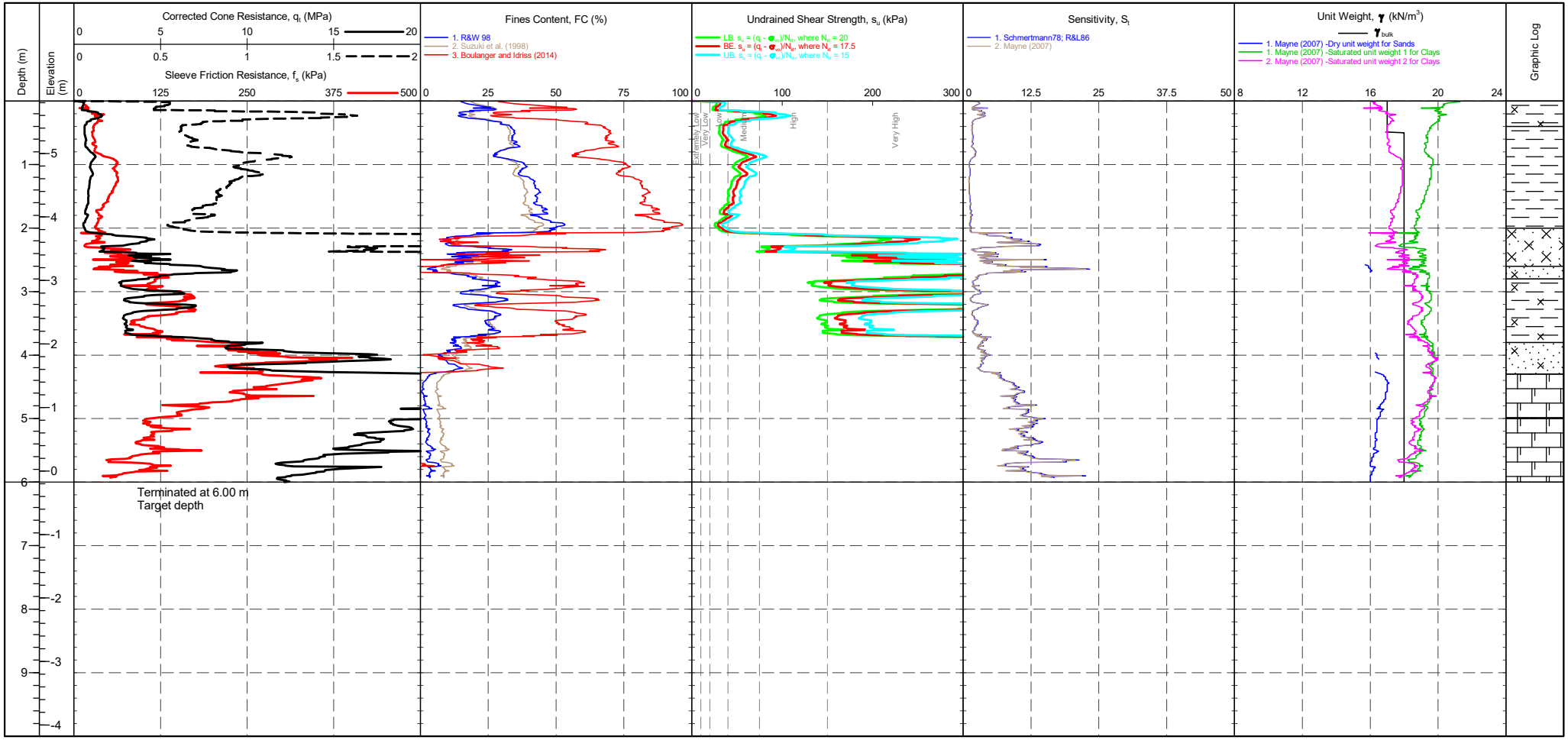
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP107**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500058.948 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102112.874 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.825 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



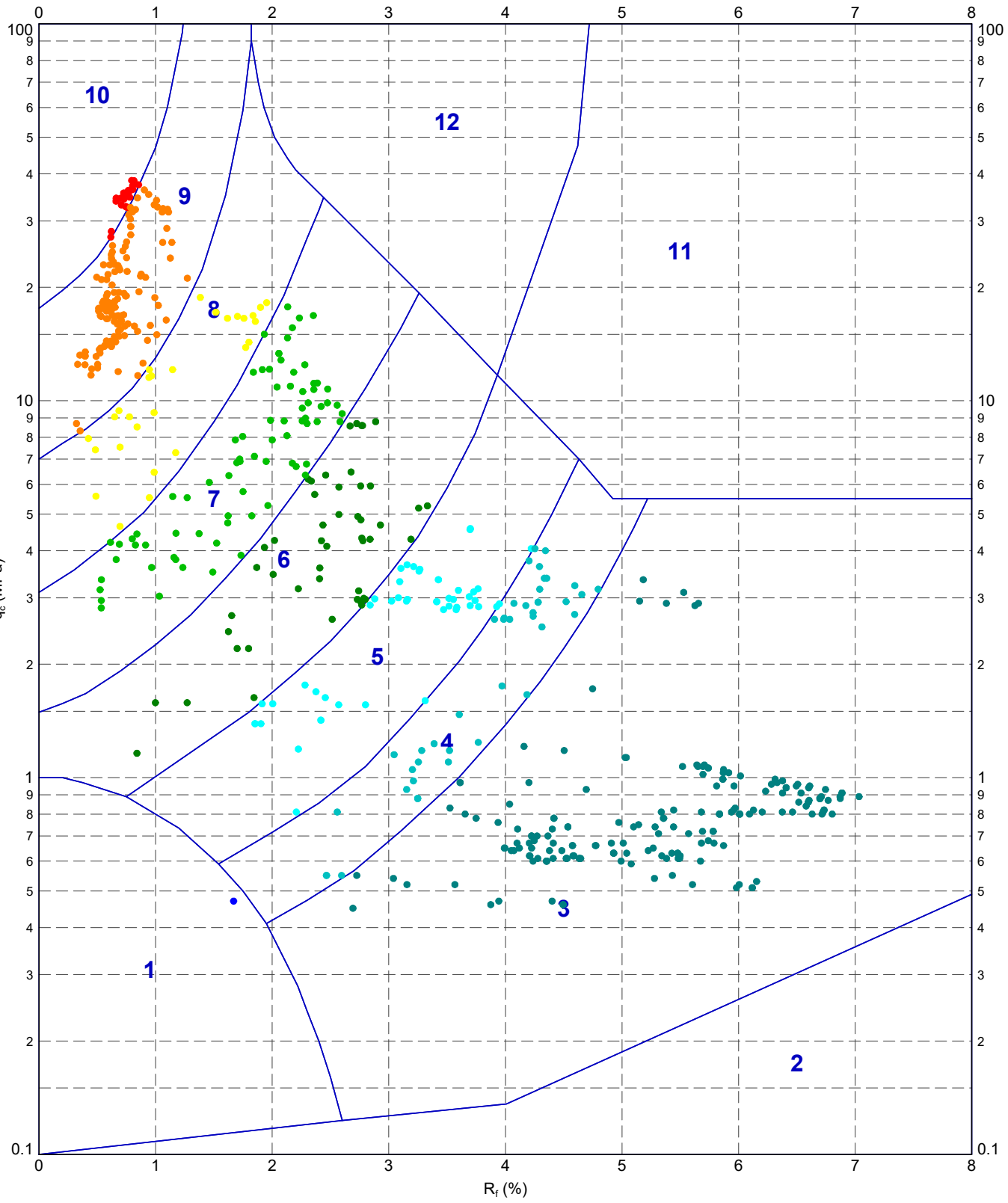

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 220 mV | 219 mV | -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 211 mV | 212 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 266 mV | 315 mV | 0.015 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2381 mV | 2365 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP107

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

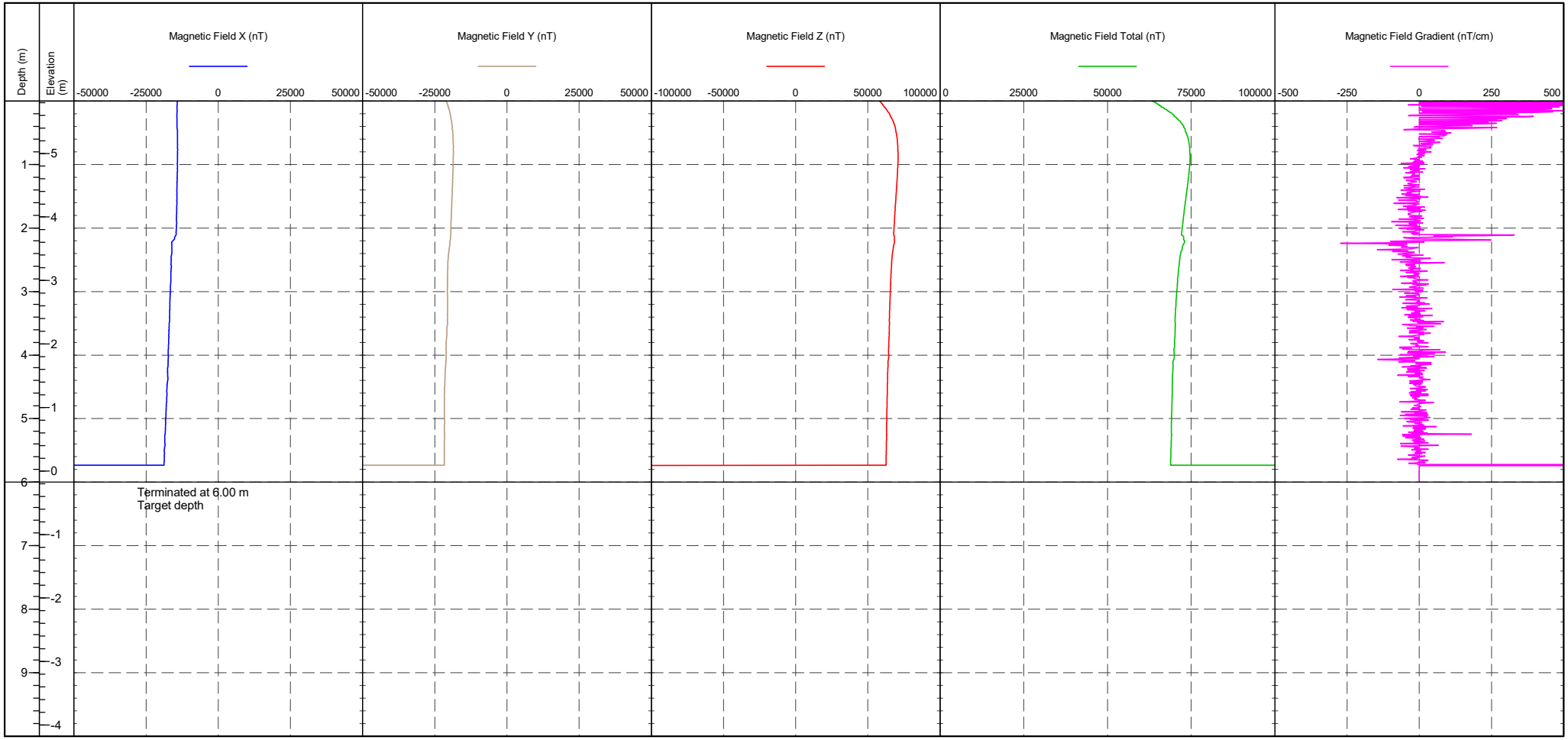
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:30 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP107**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500058.948 m<br>NORTHING : 102112.874 m<br>ELEVATION : 5.825 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



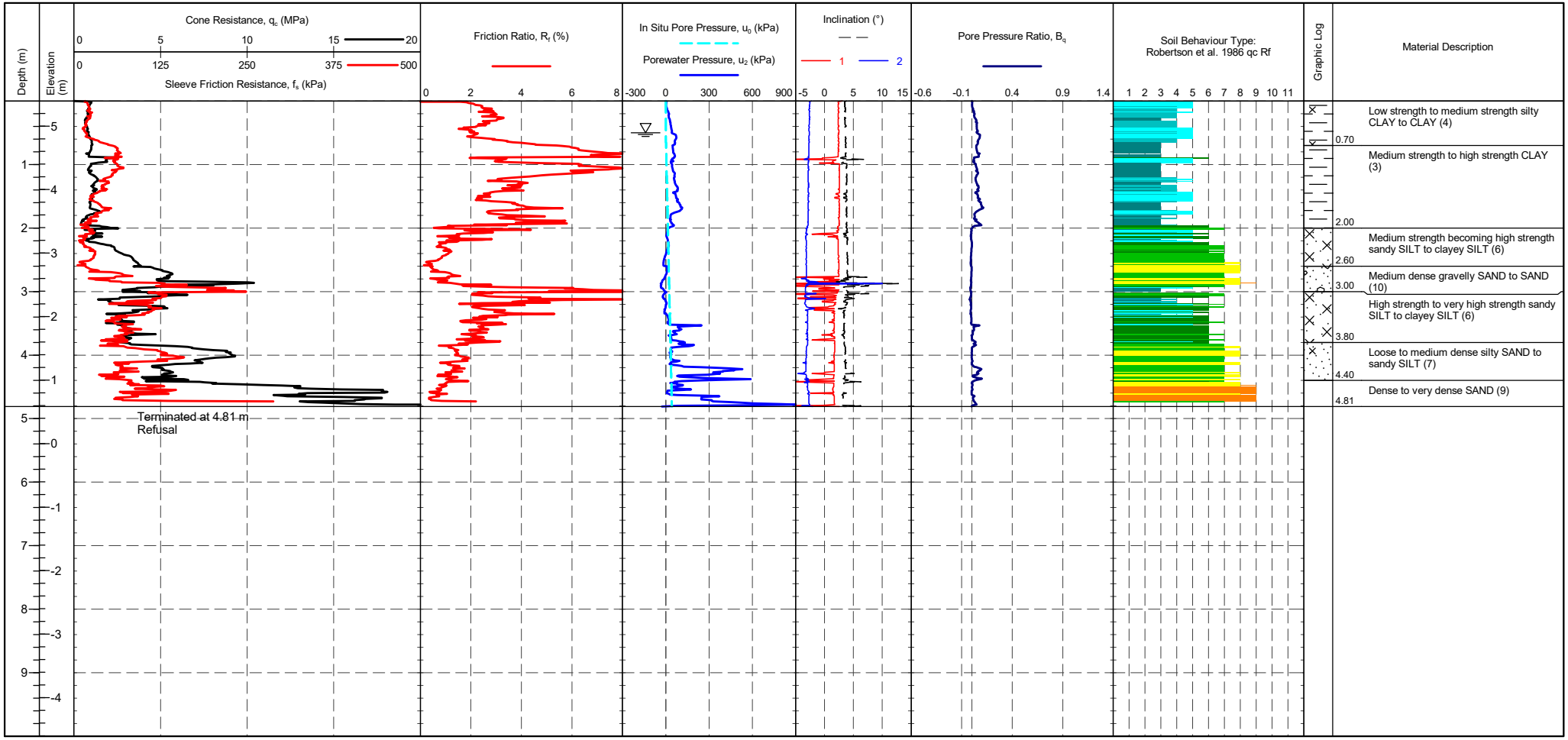

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 220 mV | 219 mV | -0.011 MPa |
| | | | | Sleeve | 211 mV | 212 mV | 0.001 kPa |
| | | | | Pore Pressure 2 | 266 mV | 315 mV | 0.015 kPa |
| | | | | X-Y Inclinometer | 2381 mV | 2365 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID **DP108**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500161.582 m<br>NORTHING : 102170.687 m<br>ELEVATION : 5.394 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on total pressure. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



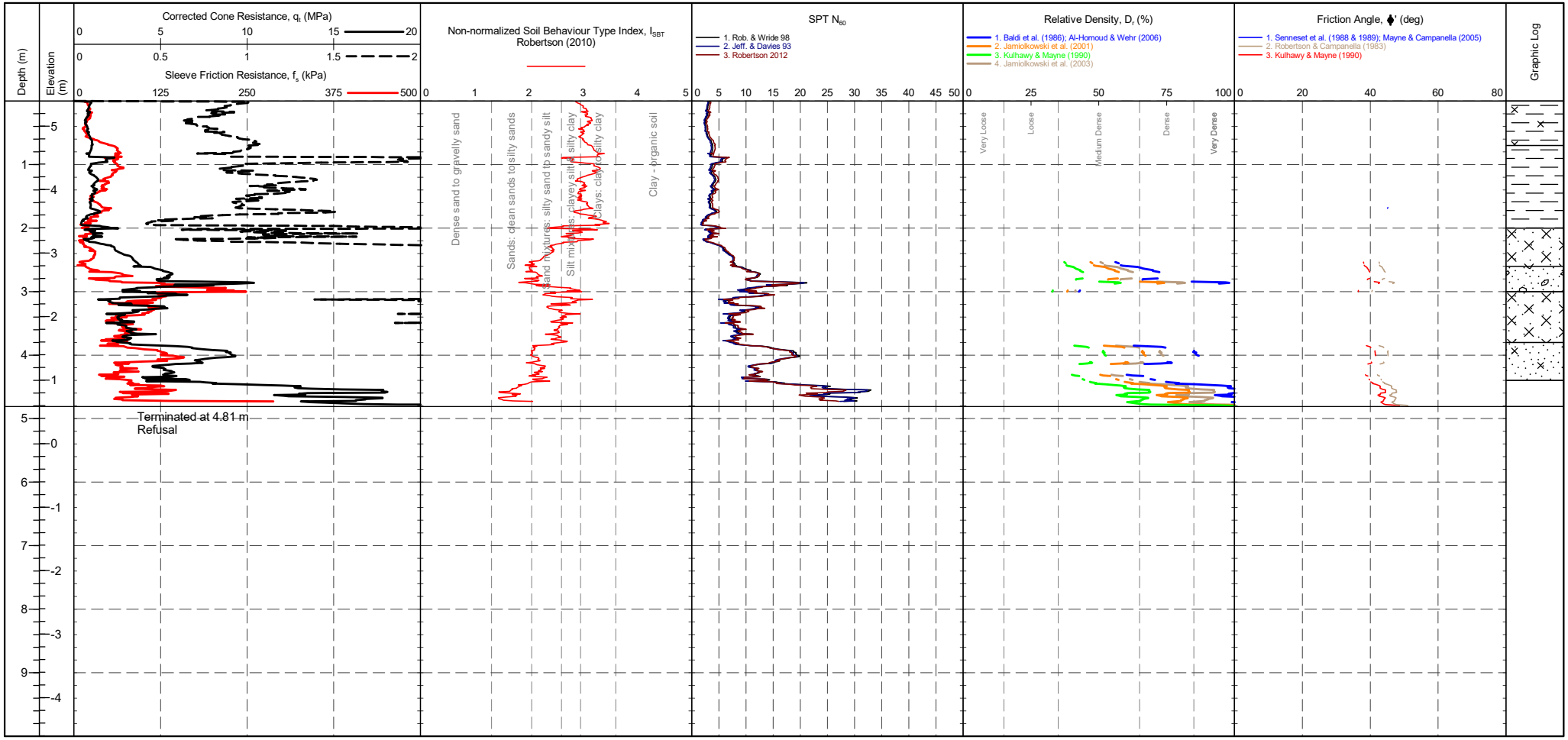

| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1983<br>CALIBRATION DATE : 16/09/2022<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES<br>Transducer: Pre / Post / Difference<br>Tip: 288 mV / 285 mV / -0.034 MPa<br>Sleeve: 256 mV / 220 mV / -0.026 kPa<br>Pore Pressure 2: 238 mV / 251 mV / 0.003 kPa<br>X-Y Inclinometer: 2697 mV / 2673 mV | METHOD: Robertson et al. 1986 qc Rf<br>1 - Sensitive fine grained material<br>2 - Organic material<br>3 - CLAY<br>4 - Silty CLAY to CLAY<br>5 - Clayey SILT to silty CLAY<br>6 - Sandy SILT to clayey SILT<br>7 - Silty SAND to sandy SILT<br>8 - SAND to silty SAND<br>9 - SAND<br>10 - Gravelly SAND to SAND<br>11 - Very stiff fine grained<br>12 - SAND to clayey SAND<br>Groundwater Level<br>Dissipation Test |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP108**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500161.582 m<br>NORTHING : 102170.687 m<br>ELEVATION : 5.394 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on total pressure. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 288 mV | 285 mV | -0.034 MPa |
| Sleeve | 256 mV | 220 mV | -0.026 kPa |
| Pore Pressure 2 | 238 mV | 251 mV | 0.003 kPa |
| X-Y Inclinometer | 2697 mV | 2673 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

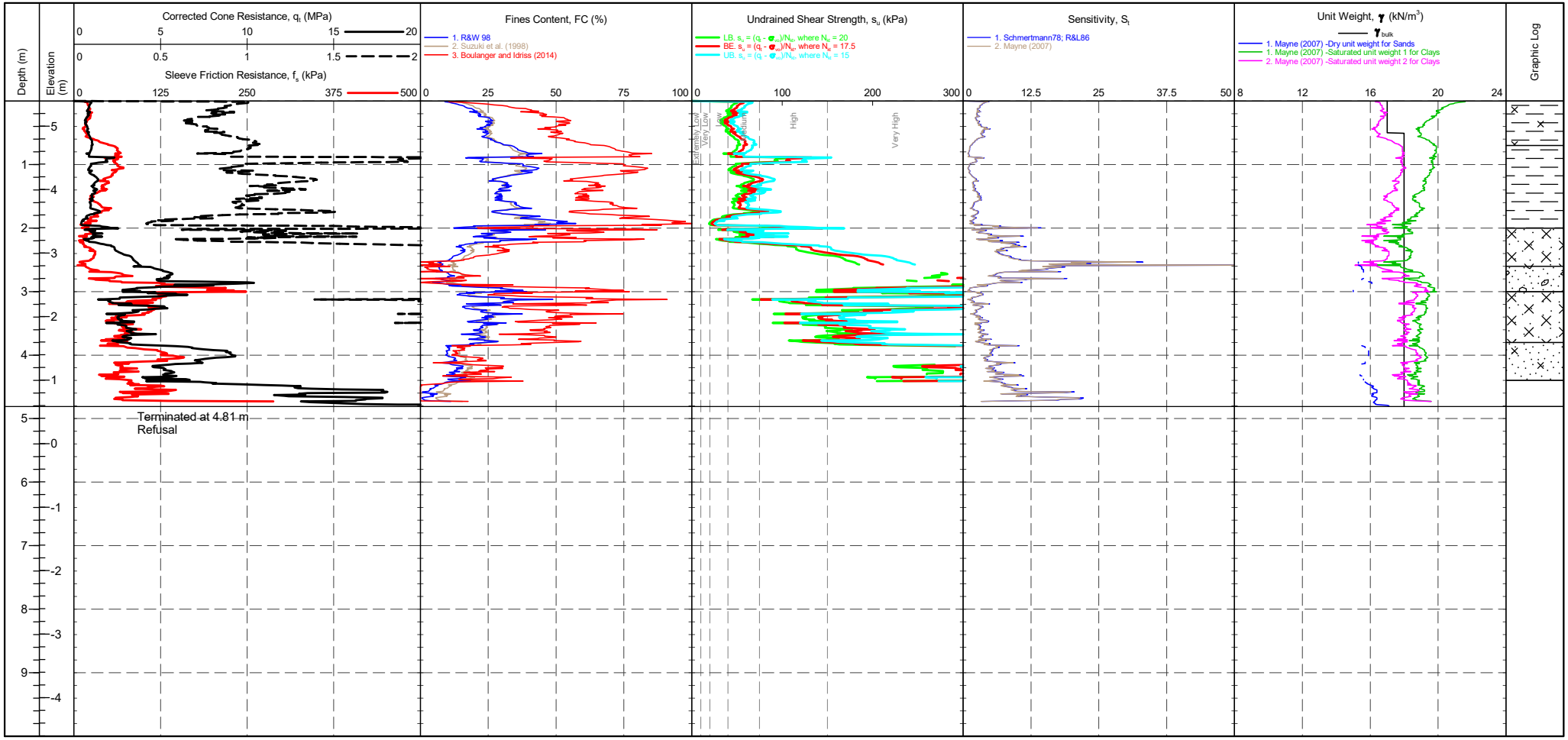
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP108**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500161.582 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102170.687 m | Test refused on total pressure. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.394 m OD | | TEST DATE : 13/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |



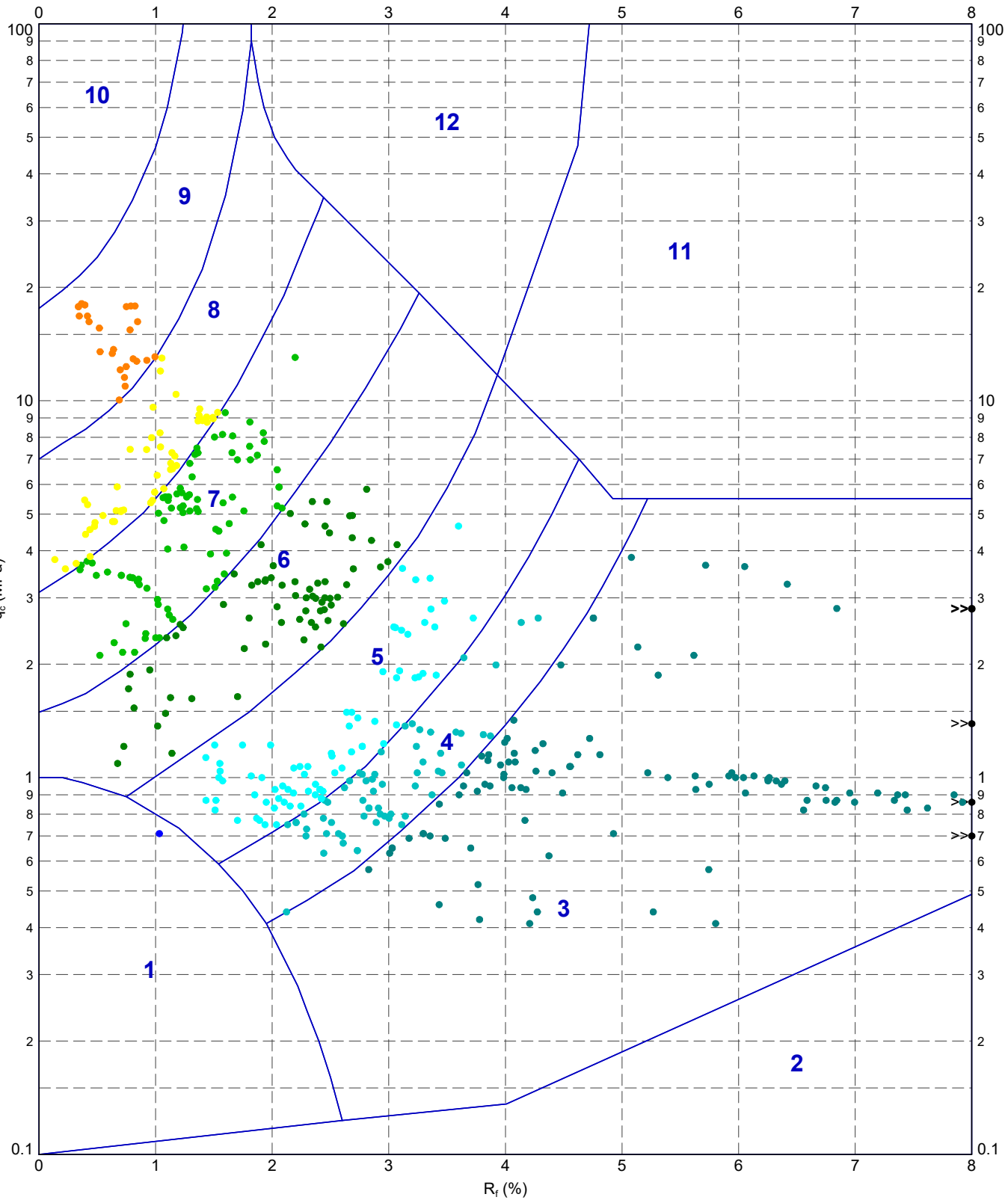

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 288 mV | 285 mV | -0.034 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 256 mV | 220 mV | -0.026 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 238 mV | 251 mV | 0.003 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2697 mV | 2673 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP108

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

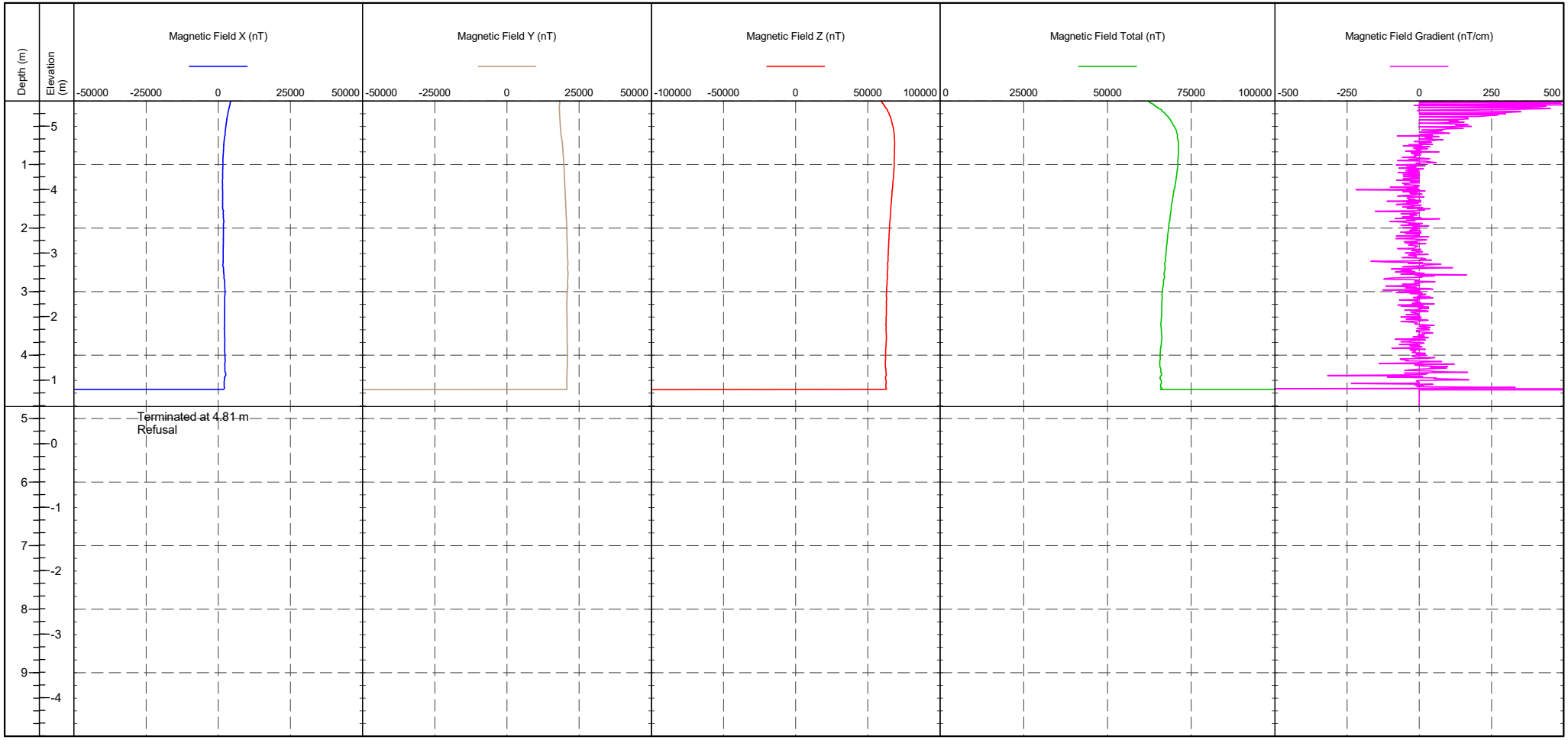
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:31 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP108**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500161.582 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102170.687 m | Test refused on total pressure. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.394 m OD | | TEST DATE : 13/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |



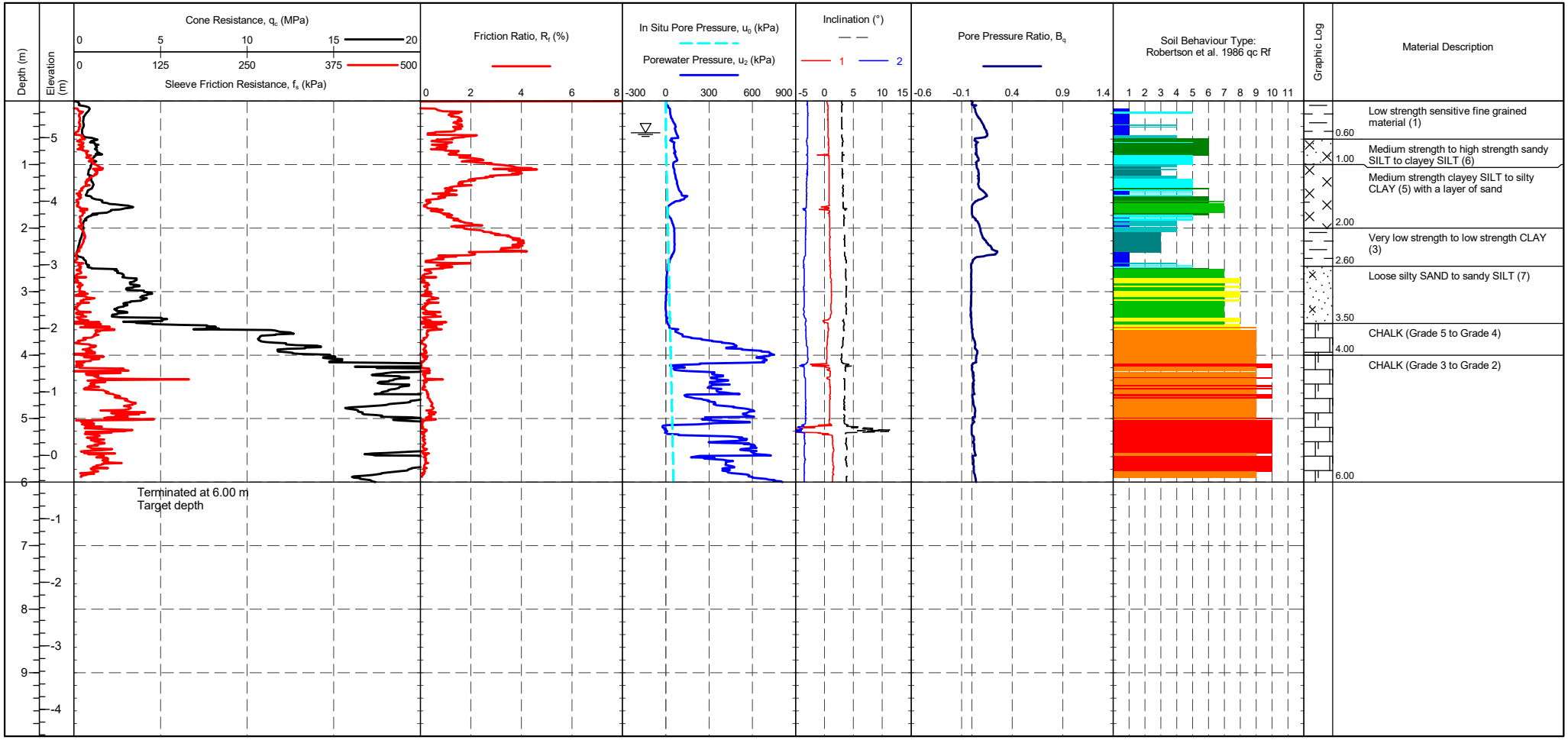

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 288 mV | 285 mV | -0.034 MPa |
| | | | | Sleeve | 256 mV | 220 mV | -0.026 kPa |
| | | | | Pore Pressure 2 | 238 mV | 251 mV | 0.003 kPa |
| | | | | X-Y Inclinometer | 2697 mV | 2673 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP109**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500203.431 m<br>NORTHING : 102180.638 m<br>ELEVATION : 5.578 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1983<br>CALIBRATION DATE : 16/09/2022<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES | |

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 290 mV | 287 mV | -0.034 MPa |
| Sleeve | 210 mV | 211 mV | 0.001 kPa |
| Pore Pressure 2 | 242 mV | 237 mV | -0.001 kPa |
| X-Y Inclinometer | 2447 mV | 2463 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

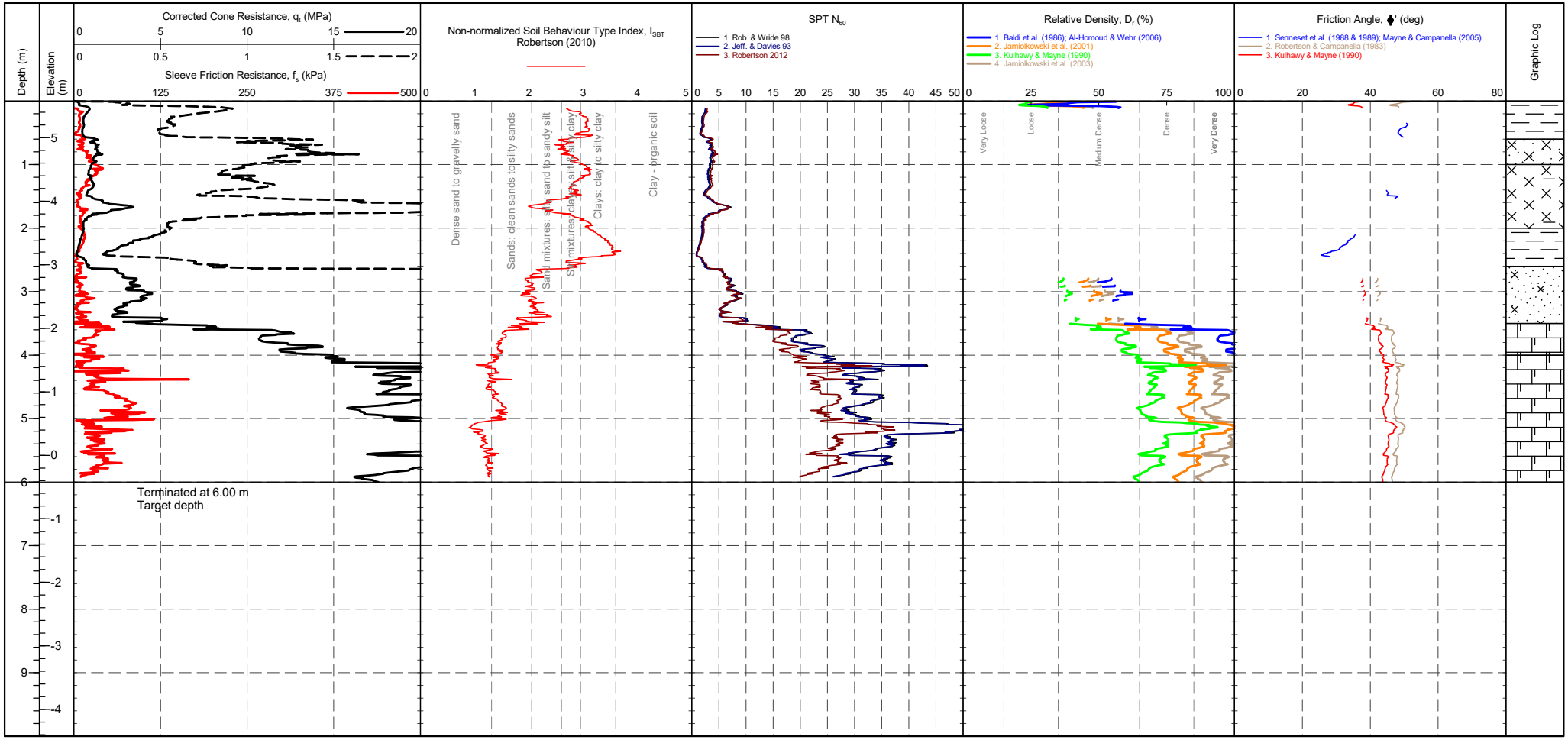
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP109**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500203.431 m<br>NORTHING : 102180.638 m<br>ELEVATION : 5.578 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 290 mV | 287 mV | -0.034 MPa |
| Sleeve | 210 mV | 211 mV | 0.001 kPa |
| Pore Pressure 2 | 242 mV | 237 mV | -0.001 kPa |
| X-Y Inclinometer | 2447 mV | 2463 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

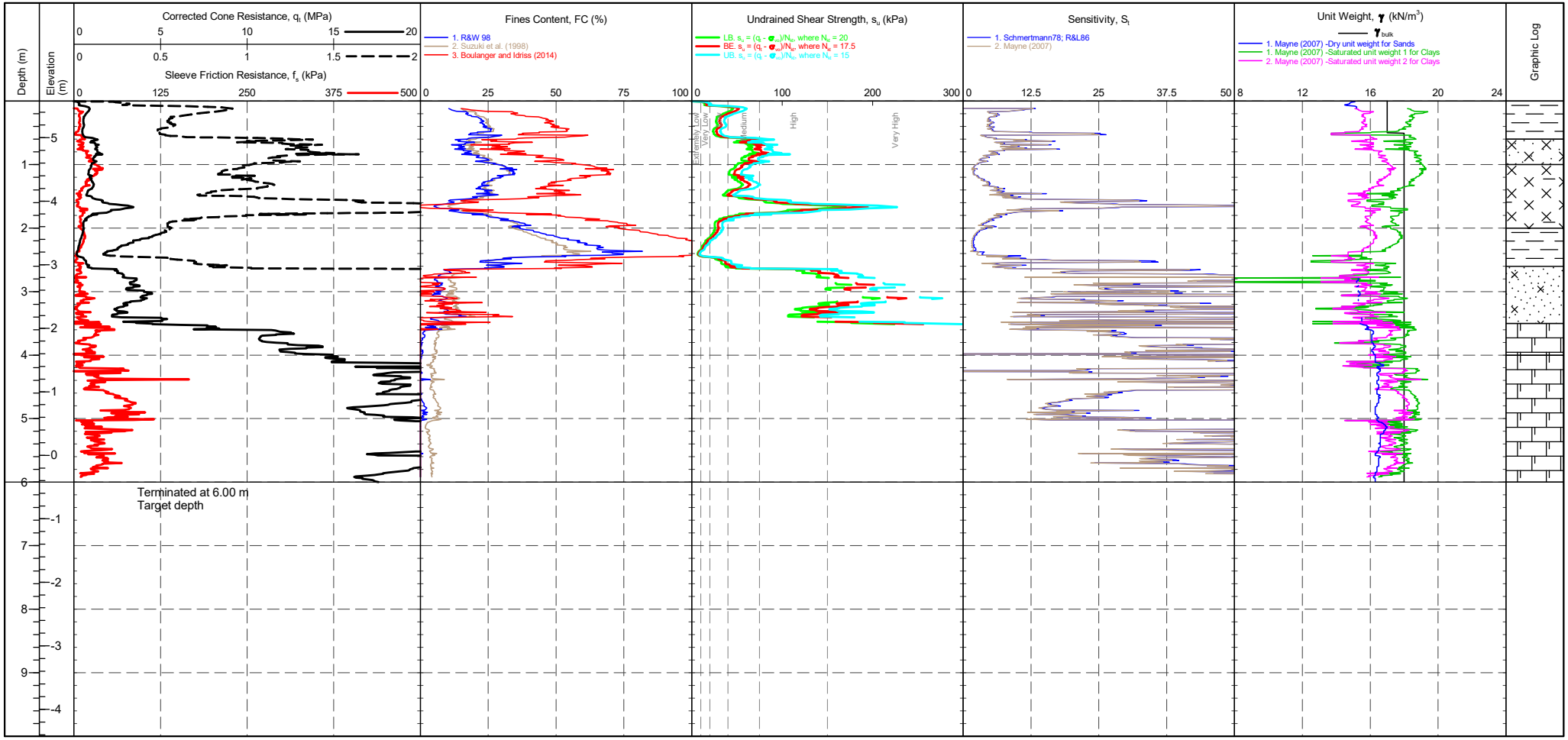
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP109**

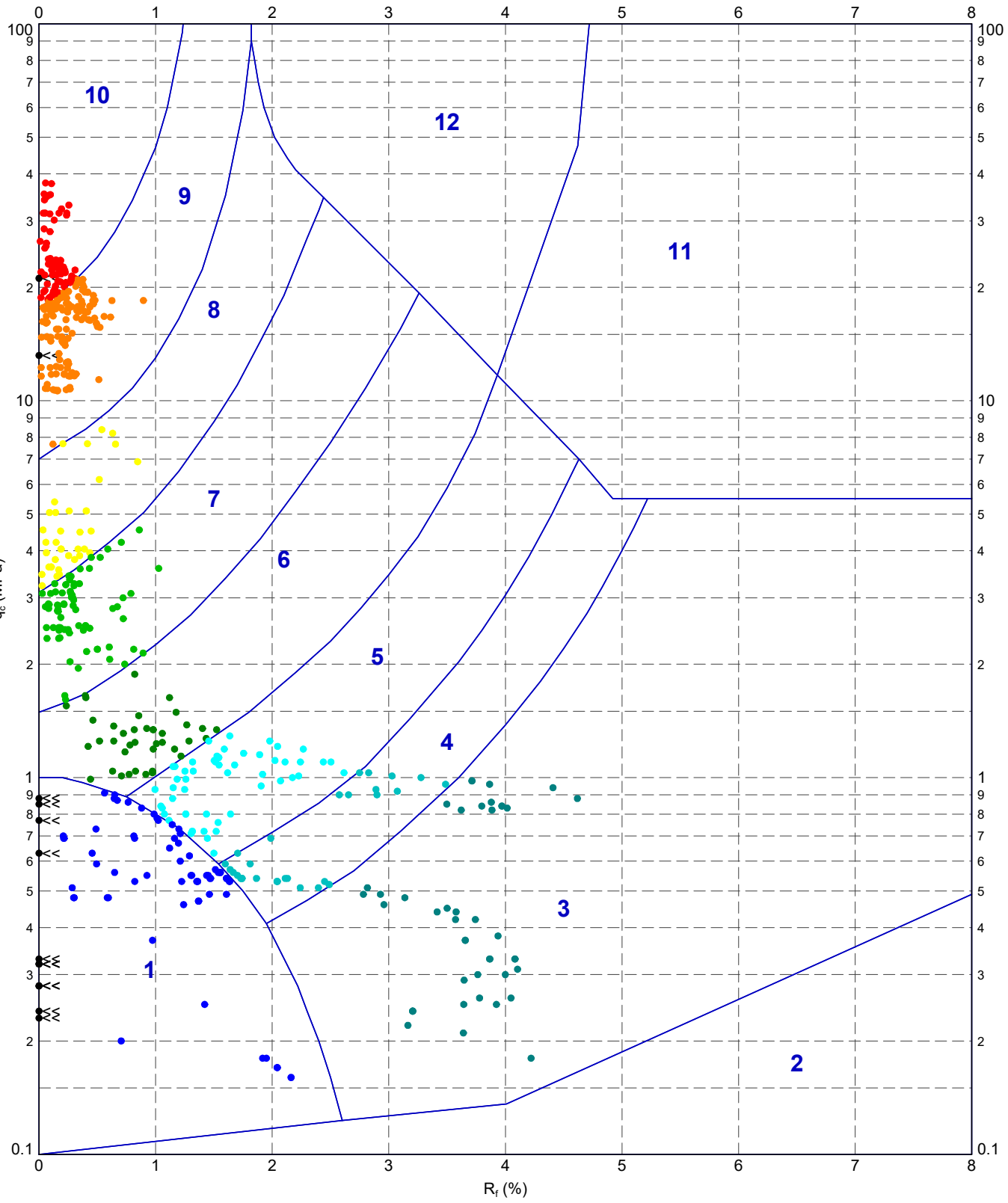
| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500203.431 m<br>NORTHING : 102180.638 m<br>ELEVATION : 5.578 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | | COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference | Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 290 mV | 287 mV | -0.034 MPa | Extremely low strength | <10 | Medium strength | 40-75 |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 210 mV | 211 mV | 0.001 kPa | Very low strength | 10-20 | High strength | 75-150 |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 242 mV | 237 mV | -0.001 kPa | Low strength | 20-40 | Very high strength | 150-300 |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2447 mV | 2463 mV | | | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP109

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

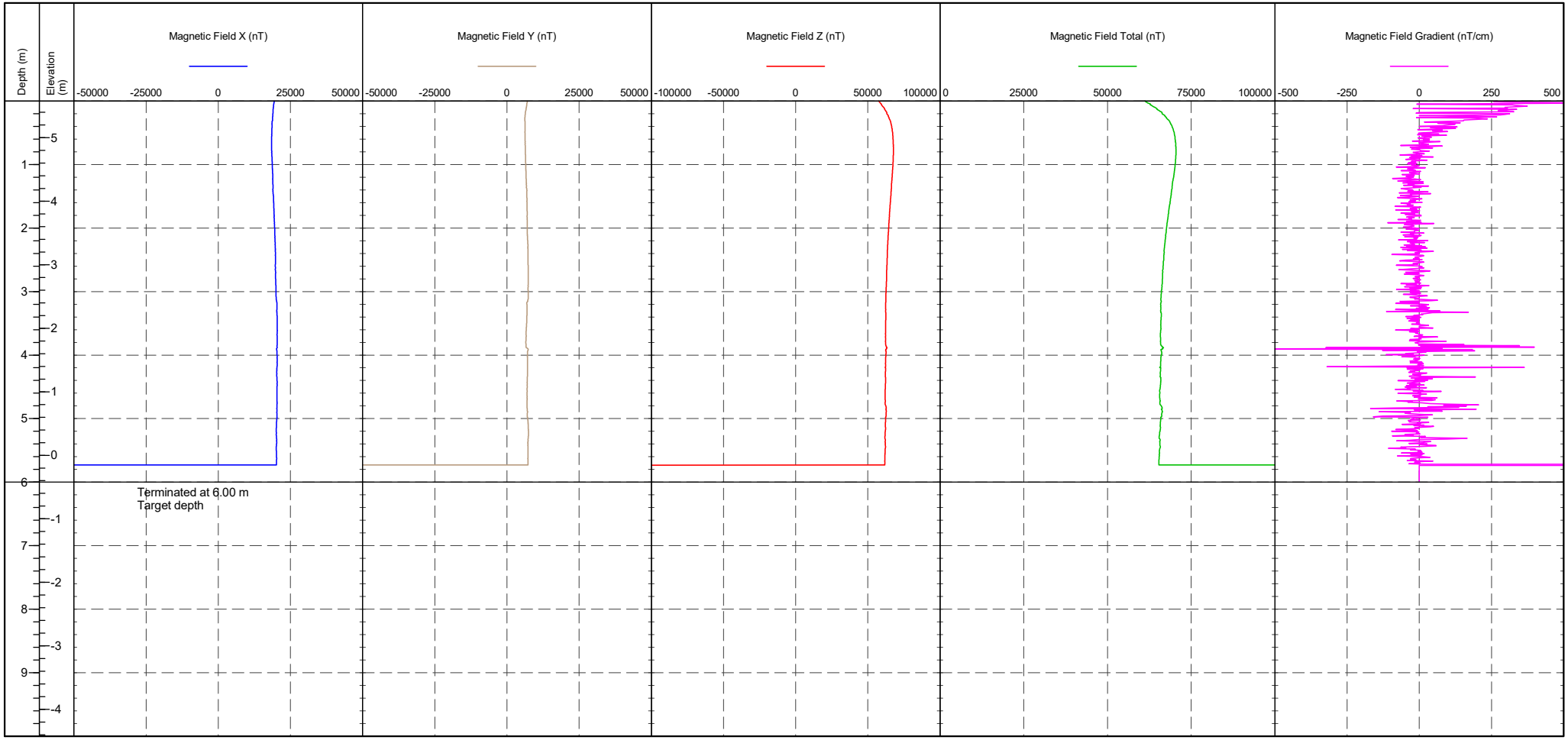
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:32 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Plt: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP109**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500203.431 m<br>NORTHING : 102180.638 m<br>ELEVATION : 5.578 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



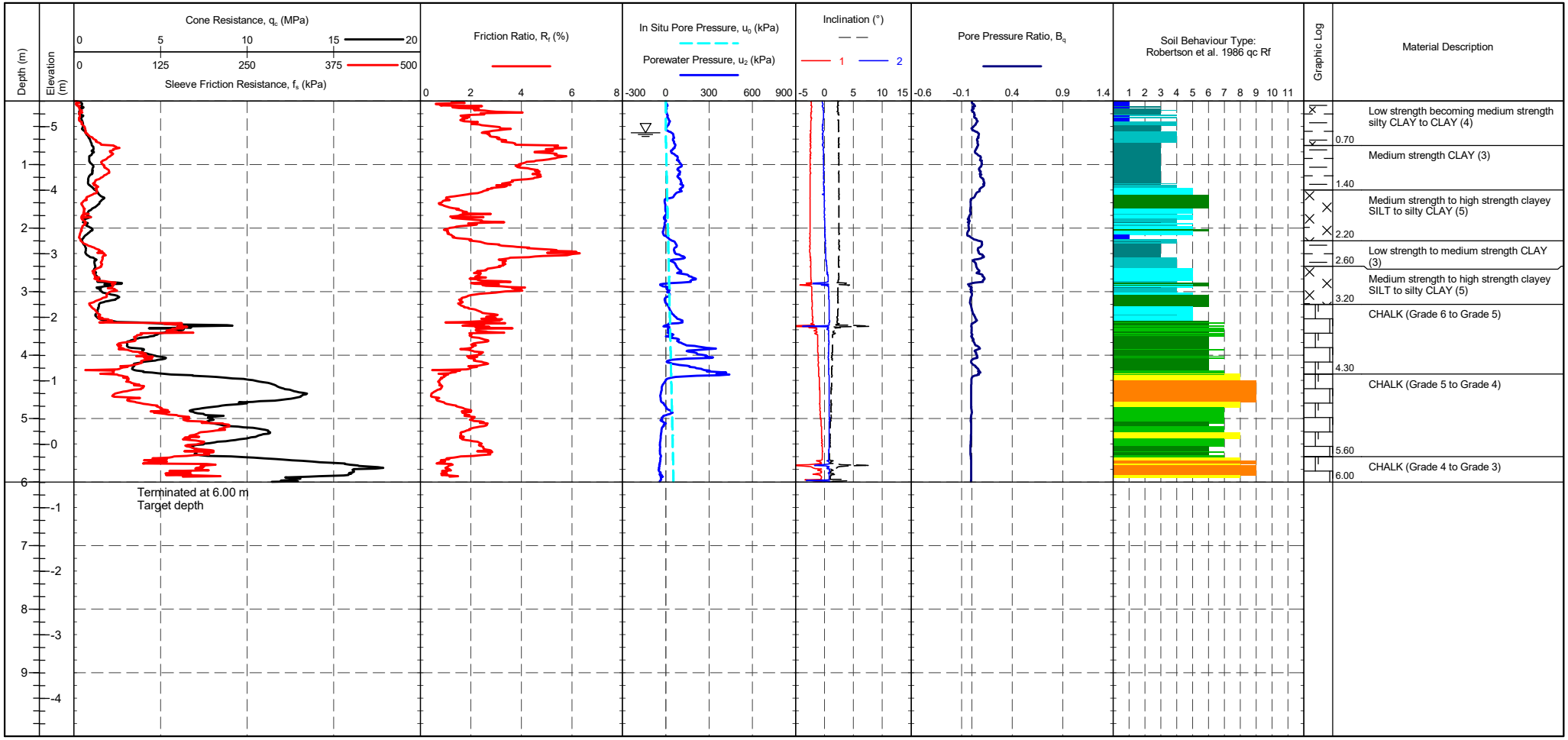

| | | | | |
|---|---|---|---|---|
| CONE ID : S15-CFIP.1983<br>CONE MODEL : Subtraction | RIG : CPT 017 - Griffen<br>OPERATOR : DHo | CPTU ZERO VALUES | | |
| | | Transducer | Pre | Post | Difference |
| | | Tip | 290 mV | 287 mV | -0.034 MPa |
| | | Sleeve | 210 mV | 211 mV | 0.001 kPa |
| | | Pore Pressure 2 | 242 mV | 237 mV | -0.001 kPa |
| | | X-Y Inclinometer | 2447 mV | 2463 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID **DP110**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500265.933 m<br>NORTHING : 102197.833 m<br>ELEVATION : 5.405 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 218 mV | -0.033 MPa |
| Sleeve | 220 mV | 215 mV | -0.004 kPa |
| Pore Pressure 2 | 264 mV | 253 mV | -0.003 kPa |
| X-Y Inclinometer | 2266 mV | 2268 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

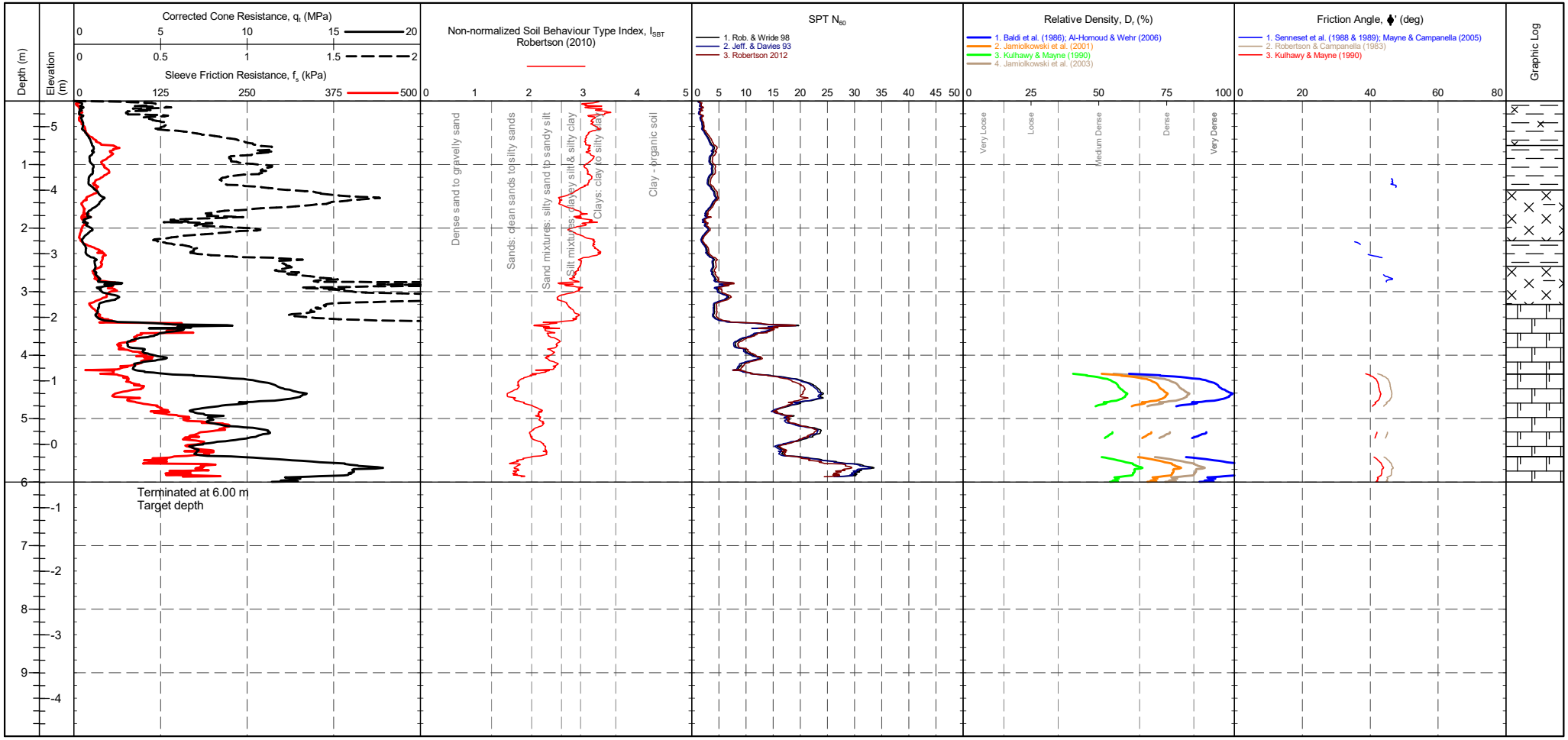
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP110**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500265.933 m<br>NORTHING : 102197.833 m<br>ELEVATION : 5.405 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 221 mV | 218 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 220 mV | 215 mV | -0.004 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 264 mV | 253 mV | -0.003 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2266 mV | 2268 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

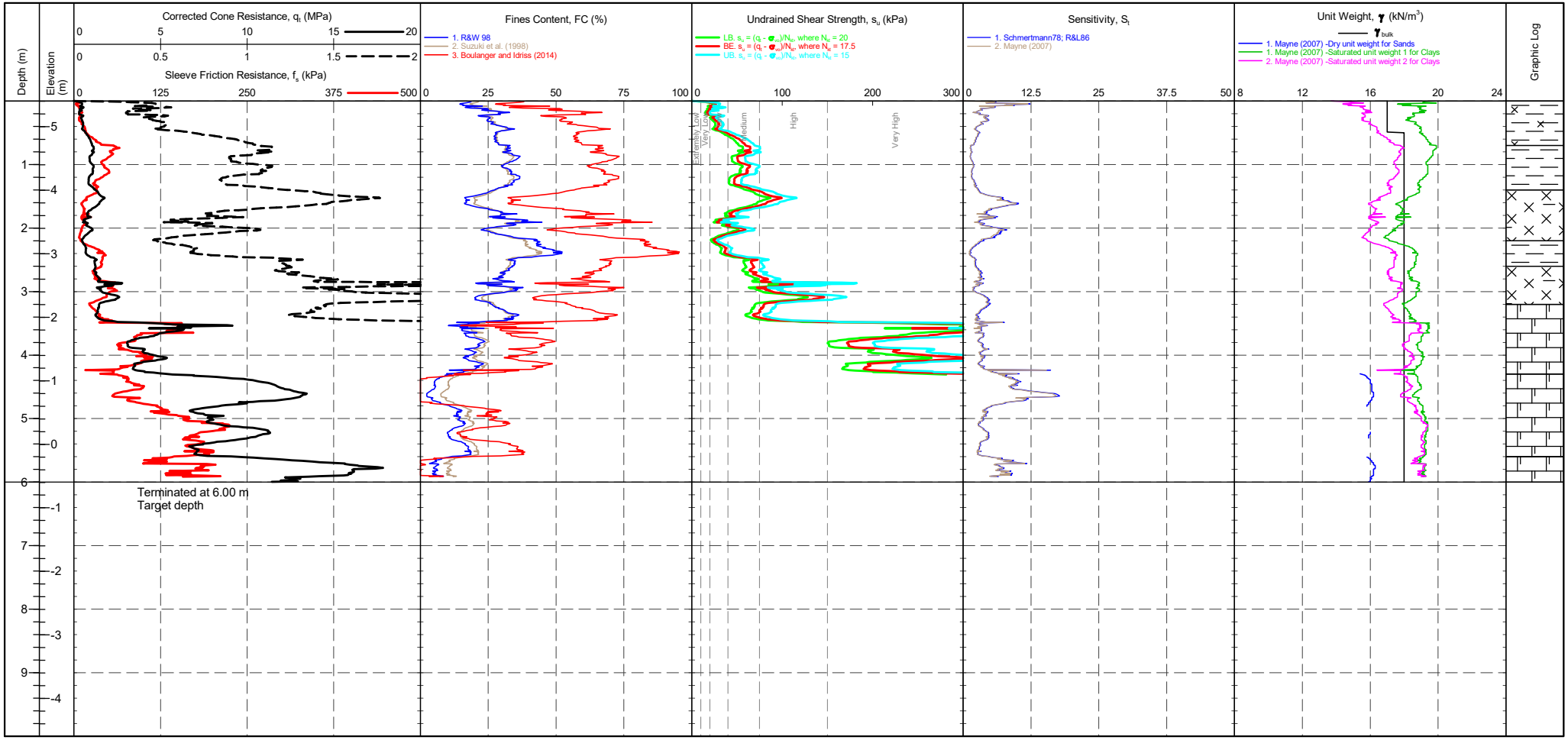
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP110**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500265.933 m<br>NORTHING : 102197.833 m<br>ELEVATION : 5.405 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | | |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | | |

CPTU ZERO VALUES

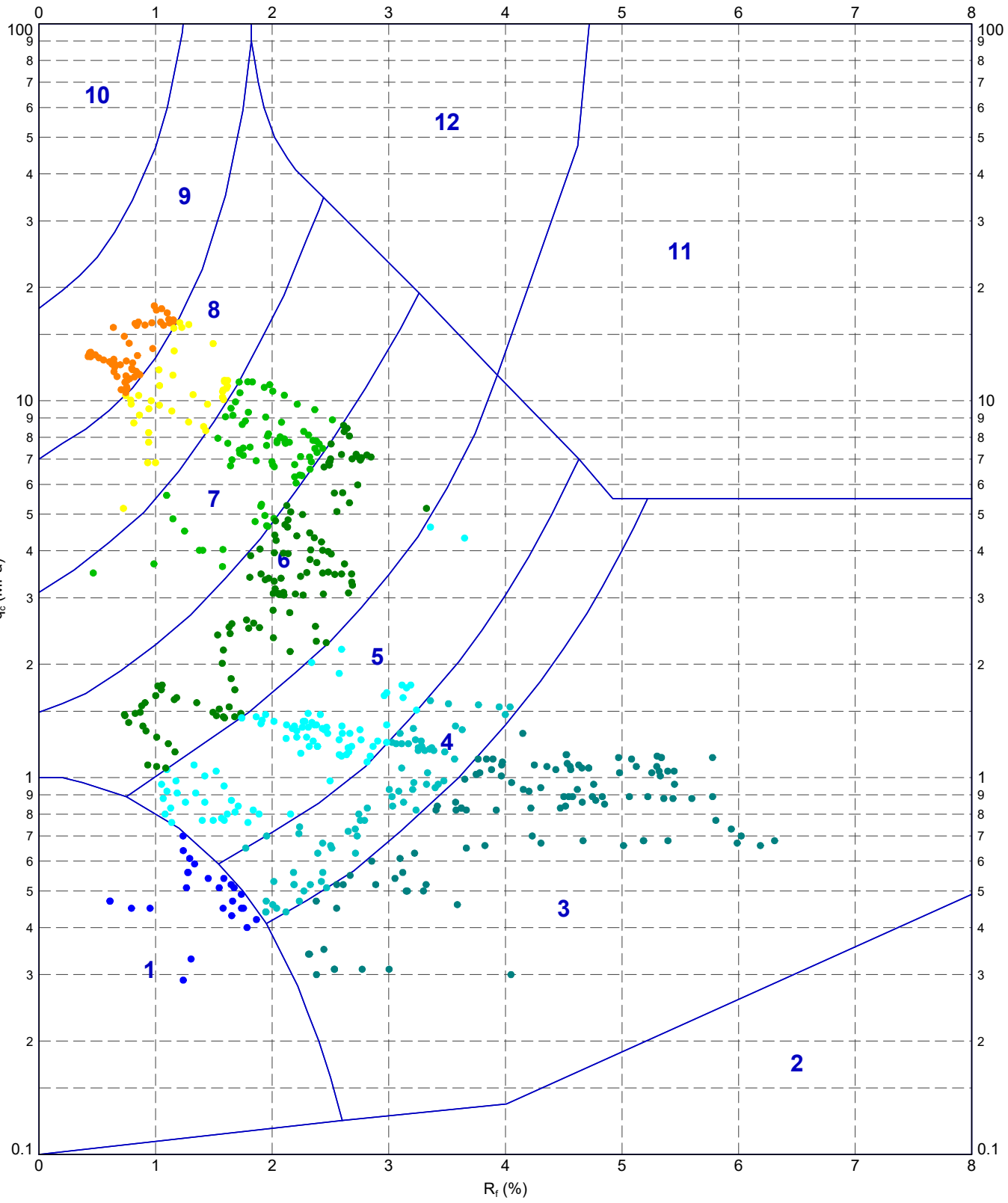
| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 218 mV | -0.033 MPa |
| Sleeve | 220 mV | 215 mV | -0.004 kPa |
| Pore Pressure 2 | 264 mV | 253 mV | -0.003 kPa |
| X-Y Inclinometer | 2266 mV | 2268 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) |
|---|---|
| Extremely low strength | <10 |
| Very low strength | 10-20 |
| Low strength | 20-40 |
| Medium strength | 40-75 |
| High strength | 75-150 |
| Very high strength | 150-300 |
| Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP110

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

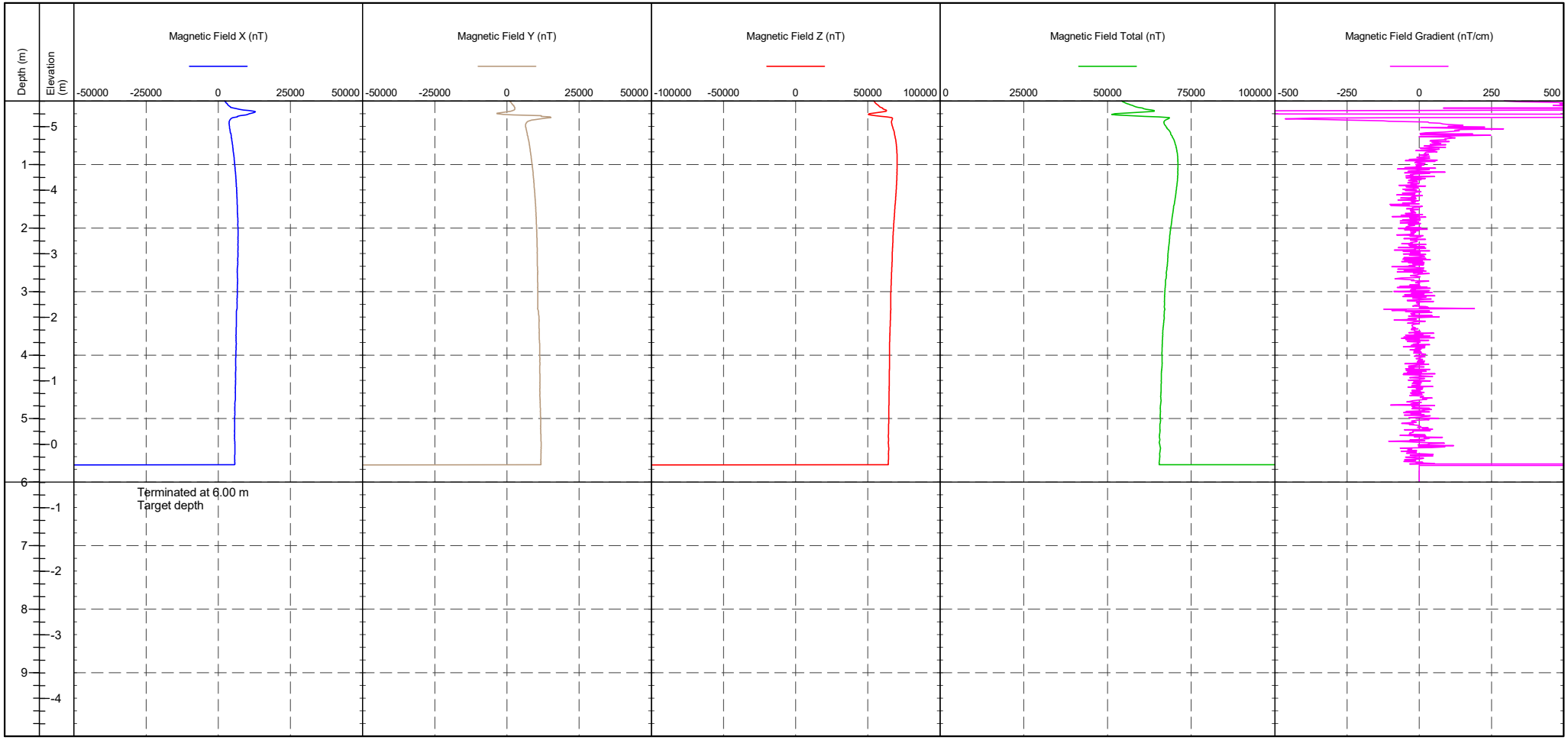
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:33 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Plt: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID **DP110**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500265.933 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102197.833 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.405 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



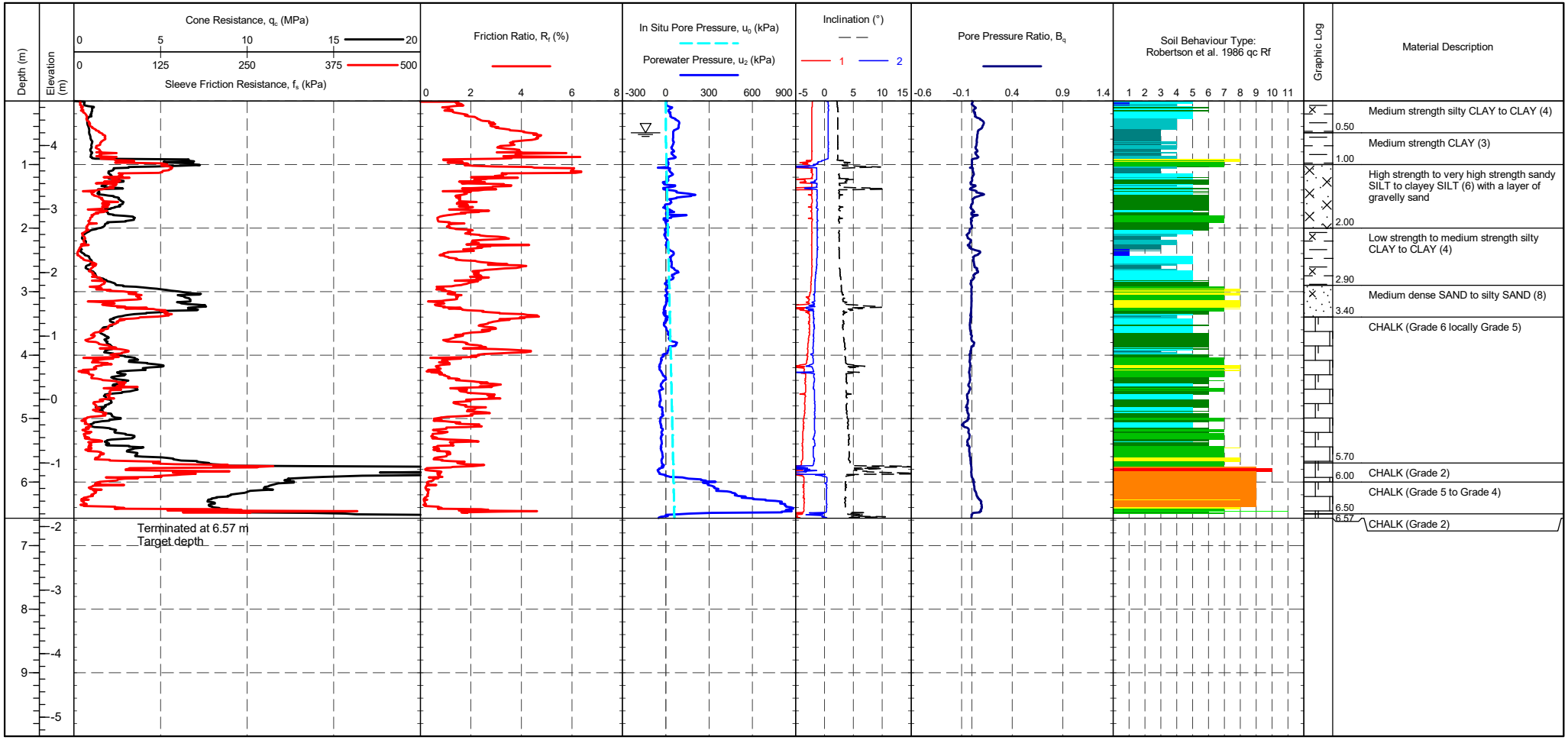

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 221 mV | 218 mV | -0.033 MPa |
| | | | | Sleeve | 220 mV | 215 mV | -0.004 kPa |
| | | | | Pore Pressure 2 | 264 mV | 253 mV | -0.003 kPa |
| | | | | X-Y Inclinometer | 2266 mV | 2268 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID **DP111**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500326.624 m<br>NORTHING : 102218.872 m<br>ELEVATION : 4.700 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 219 mV | -0.033 MPa |
| Sleeve | 222 mV | 219 mV | -0.002 kPa |
| Pore Pressure 2 | 271 mV | 257 mV | -0.004 kPa |
| X-Y Inclinometer | 2275 mV | 2286 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

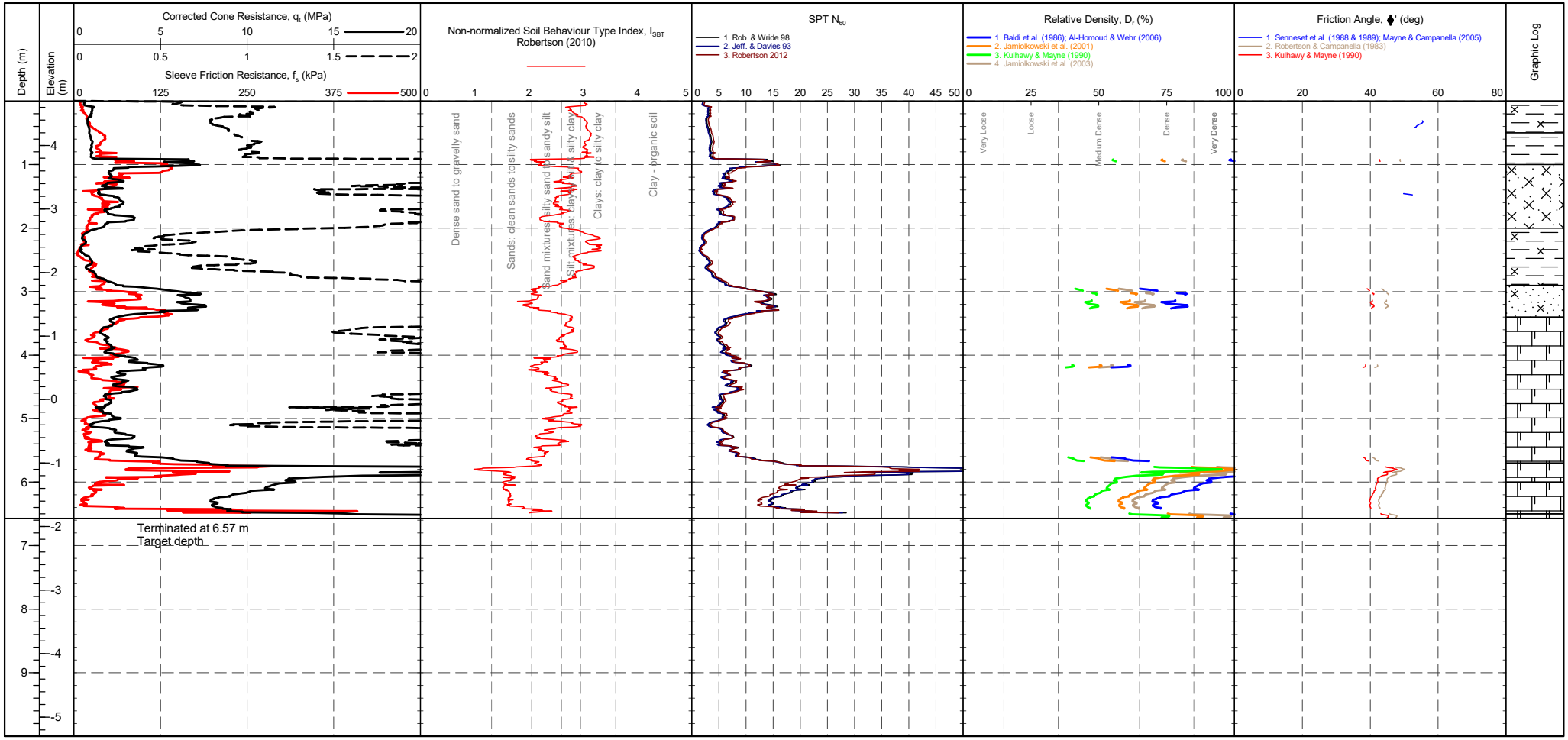
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP111**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500326.624 m<br>NORTHING : 102218.872 m<br>ELEVATION : 4.700 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 222 mV | 219 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 222 mV | 219 mV | -0.002 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 271 mV | 257 mV | -0.004 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2275 mV | 2286 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

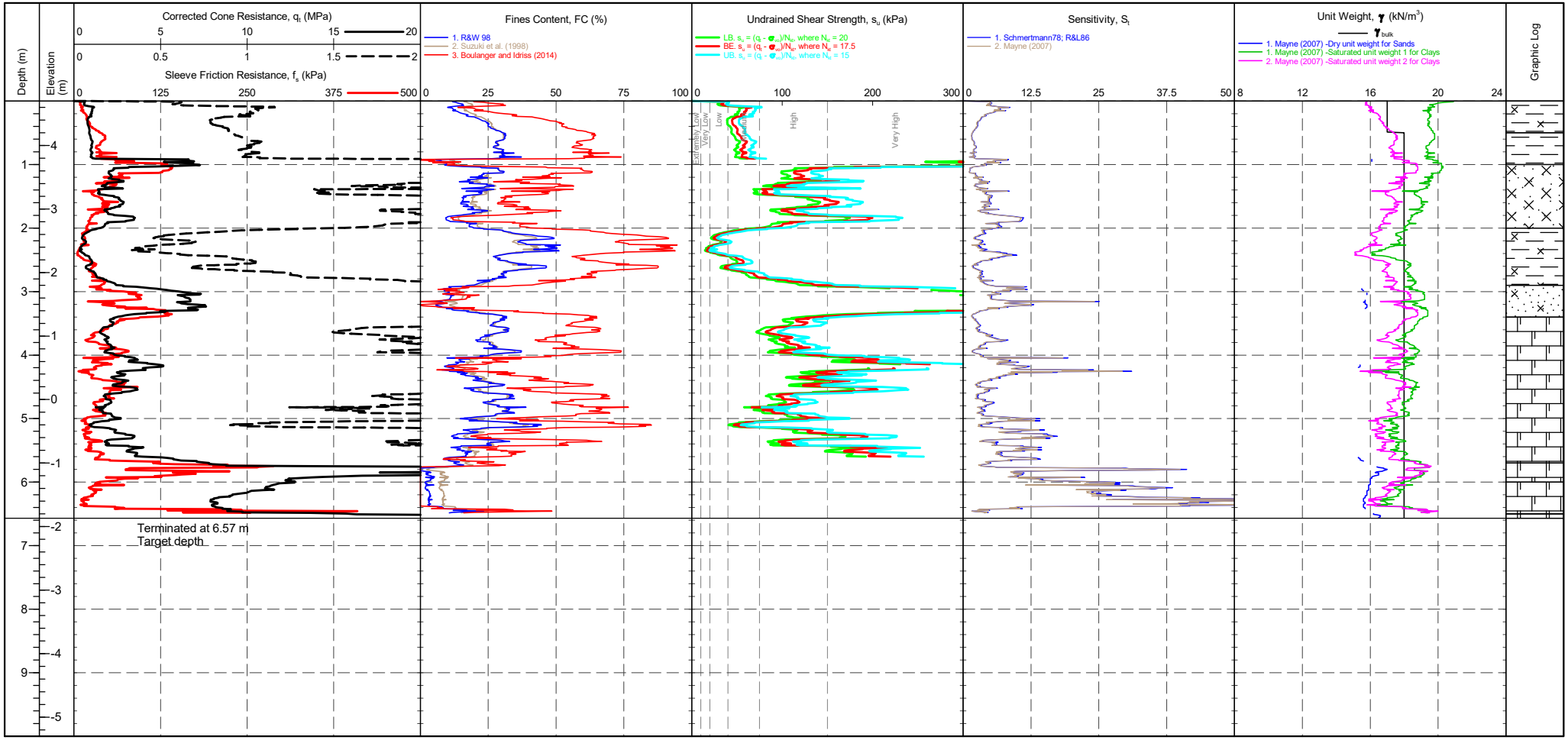
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP111**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500326.624 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102218.872 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.700 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



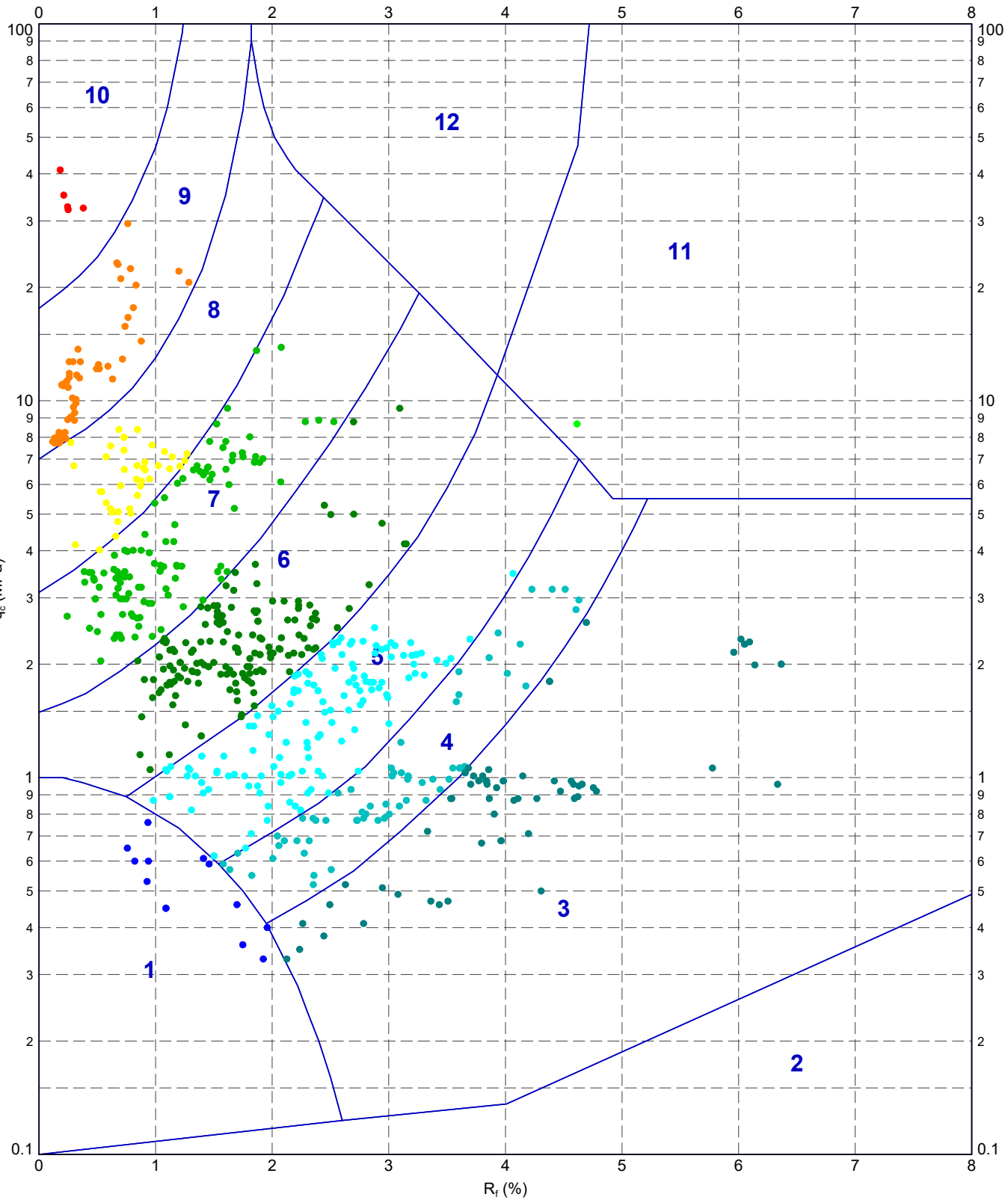

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 222 mV | 219 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 222 mV | 219 mV | -0.002 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 271 mV | 257 mV | -0.004 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2275 mV | 2286 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP111

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

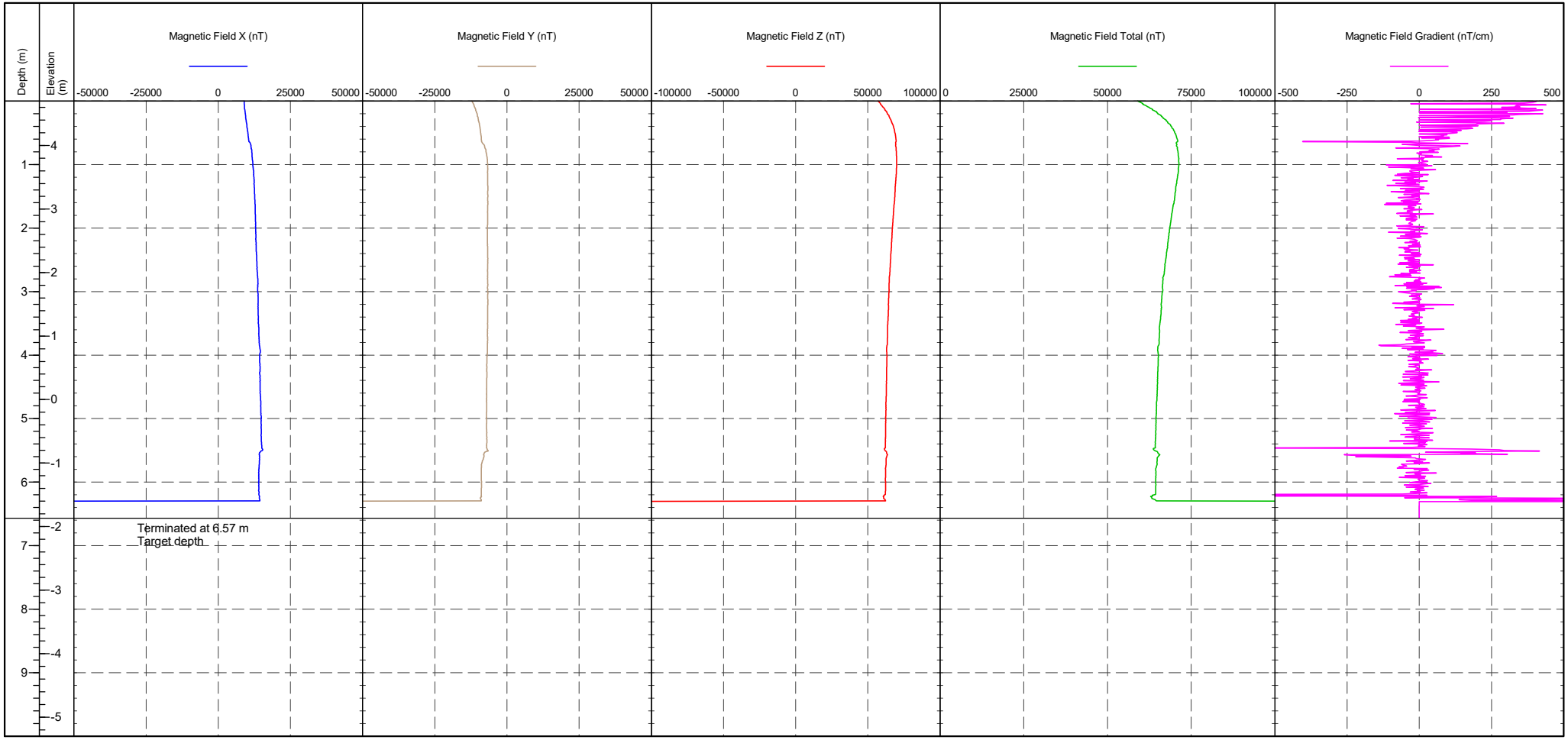
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:34 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID **DP111**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500326.624 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102218.872 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.700 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



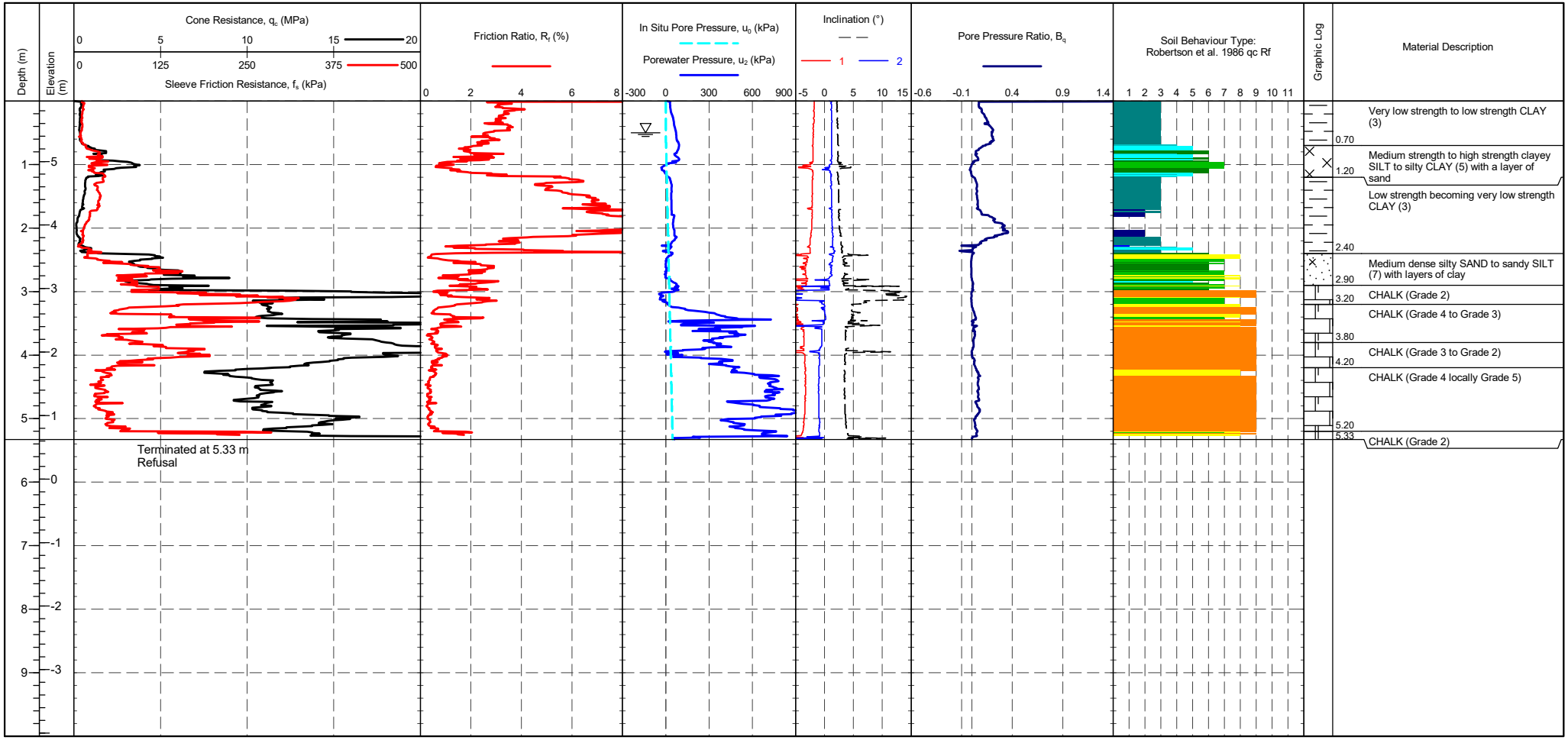

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 222 mV | 219 mV | -0.033 MPa |
| | | | | Sleeve | 222 mV | 219 mV | -0.002 kPa |
| | | | | Pore Pressure 2 | 271 mV | 257 mV | -0.004 kPa |
| | | | | X-Y Inclinometer | 2275 mV | 2286 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP117**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500018.538 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102025.956 m | Test refused on tip resistance. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.952 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 220 mV | 216 mV | -0.044 MPa |
| Sleeve | 215 mV | 212 mV | -0.002 kPa |
| Pore Pressure 2 | 266 mV | 258 mV | -0.002 kPa |
| X-Y Inclinometer | 2306 mV | 2308 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

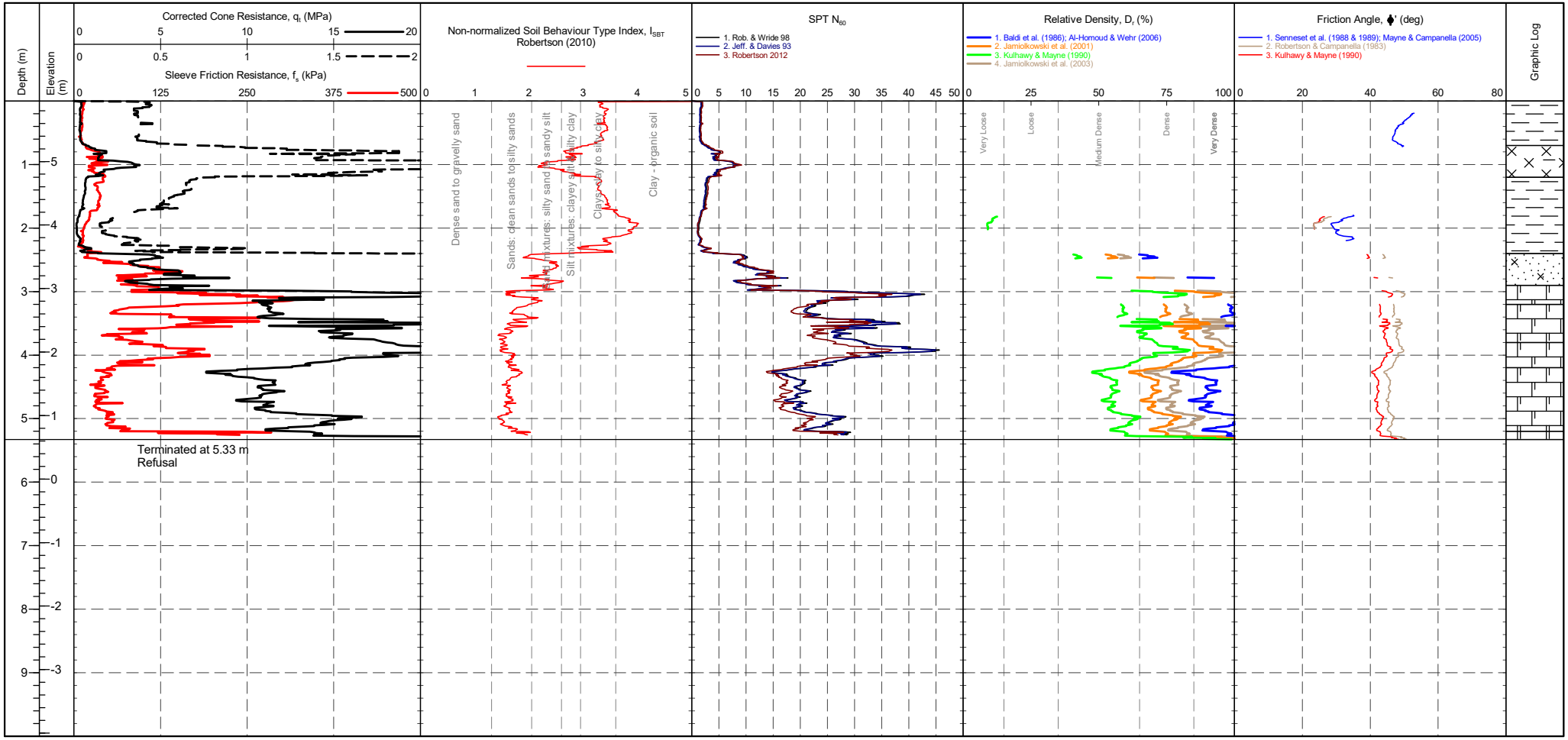
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP117**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500018.538 m<br>NORTHING : 102025.956 m<br>ELEVATION : 5.952 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on tip resistance. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | |

CPTU ZERO VALUES

| | Pre | Post | Difference |
|---|---|---|---|
| Transducer | | | |
| Tip | 220 mV | 216 mV | -0.044 MPa |
| Sleeve | 215 mV | 212 mV | -0.002 kPa |
| Pore Pressure 2 | 266 mV | 258 mV | -0.002 kPa |
| X-Y Inclinometer | 2306 mV | 2308 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

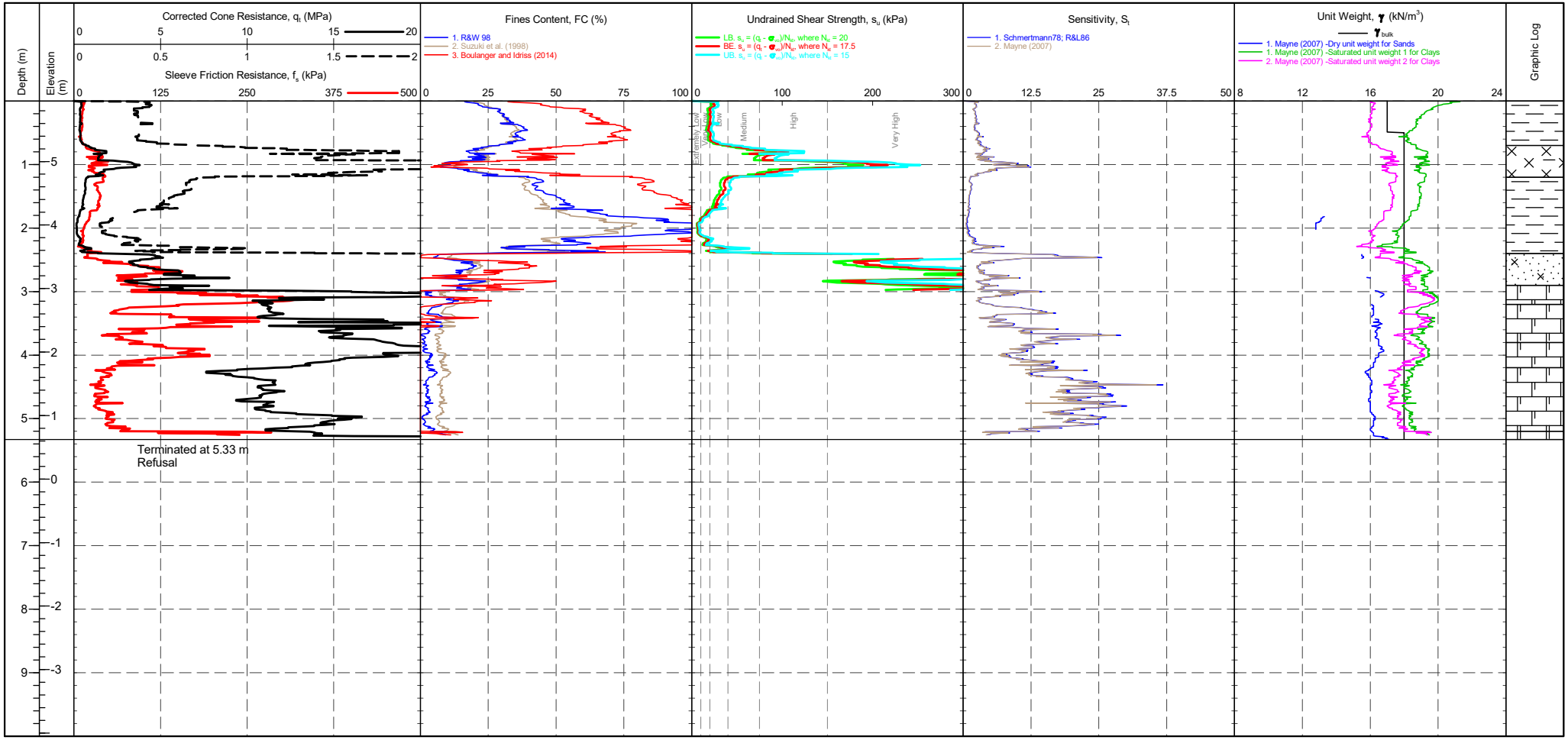
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP117**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500018.538 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102025.956 m | Test refused on tip resistance. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.952 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |



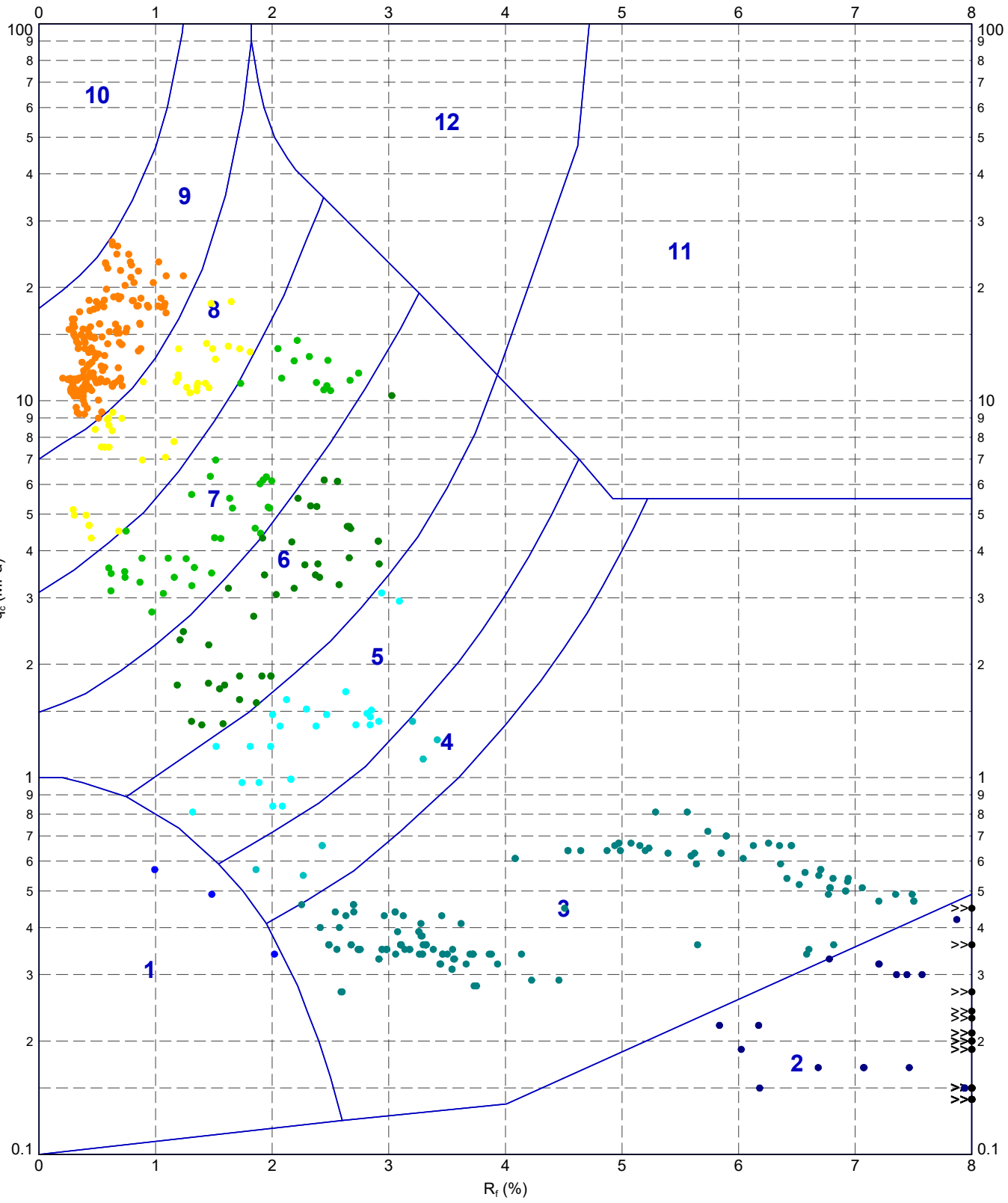

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 220 mV | 216 mV | -0.044 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 215 mV | 212 mV | -0.002 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 266 mV | 258 mV | -0.002 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2306 mV | 2308 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP117

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

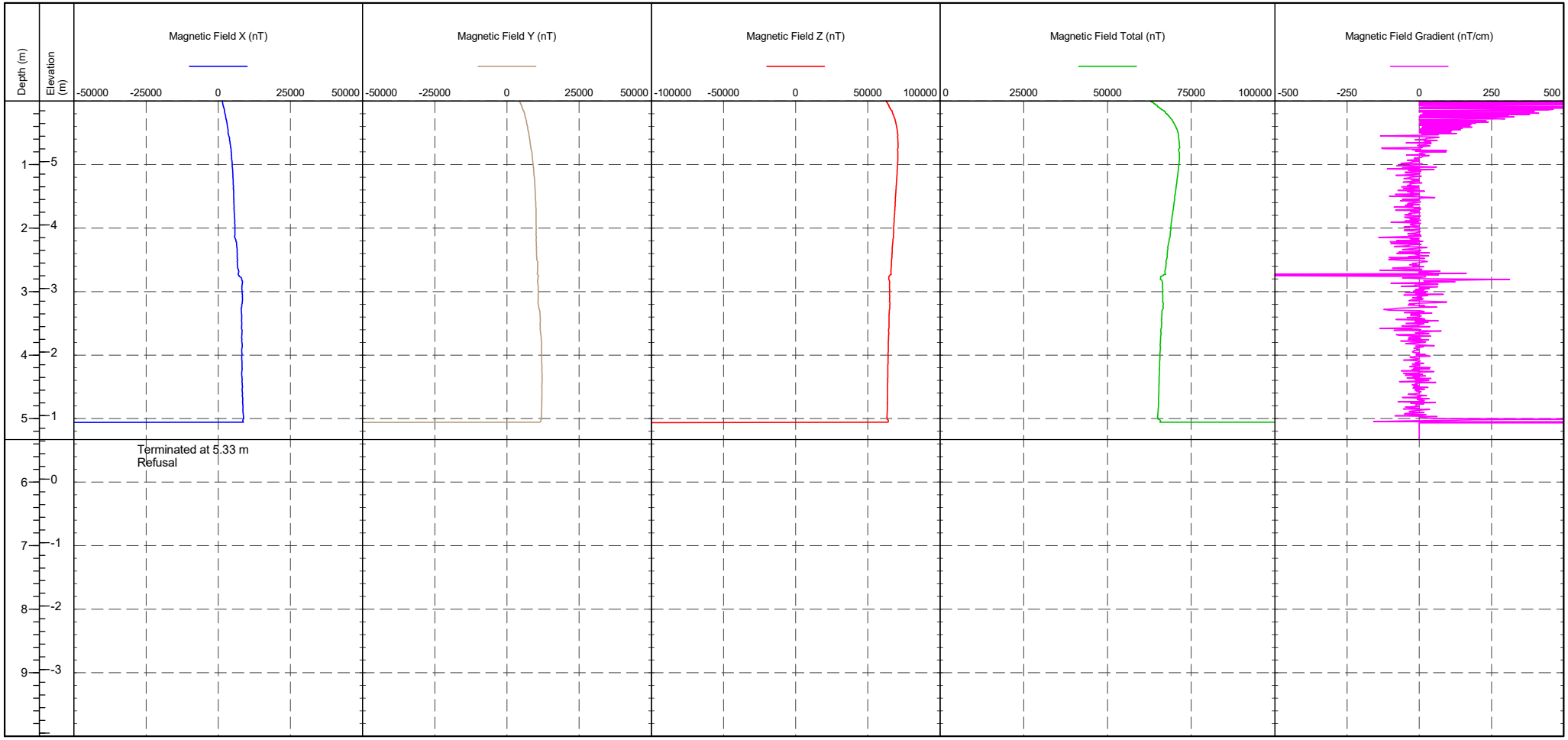
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:35 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP117**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500018.538 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102025.956 m | Test refused on tip resistance. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.952 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |



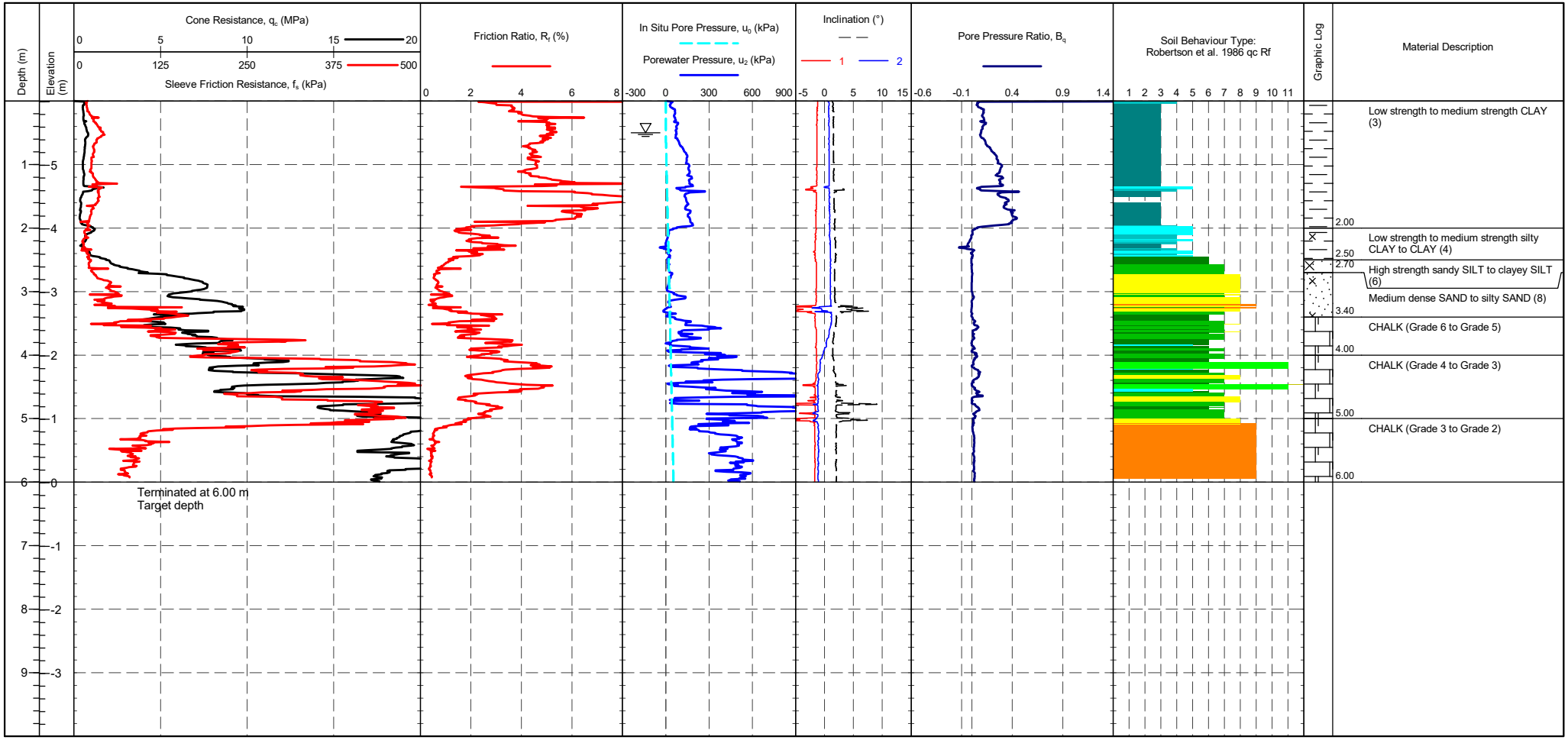

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 220 mV | 216 mV | -0.044 MPa |
| | | | | Sleeve | 215 mV | 212 mV | -0.002 kPa |
| | | | | Pore Pressure 2 | 266 mV | 258 mV | -0.002 kPa |
| | | | | X-Y Inclinometer | 2306 mV | 2308 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP118**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500085.995 m<br>NORTHING : 102041.642 m<br>ELEVATION : 6.012 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



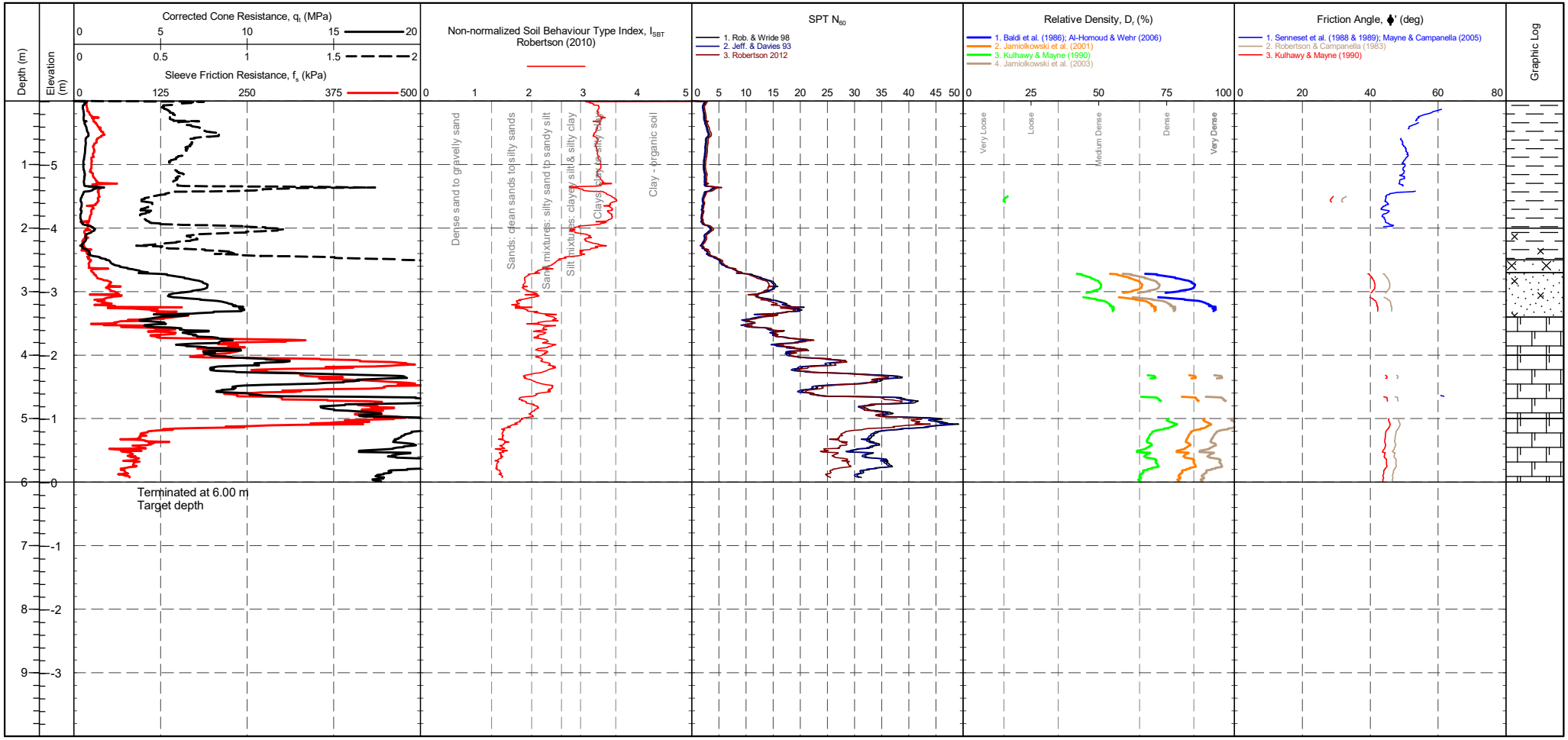

| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1186<br>CALIBRATION DATE : 09/08/2021<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES<br>Transducer: Pre 220 mV, Post 216 mV, Difference -0.044 MPa<br>Sleeve: Pre 219 mV, Post 210 mV, Difference -0.006 kPa<br>Pore Pressure 2: Pre 264 mV, Post 272 mV, Difference 0.002 kPa<br>X-Y Inclinometer: Pre 2365 mV, Post 2375 mV | METHOD: Robertson et al. 1986 qc Rf<br>1 - Sensitive fine grained material<br>2 - Organic material<br>3 - CLAY<br>4 - Silty CLAY to CLAY<br>5 - Clayey SILT to silty CLAY<br>6 - Sandy SILT to clayey SILT<br>7 - Silty SAND to sandy SILT<br>8 - SAND to silty SAND<br>9 - SAND<br>10 - Gravelly SAND to SAND<br>11 - Very stiff fine grained<br>12 - SAND to clayey SAND<br>Groundwater Level<br>Dissipation Test |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP118**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500085.995 m<br>NORTHING : 102041.642 m<br>ELEVATION : 6.012 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 220 mV | 216 mV | -0.044 MPa |
| Sleeve | 219 mV | 210 mV | -0.006 kPa |
| Pore Pressure 2 | 264 mV | 272 mV | 0.002 kPa |
| X-Y Inclinometer | 2365 mV | 2375 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

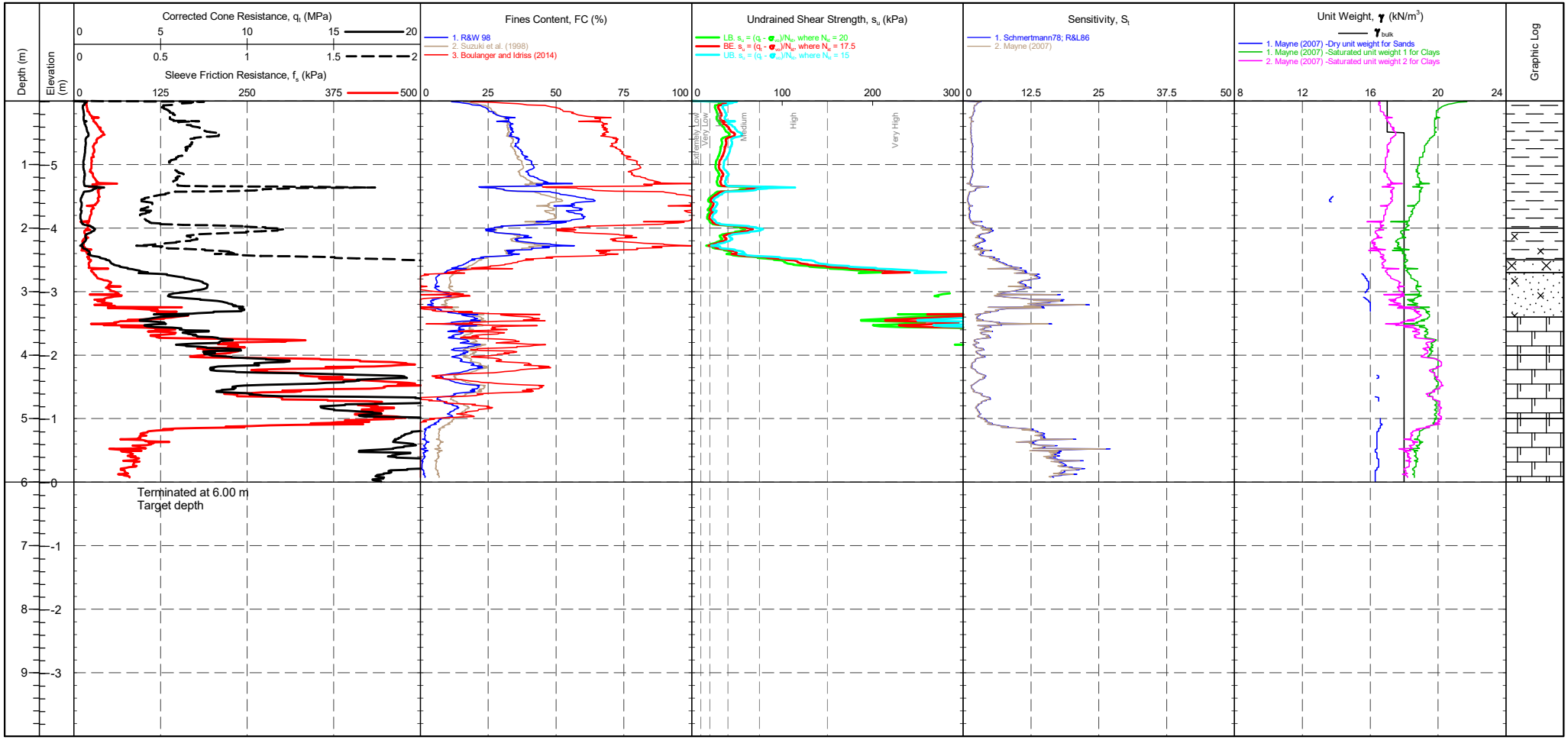
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP118**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500085.995 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102041.642 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.012 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



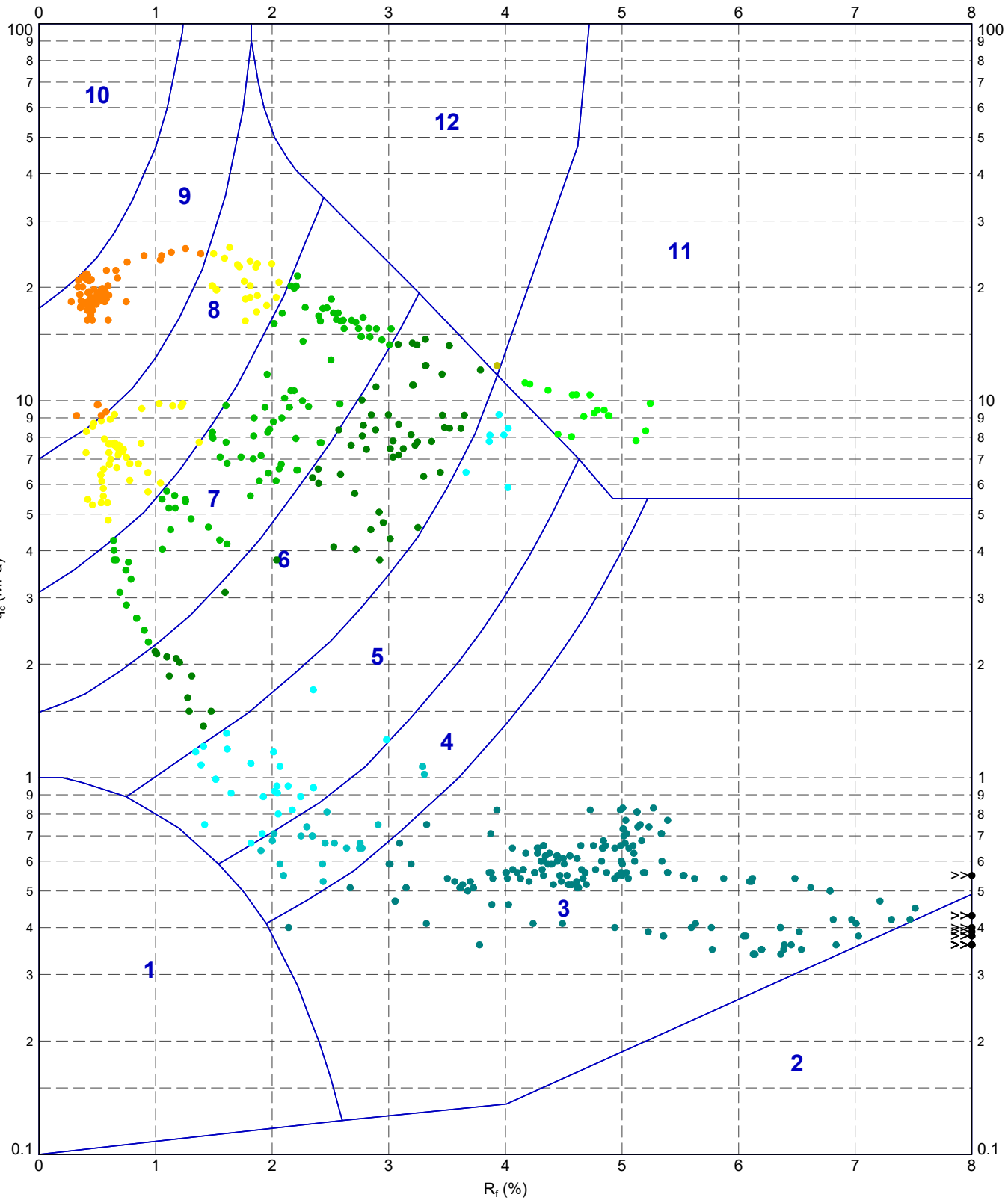

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 220 mV | 216 mV | -0.044 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 219 mV | 210 mV | -0.006 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 264 mV | 272 mV | 0.002 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2365 mV | 2375 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP118

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

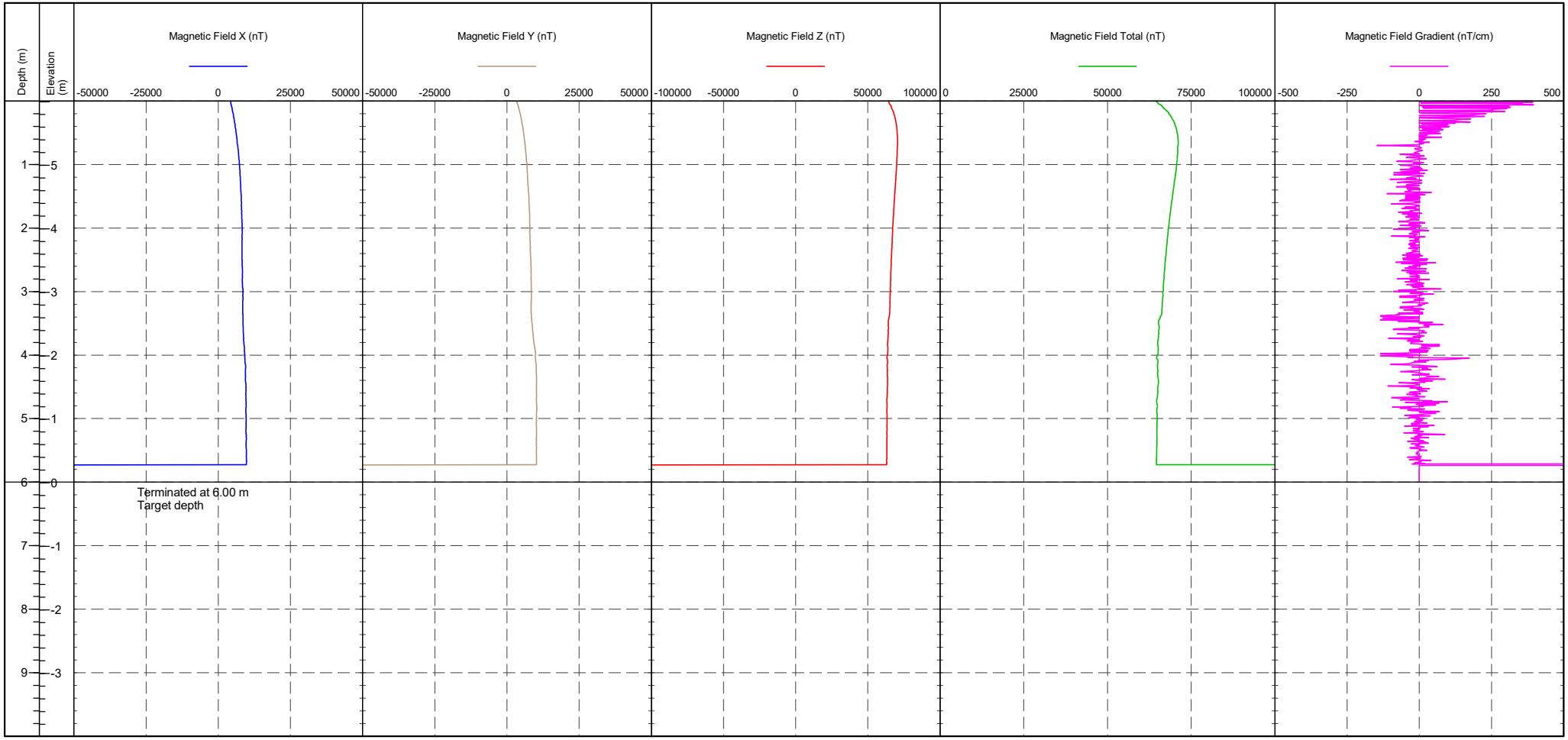
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:35 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Plt: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP118**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500085.995 m<br>NORTHING : 102041.642 m<br>ELEVATION : 6.012 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | |
|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | |

CPTU ZERO VALUES

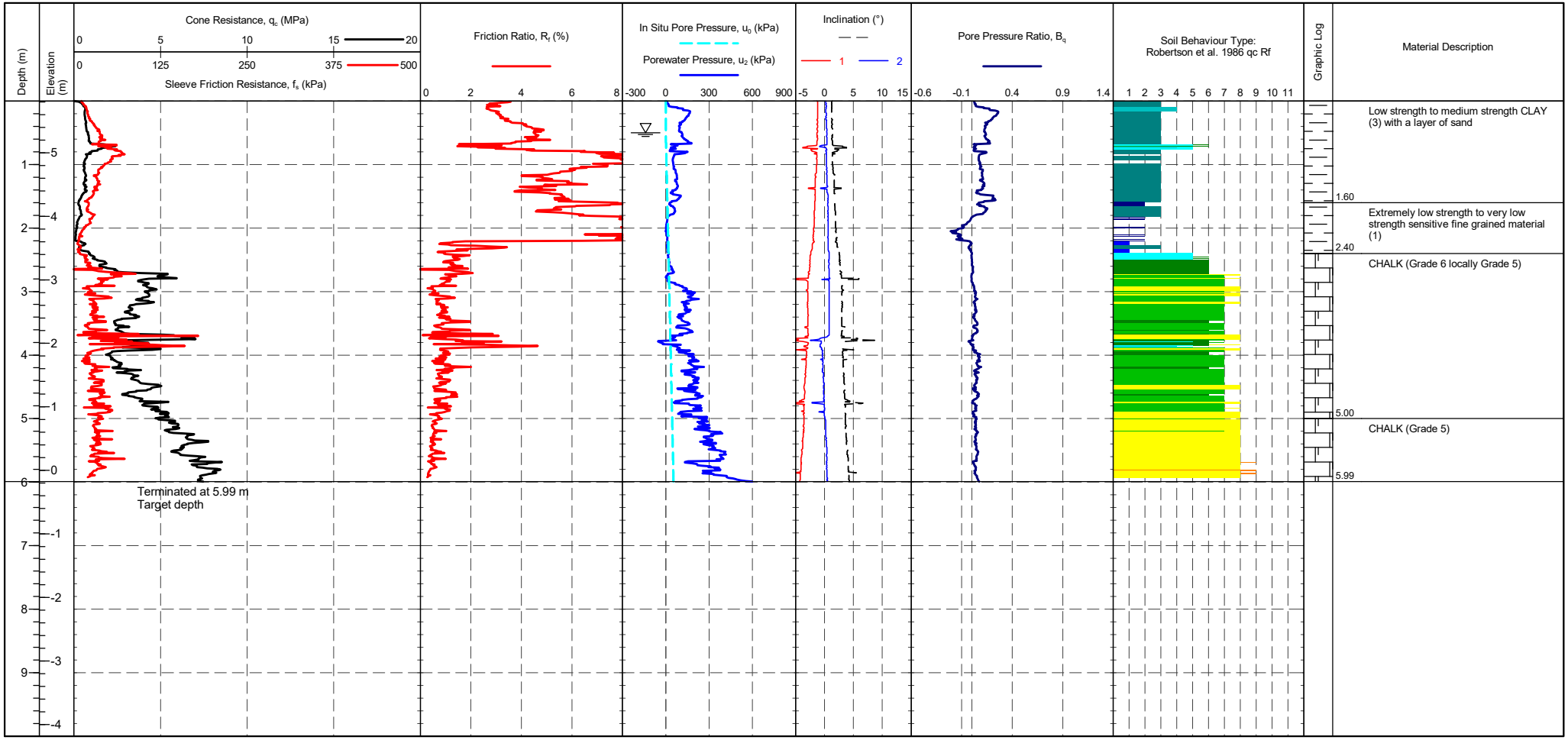
| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 220 mV | 216 mV | -0.044 MPa |
| Sleeve | 219 mV | 210 mV | -0.006 kPa |
| Pore Pressure 2 | 264 mV | 272 mV | 0.002 kPa |
| X-Y Inclinometer | 2365 mV | 2375 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP119**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500155.619 m<br>NORTHING : 102060.389 m<br>ELEVATION : 5.815 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | | |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 | | | | |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen | | | | |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo | | | | |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None | | | | |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold | | | | |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. | | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 218 mV | -0.044 MPa |
| Sleeve | 220 mV | 218 mV | -0.001 kPa |
| Pore Pressure 2 | 268 mV | 272 mV | 0.001 kPa |
| X-Y Inclinometer | 2355 mV | 2346 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

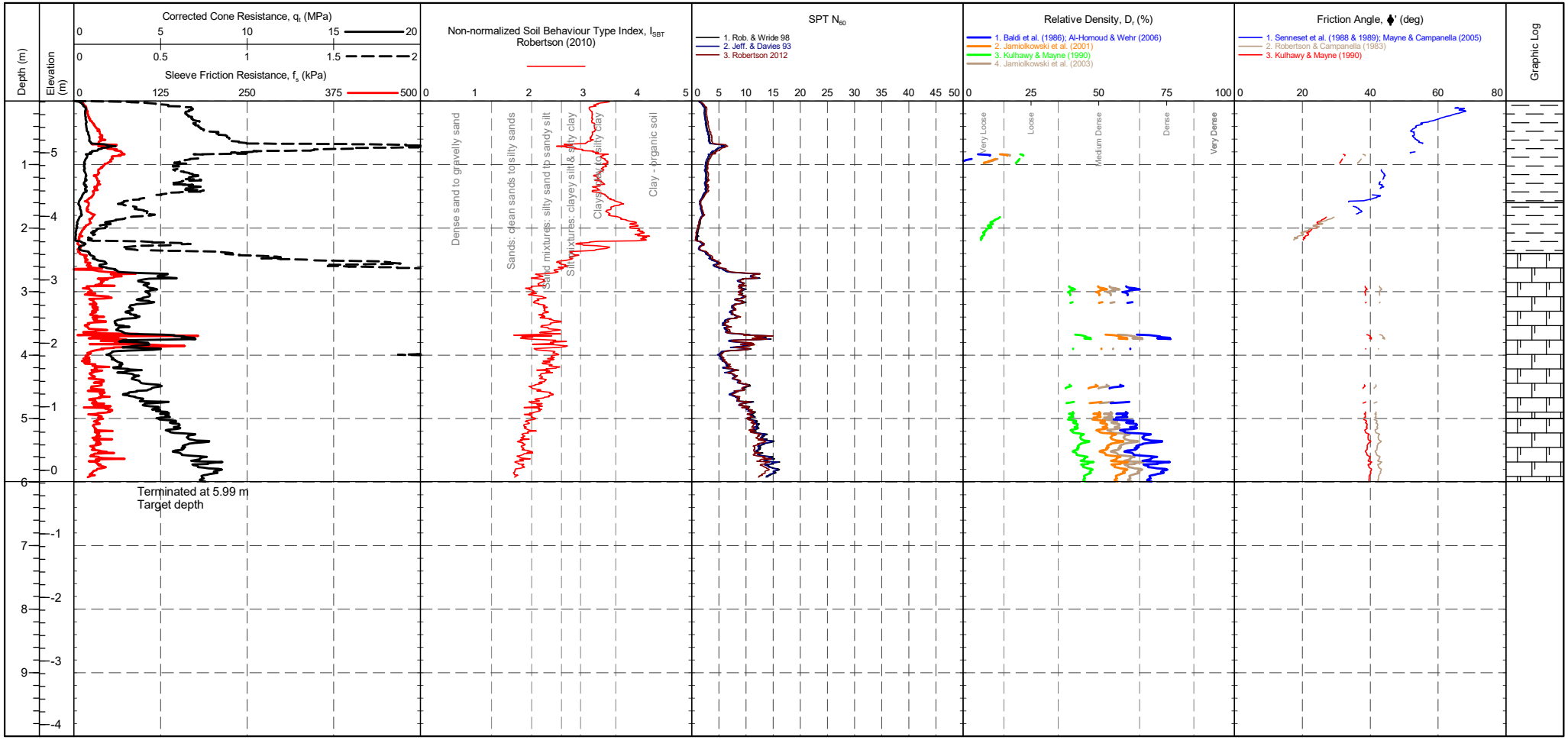
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP119**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500155.619 m<br>NORTHING : 102060.389 m<br>ELEVATION : 5.815 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 222 mV | 218 mV | -0.044 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 220 mV | 218 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 268 mV | 272 mV | 0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2355 mV | 2346 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

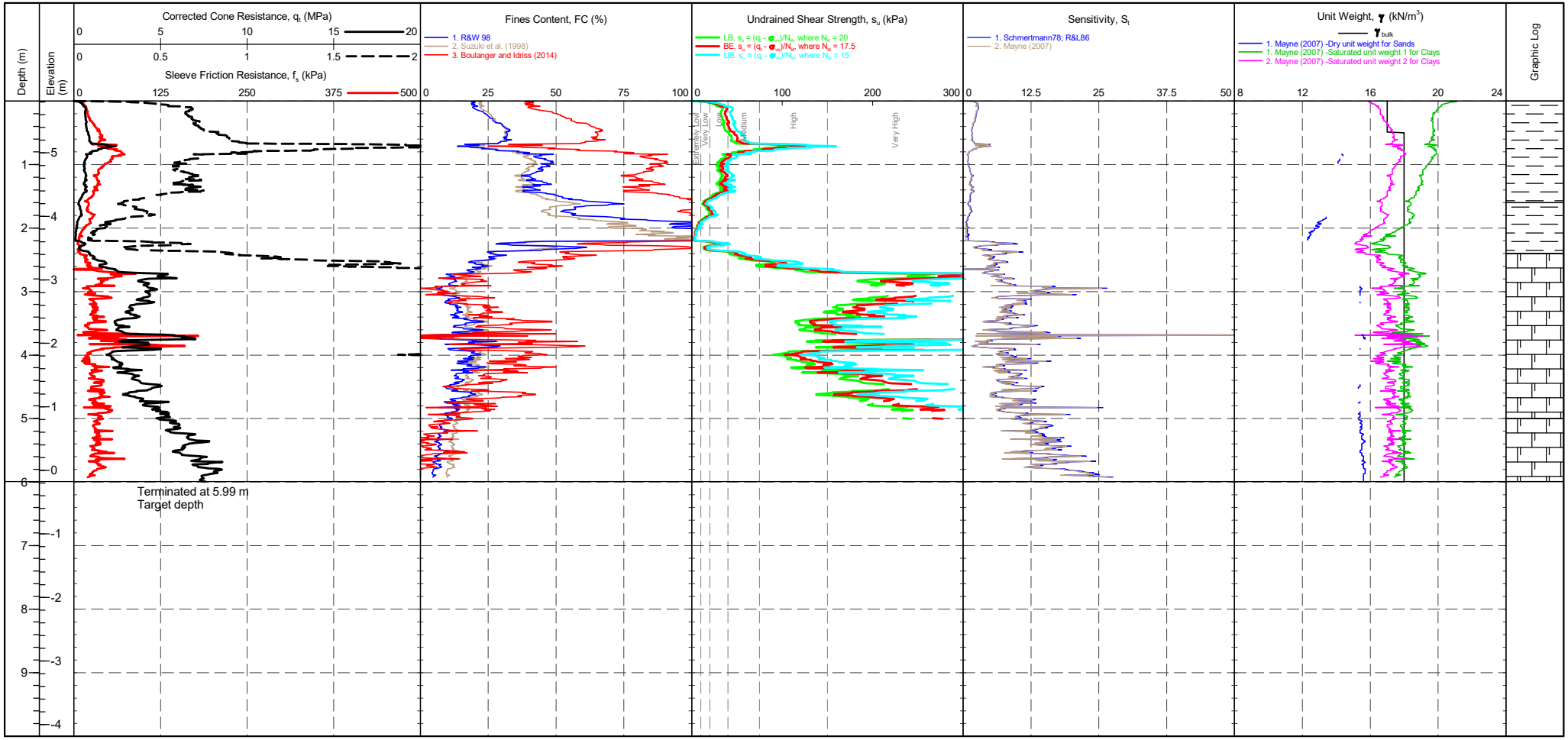
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID **DP119**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500155.619 m<br>NORTHING : 102060.389 m<br>ELEVATION : 5.815 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



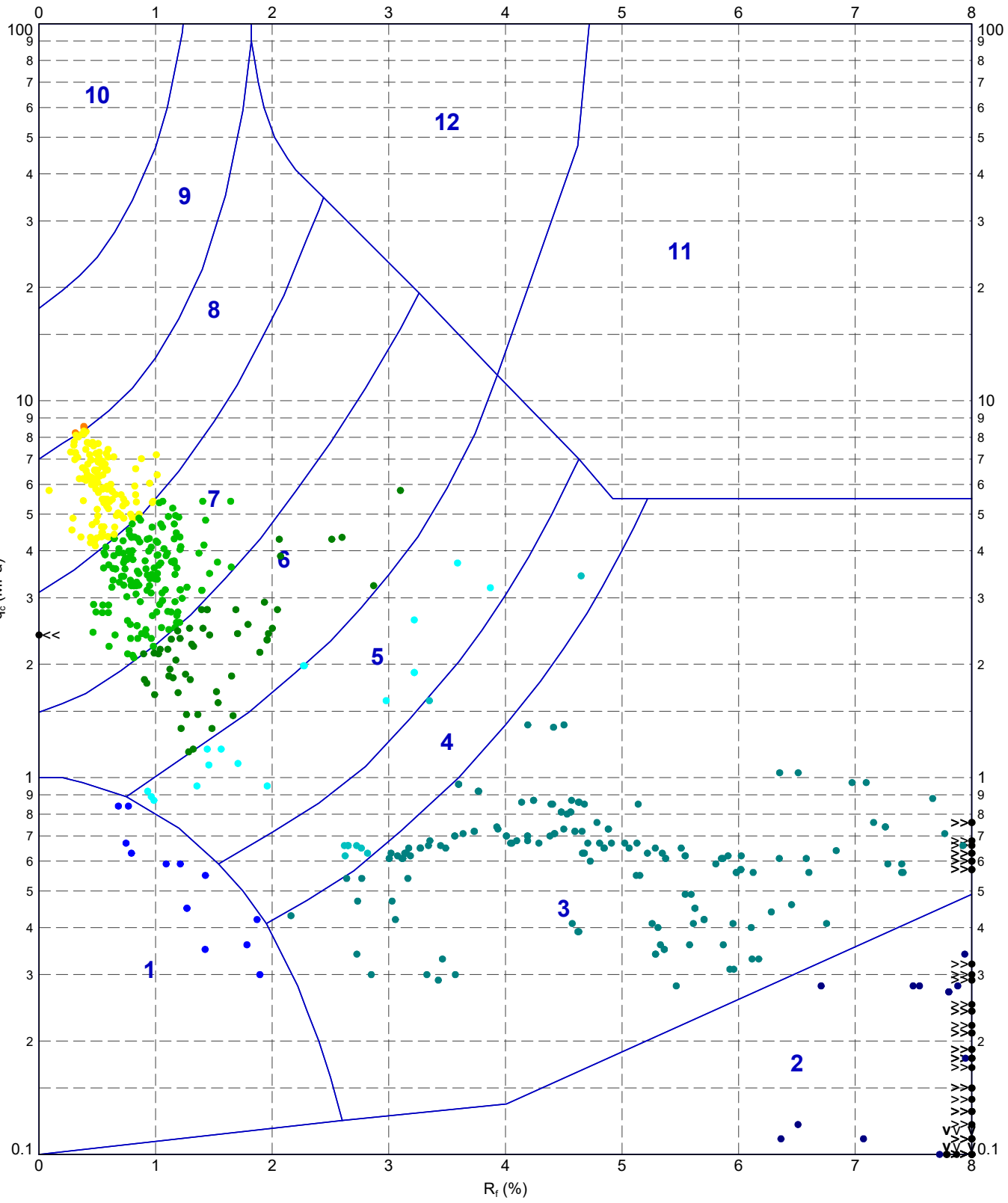

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 222 mV | 218 mV | -0.044 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 220 mV | 218 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 268 mV | 272 mV | 0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2355 mV | 2346 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP119

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

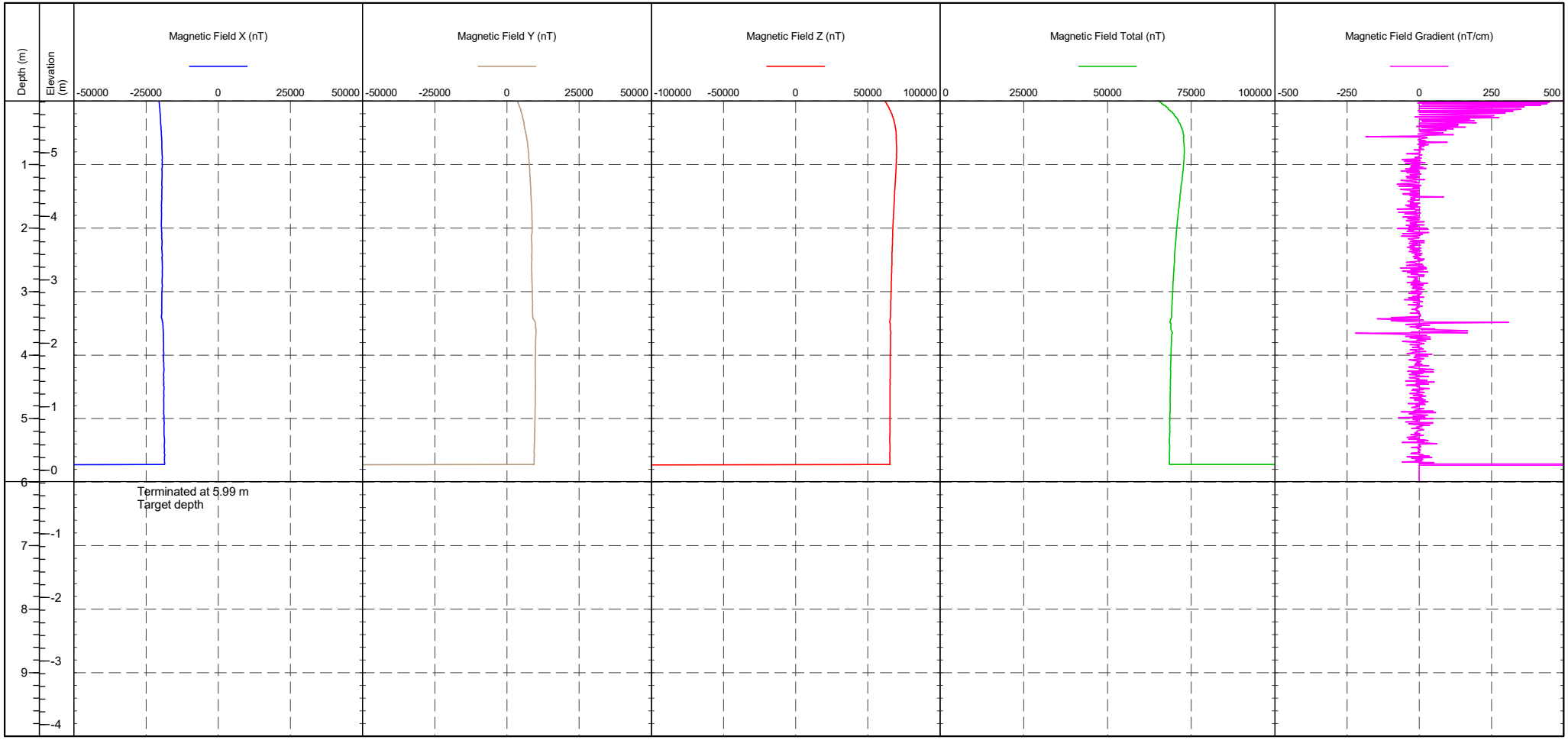
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:36 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP119**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500155.619 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102060.389 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.815 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



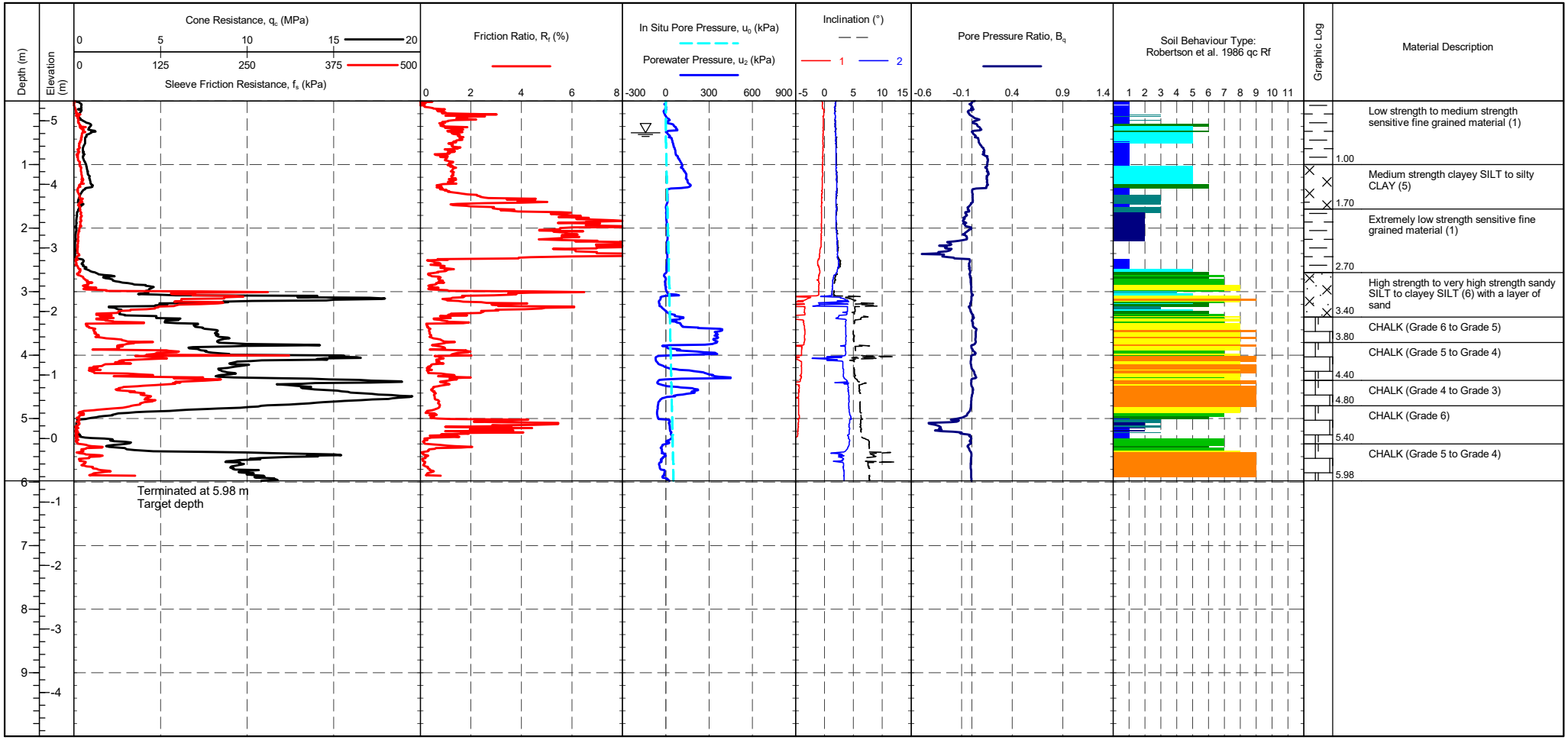

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 222 mV | 218 mV | -0.044 MPa |
| | | | | Sleeve | 220 mV | 218 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 268 mV | 272 mV | 0.001 kPa |
| | | | | X-Y Inclinometer | 2355 mV | 2346 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP120**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500223.377 m<br>NORTHING : 102079.192 m<br>ELEVATION : 5.313 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 219 mV | 216 mV | -0.033 MPa |
| Sleeve | 216 mV | 215 mV | -0.001 kPa |
| Pore Pressure 2 | 264 mV | 261 mV | -0.001 kPa |
| X-Y Inclinometer | 2435 mV | 2453 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

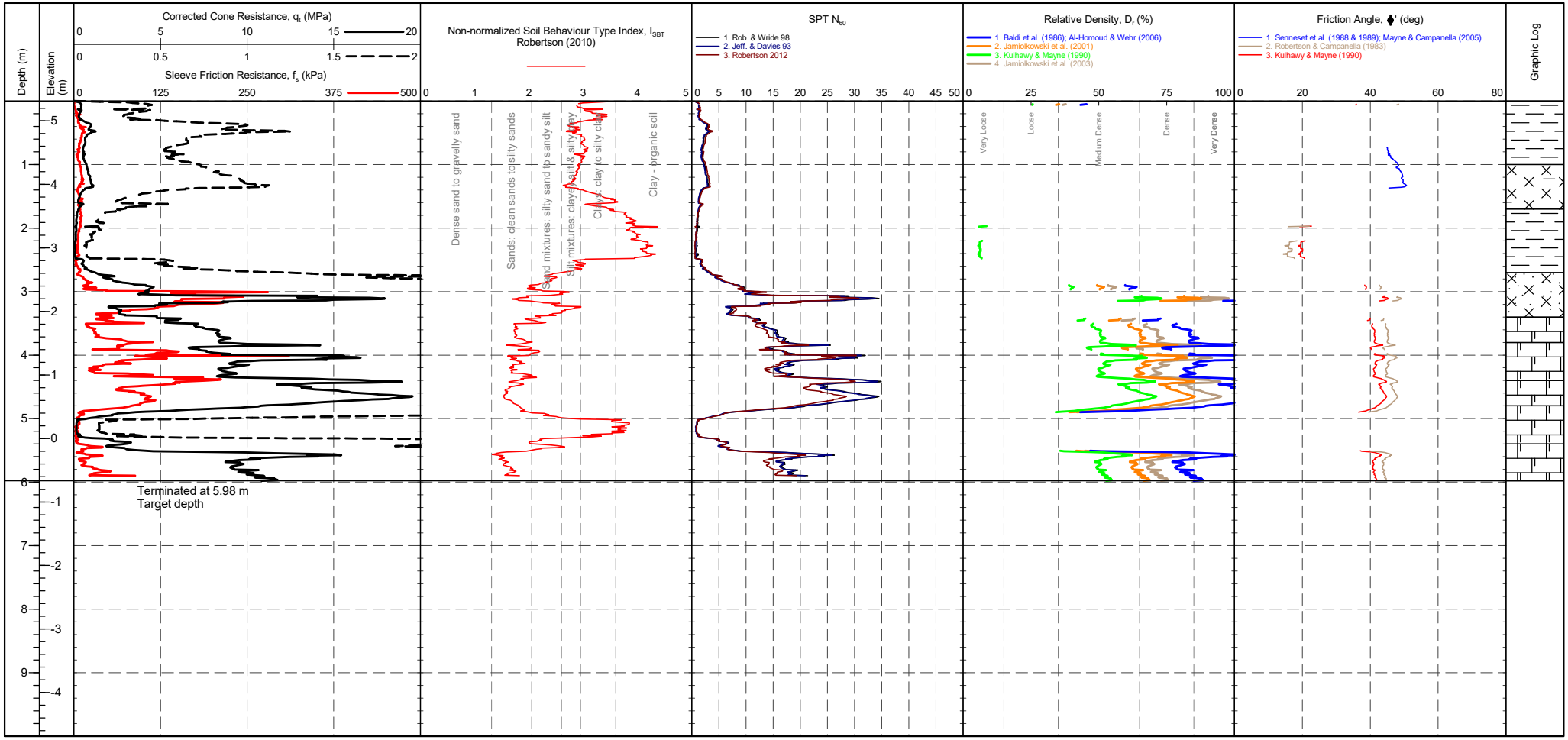
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP120**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500223.377 m<br>NORTHING : 102079.192 m<br>ELEVATION : 5.313 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 219 mV | 216 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 216 mV | 215 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 264 mV | 261 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2435 mV | 2453 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

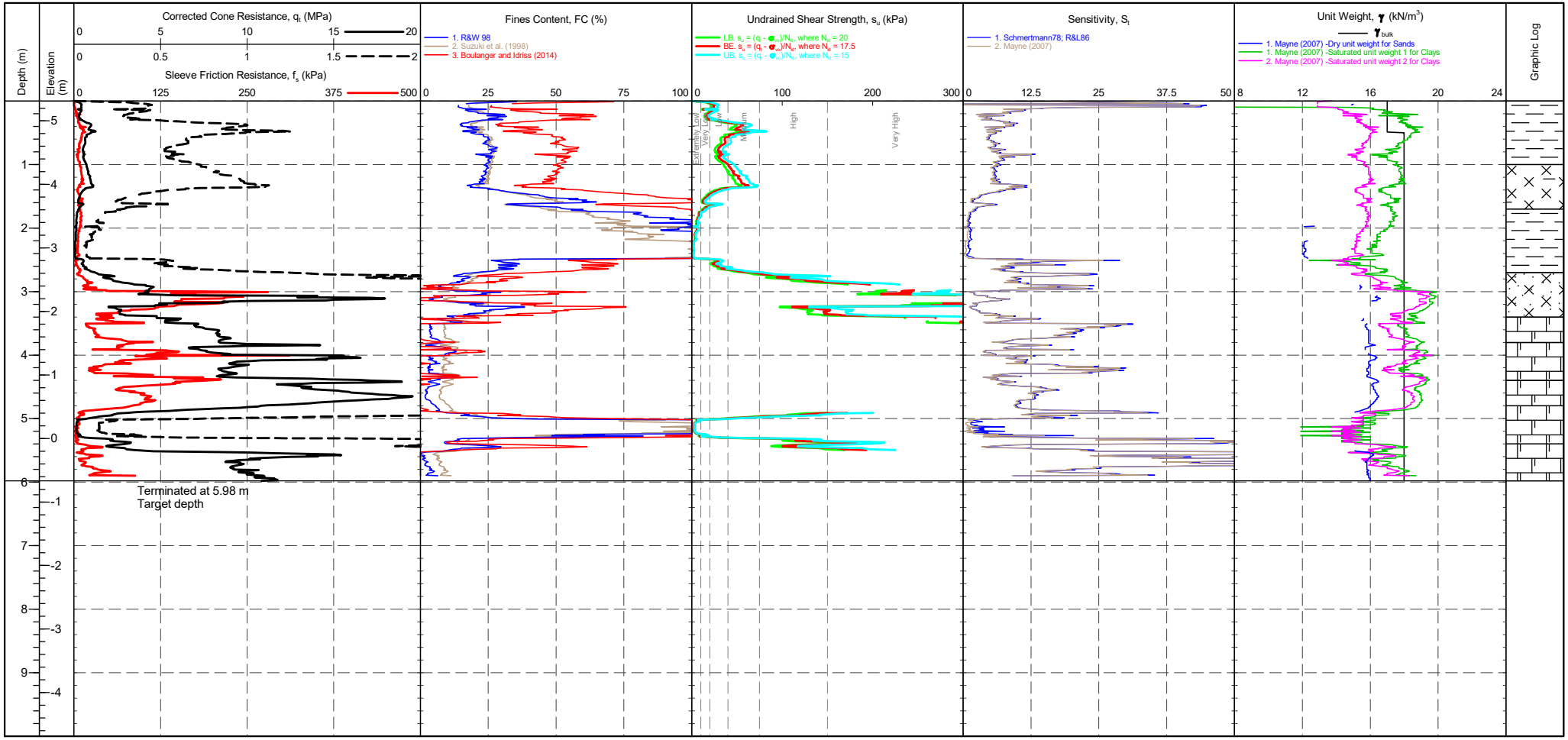
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP120**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500223.377 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102079.192 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.313 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



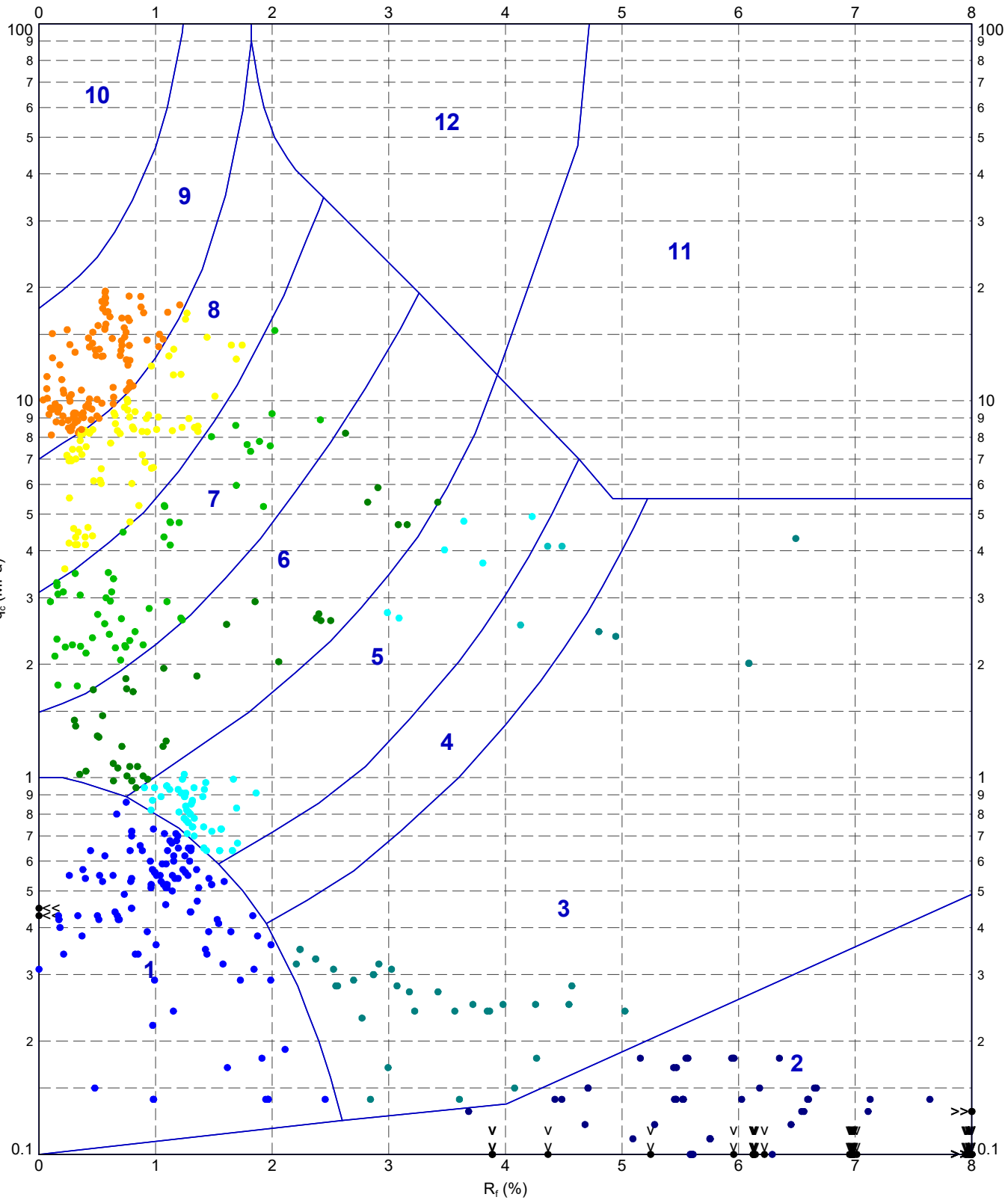

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 219 mV | 216 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 216 mV | 215 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 264 mV | 261 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2435 mV | 2453 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP120

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

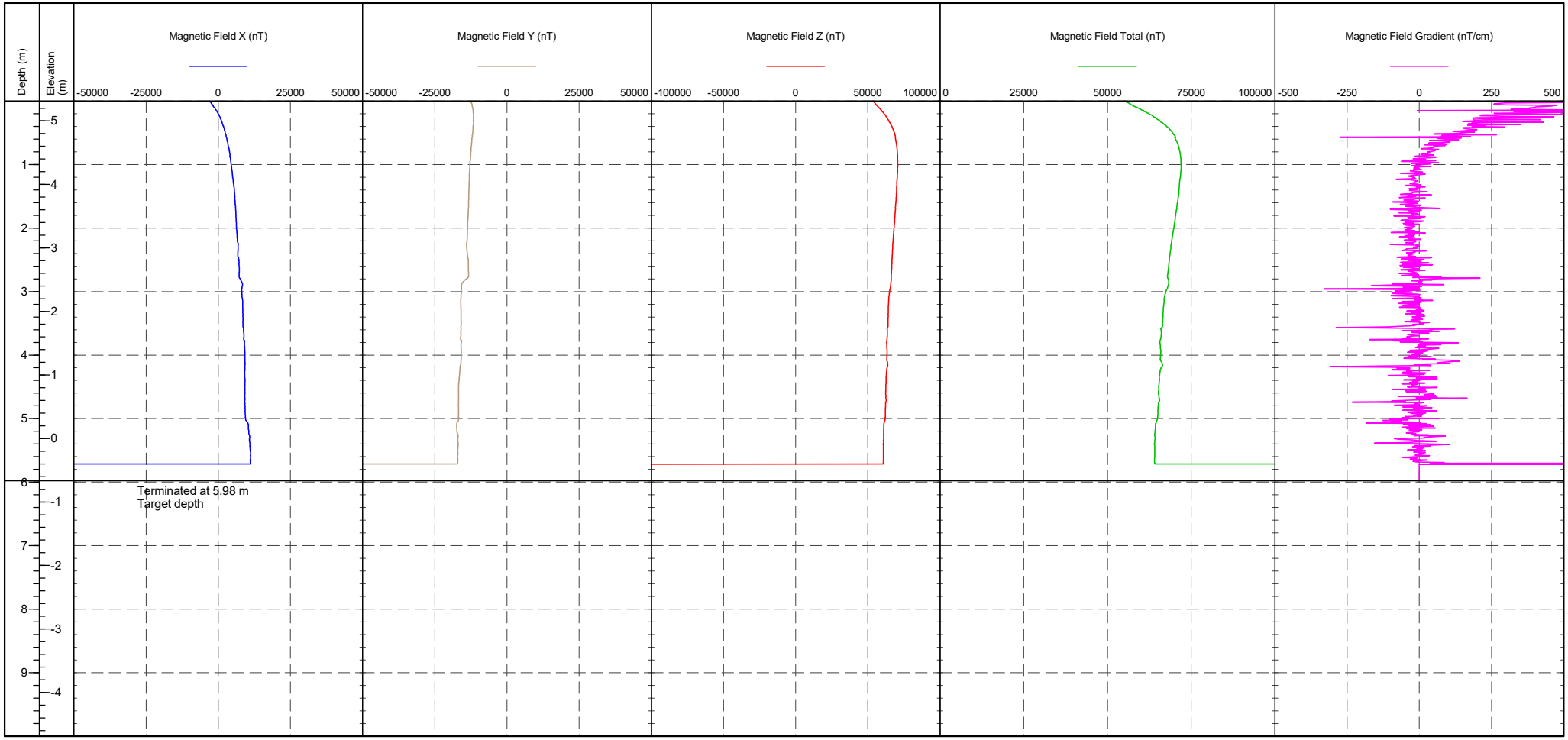
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:37 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP120**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500223.377 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102079.192 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.313 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



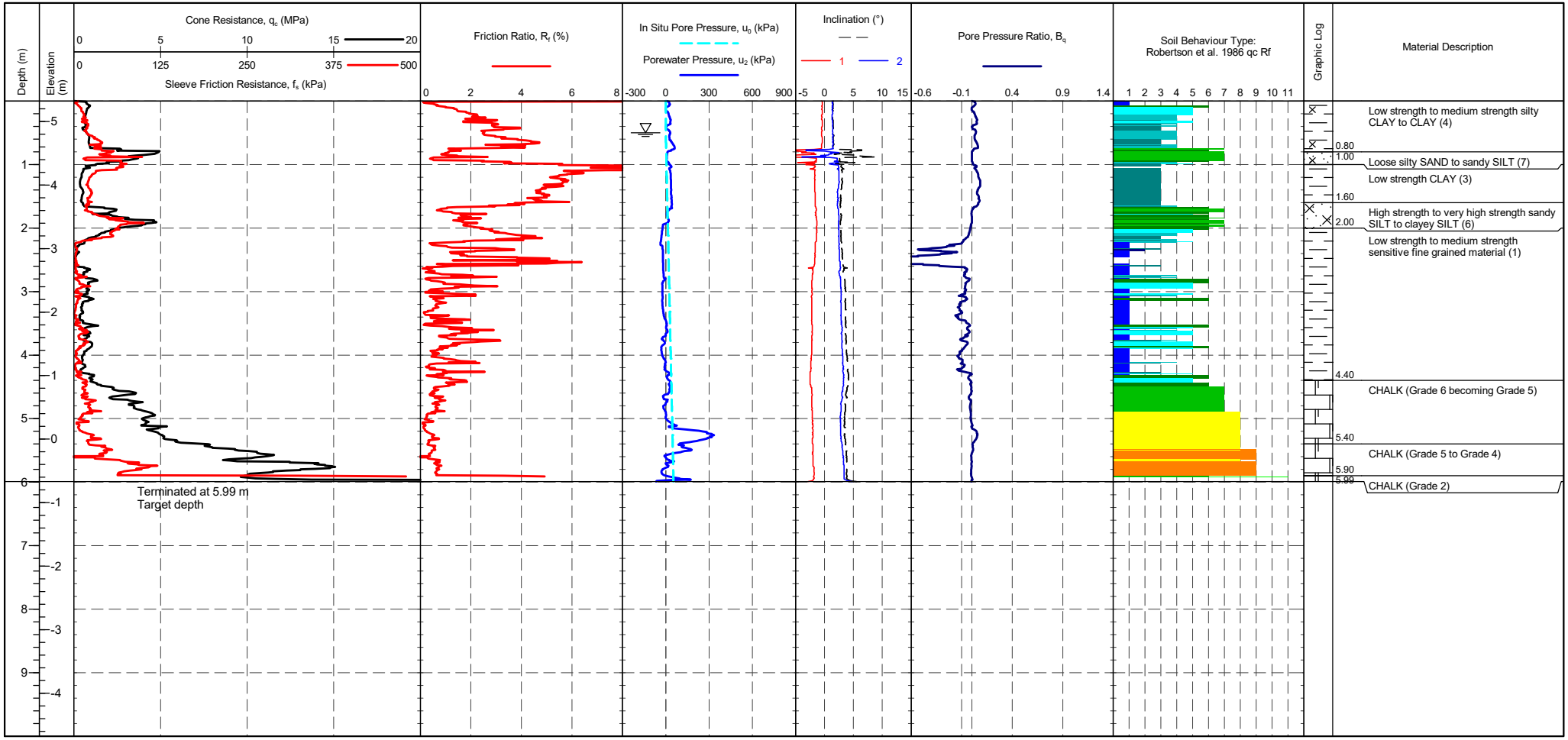

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 219 mV | 216 mV | -0.033 MPa |
| | | | | Sleeve | 216 mV | 215 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 264 mV | 261 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2435 mV | 2453 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP121**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500285.868 m<br>NORTHING : 102096.212 m<br>ELEVATION : 5.323 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 219 mV | 217 mV | -0.022 MPa |
| Sleeve | 219 mV | 215 mV | -0.003 kPa |
| Pore Pressure 2 | 265 mV | 262 mV | -0.001 kPa |
| X-Y Inclinometer | 2314 mV | 2445 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

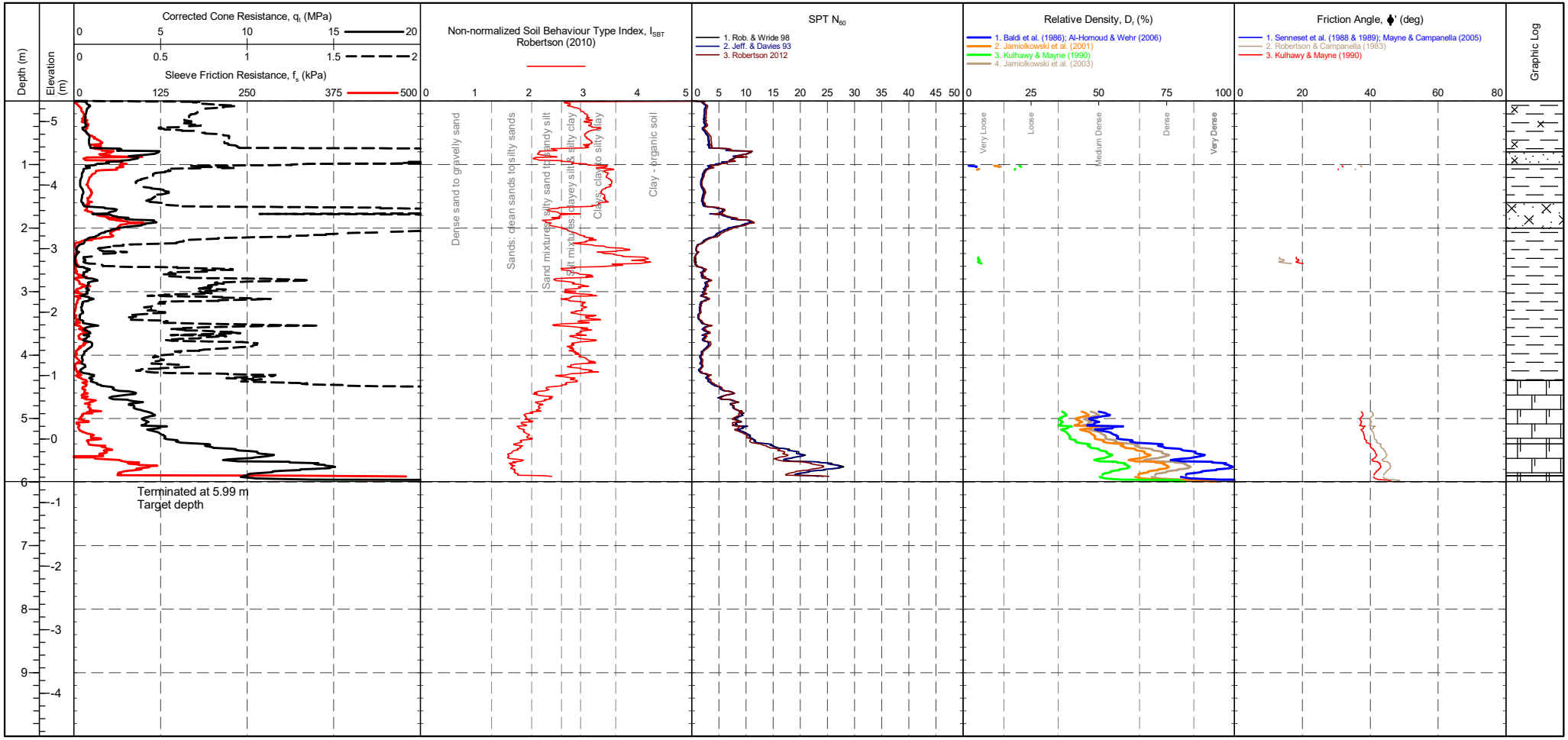
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP121**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500285.868 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102096.212 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.323 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 219 mV | 217 mV |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 219 mV | 215 mV |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 265 mV | 262 mV |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2314 mV | 2445 mV |

| Transducer | Difference |
|---|---|
| Tip | -0.022 MPa |
| Sleeve | -0.003 kPa |
| Pore Pressure 2 | -0.001 kPa |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic |
|---|---|
| Clays | 2.95-3.60 |
| Silt mixtures | 2.60-2.95 |
| Sand mixtures | 2.05-2.60 |
| Sands | 1.31-2.05 |
| Gravelly sand | <1.31 |

| Description | SPT N value, NSPT |
|---|---|
| Very Loose | 0 - 4 |
| Loose | 4 - 10 |
| Medium Dense | 10 - 30 |
| Dense | 30 - 50 |
| Very Dense | >50 |

| Description | Relative Density Dr (%) |
|---|---|
| Very Loose | 0 - 15 |
| Loose | 15 - 35 |
| Medium Dense | 35 - 65 |
| Dense | 65 - 85 |
| Very Dense | >85 |

Groundwater Level

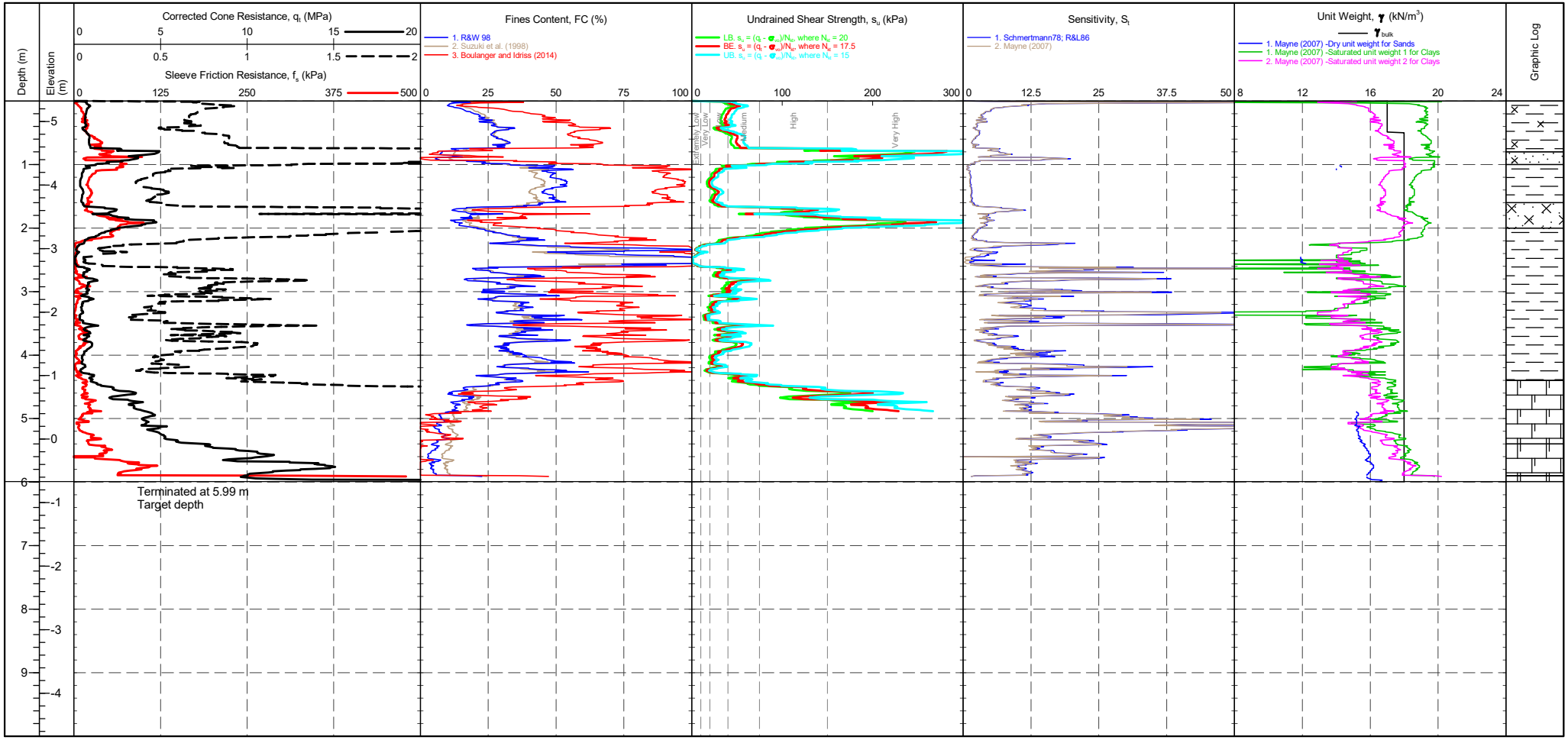
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP121**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500285.868 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102096.212 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.323 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



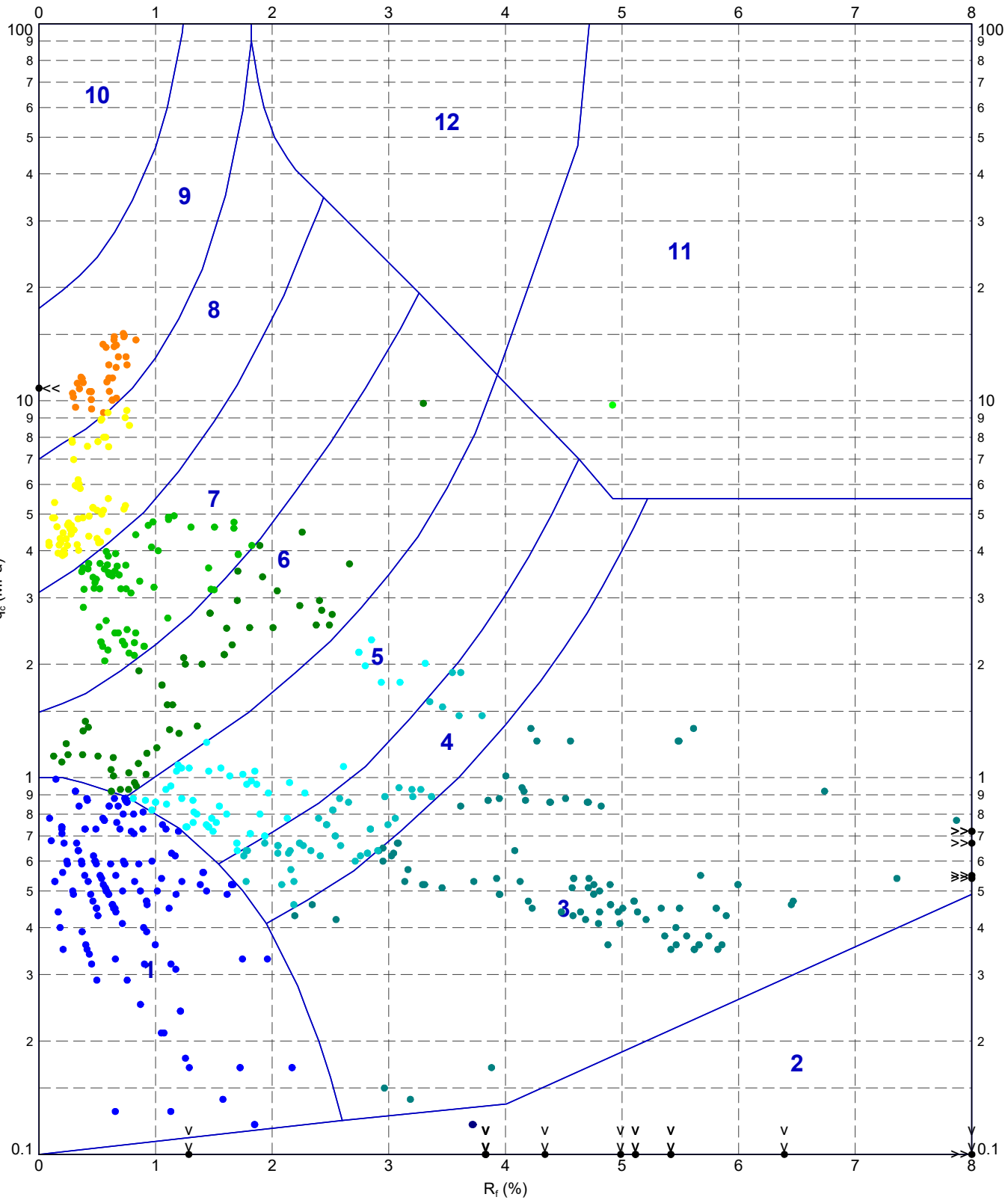

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 219 mV | 217 mV | -0.022 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 219 mV | 215 mV | -0.003 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 265 mV | 262 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2314 mV | 2445 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP121

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

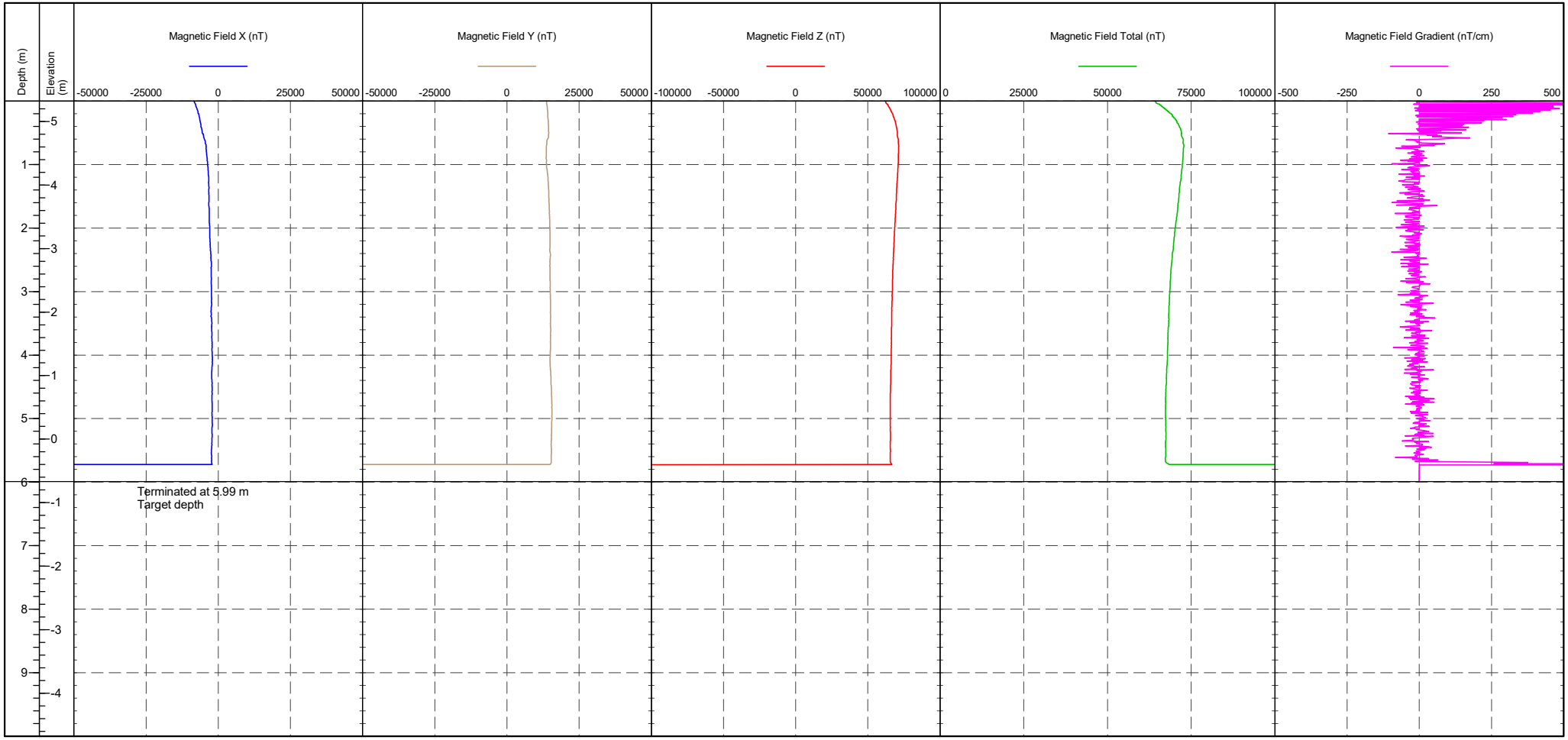
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:38 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP121**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500285.868 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102096.212 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.323 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



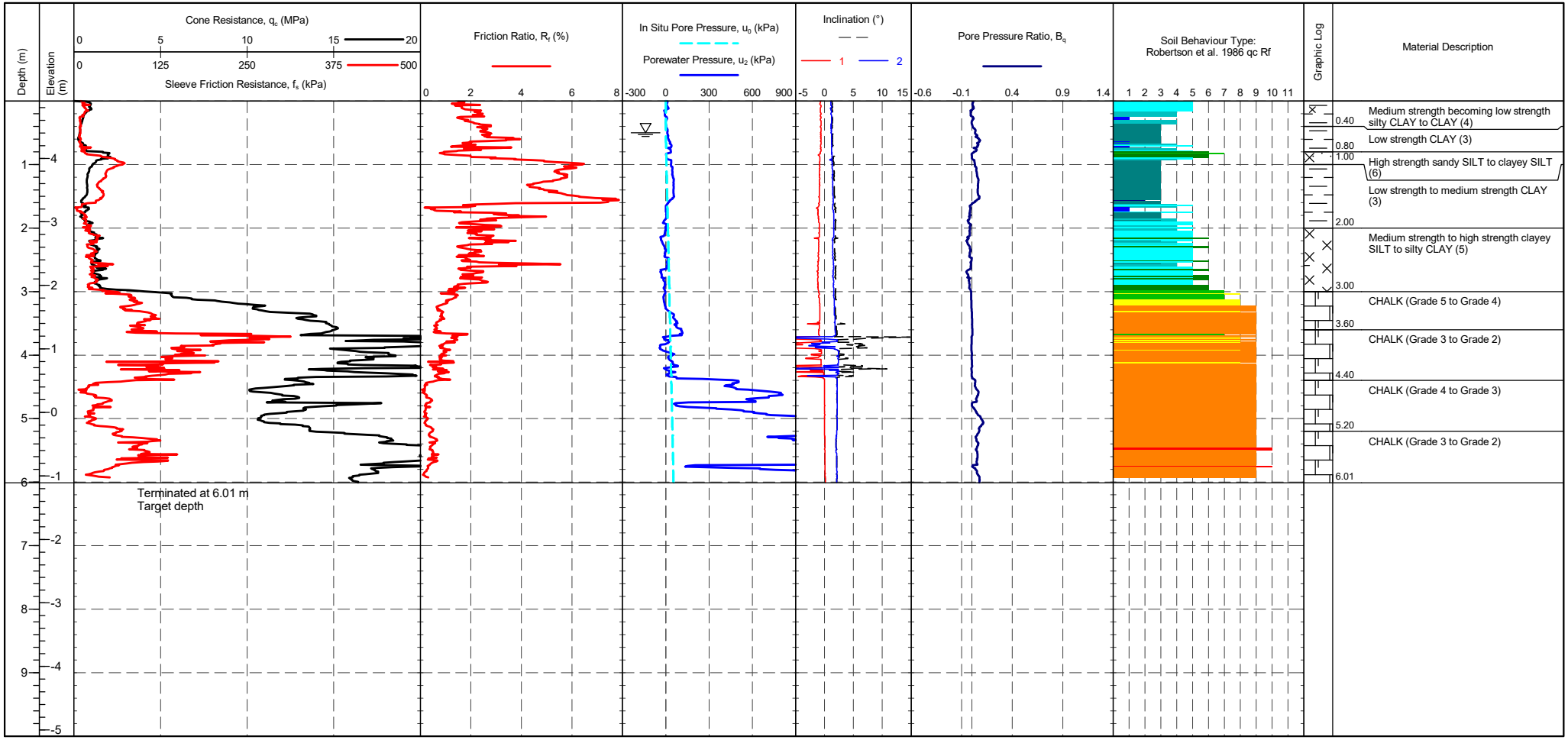

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 219 mV | 217 mV | -0.022 MPa |
| | | | | Sleeve | 219 mV | 215 mV | -0.003 kPa |
| | | | | Pore Pressure 2 | 265 mV | 262 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2314 mV | 2445 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP122**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500348.956 m<br>NORTHING : 102145.732 m<br>ELEVATION : 4.902 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm² | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 215 mV | -0.077 MPa |
| Sleeve | 219 mV | 212 mV | -0.005 kPa |
| Pore Pressure 2 | 265 mV | 249 mV | -0.005 kPa |
| X-Y Inclinometer | 2418 mV | 2422 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

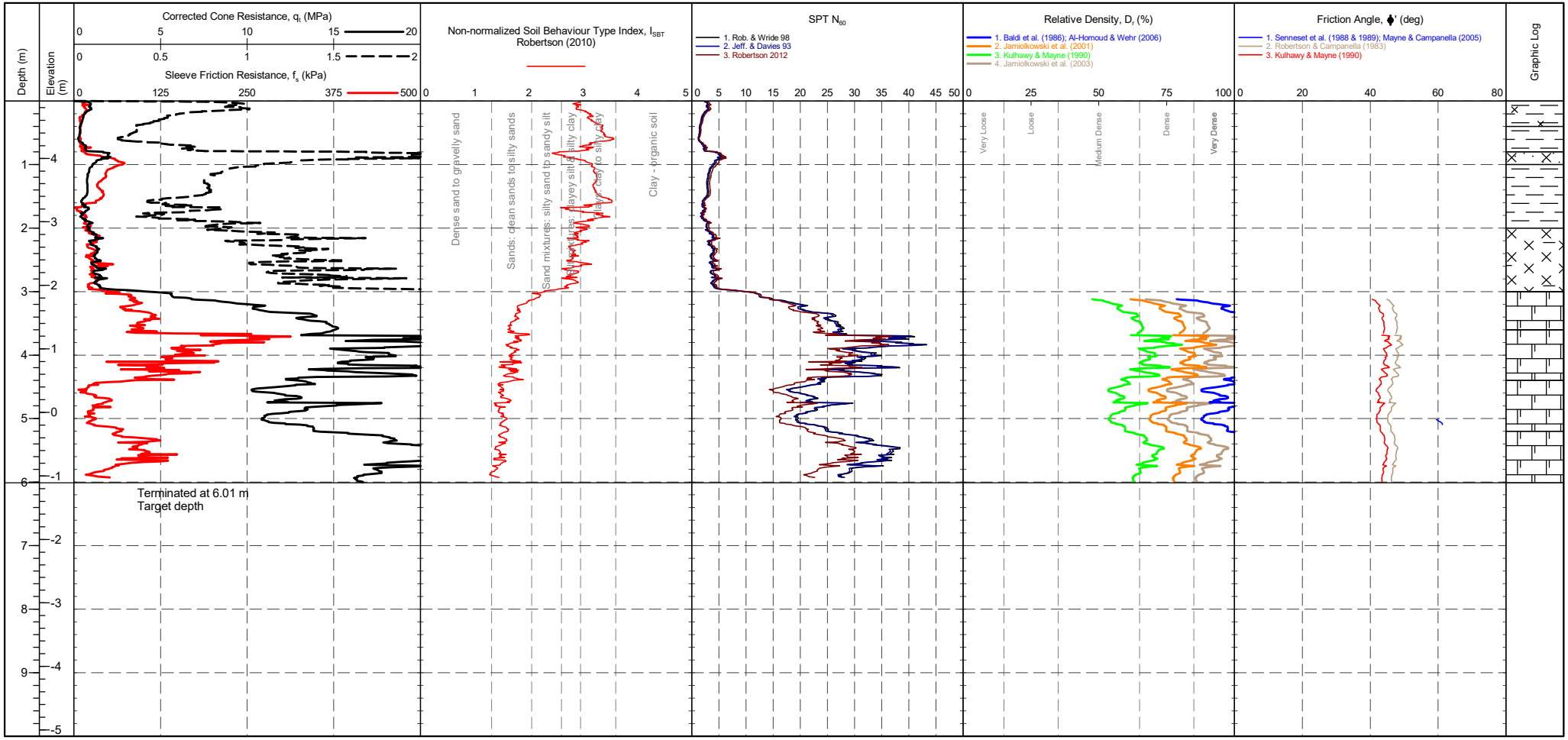
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP122**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500348.956 m<br>NORTHING : 102145.732 m<br>ELEVATION : 4.902 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 222 mV | 215 mV | -0.077 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 219 mV | 212 mV | -0.005 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 265 mV | 249 mV | -0.005 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2418 mV | 2422 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

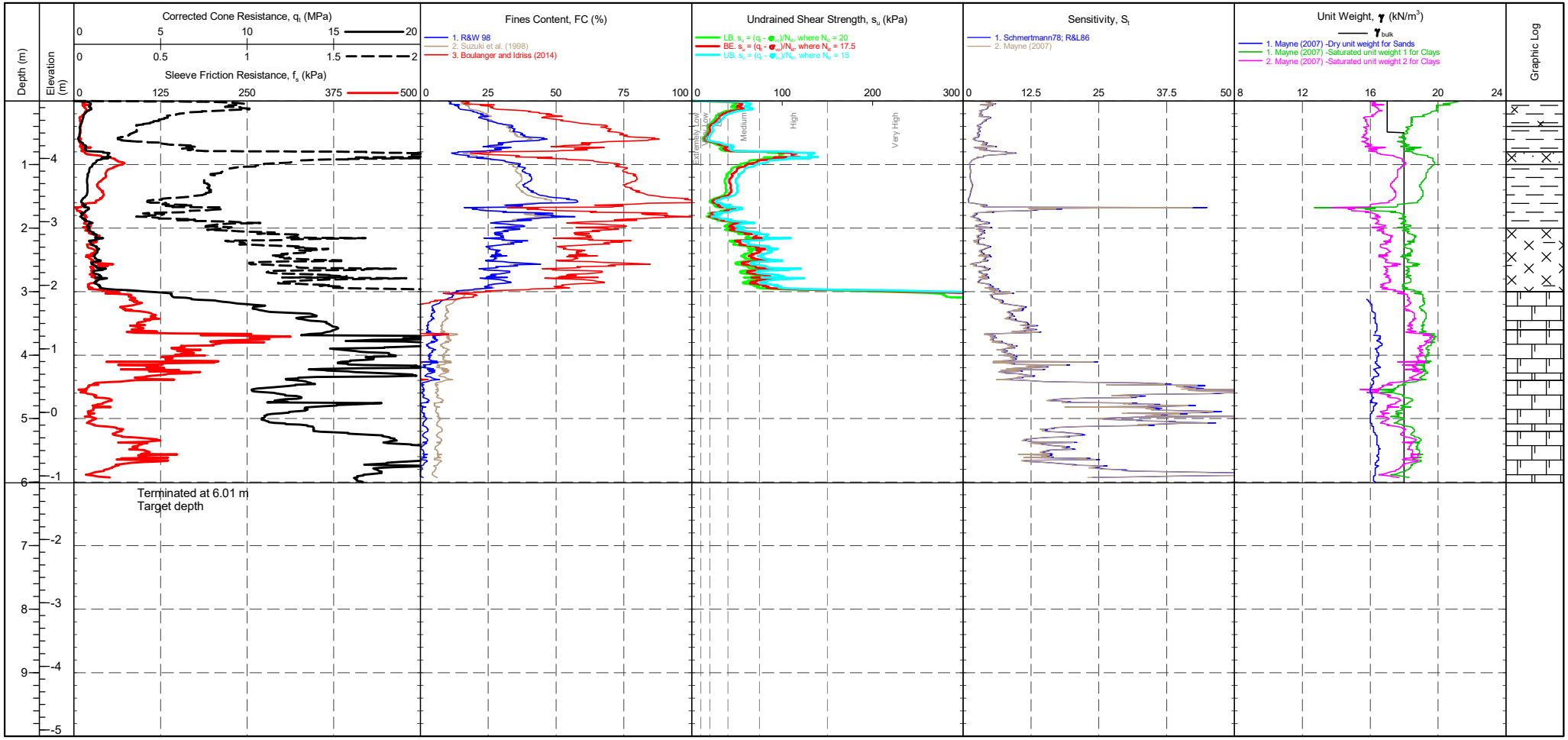
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP122**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500348.956 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102145.732 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.902 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



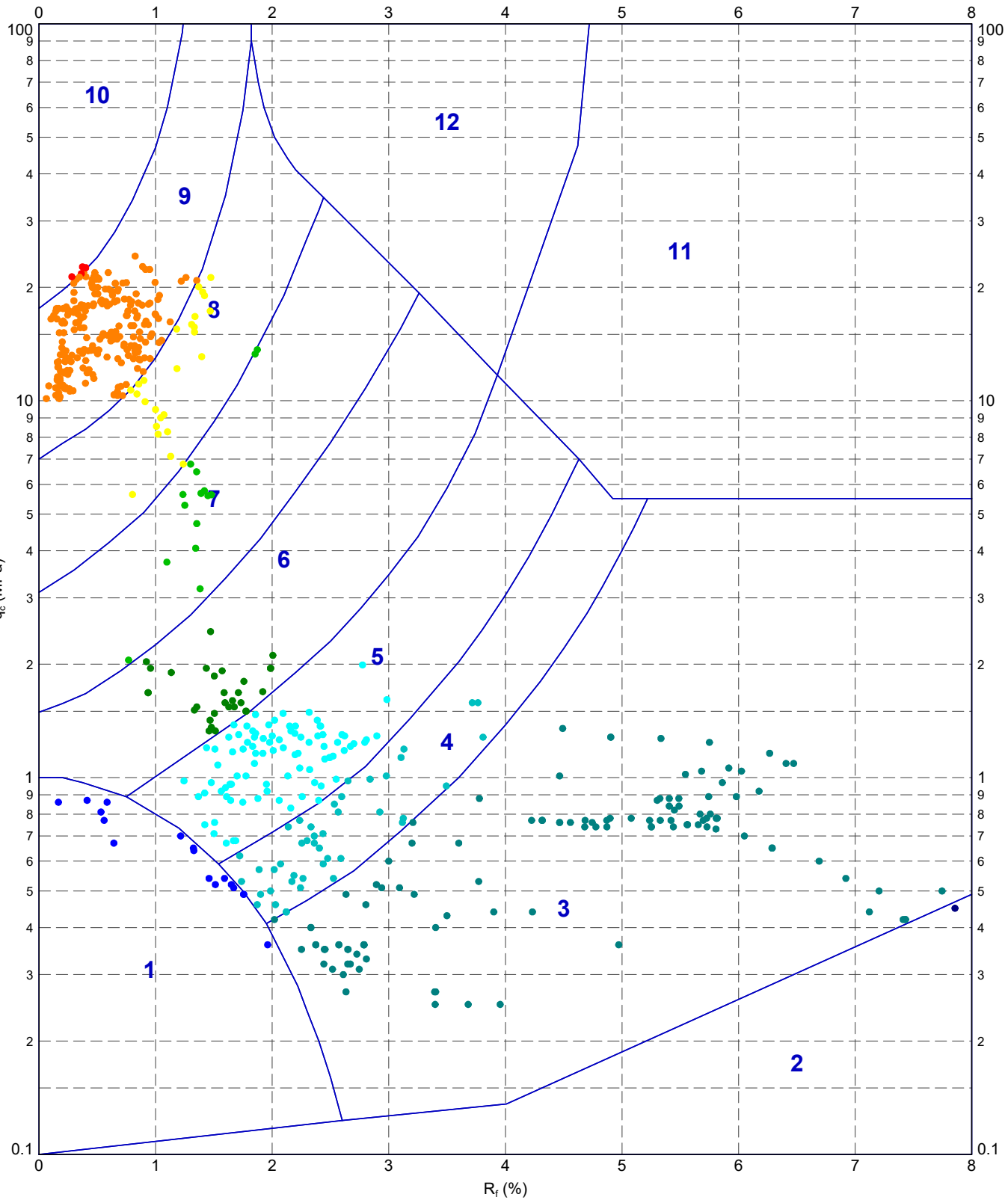

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 222 mV | 215 mV | -0.077 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 219 mV | 212 mV | -0.005 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 265 mV | 249 mV | -0.005 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2418 mV | 2422 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP122

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

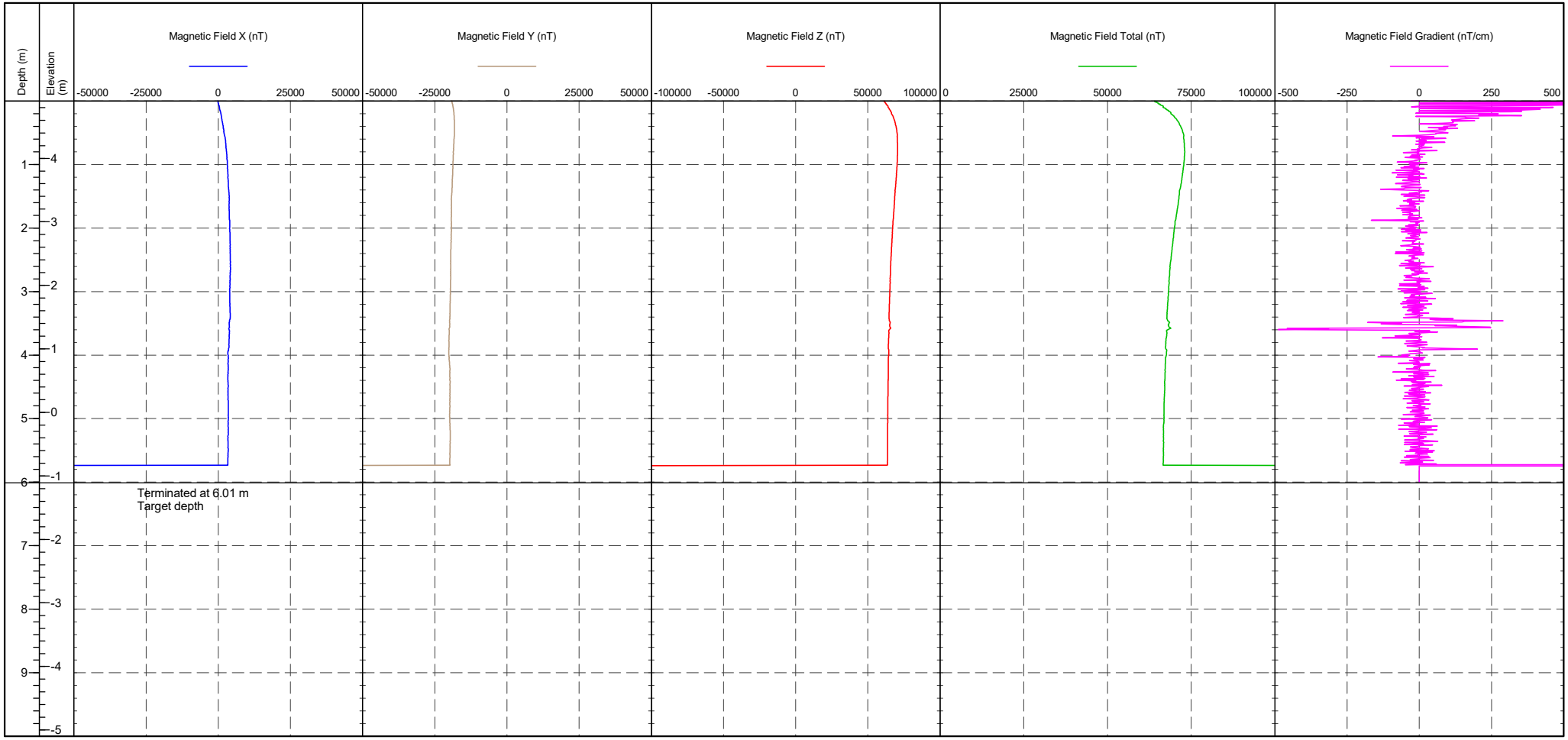
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:39 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Plt: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP122**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500348.956 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102145.732 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.902 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



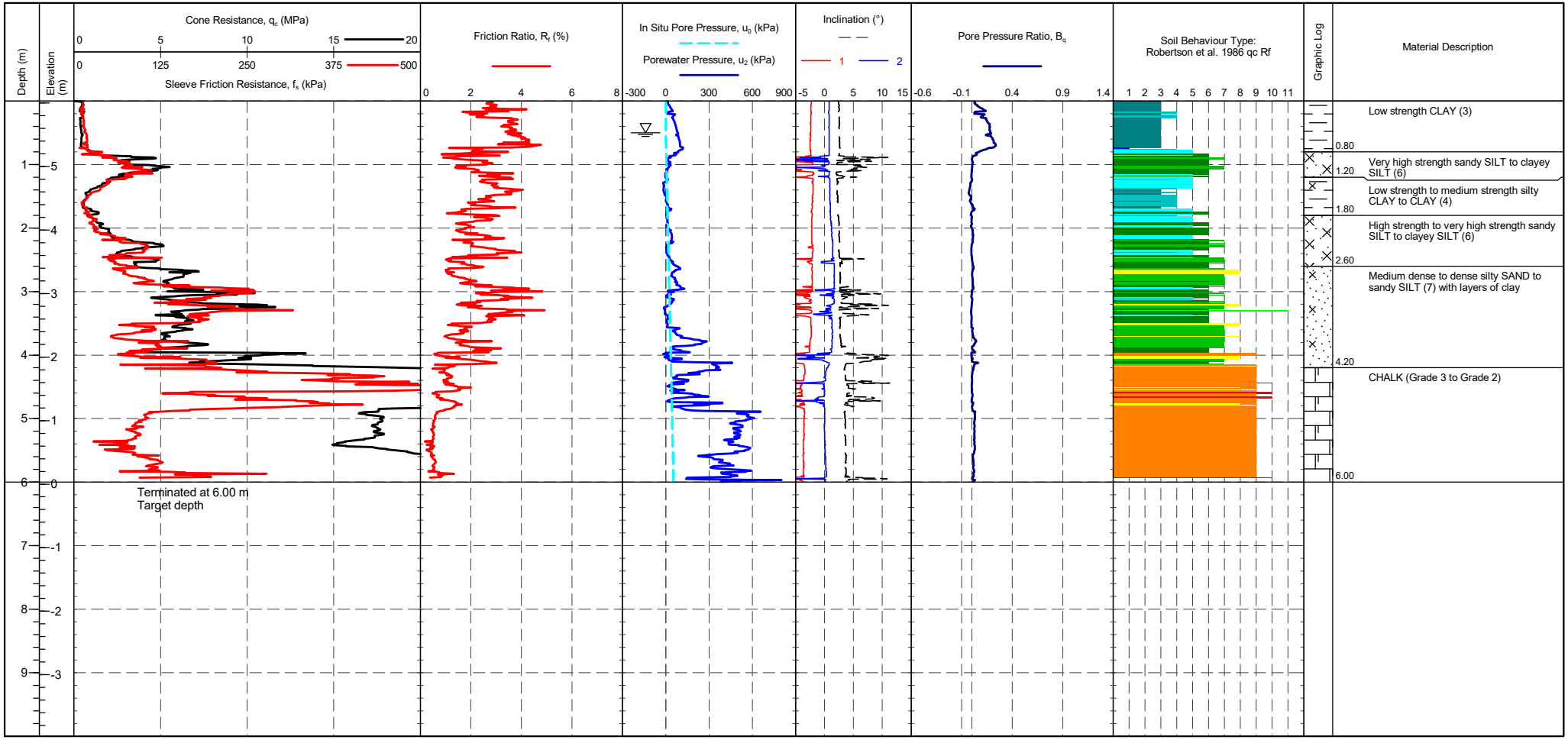

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 222 mV | 215 mV | -0.077 MPa |
| | | | | Sleeve | 219 mV | 212 mV | -0.005 kPa |
| | | | | Pore Pressure 2 | 265 mV | 249 mV | -0.005 kPa |
| | | | | X-Y Inclinometer | 2418 mV | 2422 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP128**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500036.078 m<br>NORTHING : 101955.813 m<br>ELEVATION : 6.032 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



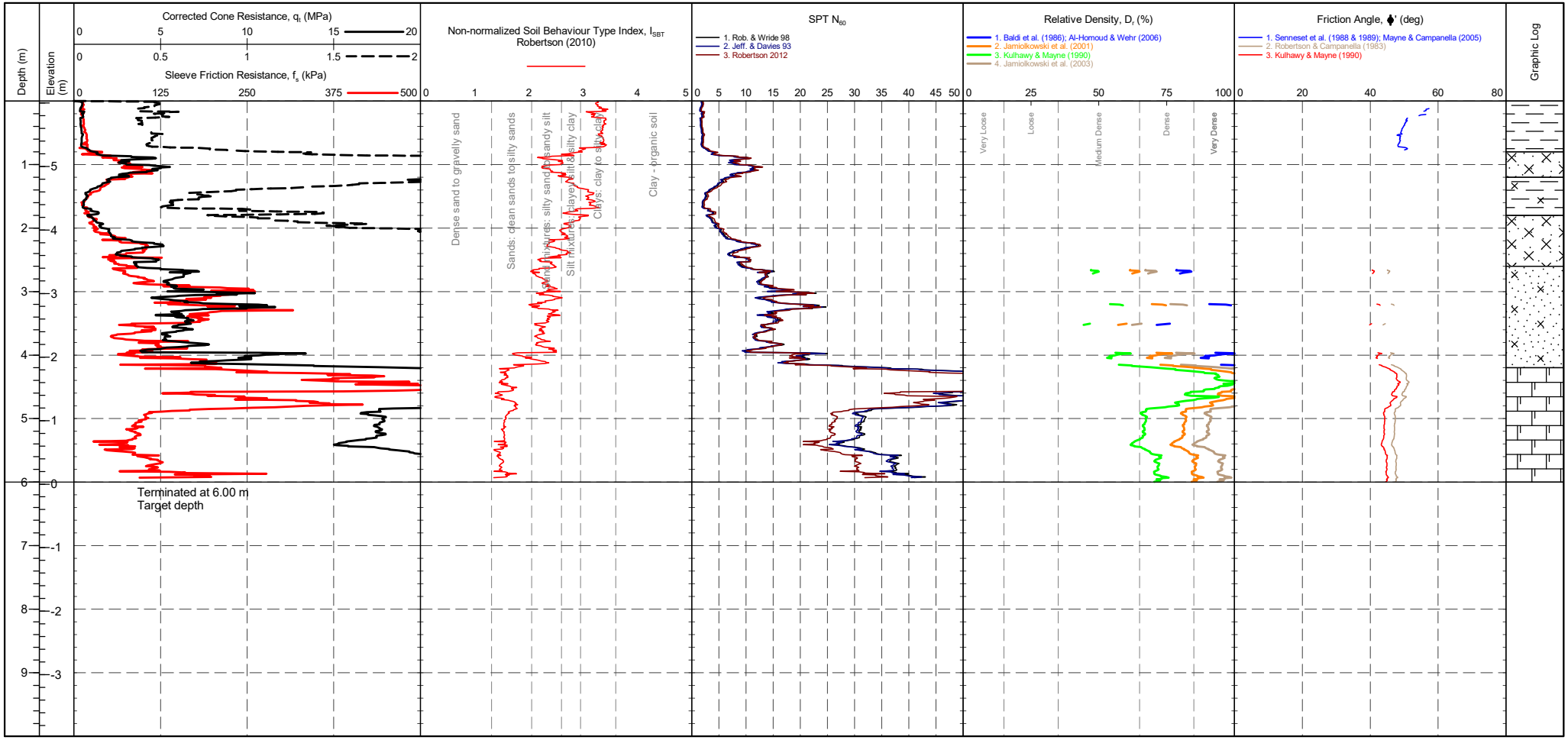

| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1186<br>CALIBRATION DATE : 09/08/2021<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES<br>Transducer: Pre 222 mV, Post 214 mV, Difference -0.088 MPa<br>Sleeve: Pre 216 mV, Post 208 mV, Difference -0.006 kPa<br>Pore Pressure 2: Pre 266 mV, Post 236 mV, Difference -0.009 kPa<br>X-Y Inclinometer: Pre 2236 mV, Post 2247 mV | METHOD: Robertson et al. 1986 qc Rf<br>1 - Sensitive fine grained material<br>2 - Organic material<br>3 - CLAY<br>4 - Silty CLAY to CLAY<br>5 - Clayey SILT to silty CLAY<br>6 - Sandy SILT to clayey SILT<br>7 - Silty SAND to sandy SILT<br>8 - SAND to silty SAND<br>9 - SAND<br>10 - Gravelly SAND to SAND<br>11 - Very stiff fine grained<br>12 - SAND to clayey SAND<br>Groundwater Level<br>Dissipation Test |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP128**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500036.078 m<br>NORTHING : 101955.813 m<br>ELEVATION : 6.032 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | |

CPTU ZERO VALUES

| | Pre | Post | Difference |
|---|---|---|---|
| Transducer | | | |
| Tip | 222 mV | 214 mV | -0.088 MPa |
| Sleeve | 216 mV | 208 mV | -0.006 kPa |
| Pore Pressure 2 | 266 mV | 236 mV | -0.009 kPa |
| X-Y Inclinometer | 2236 mV | 2247 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

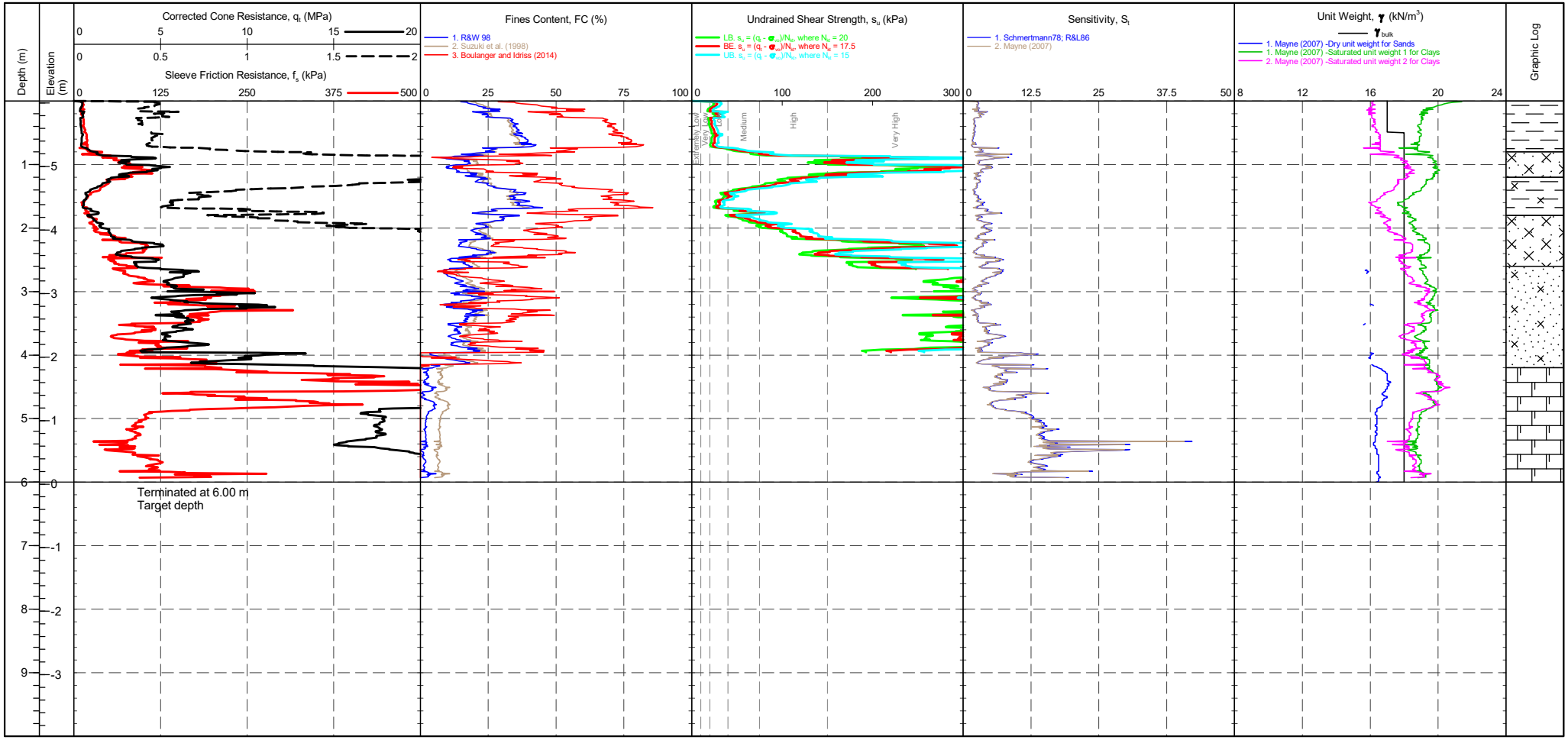
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP128**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500036.078 m<br>NORTHING : 101955.813 m<br>ELEVATION : 6.032 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | | |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | | |

CPTU ZERO VALUES

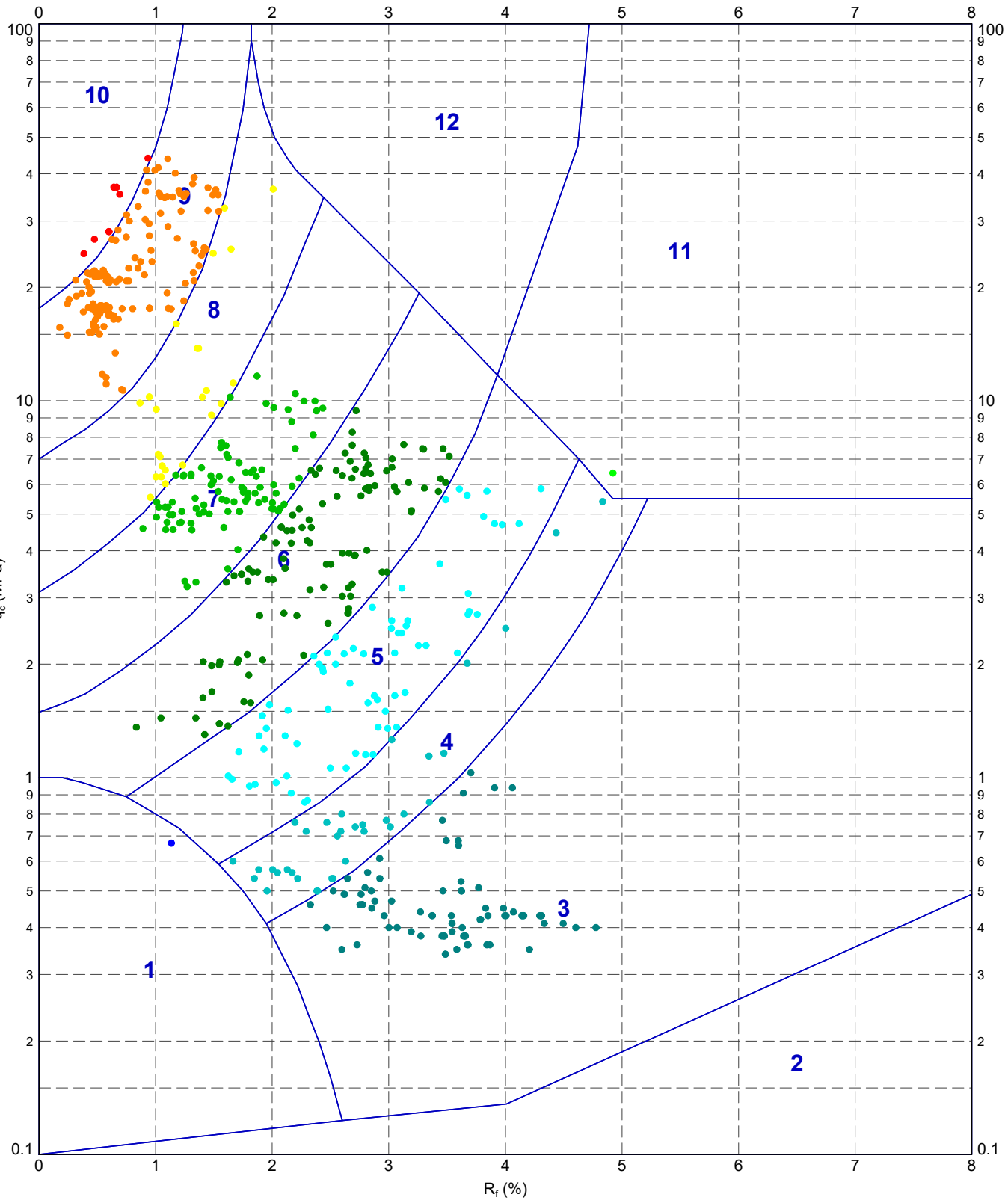
| | Pre | Post | Difference |
|---|---|---|---|
| Transducer | | | |
| Tip | 222 mV | 214 mV | -0.088 MPa |
| Sleeve | 216 mV | 208 mV | -0.006 kPa |
| Pore Pressure 2 | 266 mV | 236 mV | -0.009 kPa |
| X-Y Inclinometer | 2236 mV | 2247 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) |
|---|---|
| Extremely low strength | <10 |
| Very low strength | 10-20 |
| Low strength | 20-40 |
| Medium strength | 40-75 |
| High strength | 75-150 |
| Very high strength | 150-300 |
| Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP128

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

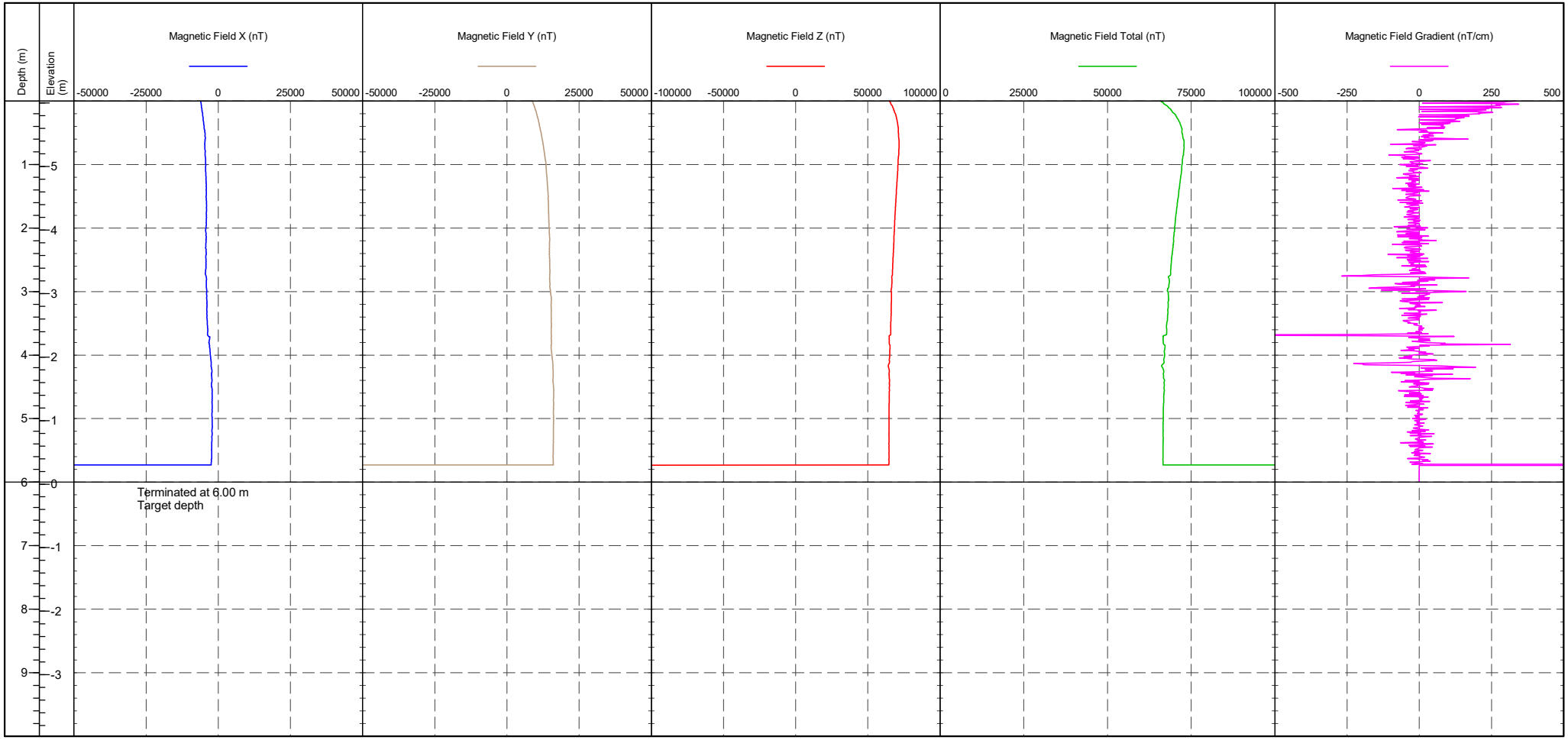
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:39 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP128**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500036.078 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101955.813 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.032 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



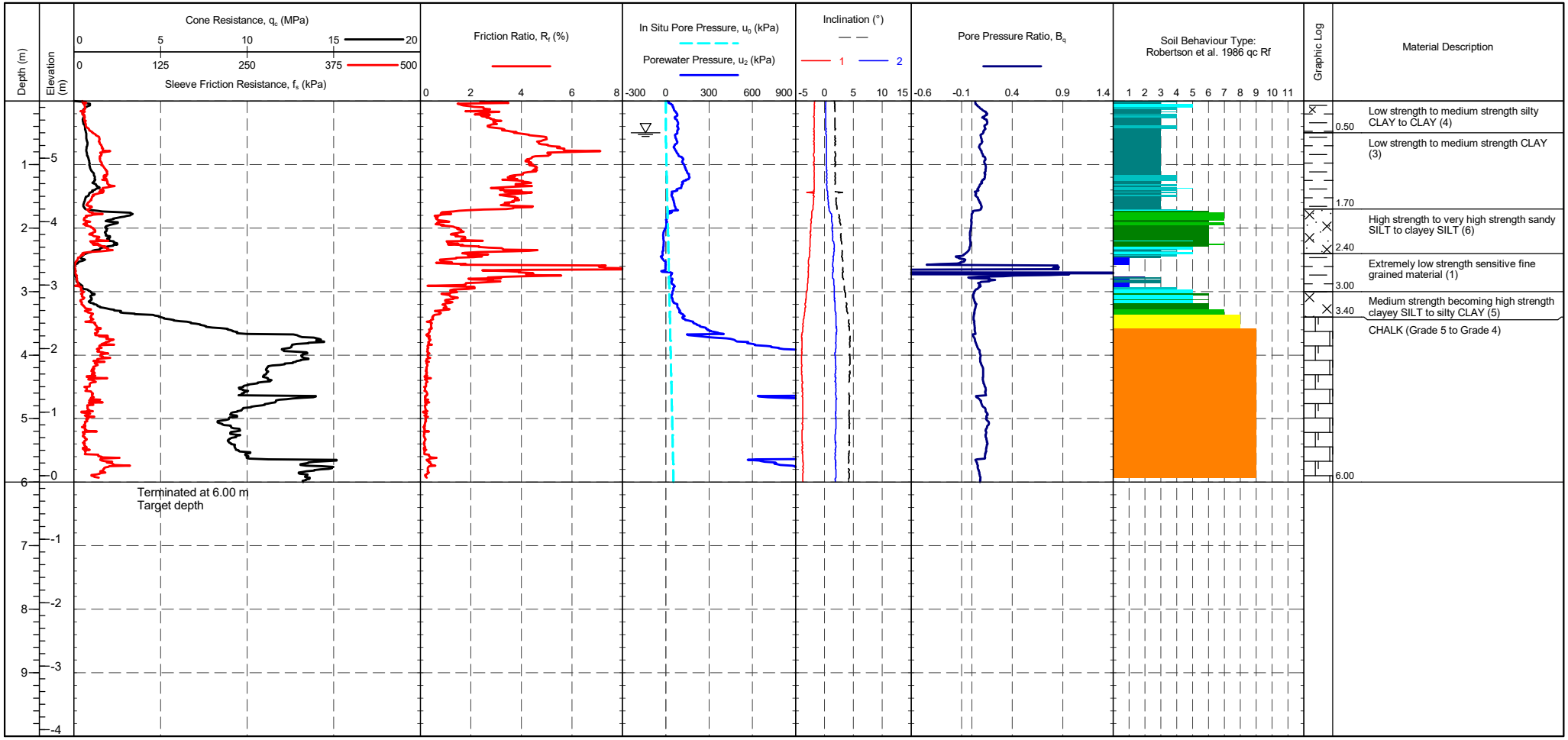

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 222 mV | 214 mV | -0.088 MPa |
| | | | | Sleeve | 216 mV | 208 mV | -0.006 kPa |
| | | | | Pore Pressure 2 | 266 mV | 236 mV | -0.009 kPa |
| | | | | X-Y Inclinometer | 2236 mV | 2247 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP129**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500103.299 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101973.777 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.899 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 218 mV | -0.033 MPa |
| Sleeve | 216 mV | 213 mV | -0.002 kPa |
| Pore Pressure 2 | 263 mV | 265 mV | 0.001 kPa |
| X-Y Inclinometer | 2329 mV | 2308 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

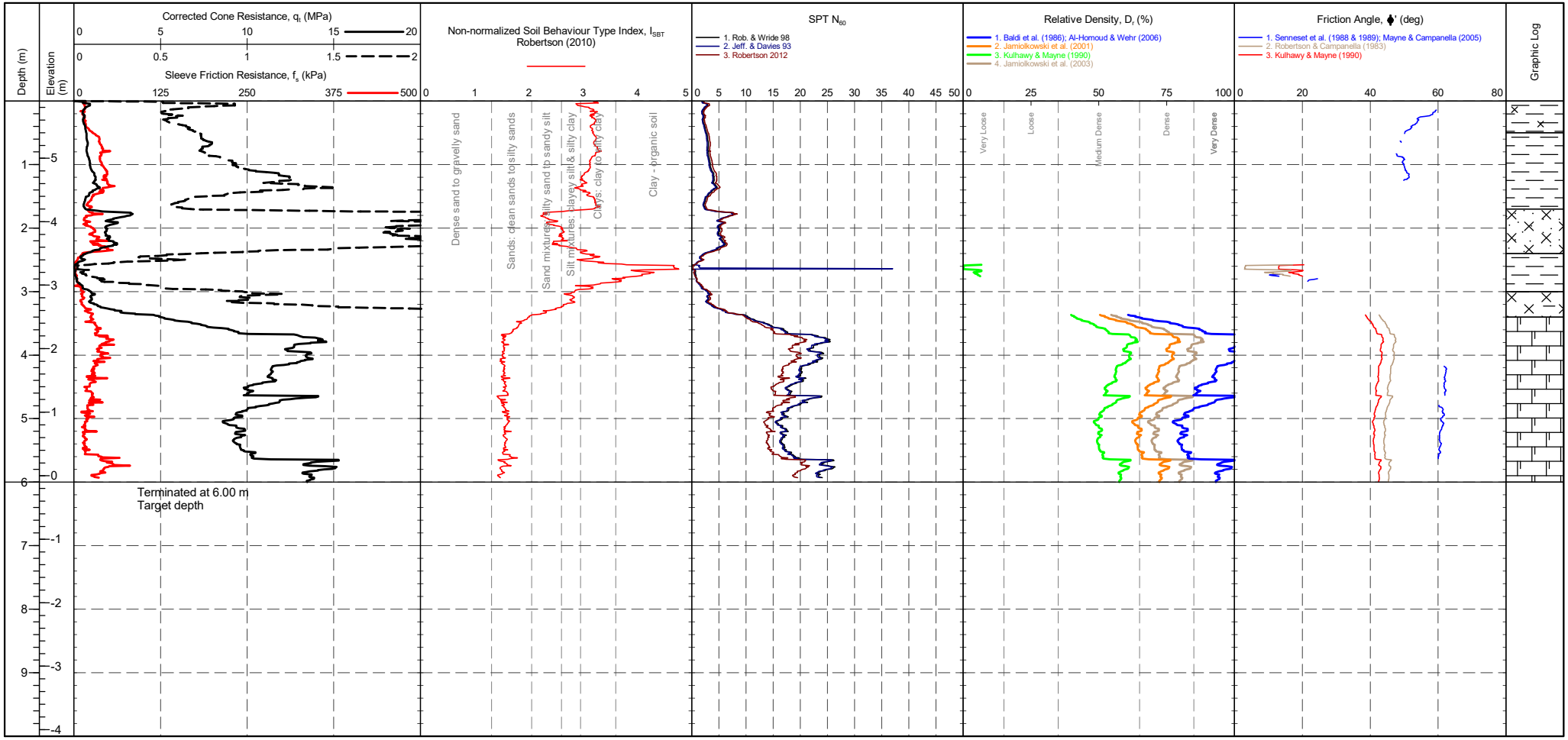
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP129**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500103.299 m<br>NORTHING : 101973.777 m<br>ELEVATION : 5.899 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 218 mV | -0.033 MPa |
| Sleeve | 216 mV | 213 mV | -0.002 kPa |
| Pore Pressure 2 | 263 mV | 265 mV | 0.001 kPa |
| X-Y Inclinometer | 2329 mV | 2308 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

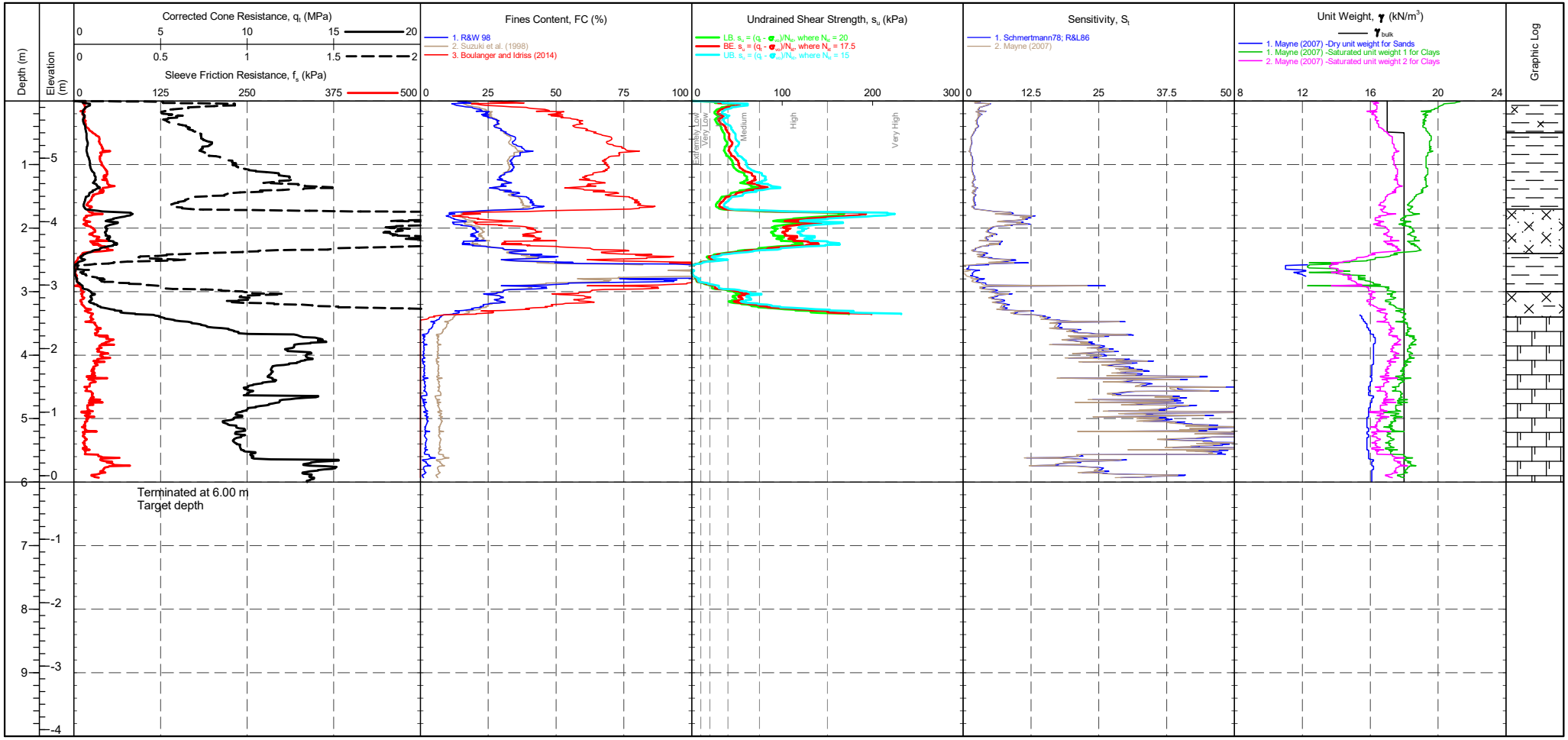
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP129**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500103.299 m<br>NORTHING : 101973.777 m<br>ELEVATION : 5.899 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



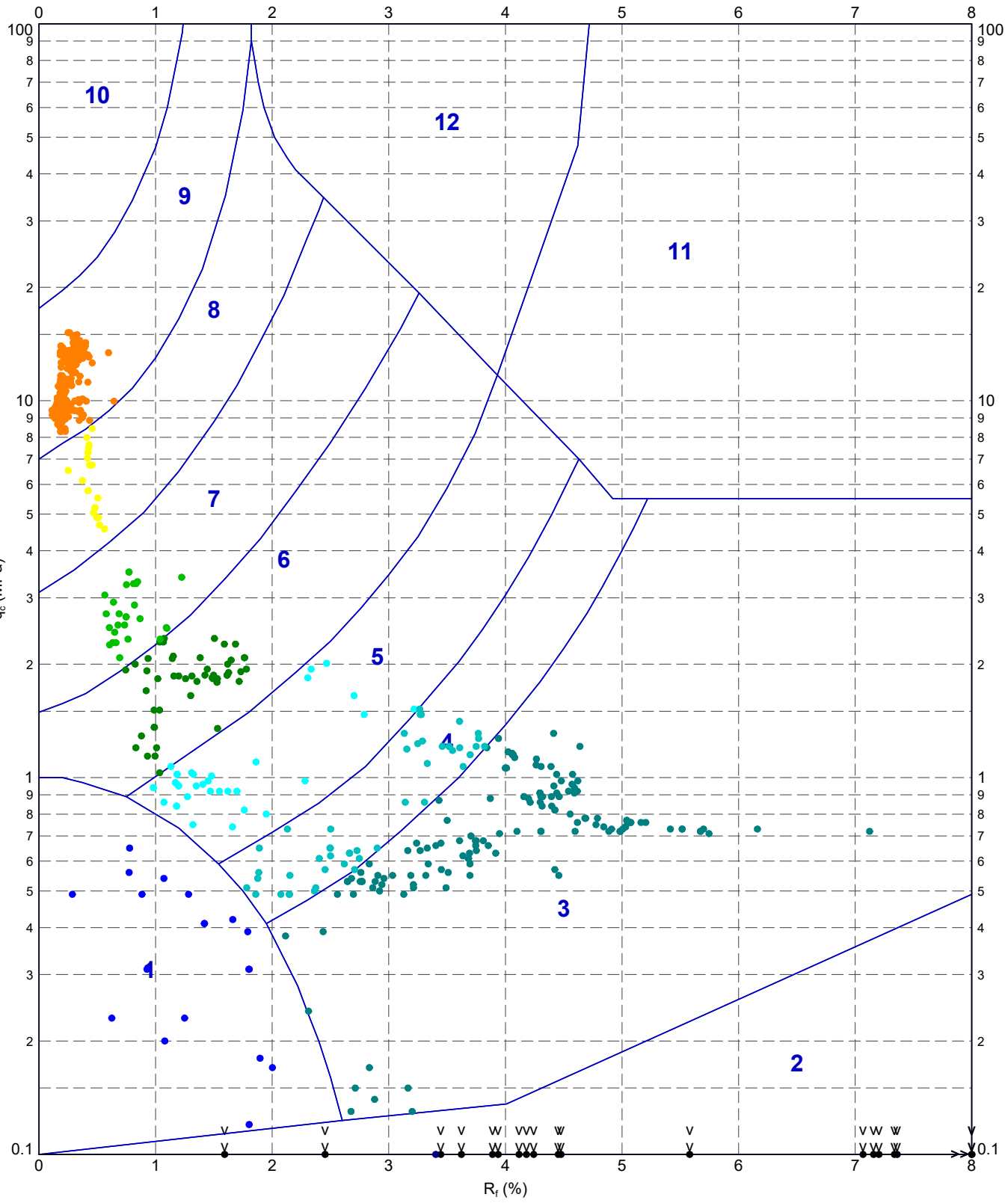

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 221 mV | 218 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 216 mV | 213 mV | -0.002 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 263 mV | 265 mV | 0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2329 mV | 2308 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP129

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

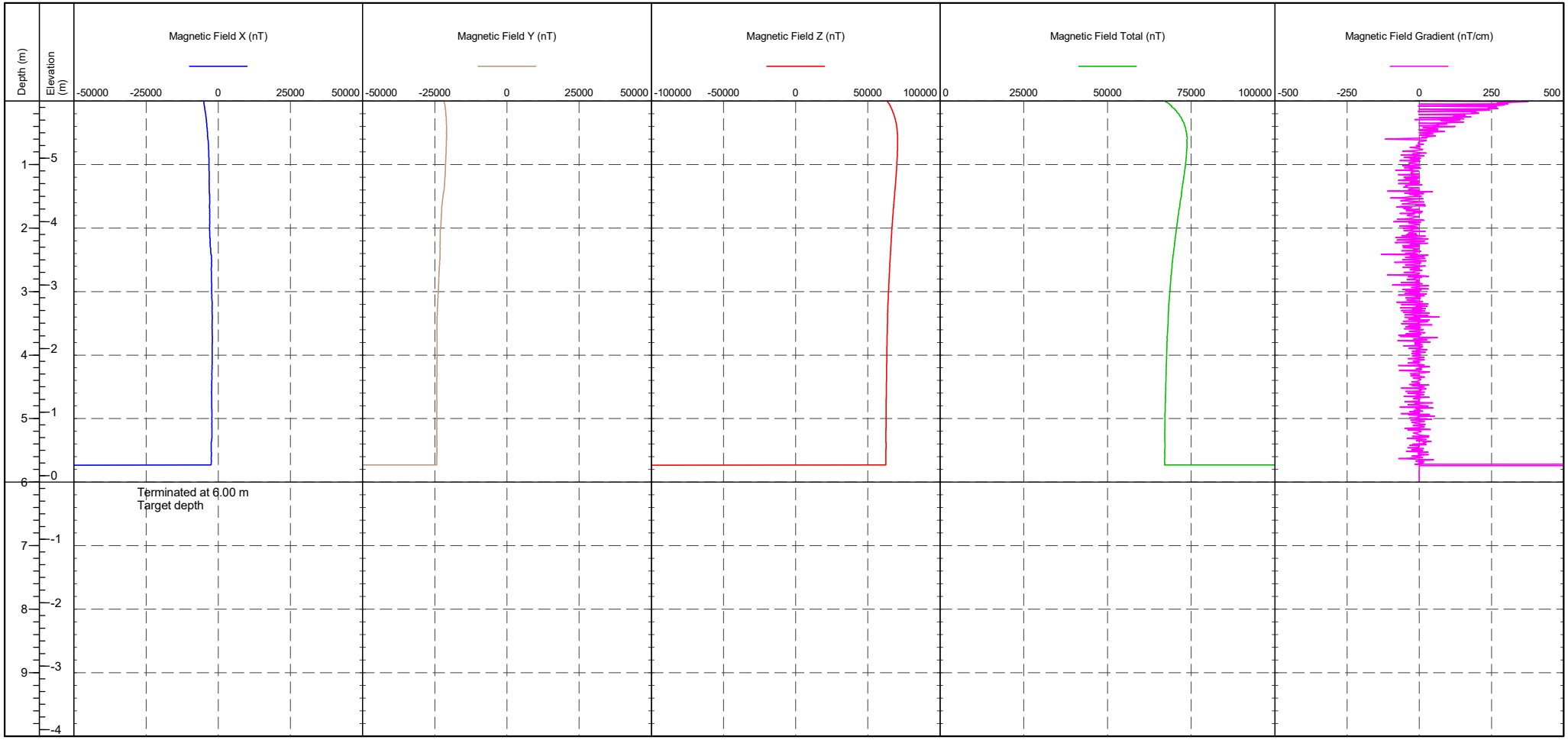
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:40 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP129**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500103.299 m<br>NORTHING : 101973.777 m<br>ELEVATION : 5.899 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



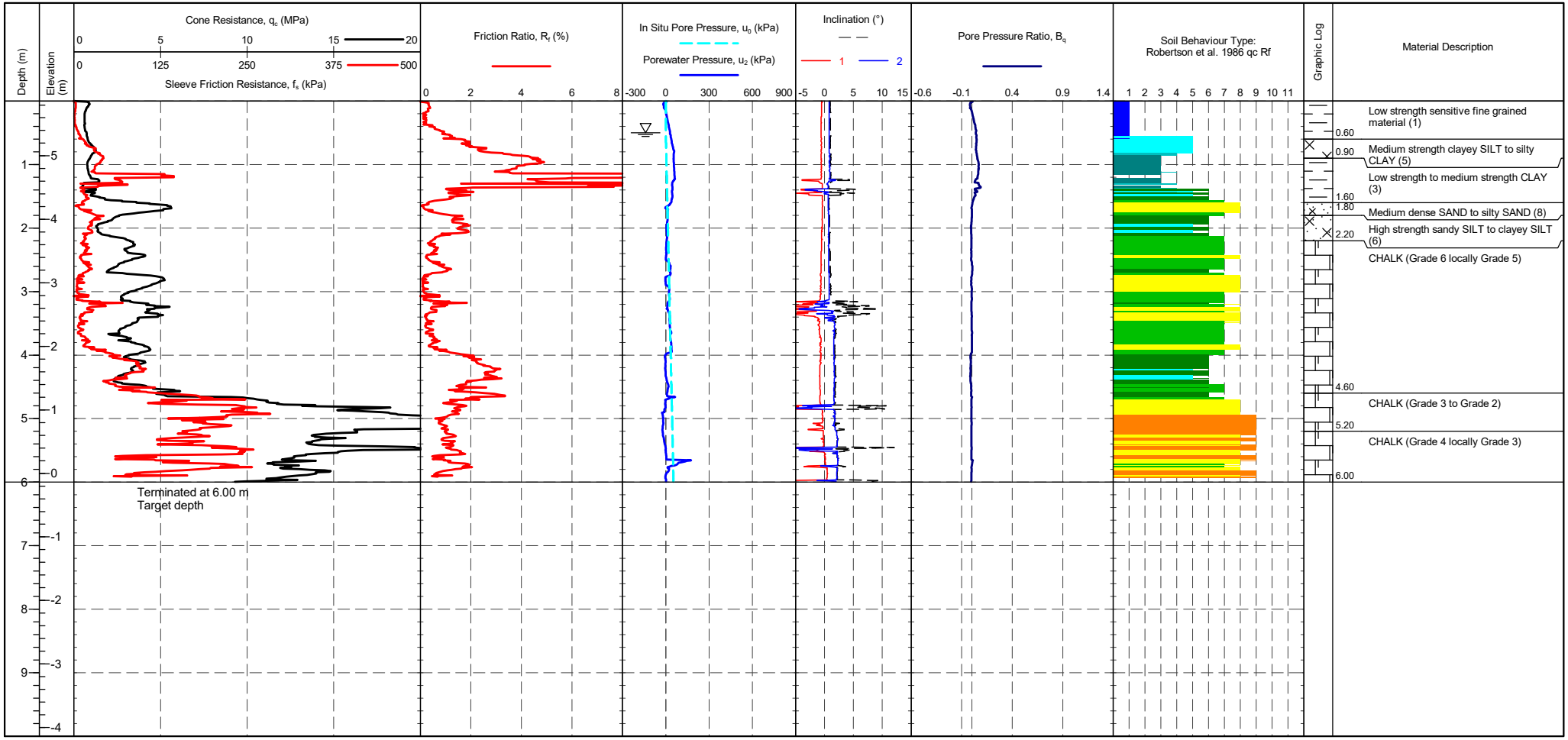

| | | | | |
|---|---|---|---|---|
| CONE ID : S15-CFIP.1186<br>CONE MODEL : Subtraction | RIG : CPT 017 - Griffen<br>OPERATOR : DHo | CPTU ZERO VALUES | | |
| | | Transducer | Pre | Post | Difference |
| | | Tip | 221 mV | 218 mV | -0.033 MPa |
| | | Sleeve | 216 mV | 213 mV | -0.002 kPa |
| | | Pore Pressure 2 | 263 mV | 265 mV | 0.001 kPa |
| | | X-Y Inclinometer | 2329 mV | 2308 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP130**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500169.992 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102019.031 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.863 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 216 mV | 219 mV | 0.033 MPa |
| Sleeve | 215 mV | 218 mV | 0.002 kPa |
| Pore Pressure 2 | 273 mV | 273 mV | 0 kPa |
| X-Y Inclinometer | 2441 mV | 2439 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

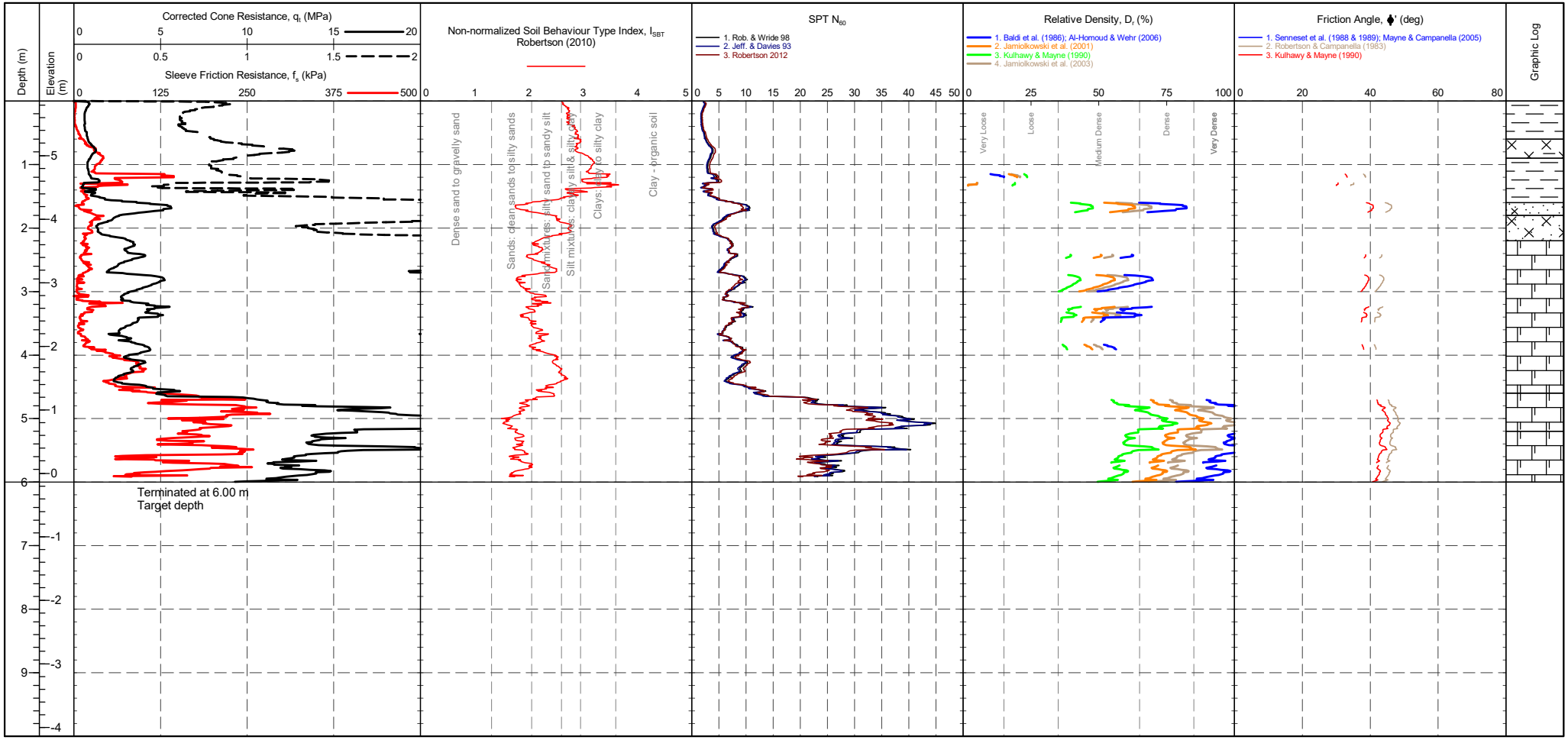
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP130**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500169.992 m<br>NORTHING : 102019.031 m<br>ELEVATION : 5.863 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post / Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 216 mV | 219 mV / 0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 215 mV | 218 mV / 0.002 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 273 mV | 273 mV / 0 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2441 mV | 2439 mV |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

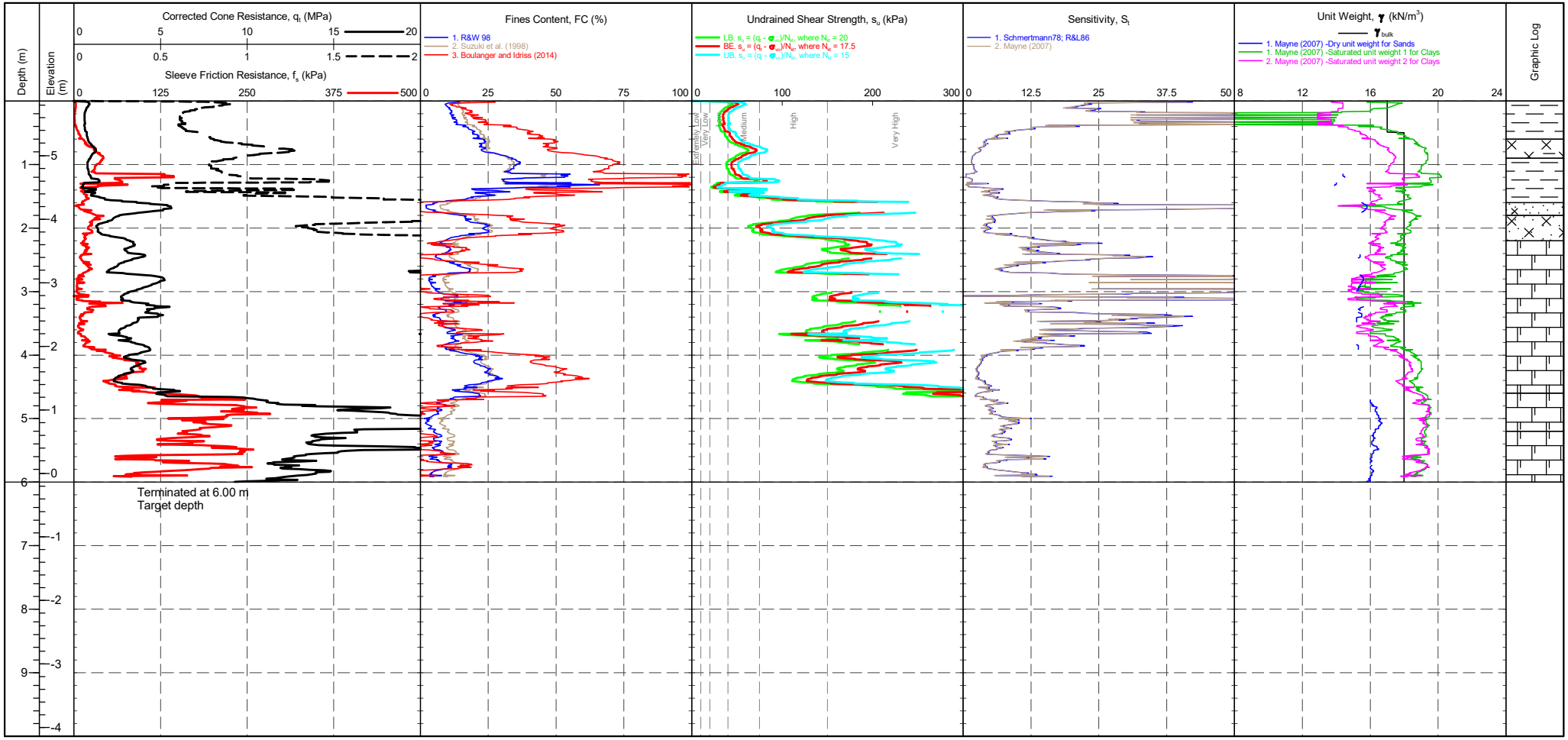
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP130**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500169.992 m<br>NORTHING : 102019.031 m<br>ELEVATION : 5.863 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



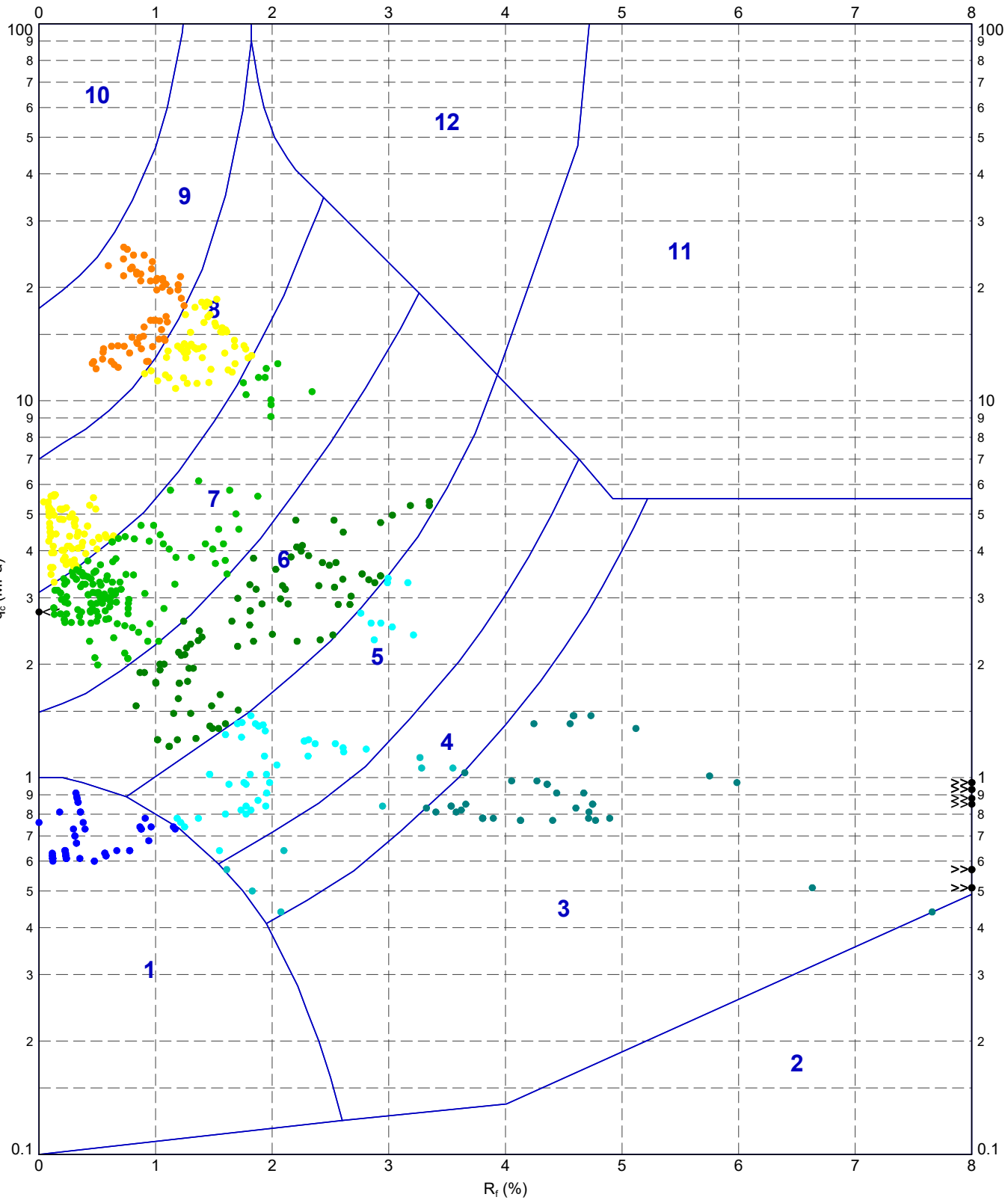

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 216 mV | 219 mV | 0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 215 mV | 218 mV | 0.002 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 273 mV | 273 mV | 0 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2441 mV | 2439 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP130

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

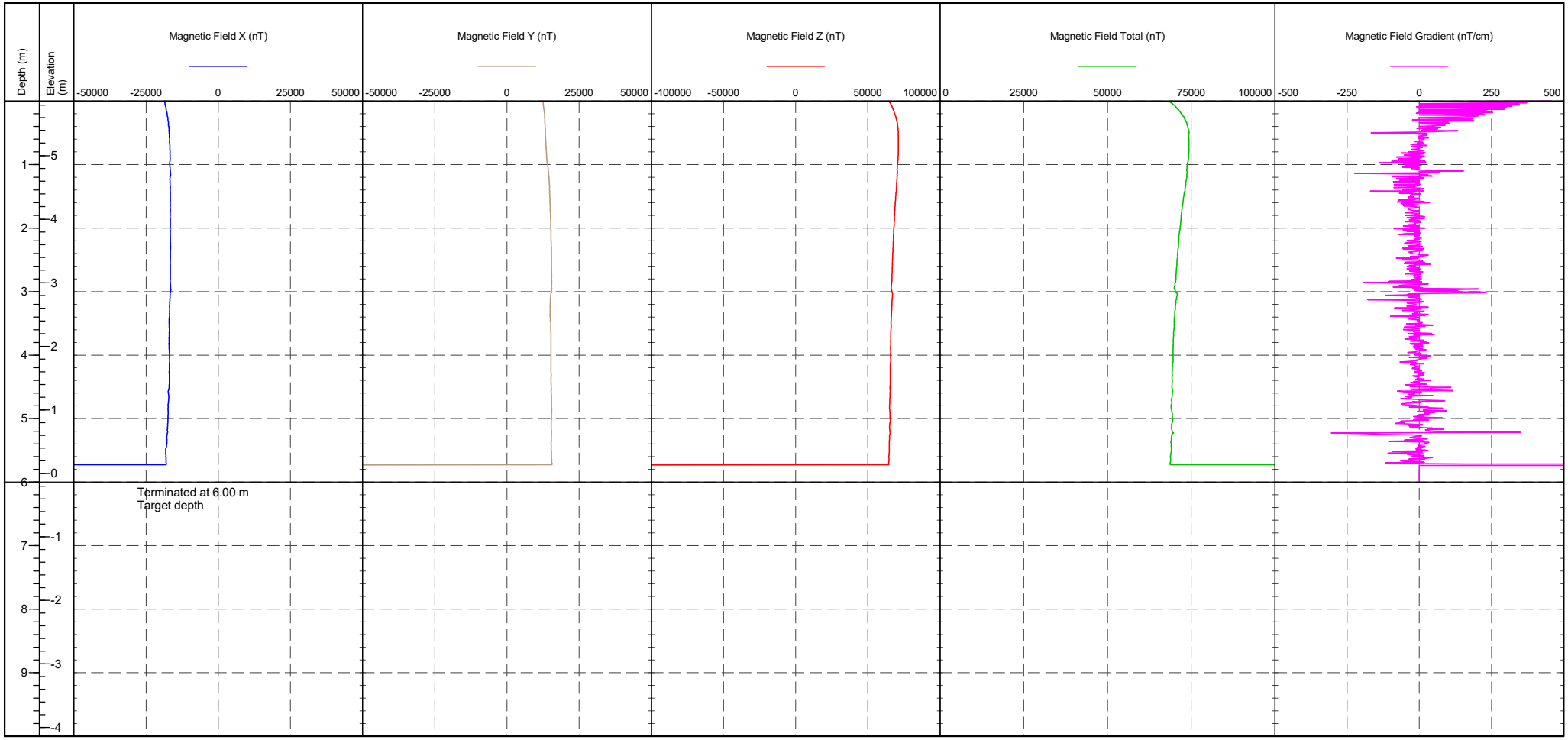
220829-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:41 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP130**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500169.992 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102019.031 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.863 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



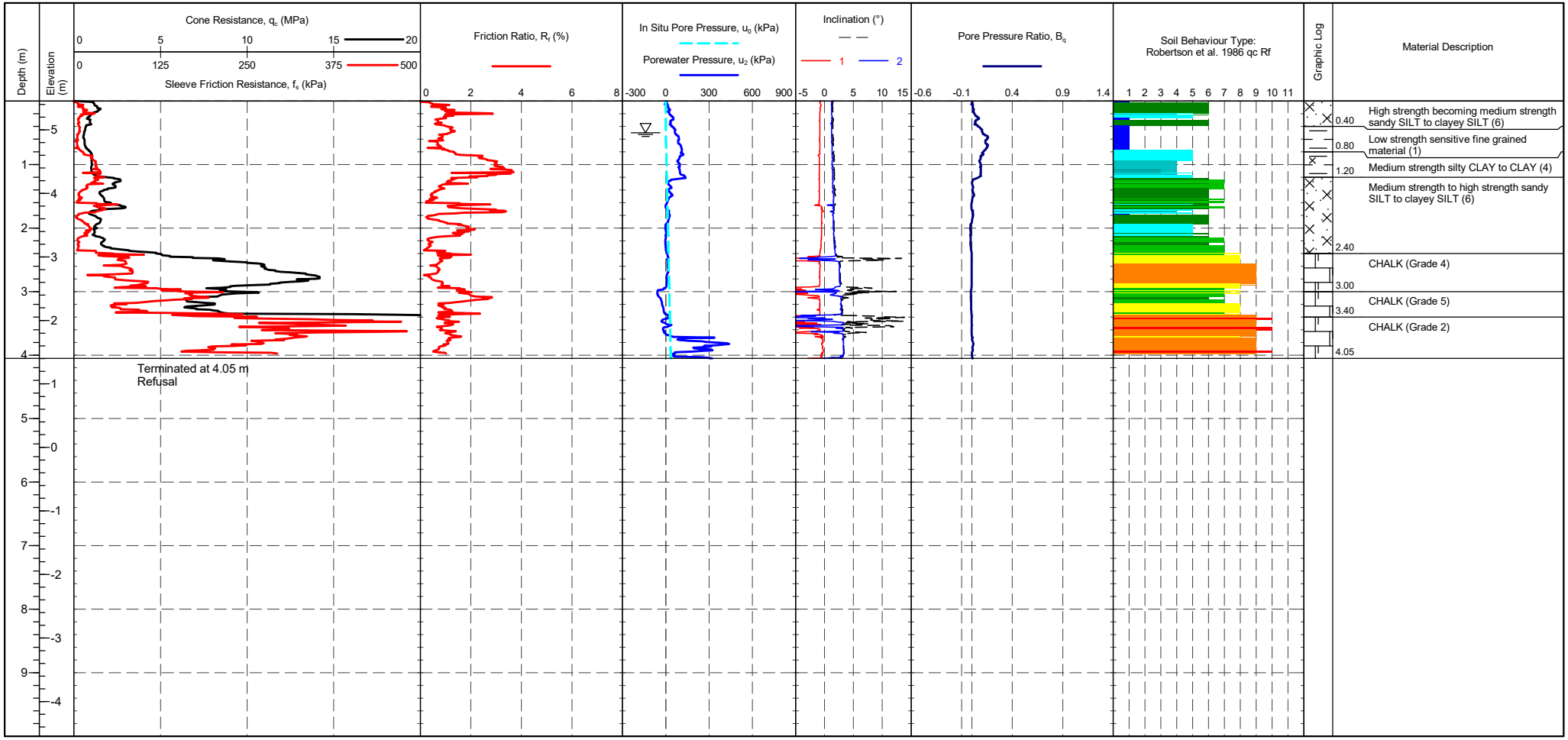

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 216 mV | 219 mV | 0.033 MPa |
| | | | | Sleeve | 215 mV | 218 mV | 0.002 kPa |
| | | | | Pore Pressure 2 | 273 mV | 273 mV | 0 kPa |
| | | | | X-Y Inclinometer | 2441 mV | 2439 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP131**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500231.472 m<br>NORTHING : 102043.110 m<br>ELEVATION : 5.454 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on total pressure. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



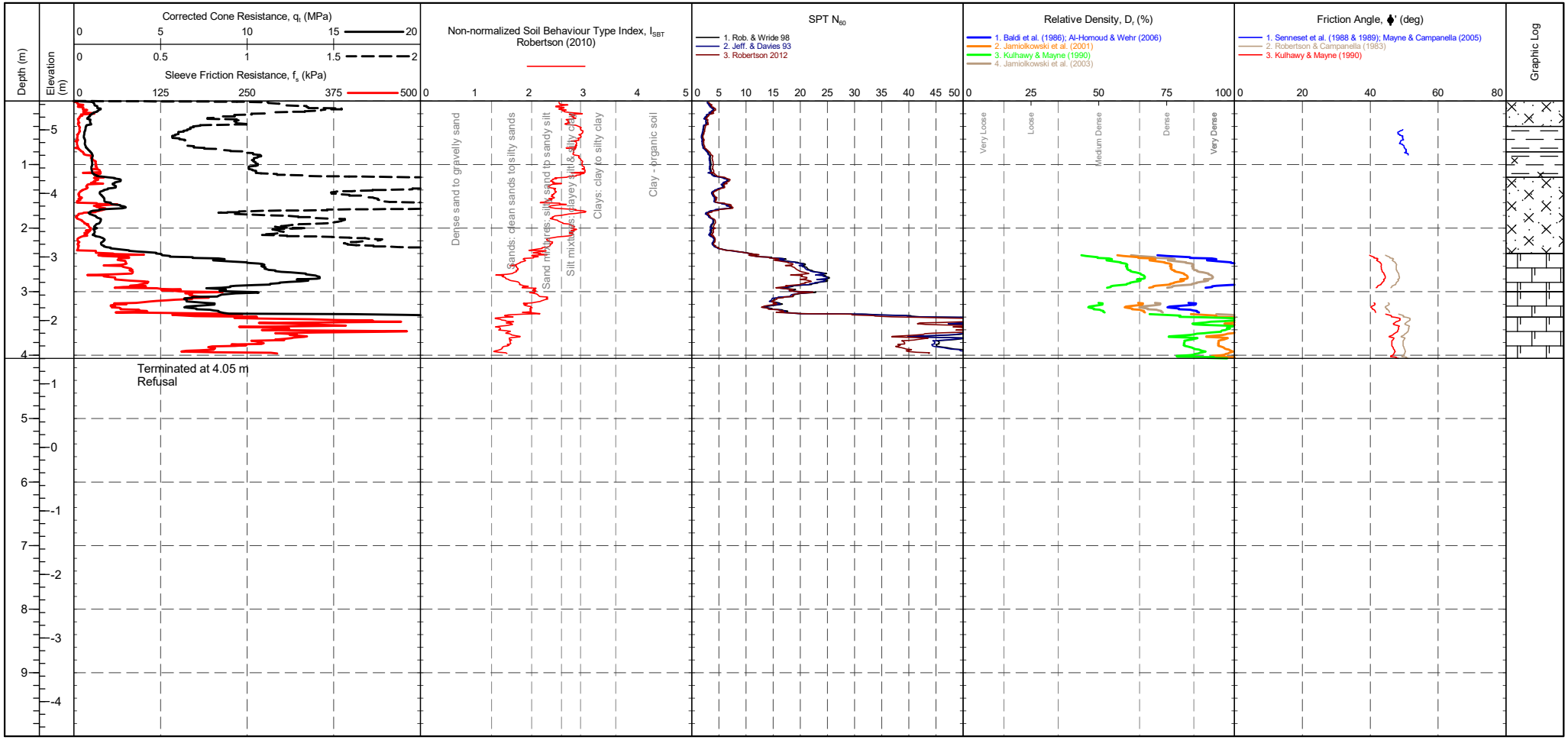

| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1186<br>CALIBRATION DATE : 09/08/2021<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES<br>Transducer: Pre / Post / Difference<br>Tip: 218 mV / 210 mV / -0.088 MPa<br>Sleeve: 217 mV / 210 mV / -0.005 kPa<br>Pore Pressure 2: 265 mV / 262 mV / -0.001 kPa<br>X-Y Inclinometer: 2428 mV / 2405 mV | METHOD: Robertson et al. 1986 qc Rf<br>1 - Sensitive fine grained material<br>2 - Organic material<br>3 - CLAY<br>4 - Silty CLAY to CLAY<br>5 - Clayey SILT to silty CLAY<br>6 - Sandy SILT to clayey SILT<br>7 - Silty SAND to sandy SILT<br>8 - SAND to silty SAND<br>9 - SAND<br>10 - Gravelly SAND to SAND<br>11 - Very stiff fine grained<br>12 - SAND to clayey SAND<br>Groundwater Level<br>Dissipation Test |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP131**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500231.472 m<br>NORTHING : 102043.110 m<br>ELEVATION : 5.454 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on total pressure. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 218 mV | 210 mV | -0.088 MPa |
| Sleeve | 217 mV | 210 mV | -0.005 kPa |
| Pore Pressure 2 | 265 mV | 262 mV | -0.001 kPa |
| X-Y Inclinometer | 2428 mV | 2405 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

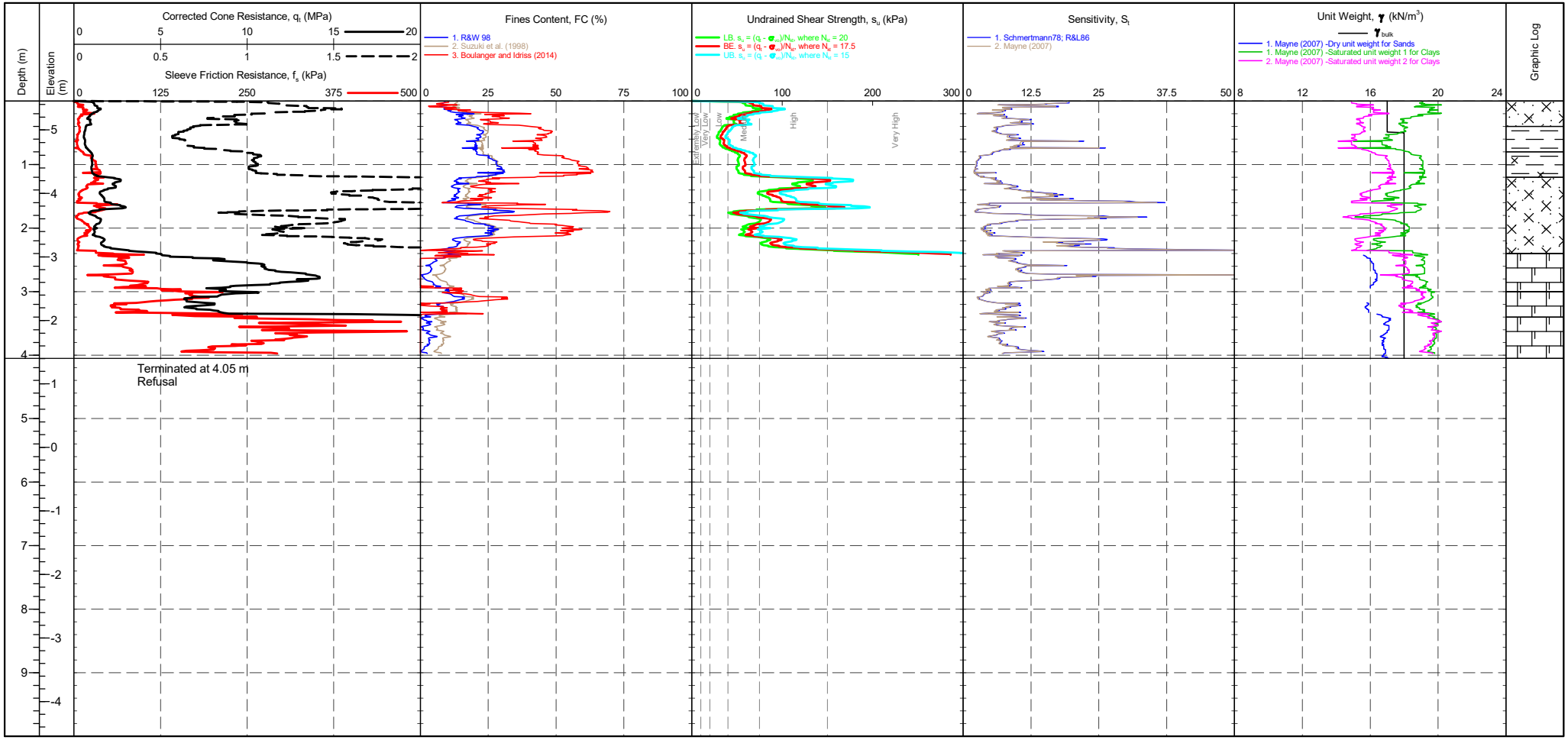
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP131**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500231.472 m<br>NORTHING : 102043.110 m<br>ELEVATION : 5.454 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on total pressure. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



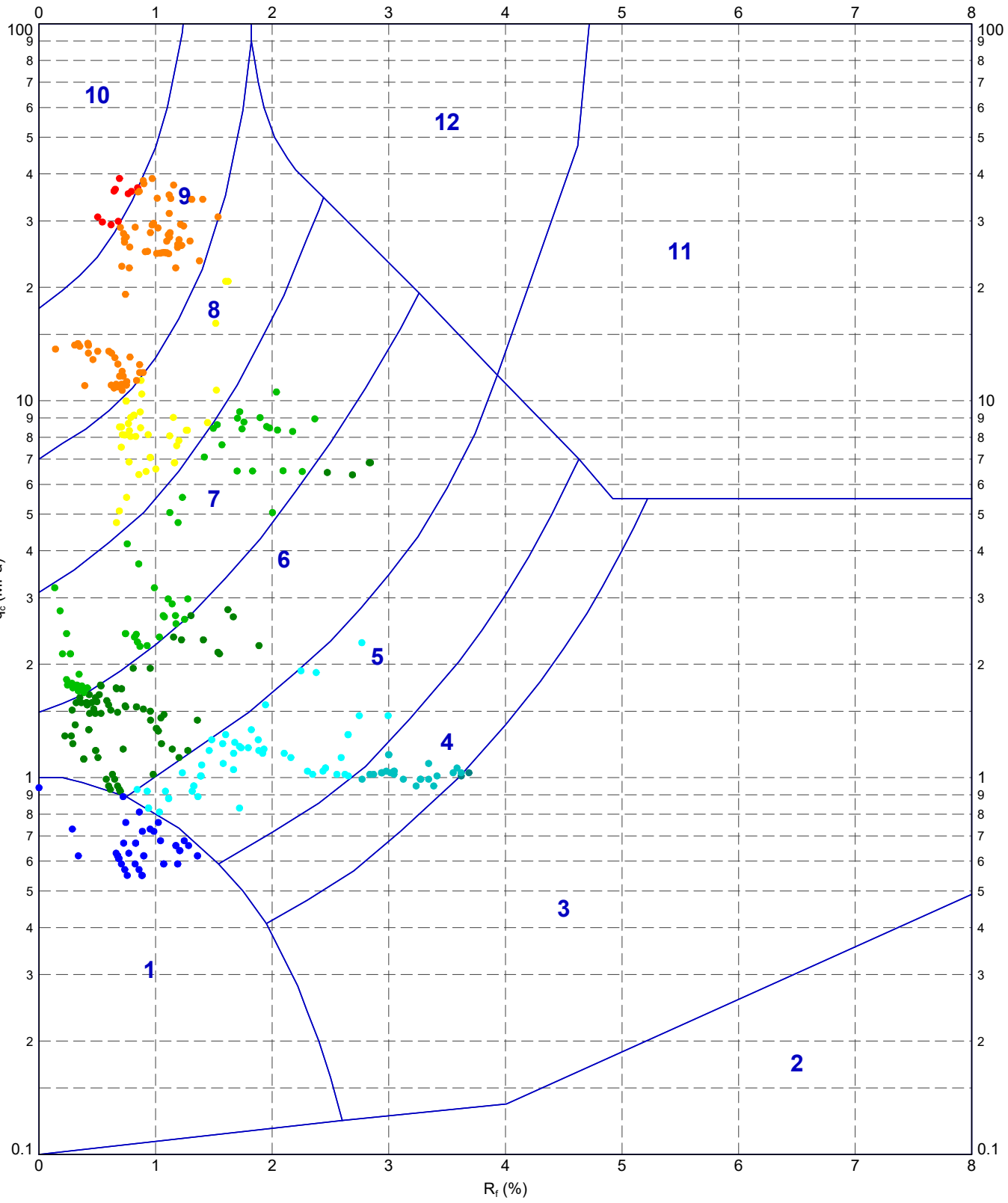

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 218 mV | 210 mV | -0.088 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 217 mV | 210 mV | -0.005 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 265 mV | 262 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2428 mV | 2405 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP131

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

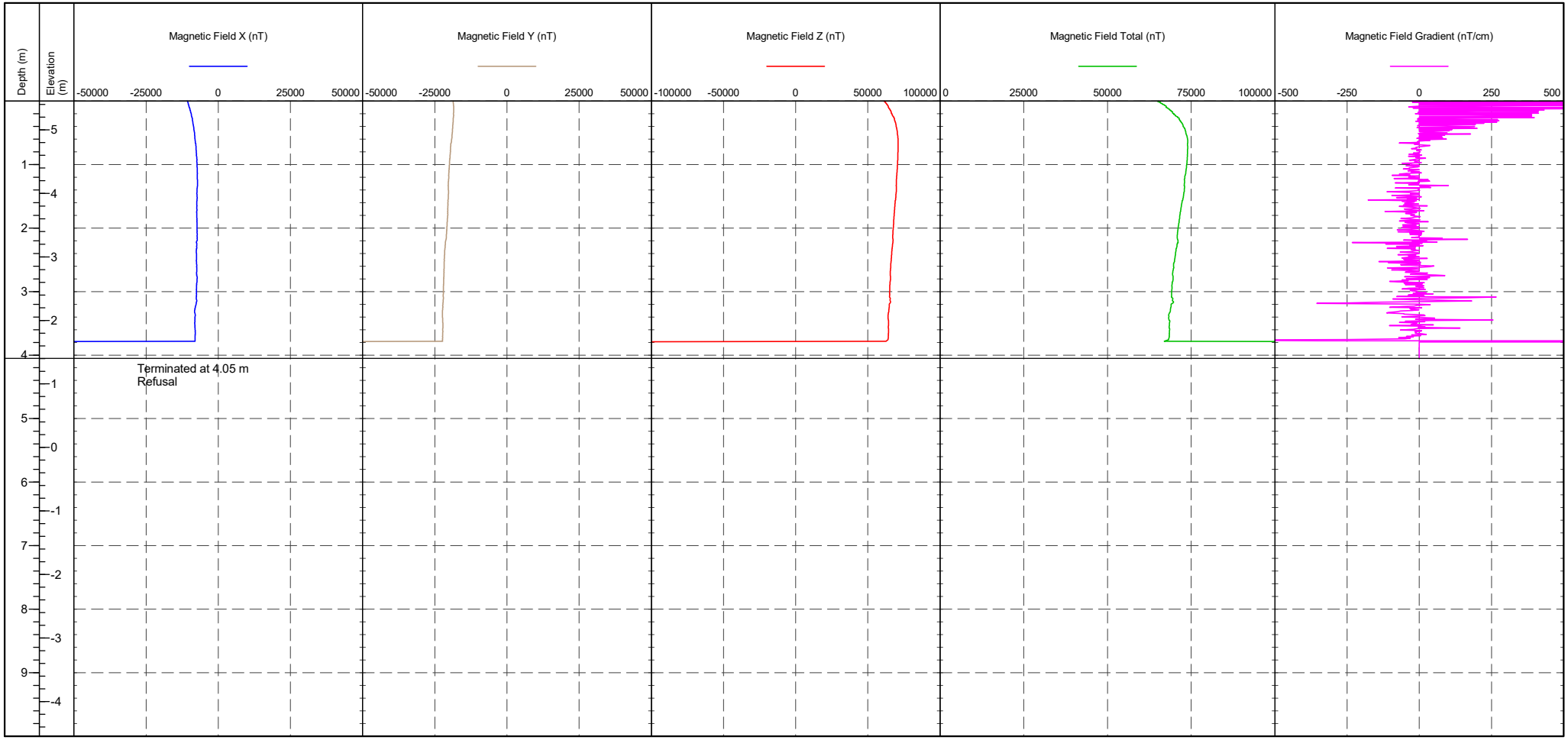
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP131**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500231.472 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102043.110 m | Test refused on total pressure. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.454 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |



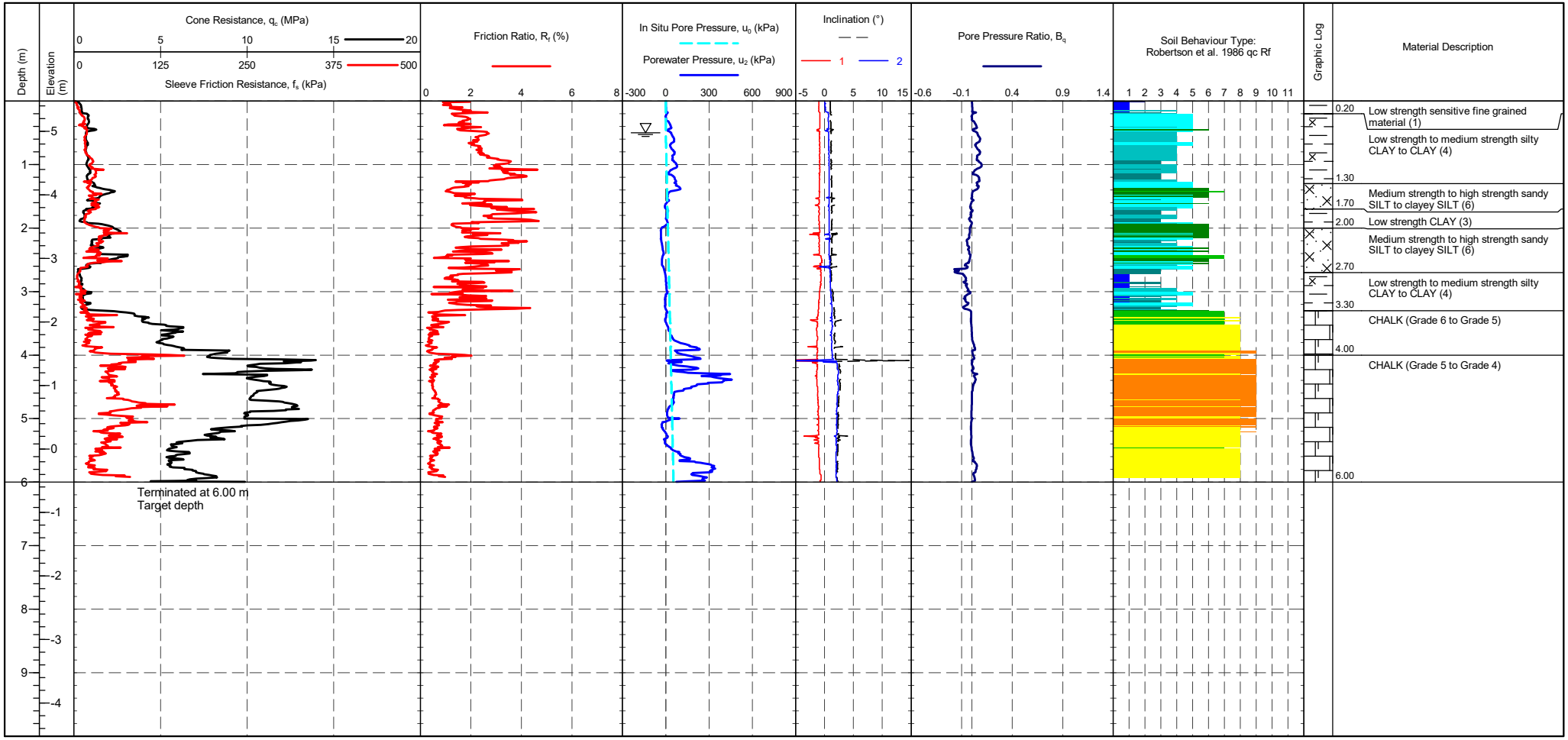

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 218 mV | 210 mV | -0.088 MPa |
| | | | | Sleeve | 217 mV | 210 mV | -0.005 kPa |
| | | | | Pore Pressure 2 | 265 mV | 262 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2428 mV | 2405 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP132**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500299.435 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102053.376 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.478 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 | | |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen | | |
| CONE AREA | : 15cm² | OPERATOR | : DHo | | |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None | | |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold | | |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 217 mV | -0.055 MPa |
| Sleeve | 216 mV | 217 mV | 0.001 kPa |
| Pore Pressure 2 | 266 mV | 261 mV | -0.001 kPa |
| X-Y Inclinometer | 2385 mV | 2401 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

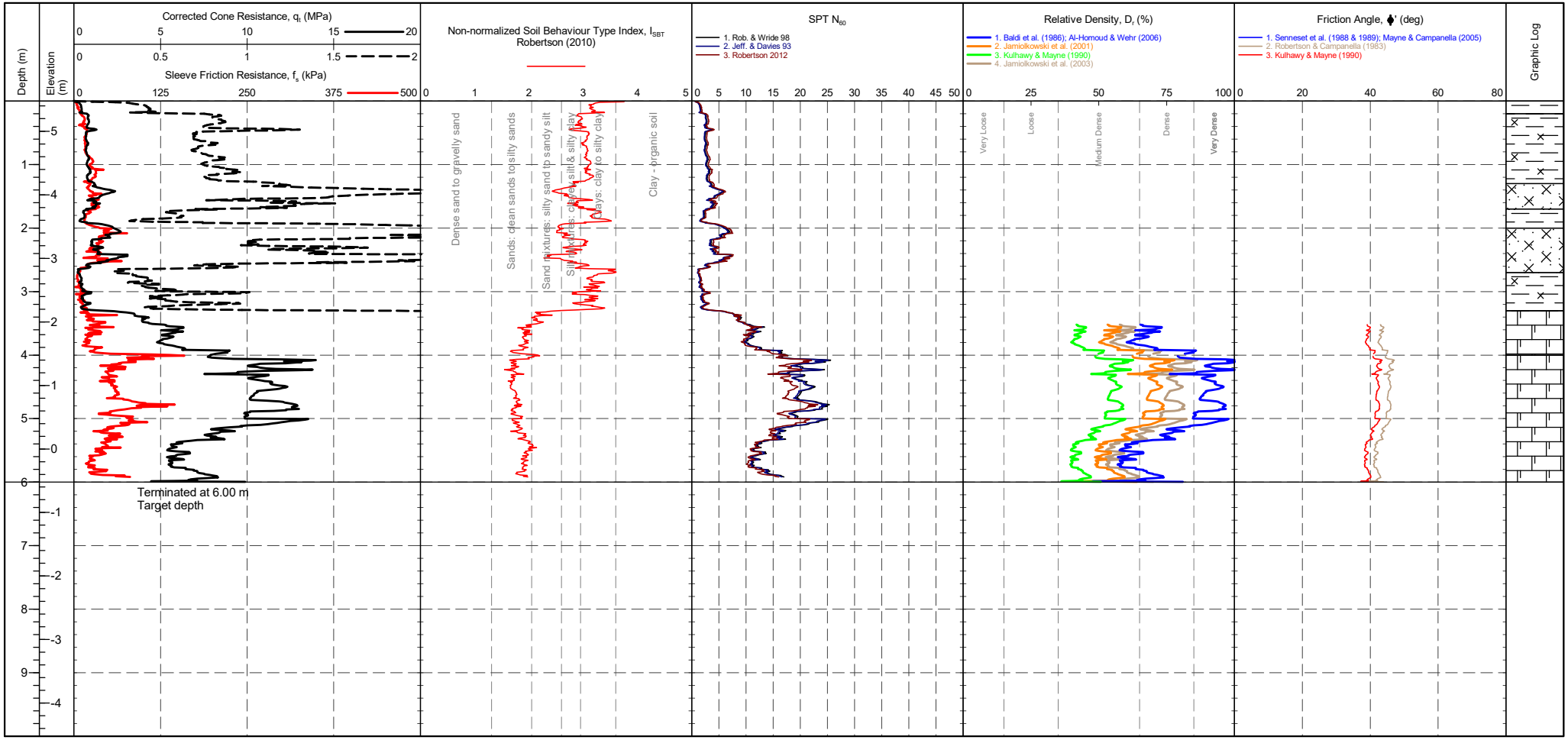
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP132**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500299.435 m<br>NORTHING : 102053.376 m<br>ELEVATION : 5.478 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 222 mV | 217 mV | -0.055 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 216 mV | 217 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 266 mV | 261 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2385 mV | 2401 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

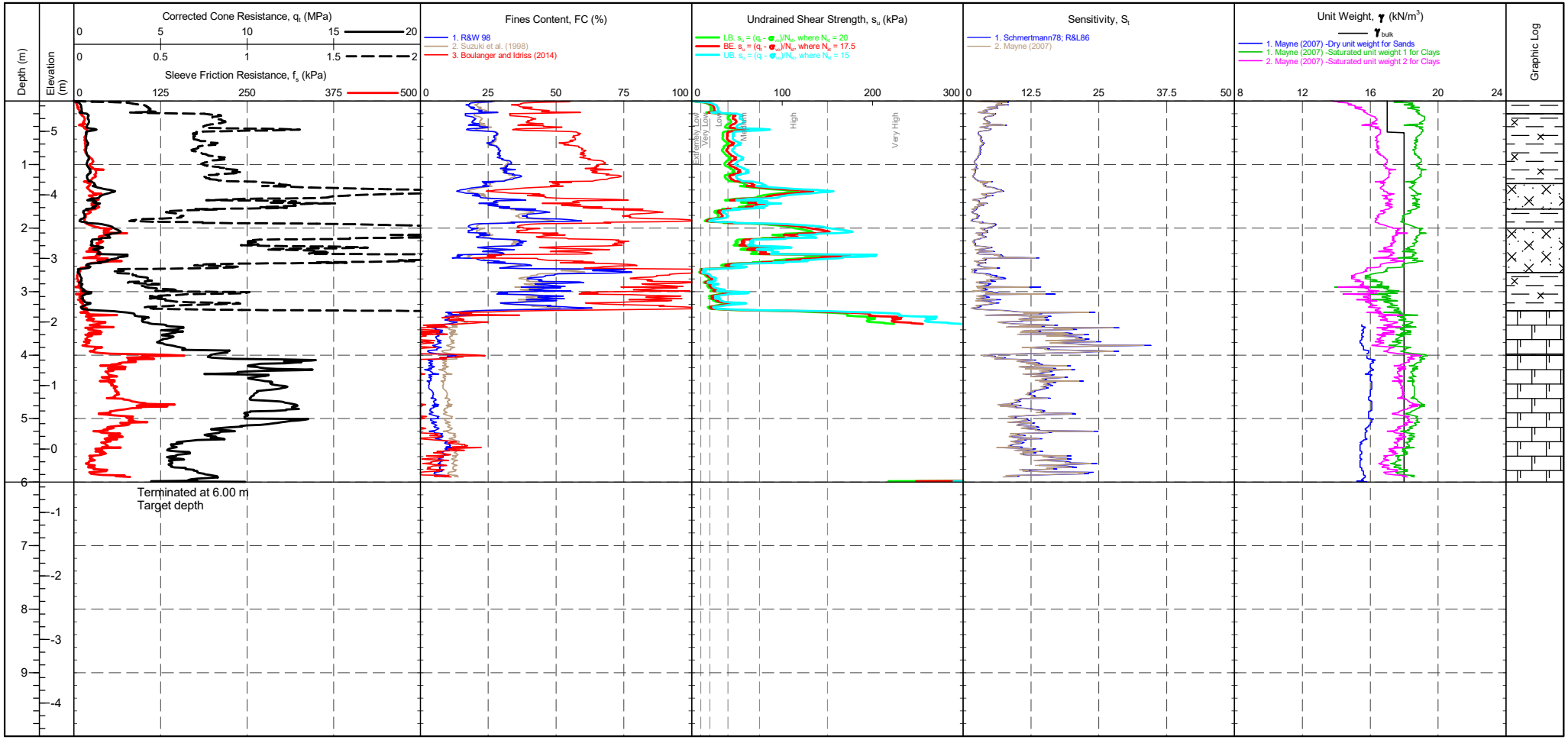
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP132**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500299.435 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102053.376 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.478 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



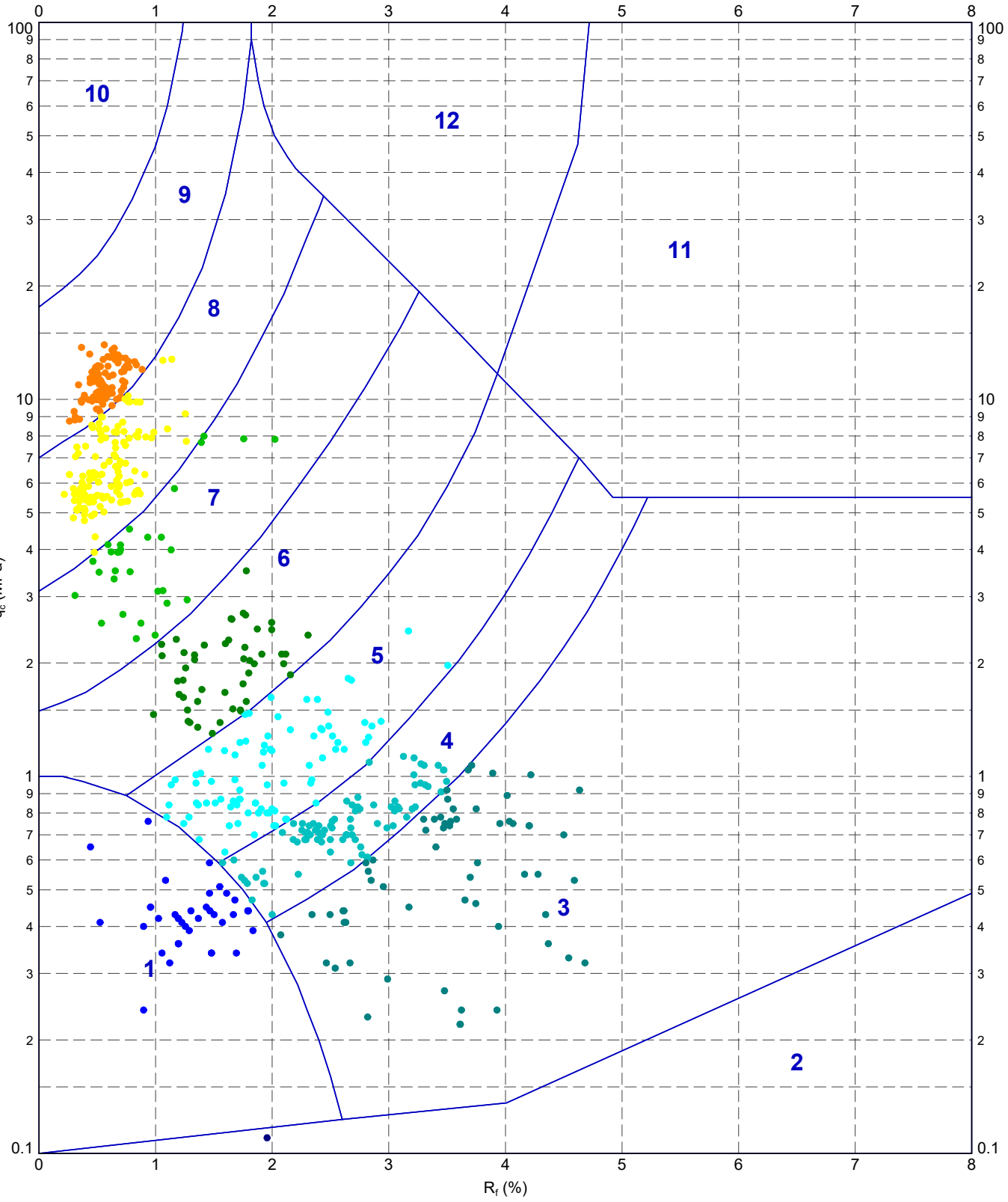

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 222 mV | 217 mV | -0.055 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 216 mV | 217 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 266 mV | 261 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2385 mV | 2401 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP132

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

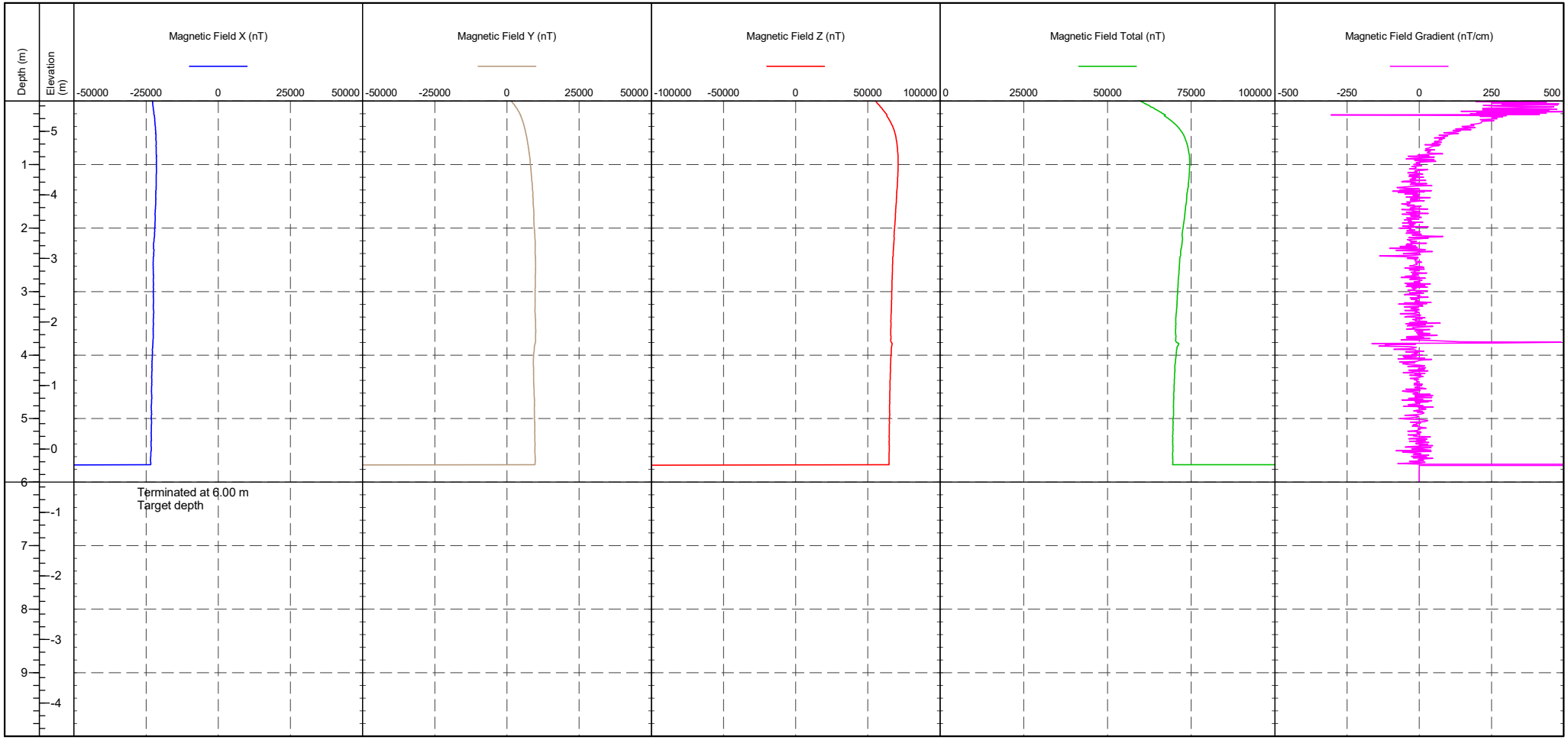
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP132**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500299.435 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102053.376 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.478 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



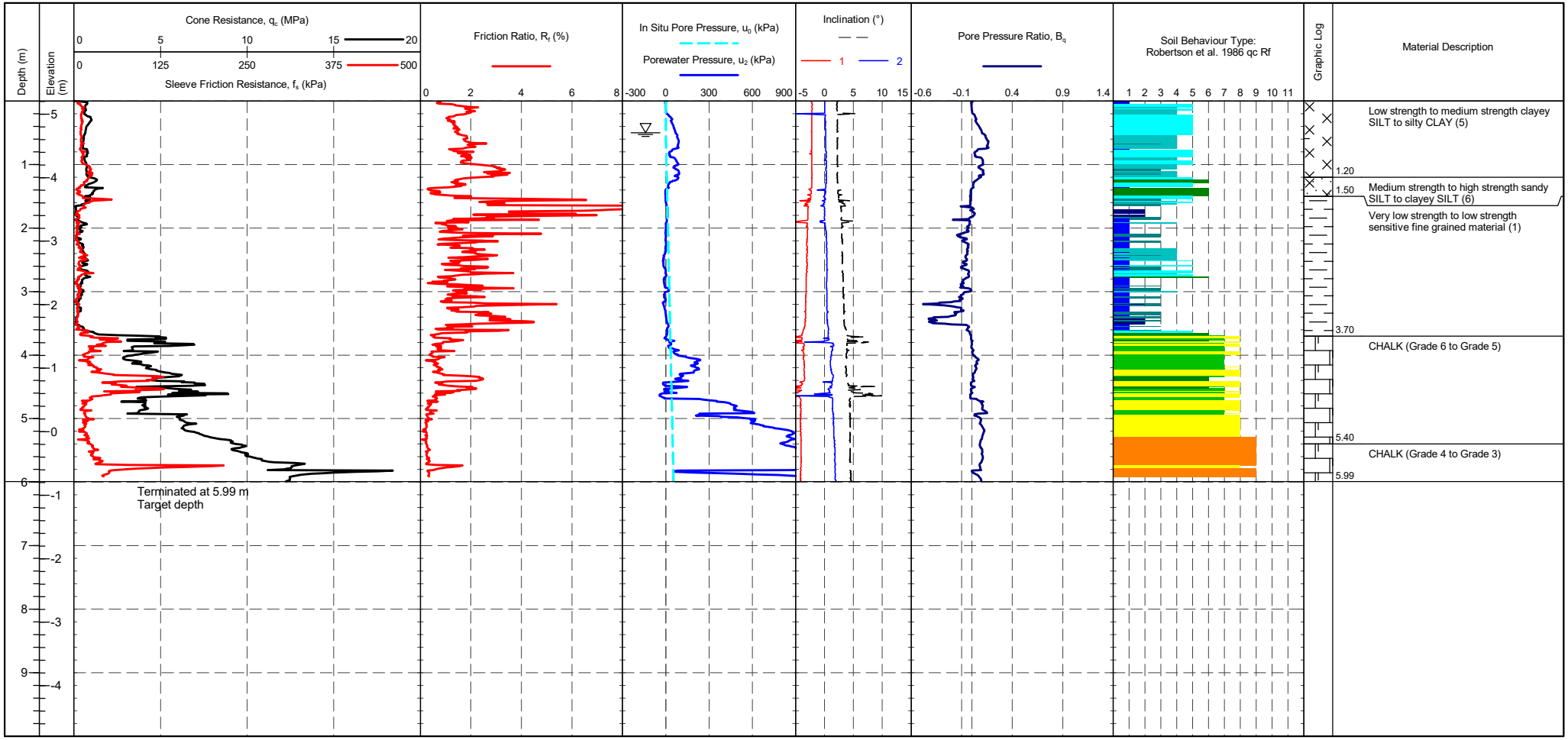

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 222 mV | 217 mV | -0.055 MPa |
| | | | | Sleeve | 216 mV | 217 mV | 0.001 kPa |
| | | | | Pore Pressure 2 | 266 mV | 261 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2385 mV | 2401 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP133**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500370.562 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102077.627 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.206 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 217 mV | -0.044 MPa |
| Sleeve | 217 mV | 215 mV | -0.001 kPa |
| Pore Pressure 2 | 259 mV | 264 mV | 0.001 kPa |
| X-Y Inclinometer | 2237 mV | 2237 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

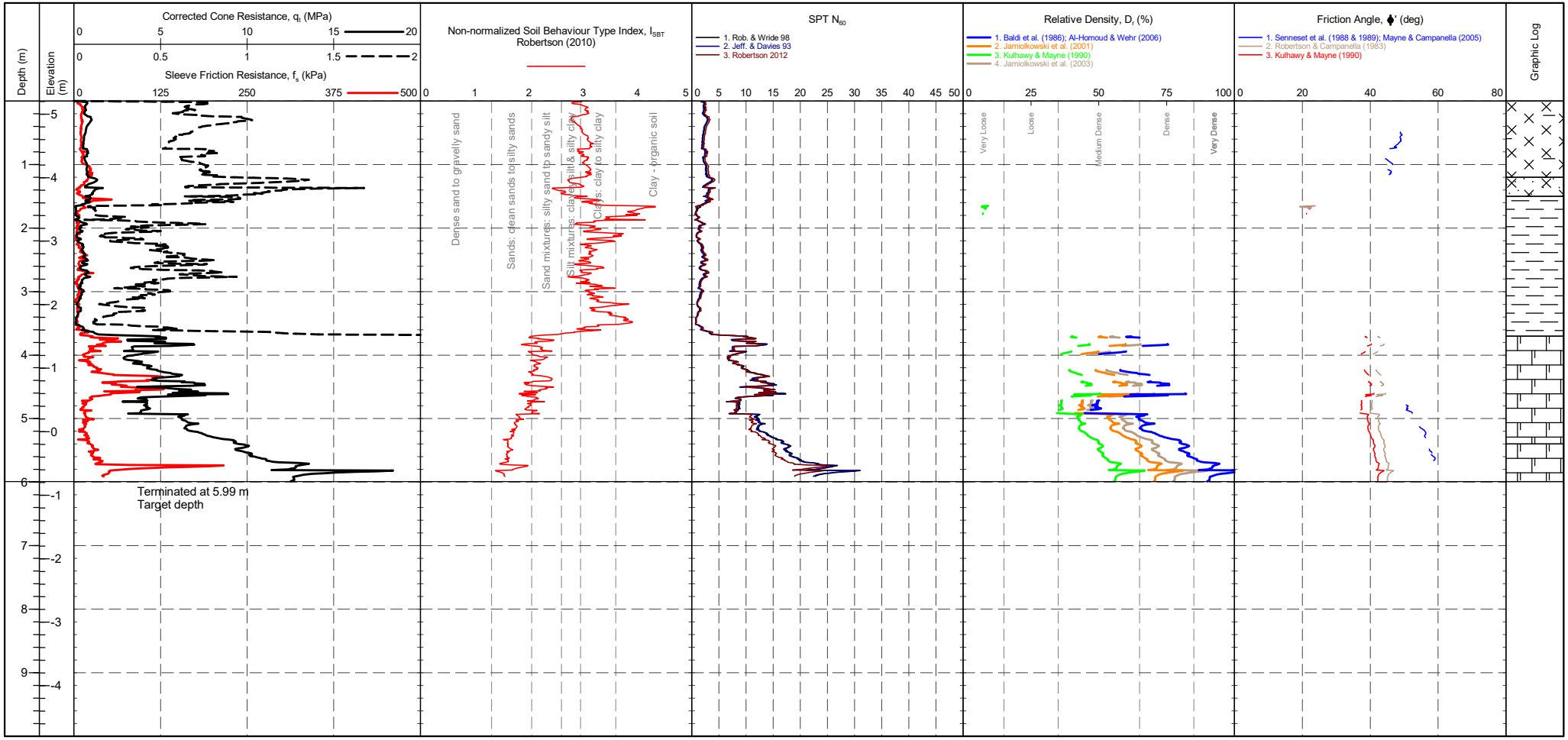
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP133**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500370.562 m<br>NORTHING : 102077.627 m<br>ELEVATION : 5.206 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 221 mV | 217 mV |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 217 mV | 215 mV |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 259 mV | 264 mV |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2237 mV | 2237 mV |

| Transducer | Difference |
|---|---|
| Tip | -0.044 MPa |
| Sleeve | -0.001 kPa |
| Pore Pressure 2 | 0.001 kPa |
| X-Y Inclinometer | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

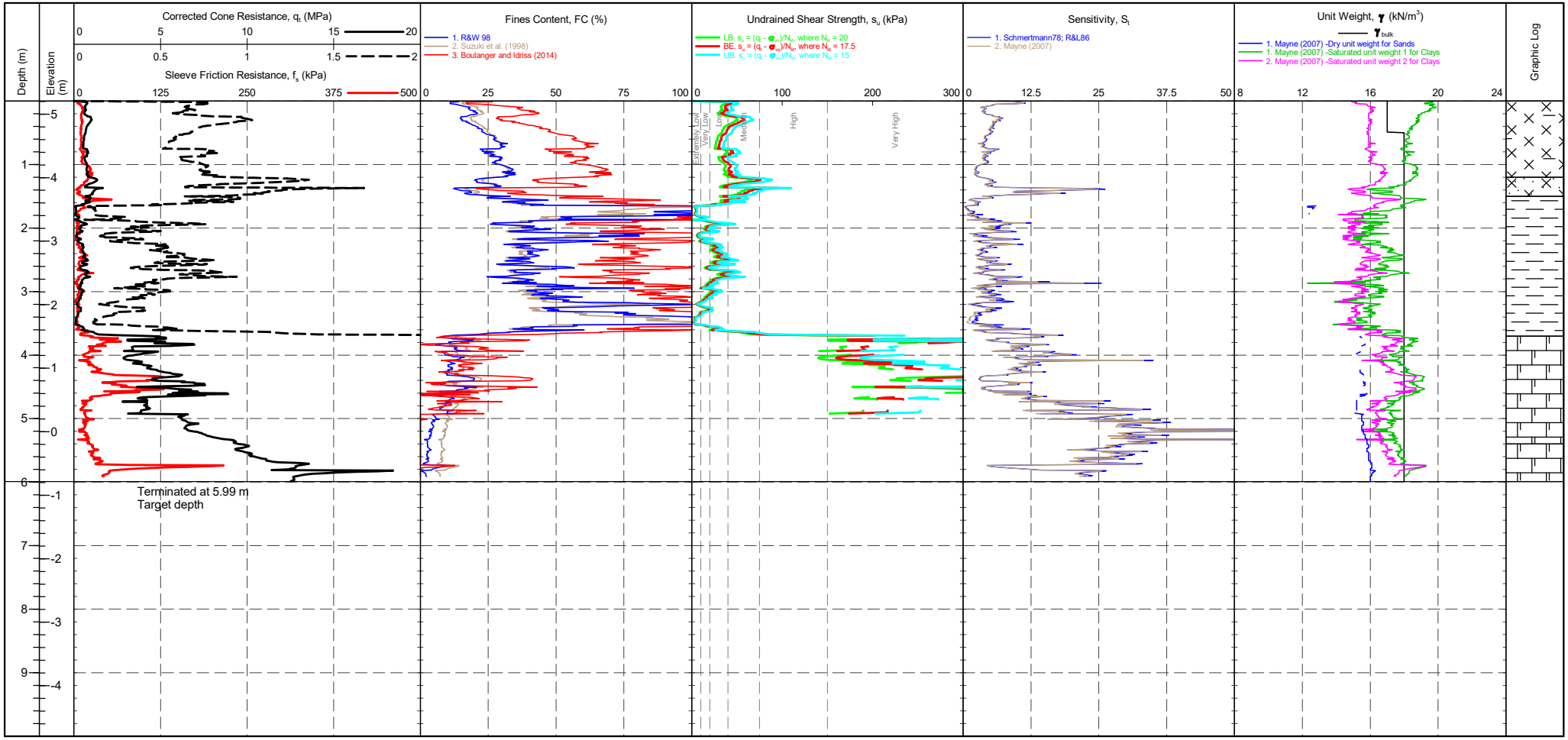
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP133**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500370.562 m<br>NORTHING : 102077.627 m<br>ELEVATION : 5.206 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



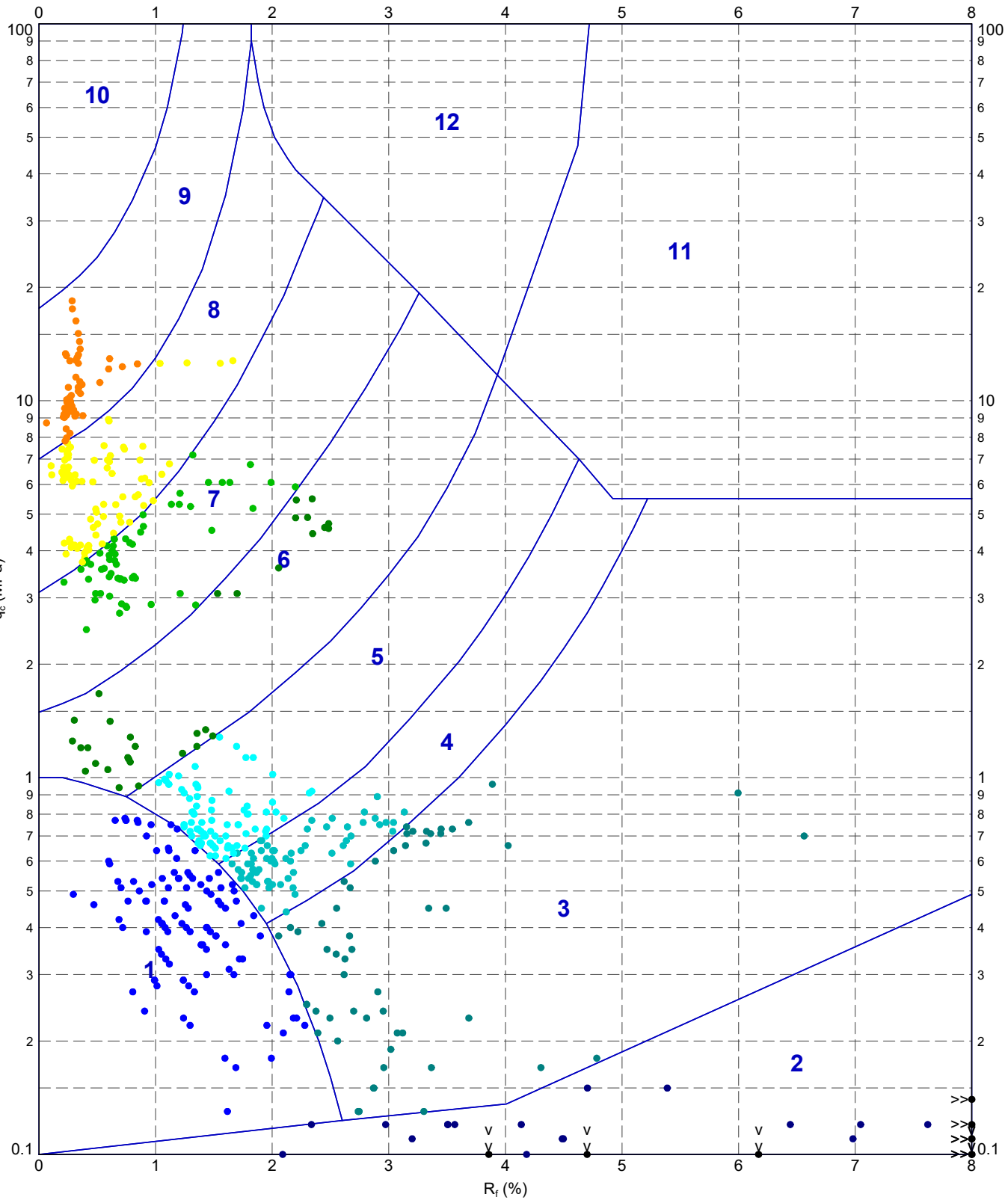

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 221 mV | 217 mV | -0.044 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 217 mV | 215 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 259 mV | 264 mV | 0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2237 mV | 2237 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP133

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

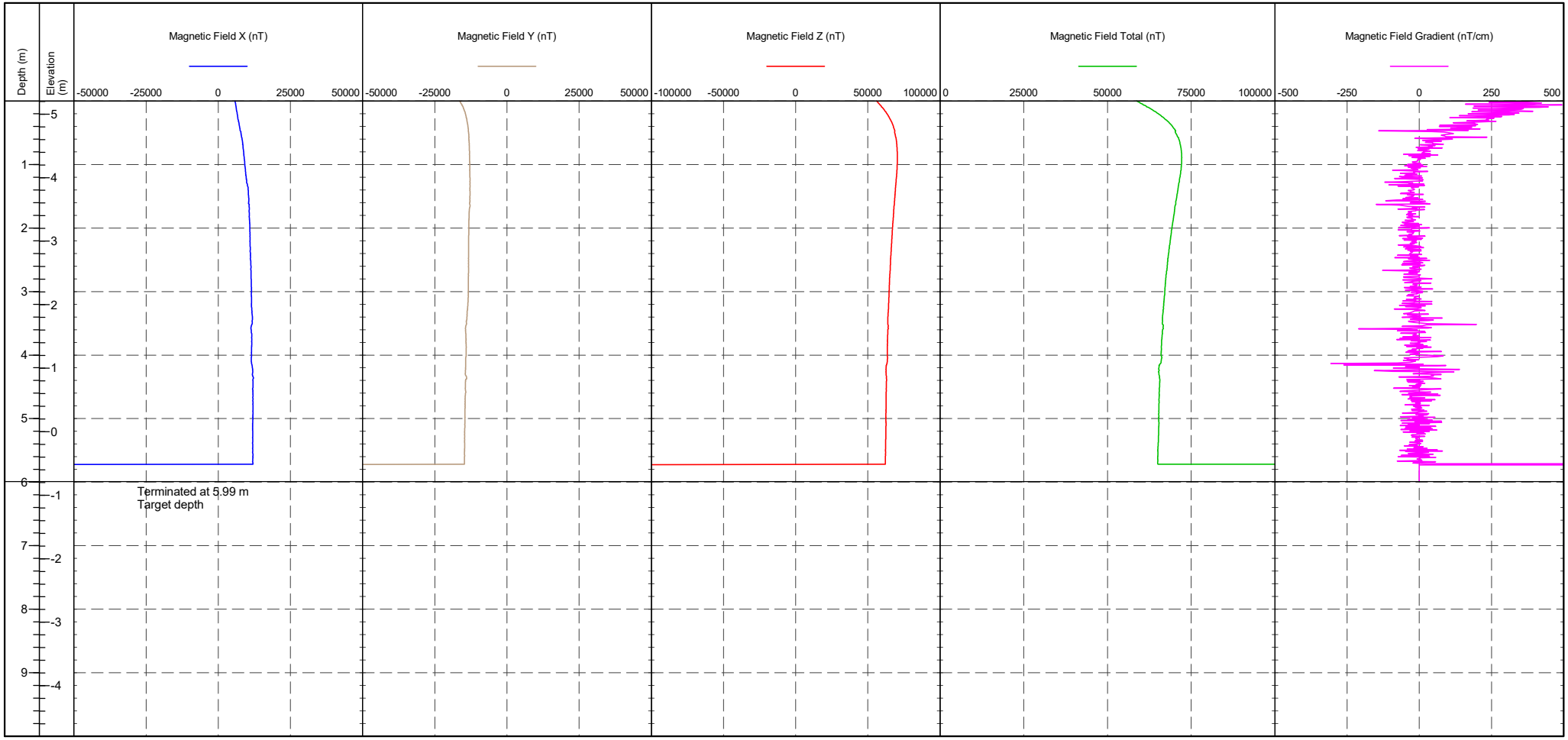
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:43 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP133**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500370.562 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102077.627 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.206 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



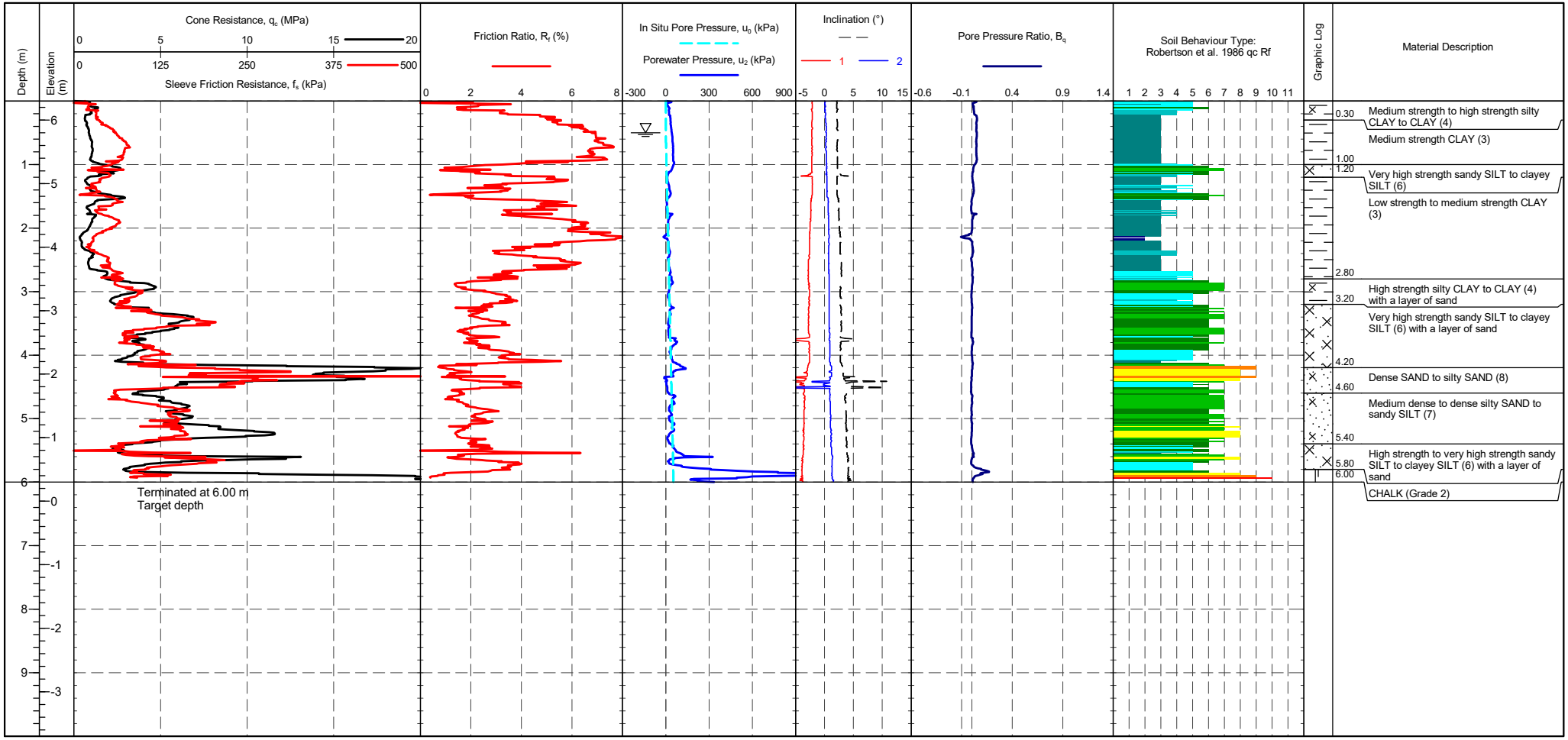

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 221 mV | 217 mV | -0.044 MPa |
| | | | | Sleeve | 217 mV | 215 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 259 mV | 264 mV | 0.001 kPa |
| | | | | X-Y Inclinometer | 2237 mV | 2237 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP137**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 499914.533 m<br>NORTHING : 101842.976 m<br>ELEVATION : 6.300 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 220 mV | 221 mV | 0.011 MPa |
| Sleeve | 212 mV | 213 mV | 0.001 kPa |
| Pore Pressure 2 | 262 mV | 256 mV | -0.002 kPa |
| X-Y Inclinometer | 2266 mV | 2345 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

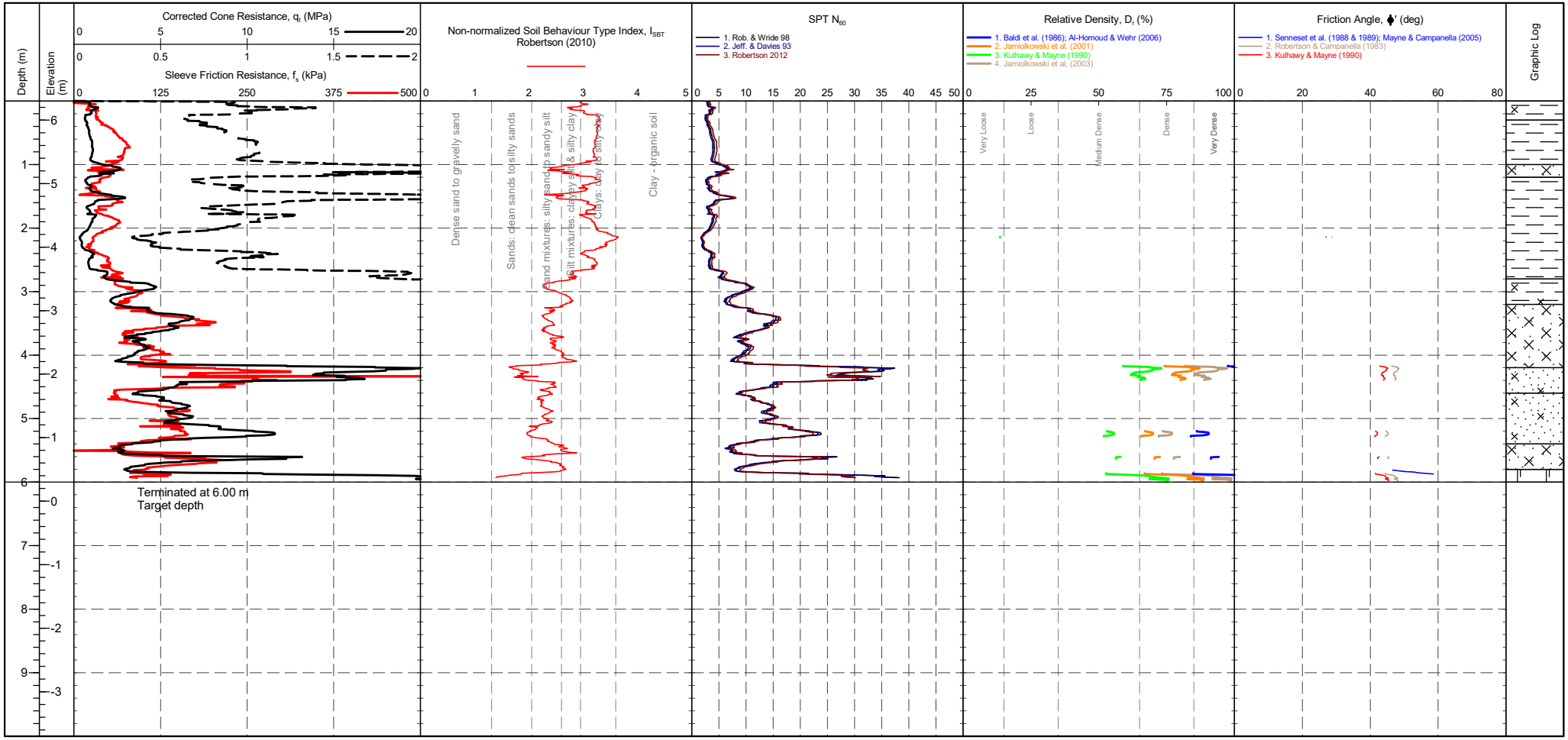
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP137**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 499914.533 m<br>NORTHING : 101842.976 m<br>ELEVATION : 6.300 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 220 mV | 221 mV |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 212 mV | 213 mV |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 262 mV | 256 mV |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2266 mV | 2345 mV |

| Transducer | Difference |
|---|---|
| Tip | 0.011 MPa |
| Sleeve | 0.001 kPa |
| Pore Pressure 2 | -0.002 kPa |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

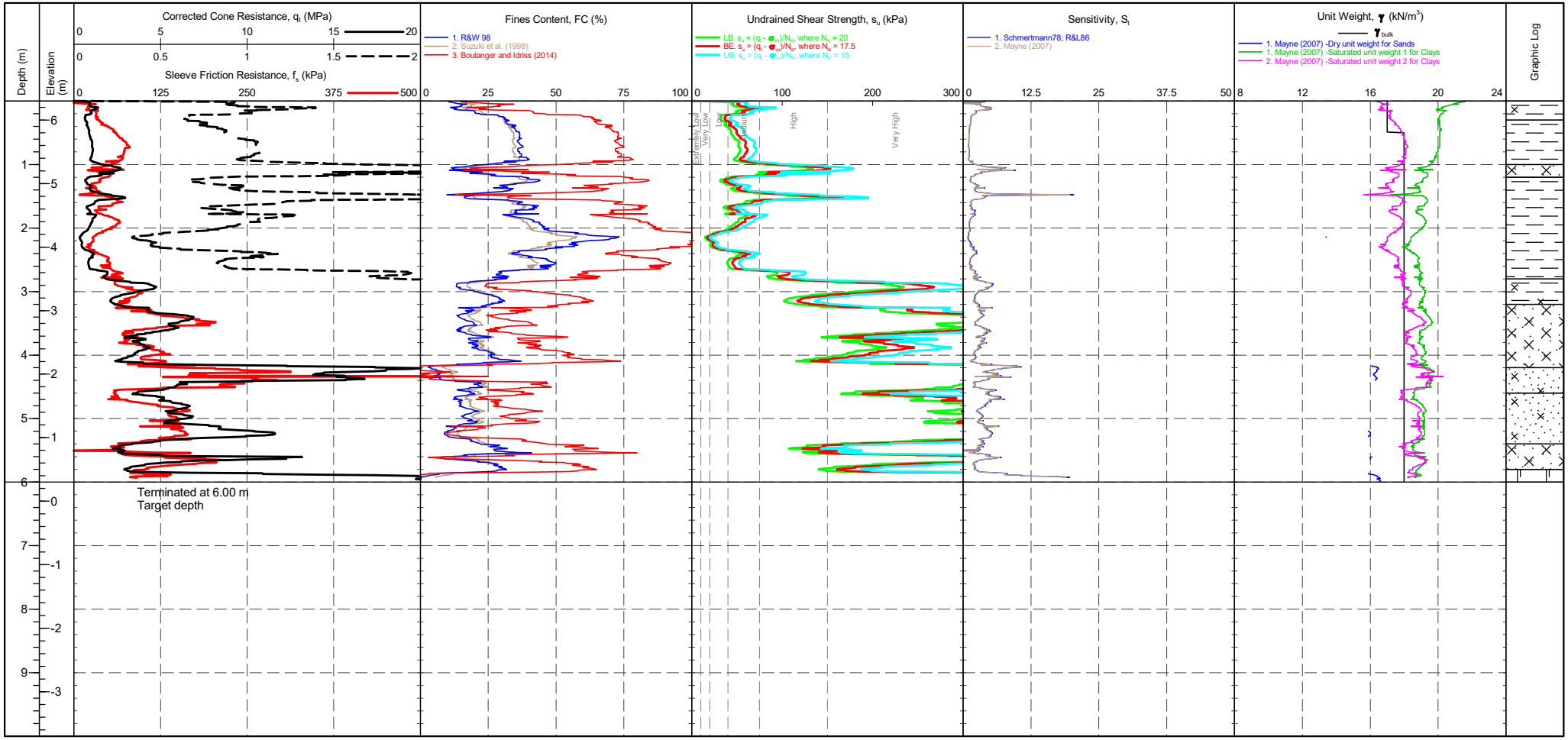
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP137**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499914.533 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101842.976 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.300 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



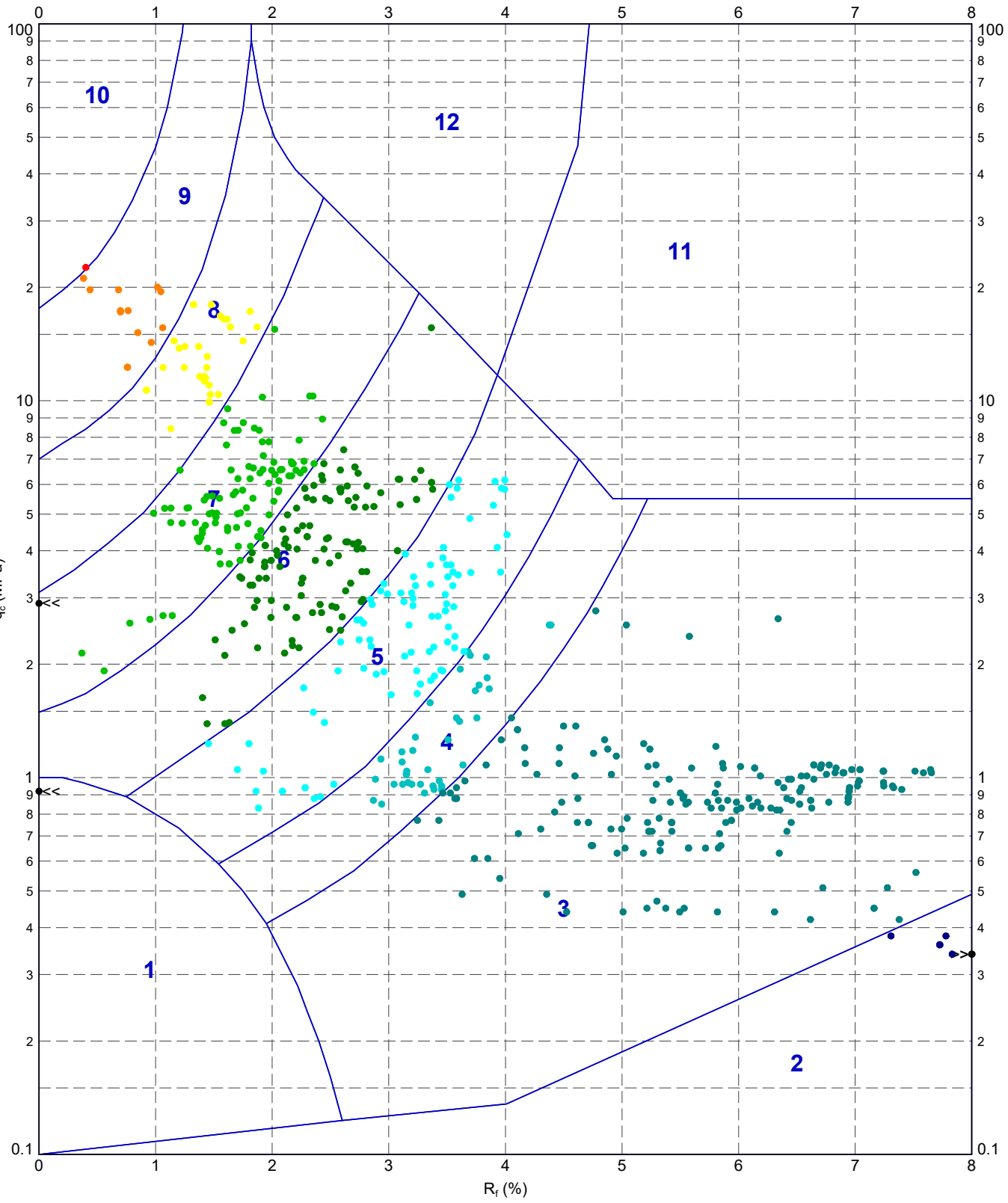

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 220 mV | 221 mV | 0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 212 mV | 213 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 262 mV | 256 mV | -0.002 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2266 mV | 2345 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP137

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

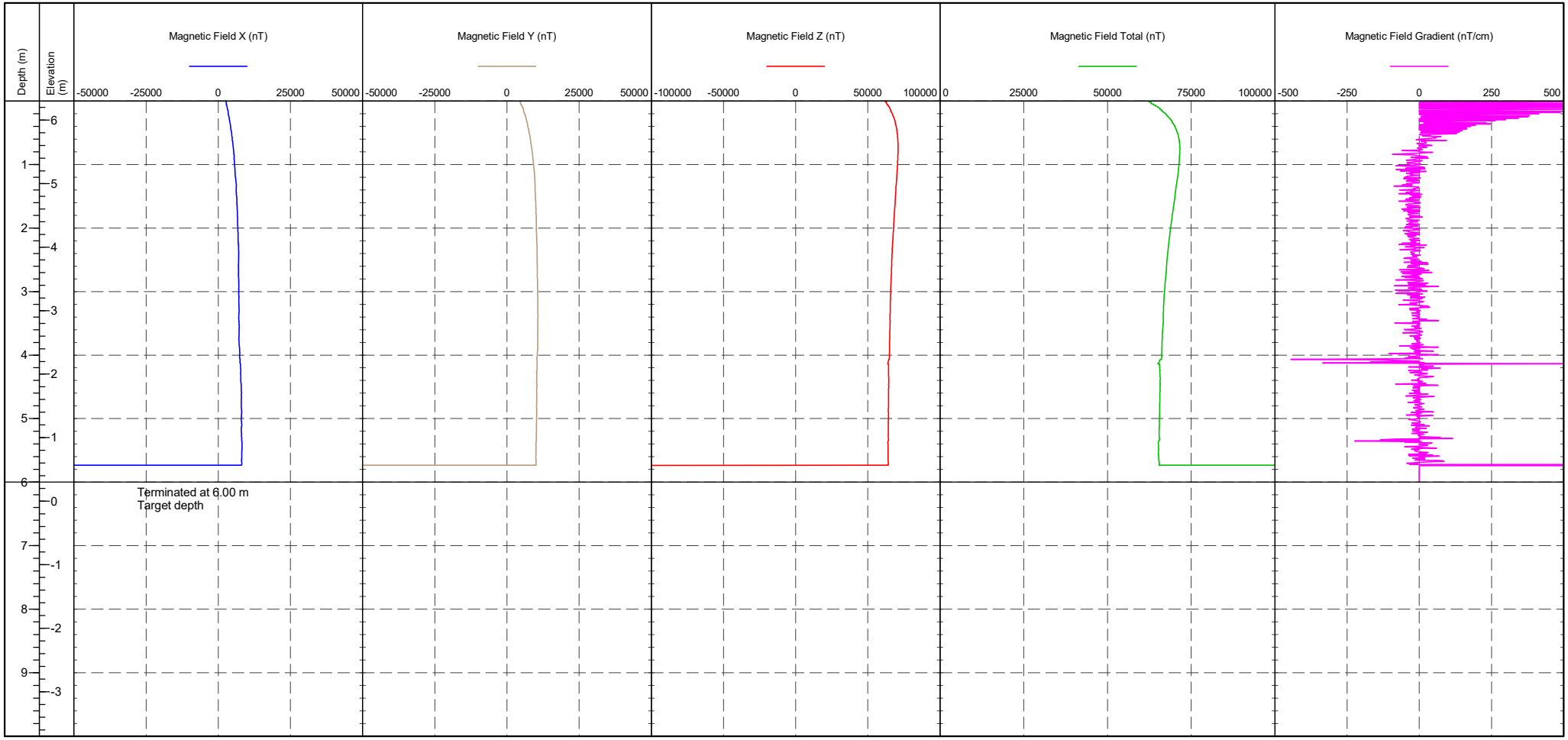
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:44 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Plt: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP137**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499914.533 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101842.976 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 6.300 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



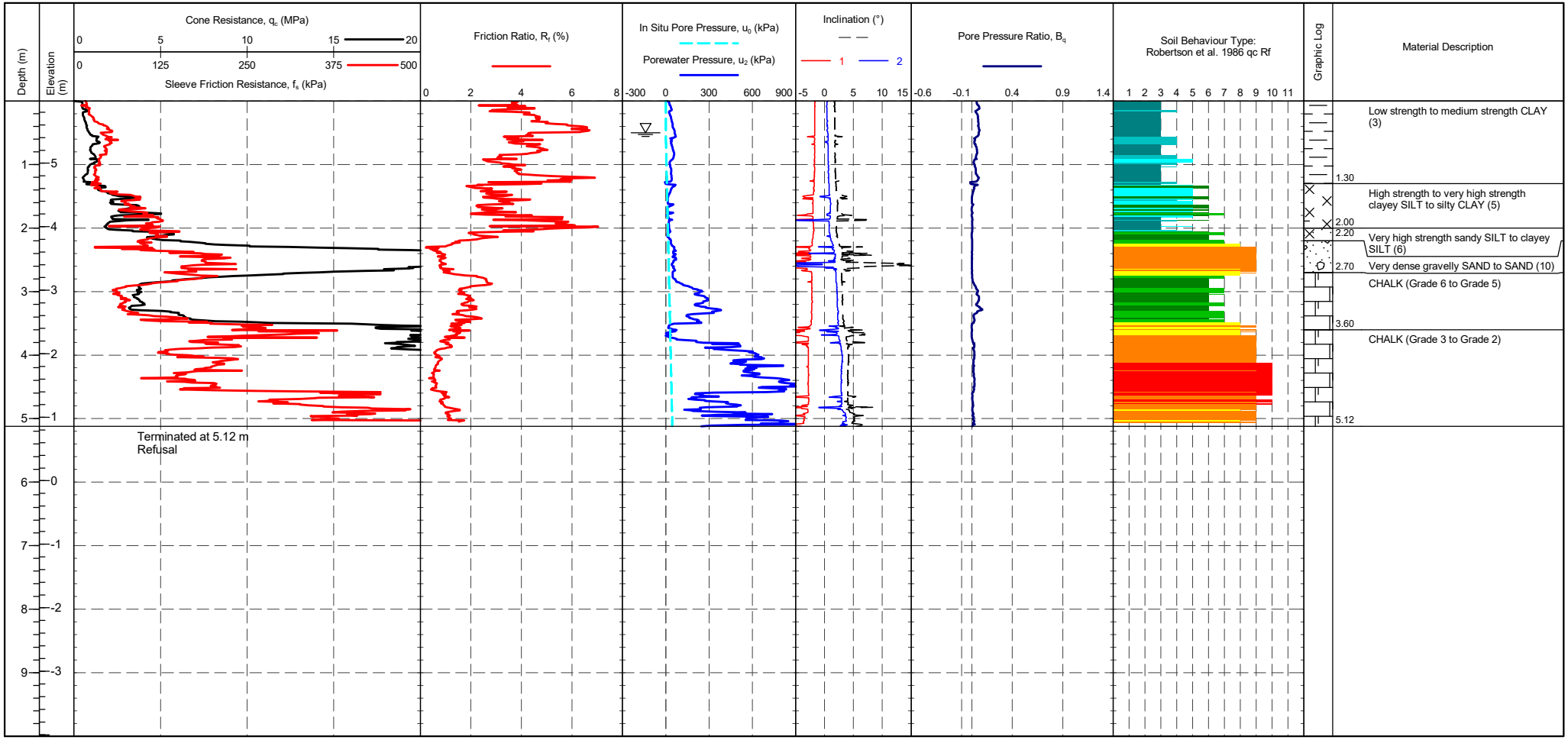

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 220 mV | 221 mV | 0.011 MPa |
| | | | | Sleeve | 212 mV | 213 mV | 0.001 kPa |
| | | | | Pore Pressure 2 | 262 mV | 256 mV | -0.002 kPa |
| | | | | X-Y Inclinometer | 2266 mV | 2345 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP138**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499982.467 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101869.554 m | Test refused on tip resistance. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.978 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 | | |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen | | |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo | | |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None | | |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold | | |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 212 mV | -0.11 MPa |
| Sleeve | 214 mV | 206 mV | -0.006 kPa |
| Pore Pressure 2 | 257 mV | 249 mV | -0.002 kPa |
| X-Y Inclinometer | 2319 mV | 2306 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

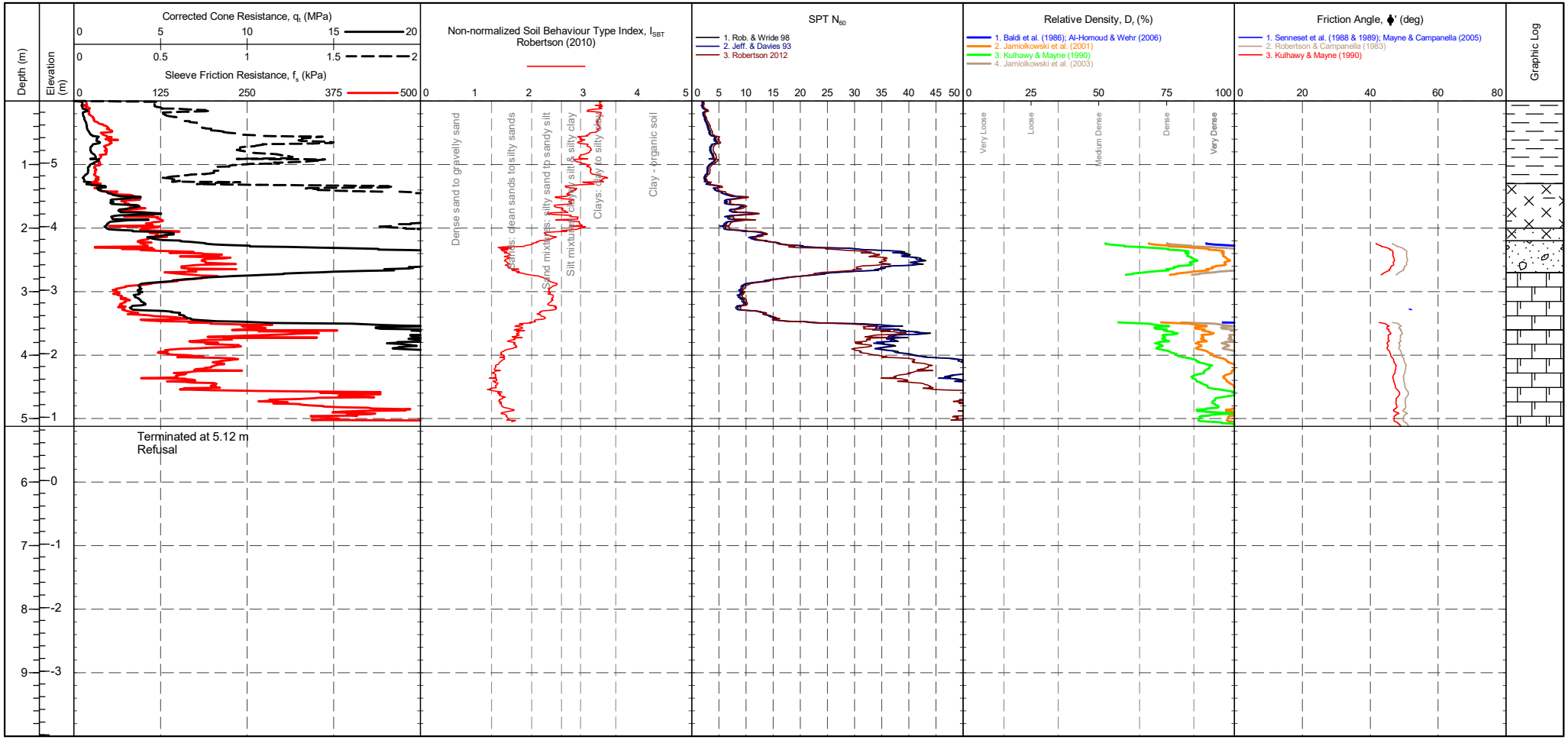
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP138**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 499982.467 m<br>NORTHING : 101869.554 m<br>ELEVATION : 5.978 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on tip resistance. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 212 mV | -0.11 MPa |
| Sleeve | 214 mV | 206 mV | -0.006 kPa |
| Pore Pressure 2 | 257 mV | 249 mV | -0.002 kPa |
| X-Y Inclinometer | 2319 mV | 2306 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

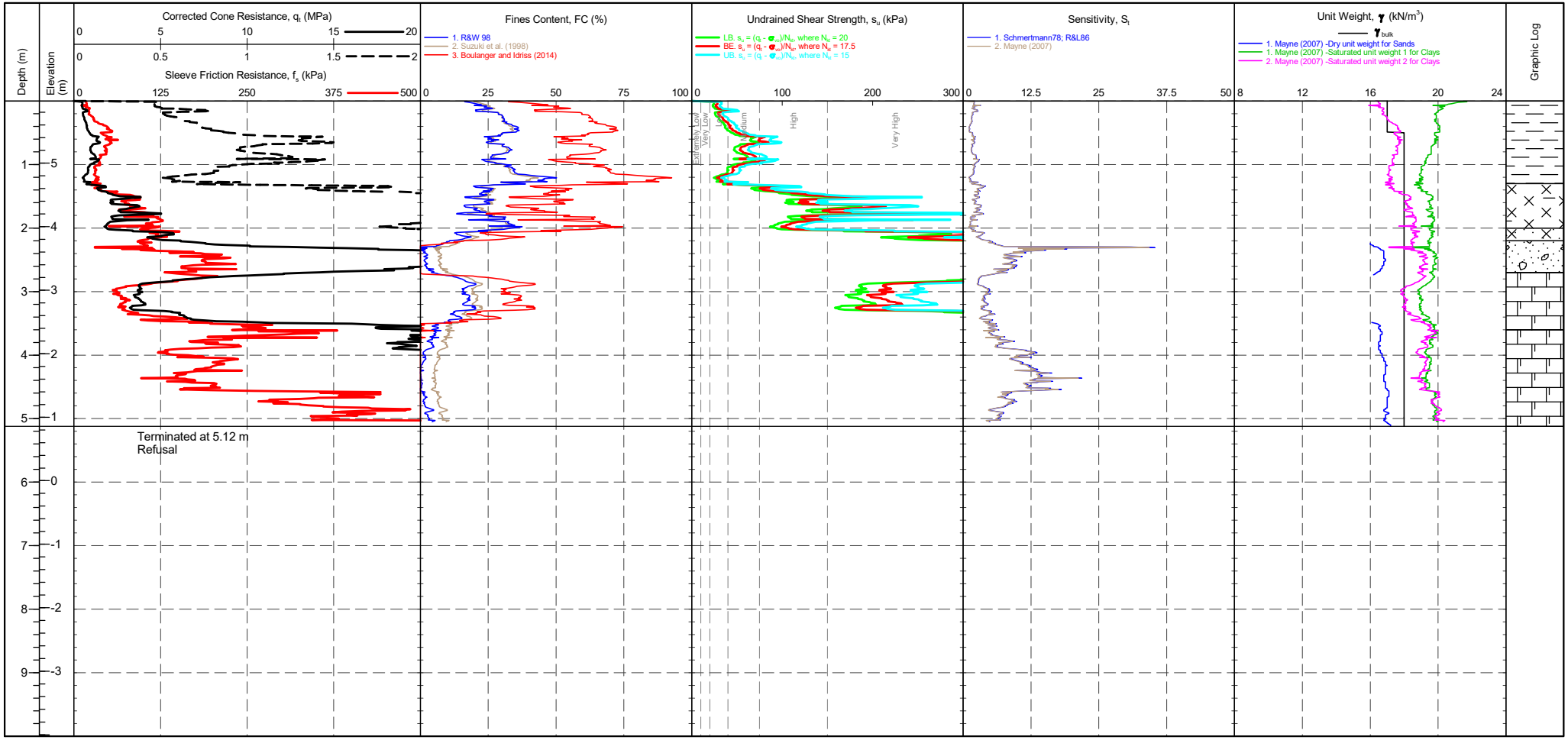
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP138**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 499982.467 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101869.554 m | Test refused on tip resistance. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.978 m OD | | TEST DATE : 15/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Refusal | | METHOD : ISO 22476-1:2022 |



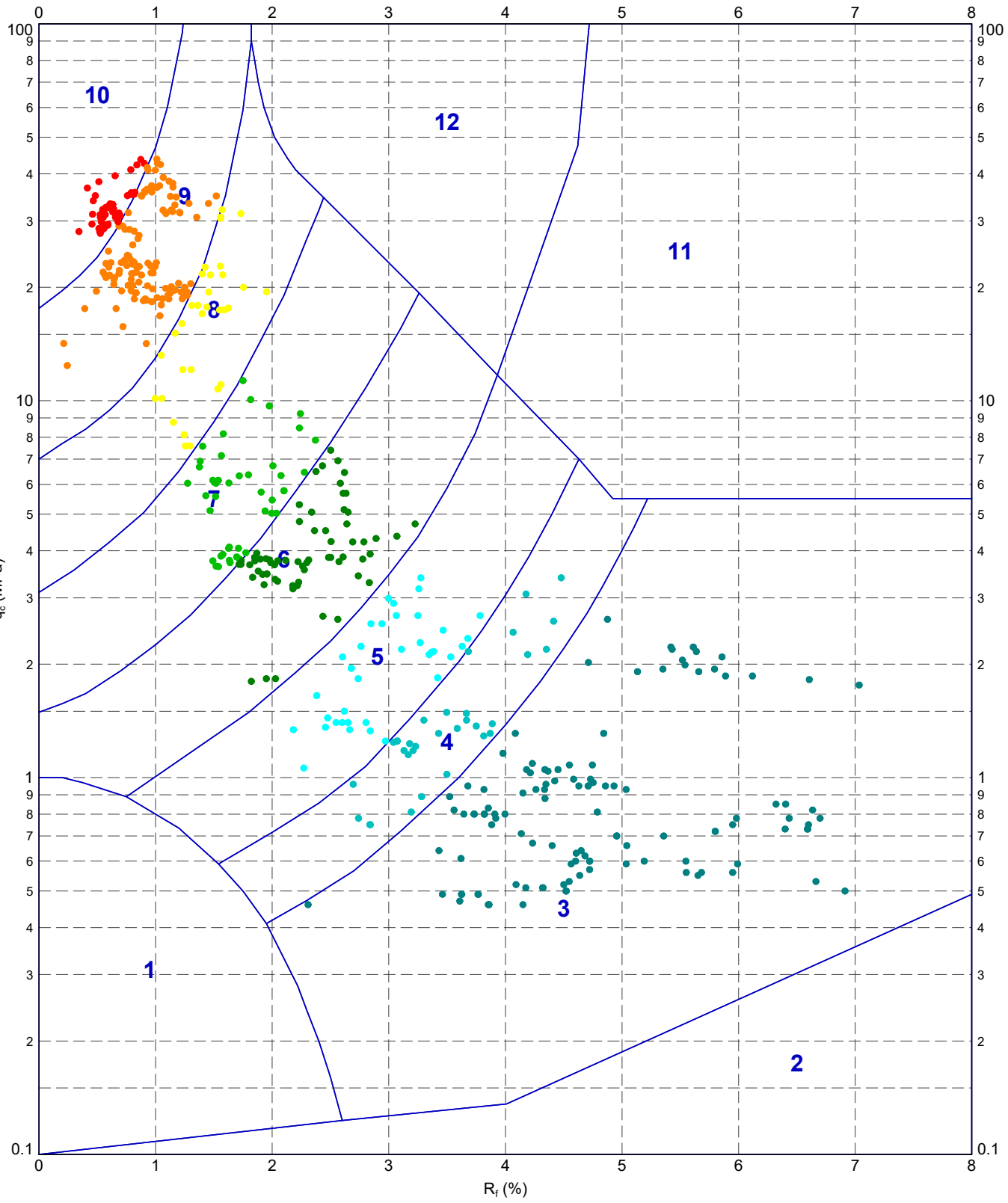

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 222 mV | 212 mV | -0.11 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 214 mV | 206 mV | -0.006 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 257 mV | 249 mV | -0.002 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2319 mV | 2306 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP138

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

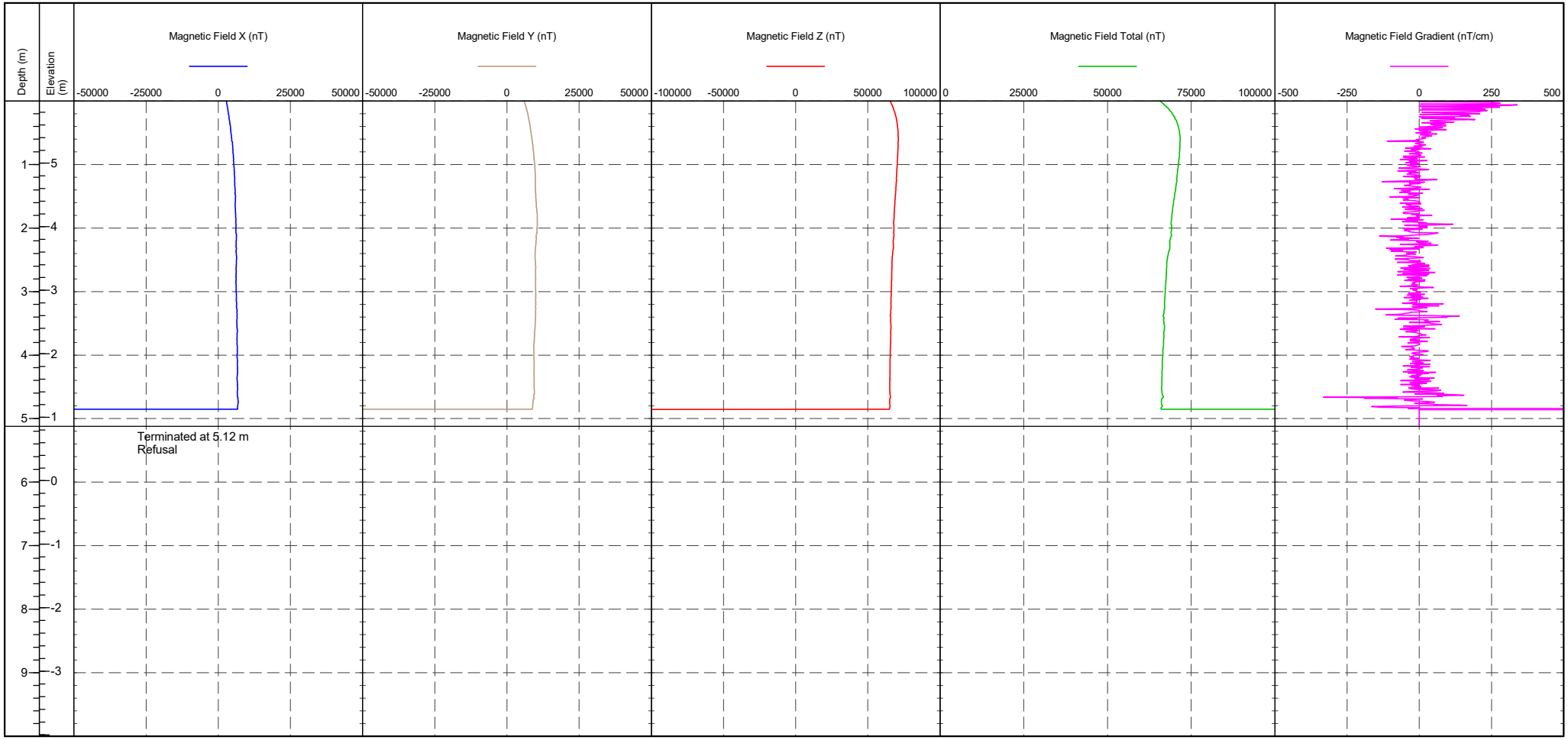
220829-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:45 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID **DP138**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 499982.467 m<br>NORTHING : 101869.554 m<br>ELEVATION : 5.978 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Refusal | Remark:<br>Test refused on tip resistance. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 15/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | |
|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | |

CPTU ZERO VALUES

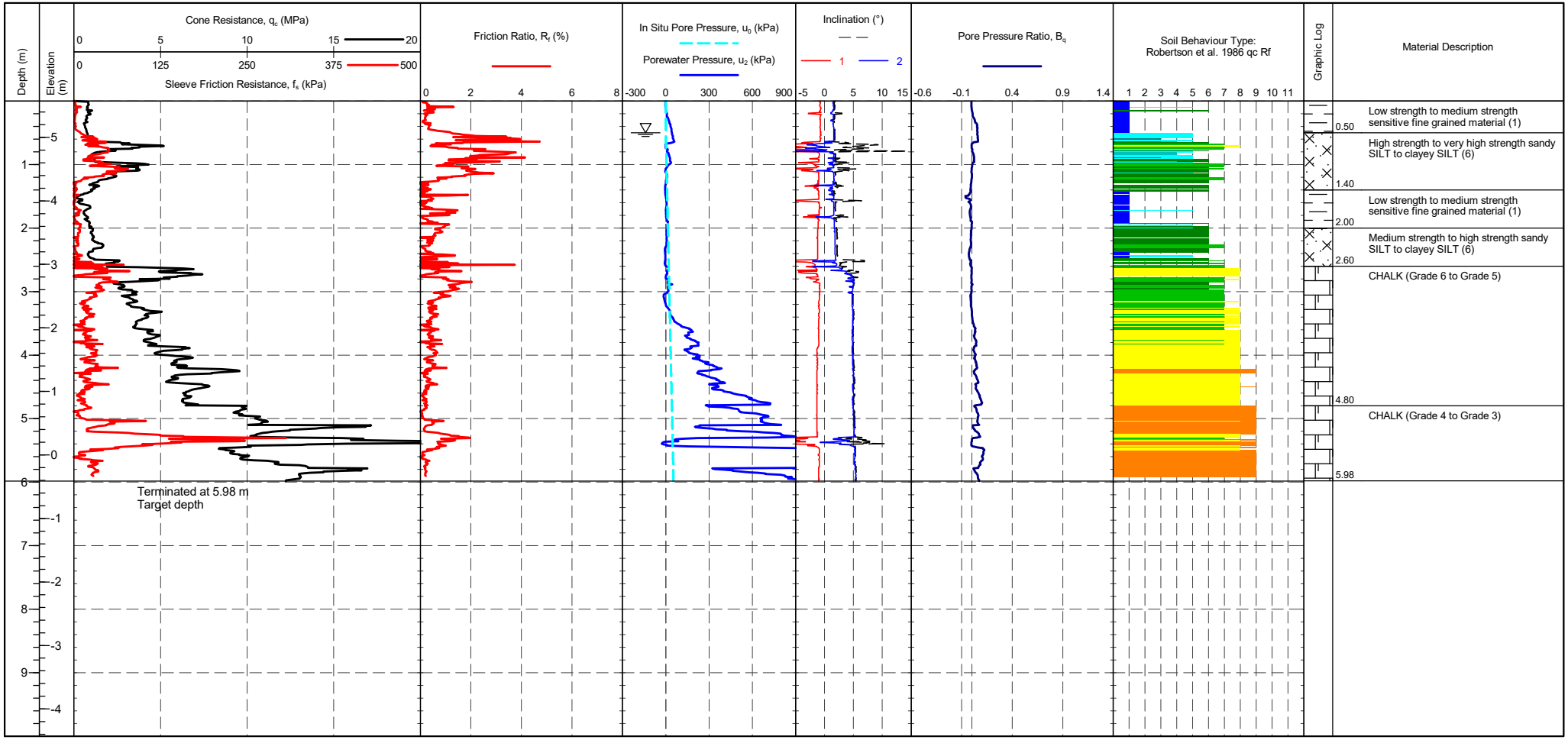
| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 212 mV | -0.11 MPa |
| Sleeve | 214 mV | 206 mV | -0.006 kPa |
| Pore Pressure 2 | 257 mV | 249 mV | -0.002 kPa |
| X-Y Inclinometer | 2319 mV | 2306 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP141**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500185.442 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101952.284 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.572 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 216 mV | 213 mV | -0.033 MPa |
| Sleeve | 214 mV | 212 mV | -0.001 kPa |
| Pore Pressure 2 | 258 mV | 288 mV | 0.009 kPa |
| X-Y Inclinometer | 2353 mV | 2392 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

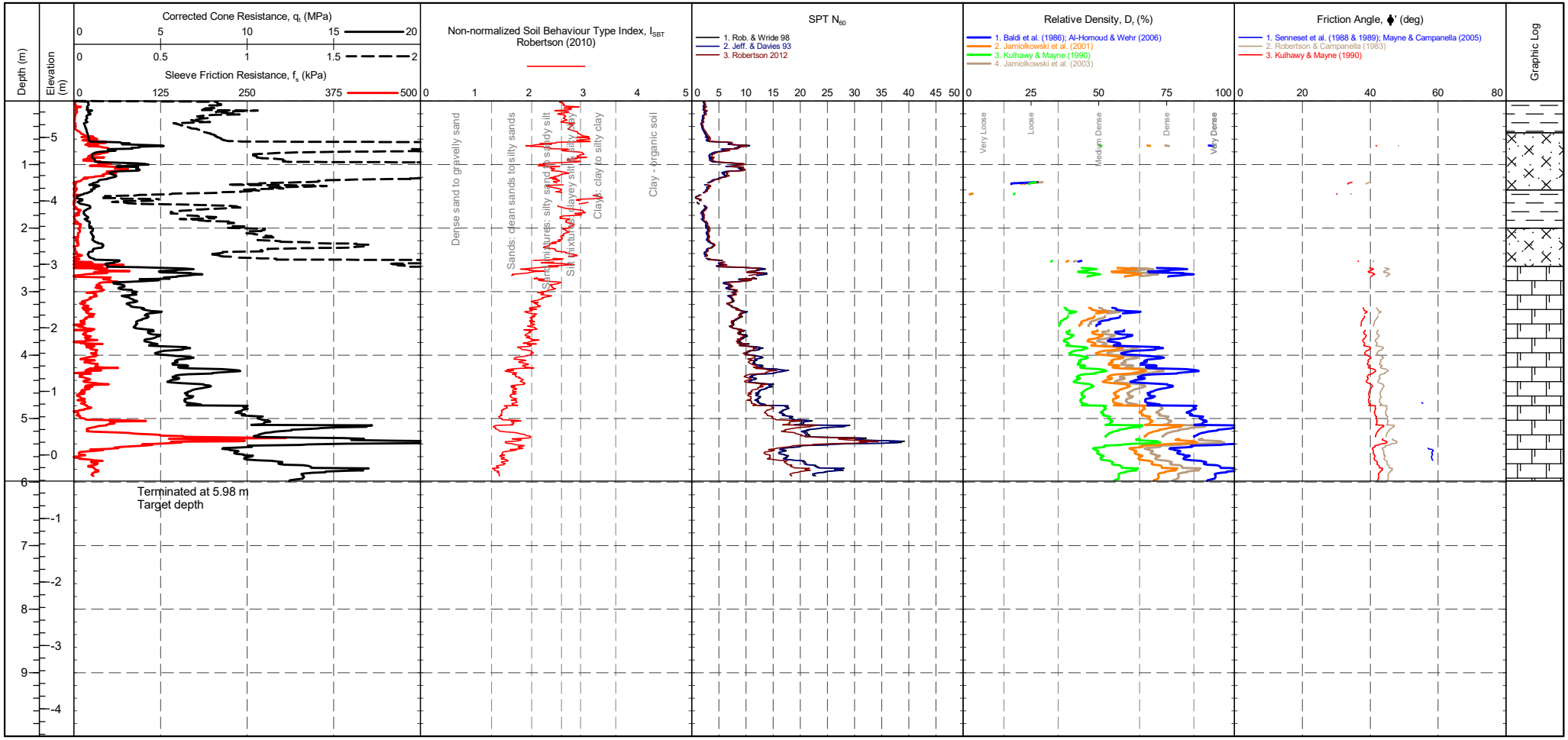
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP141**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500185.442 m<br>NORTHING : 101952.284 m<br>ELEVATION : 5.572 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 216 mV | 213 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 214 mV | 212 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 258 mV | 288 mV | 0.009 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2353 mV | 2392 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

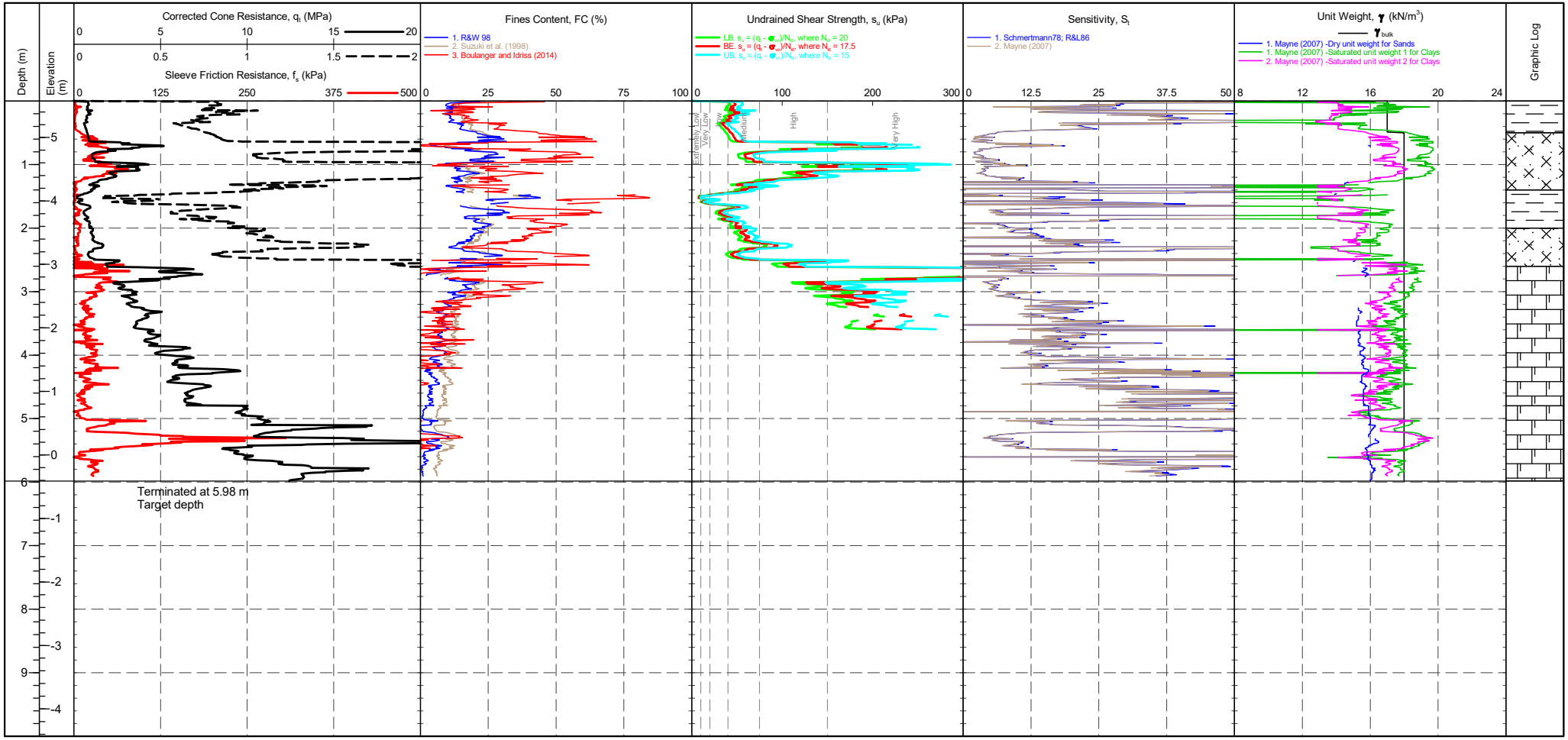
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP141**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500185.442 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101952.284 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.572 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



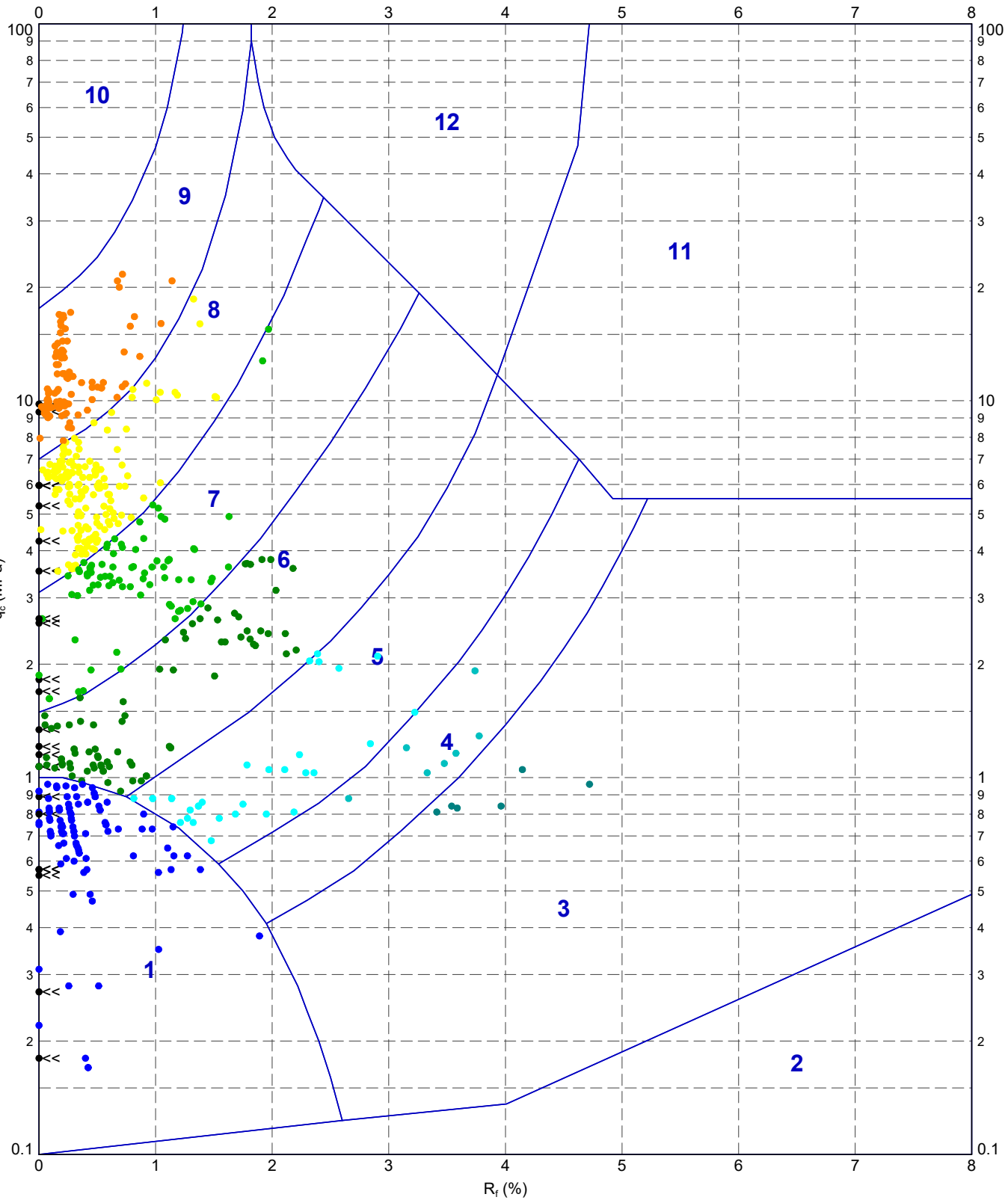

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 216 mV | 213 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 214 mV | 212 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 258 mV | 288 mV | 0.009 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2353 mV | 2392 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP141

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

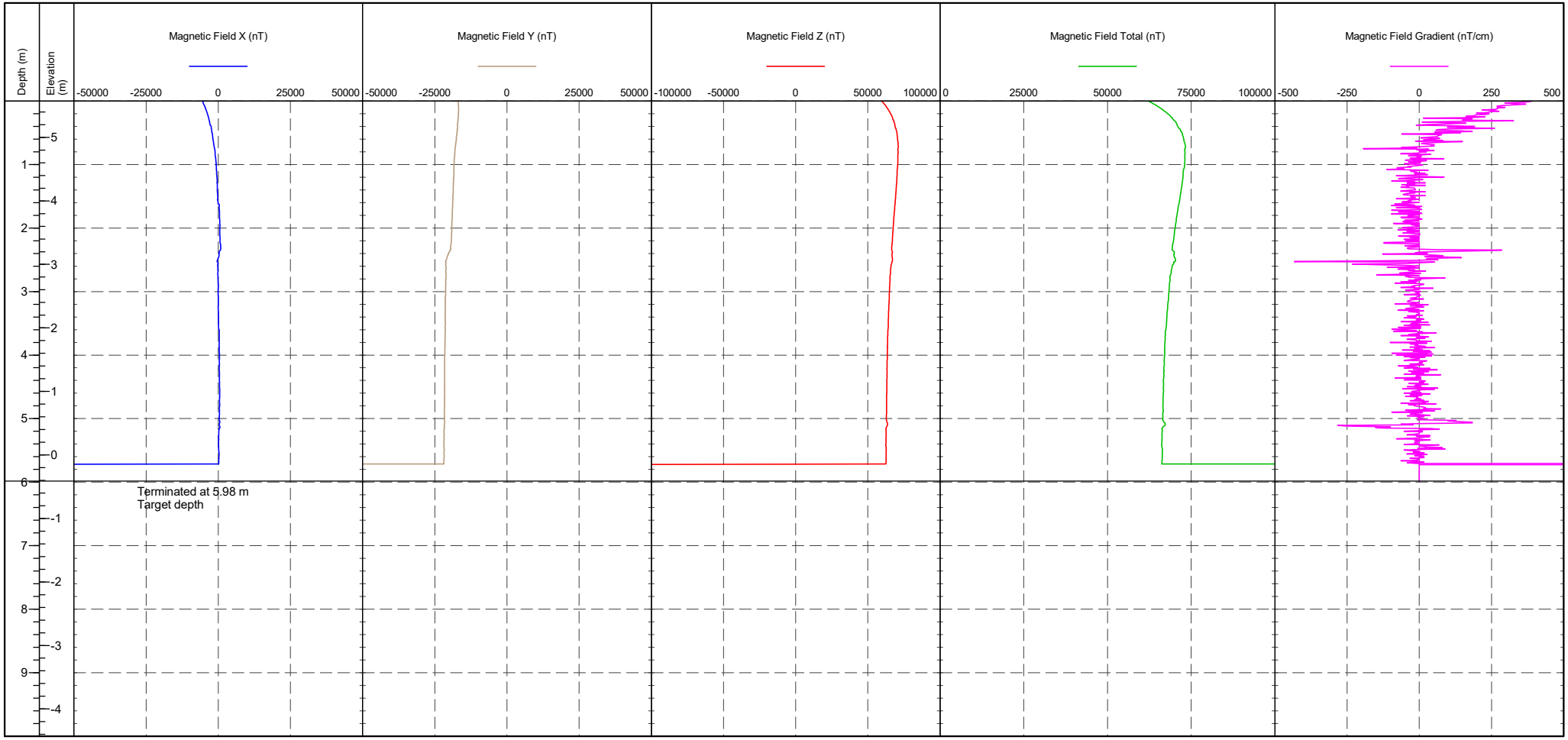
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:45 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP141**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500185.442 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101952.284 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.572 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



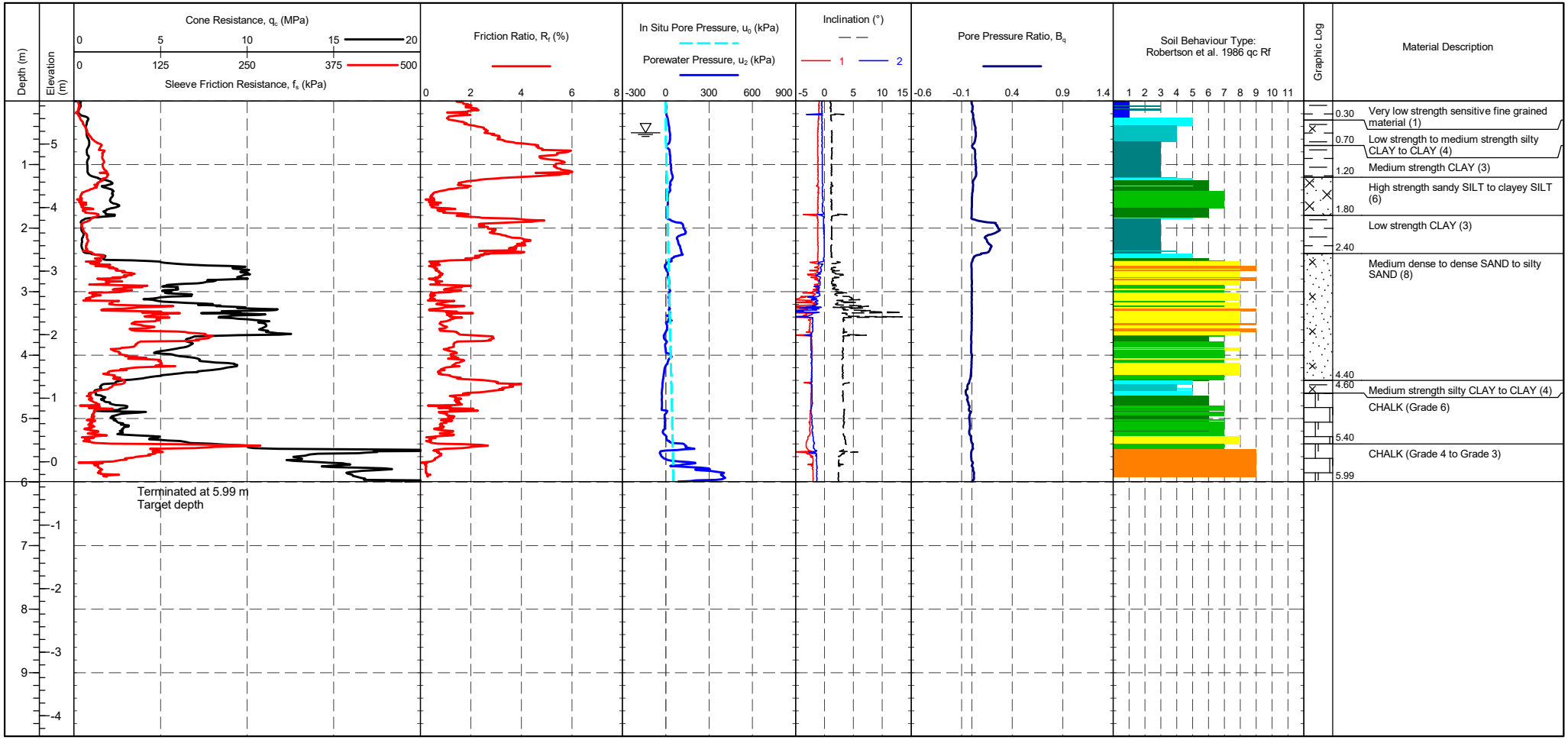

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 216 mV | 213 mV | -0.033 MPa |
| | | | | Sleeve | 214 mV | 212 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 258 mV | 288 mV | 0.009 kPa |
| | | | | X-Y Inclinometer | 2353 mV | 2392 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP143**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500322.997 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101984.729 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.678 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 | | | |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen | | | |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo | | | |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None | | | |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold | | | |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 223 mV | 220 mV | -0.033 MPa |
| Sleeve | 216 mV | 215 mV | -0.001 kPa |
| Pore Pressure 2 | 256 mV | 275 mV | 0.006 kPa |
| X-Y Inclinometer | 2384 mV | 2375 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

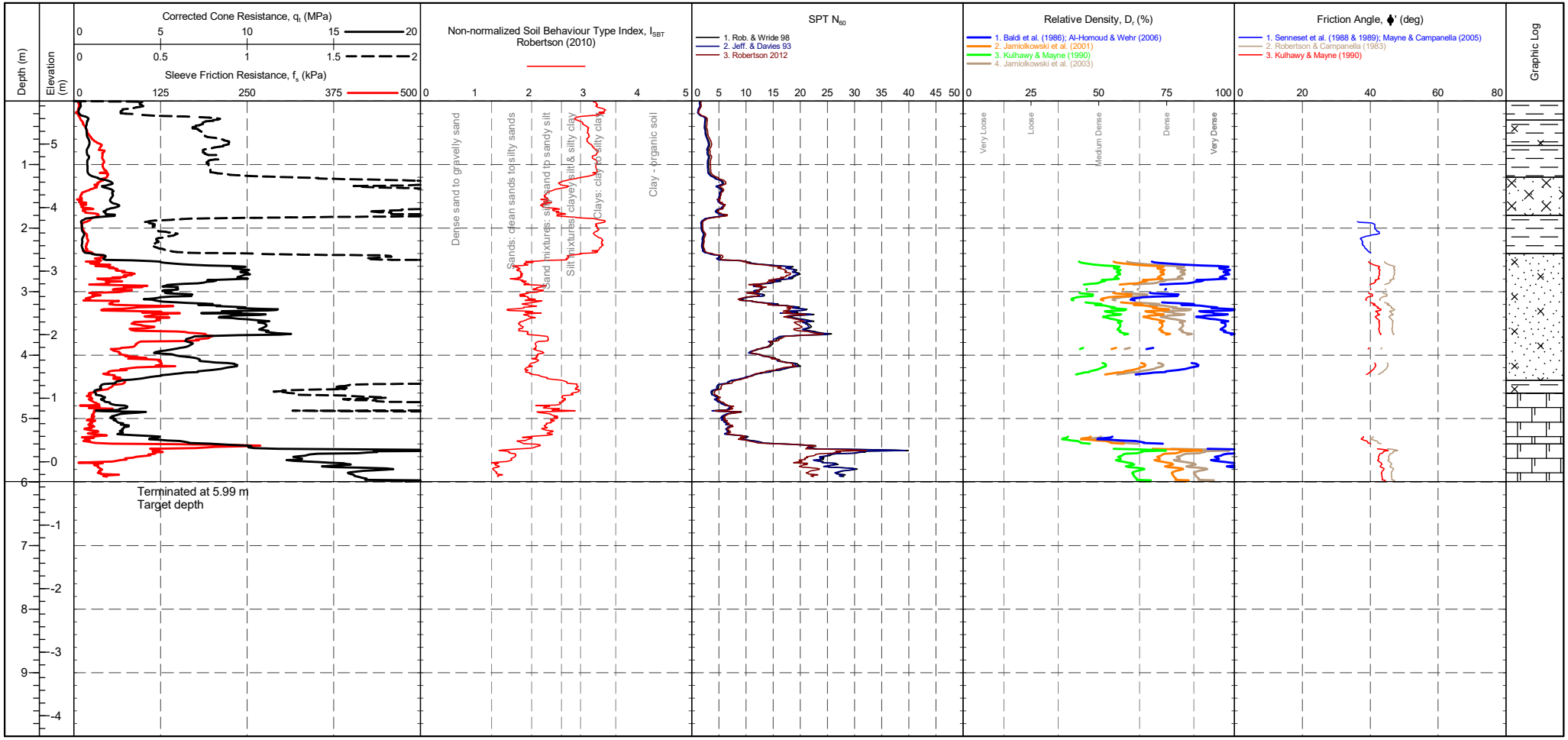
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP143**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500322.997 m<br>NORTHING : 101984.729 m<br>ELEVATION : 5.678 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 223 mV | 220 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 216 mV | 215 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 256 mV | 275 mV | 0.006 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2384 mV | 2375 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

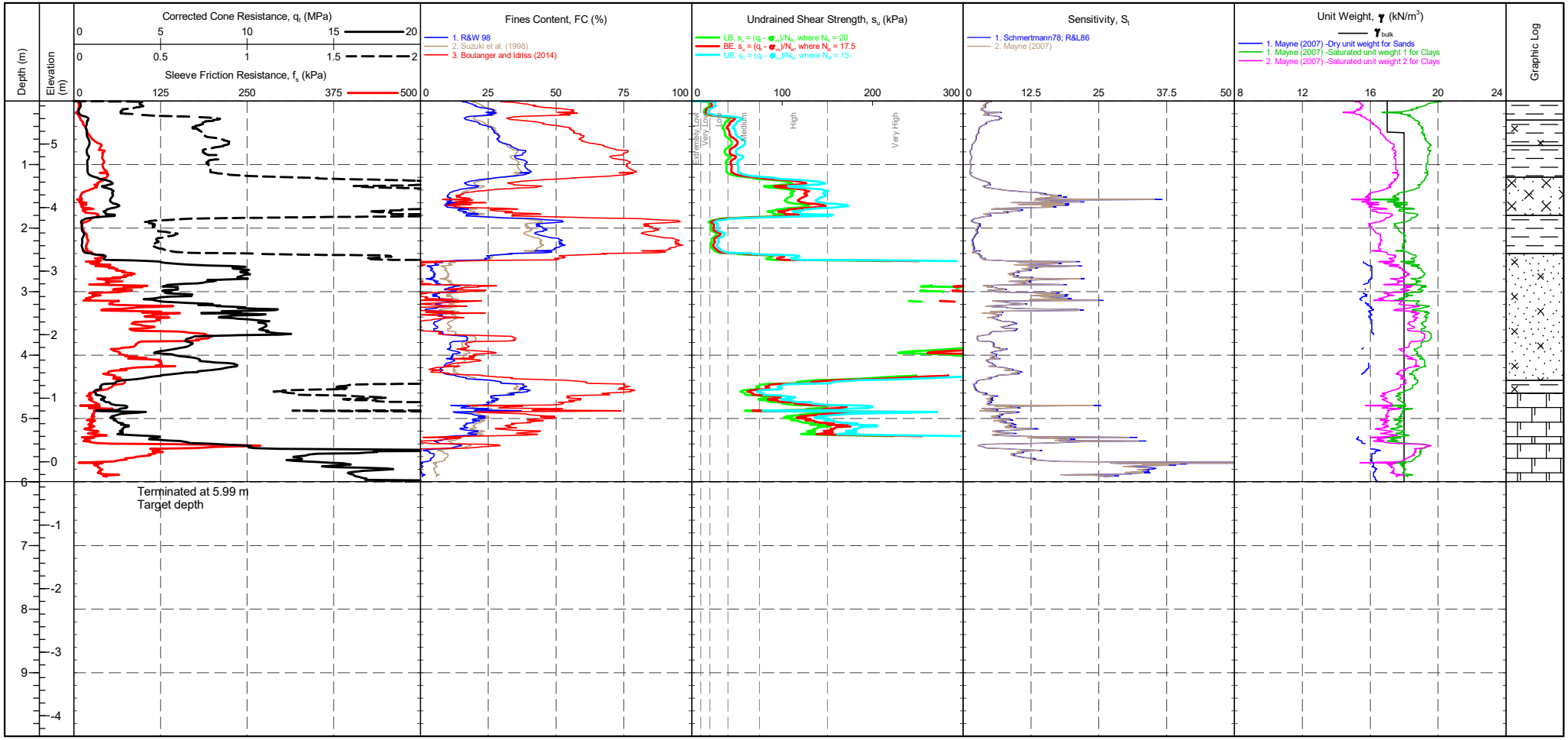
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP143**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500322.997 m<br>NORTHING : 101984.729 m<br>ELEVATION : 5.678 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



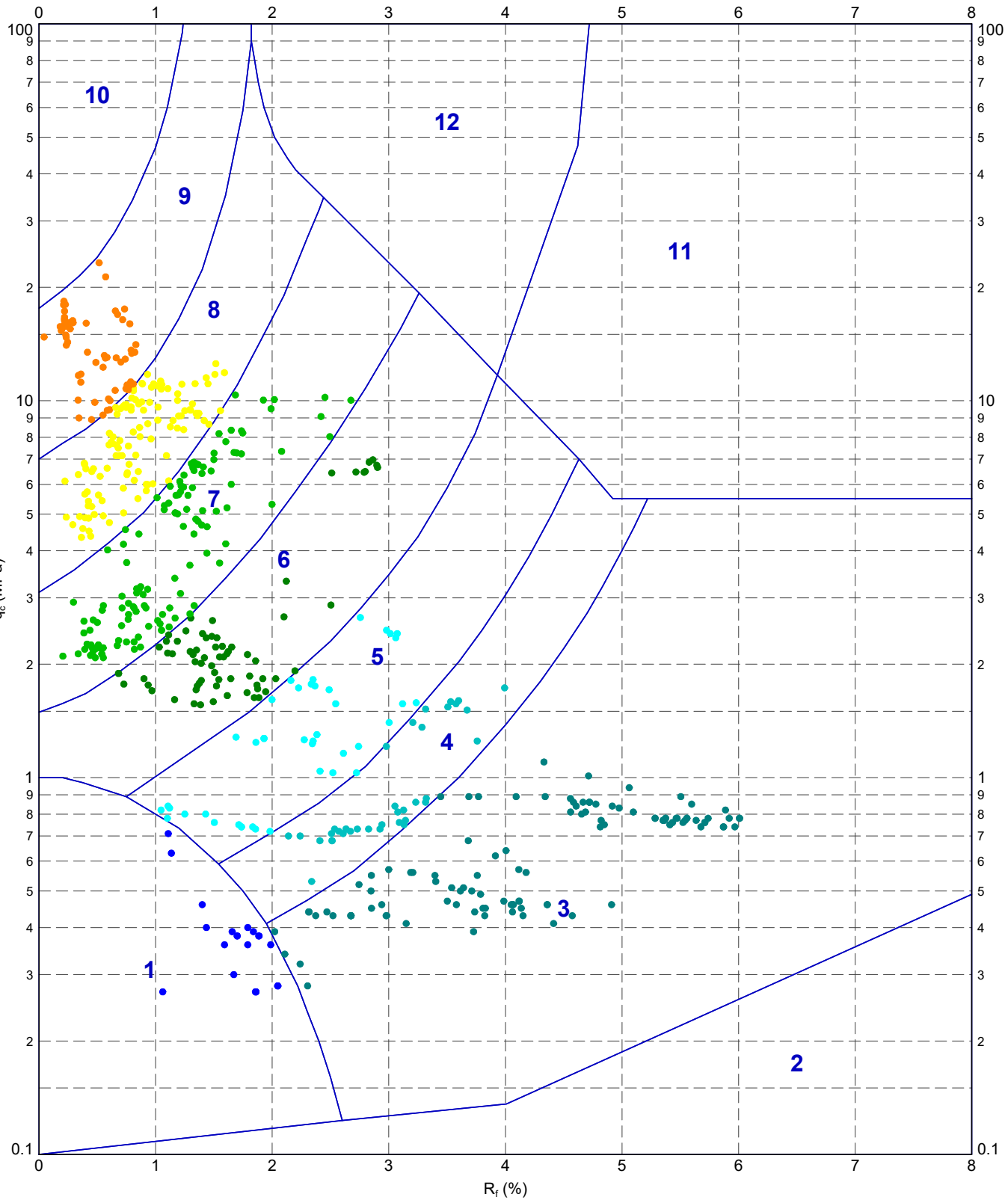

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 223 mV | 220 mV | -0.033 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 216 mV | 215 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 256 mV | 275 mV | 0.006 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2384 mV | 2375 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP143

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

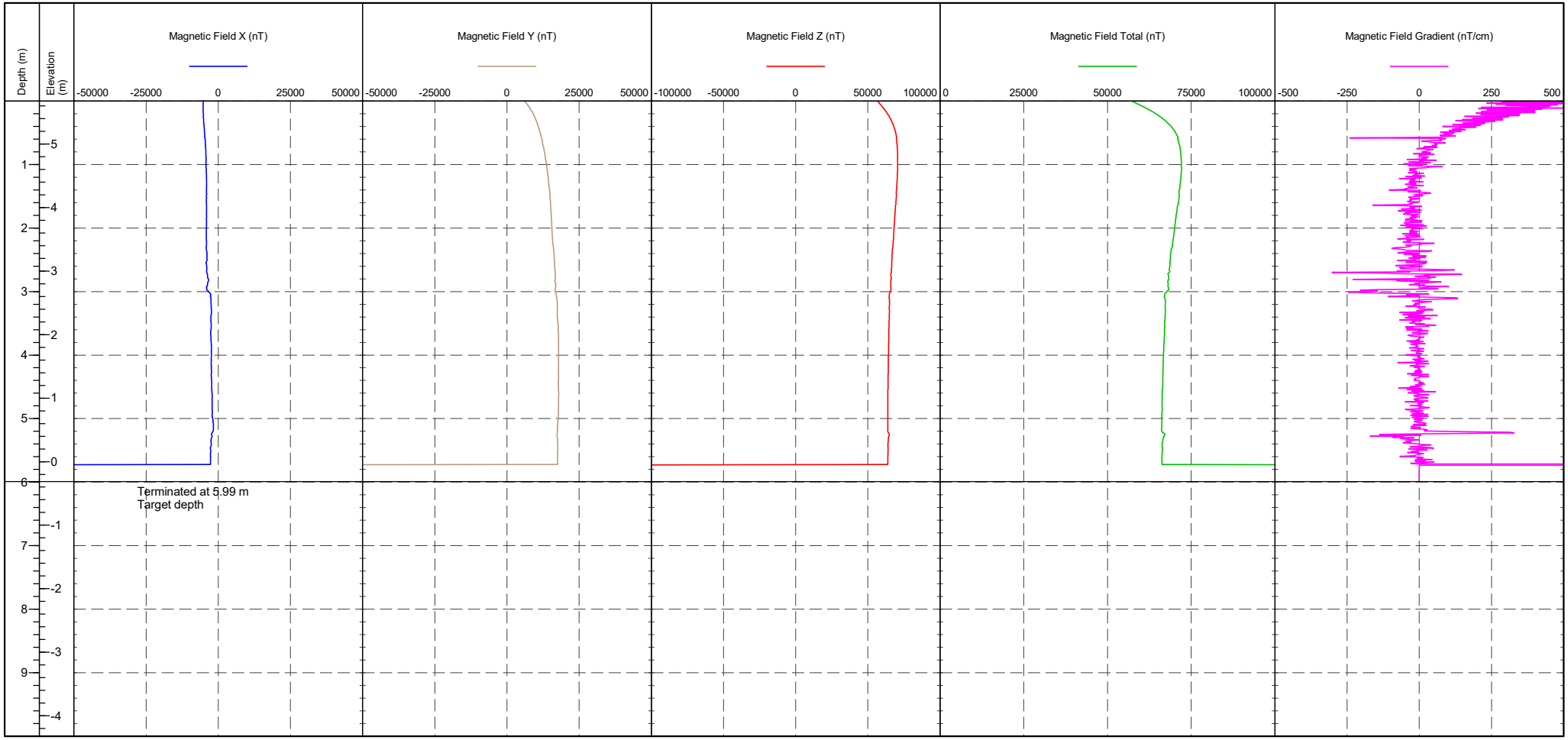
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:46 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP143**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500322.997 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 101984.729 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.678 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



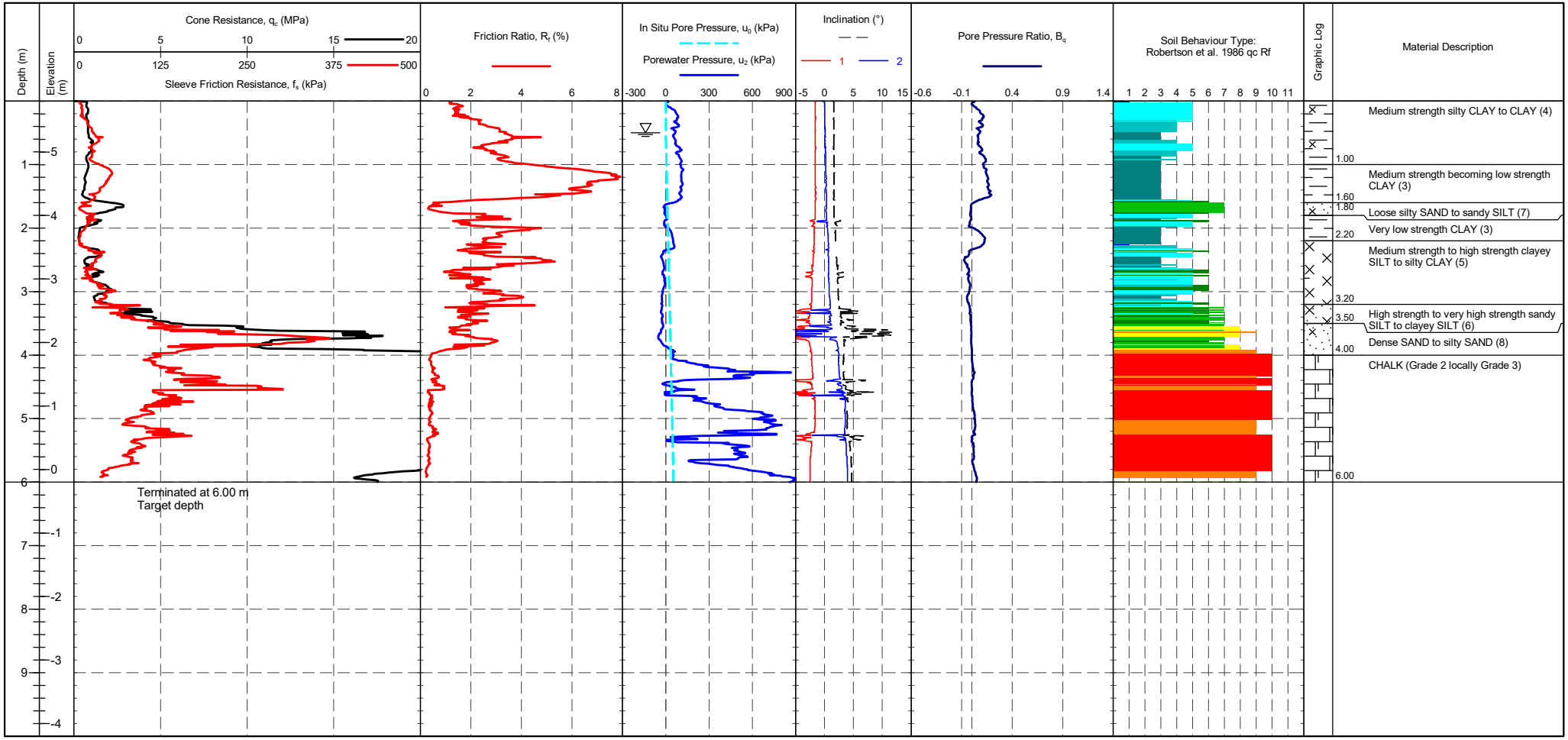

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 223 mV | 220 mV | -0.033 MPa |
| | | | | Sleeve | 216 mV | 215 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 256 mV | 275 mV | 0.006 kPa |
| | | | | X-Y Inclinometer | 2384 mV | 2375 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP144**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500394.417 m<br>NORTHING : 102005.626 m<br>ELEVATION : 5.802 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1186<br>CALIBRATION DATE : 09/08/2021<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES | |

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 213 mV | -0.088 MPa |
| Sleeve | 218 mV | 209 mV | -0.006 kPa |
| Pore Pressure 2 | 268 mV | 244 mV | -0.007 kPa |
| X-Y Inclinometer | 2355 mV | 2355 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

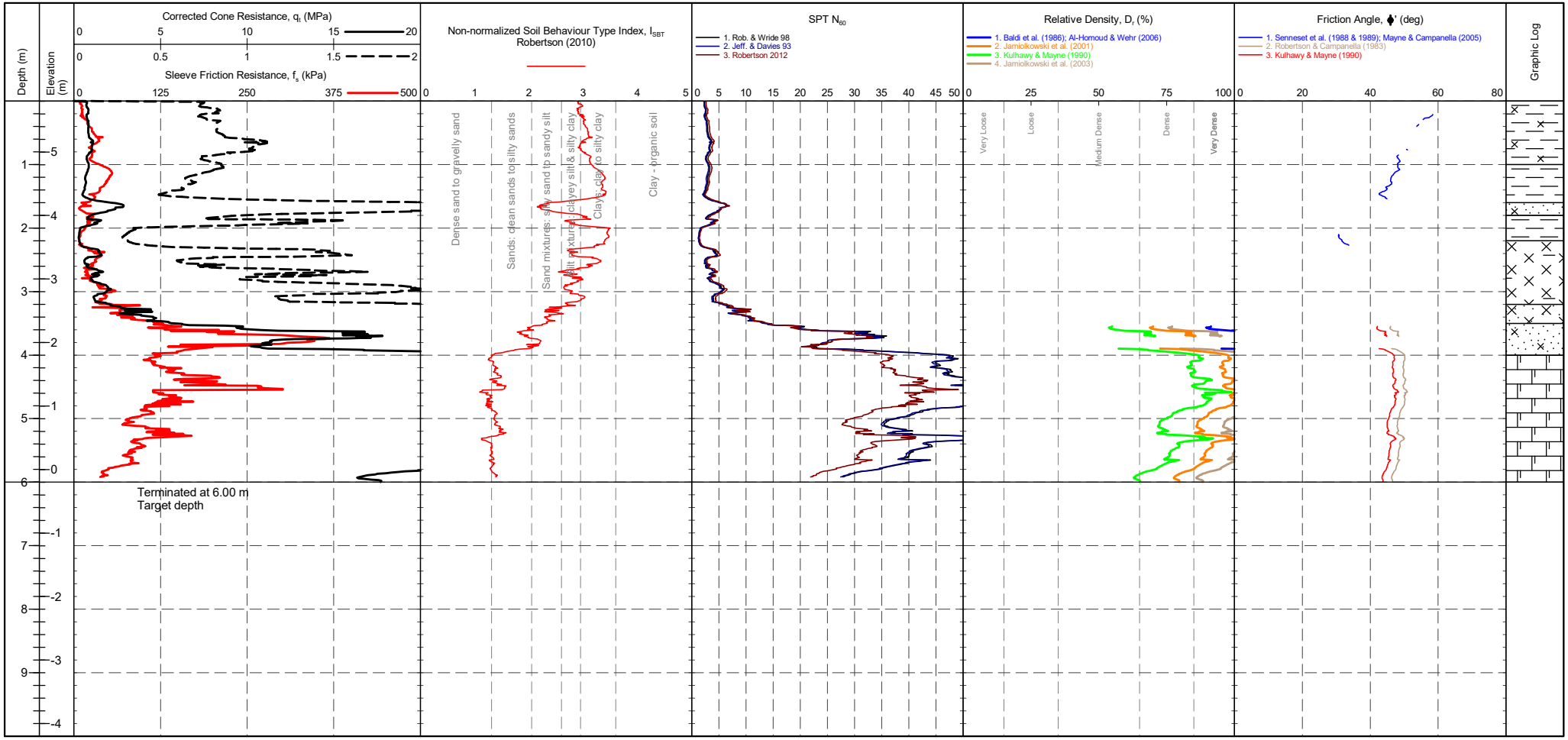
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP144**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500394.417 m<br>NORTHING : 102005.626 m<br>ELEVATION : 5.802 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 213 mV | -0.088 MPa |
| Sleeve | 218 mV | 209 mV | -0.006 kPa |
| Pore Pressure 2 | 268 mV | 244 mV | -0.007 kPa |
| X-Y Inclinometer | 2355 mV | 2355 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

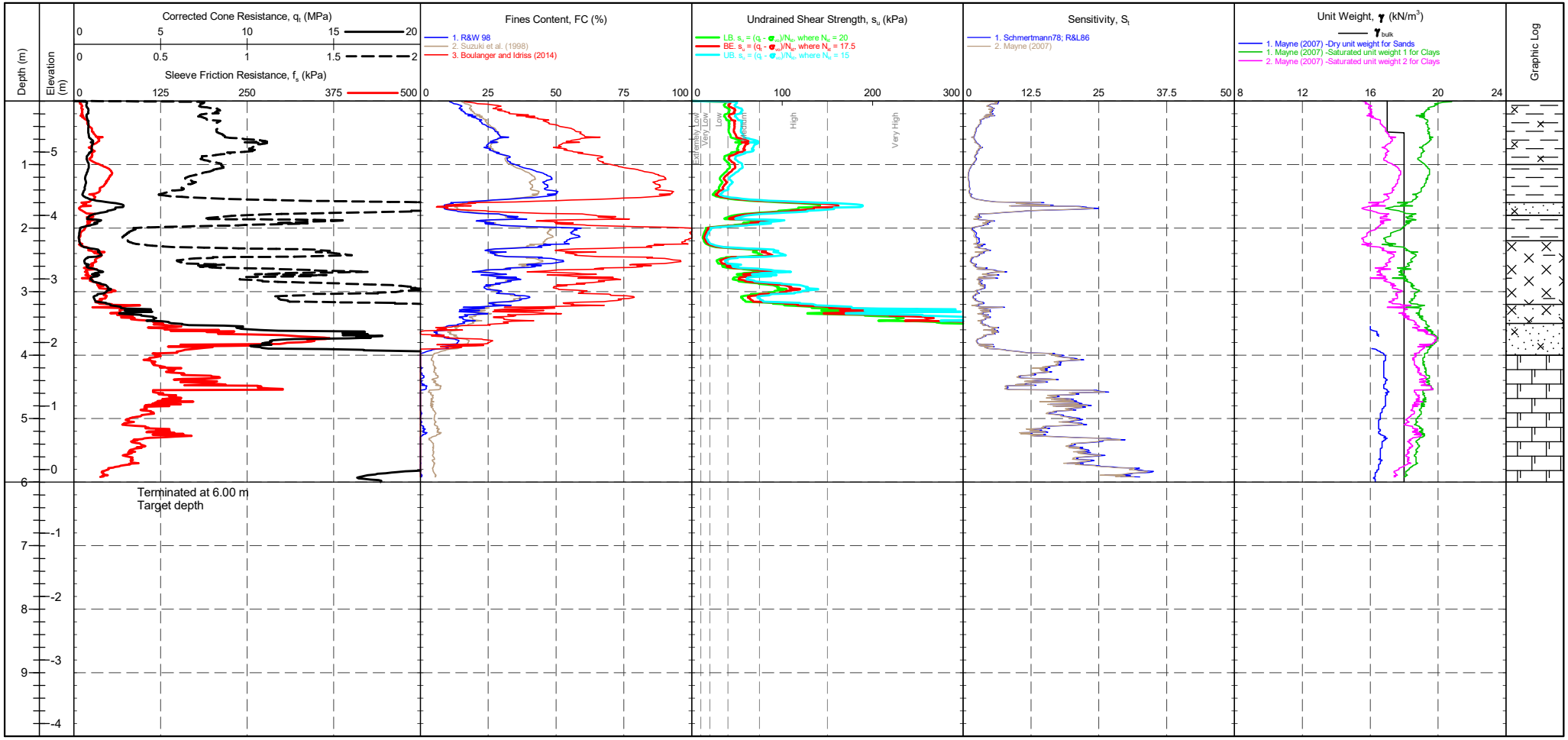
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID **DP144**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500394.417 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102005.626 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.802 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



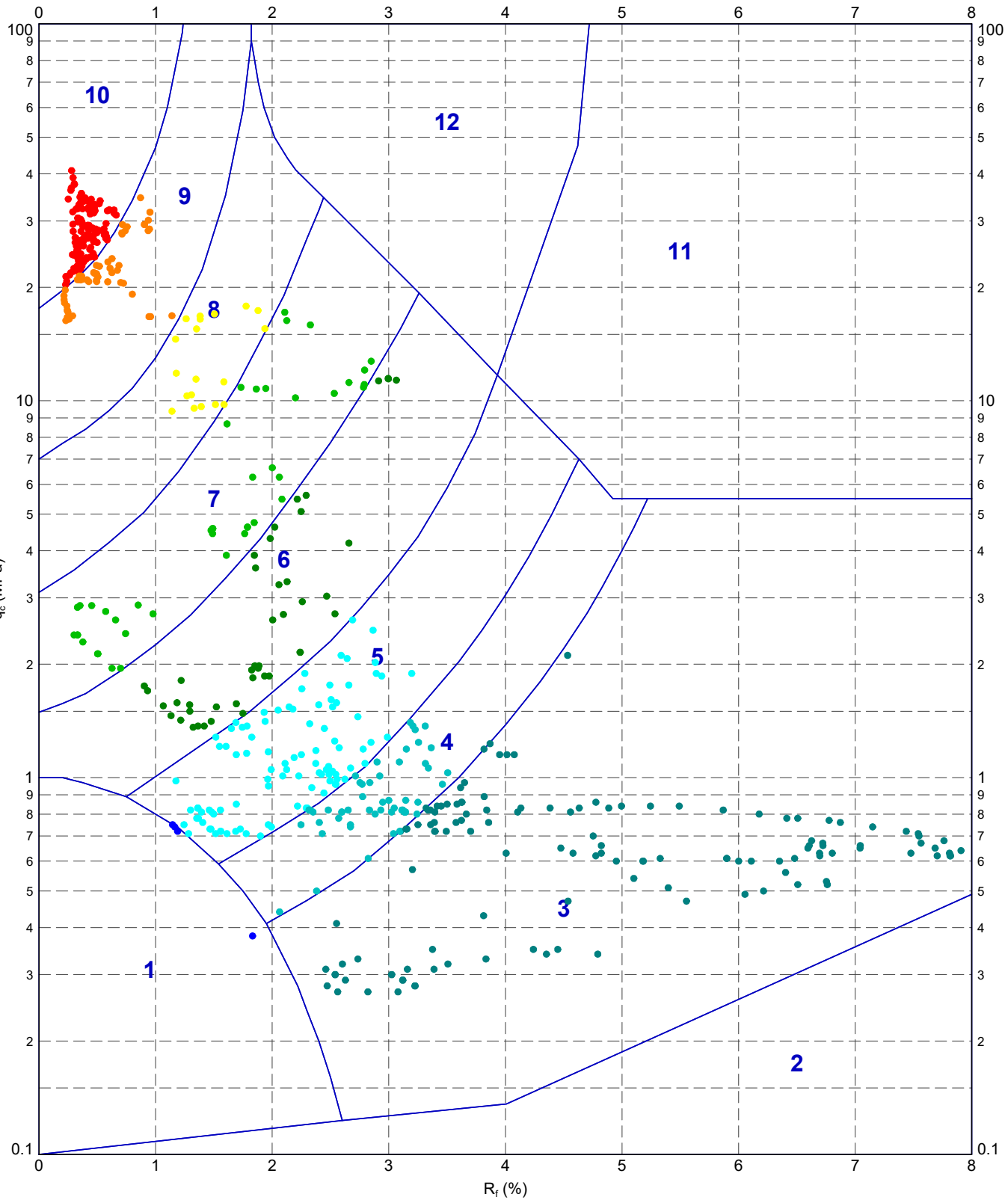

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 221 mV | 213 mV | -0.088 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 218 mV | 209 mV | -0.006 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 268 mV | 244 mV | -0.007 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2355 mV | 2355 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP144

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

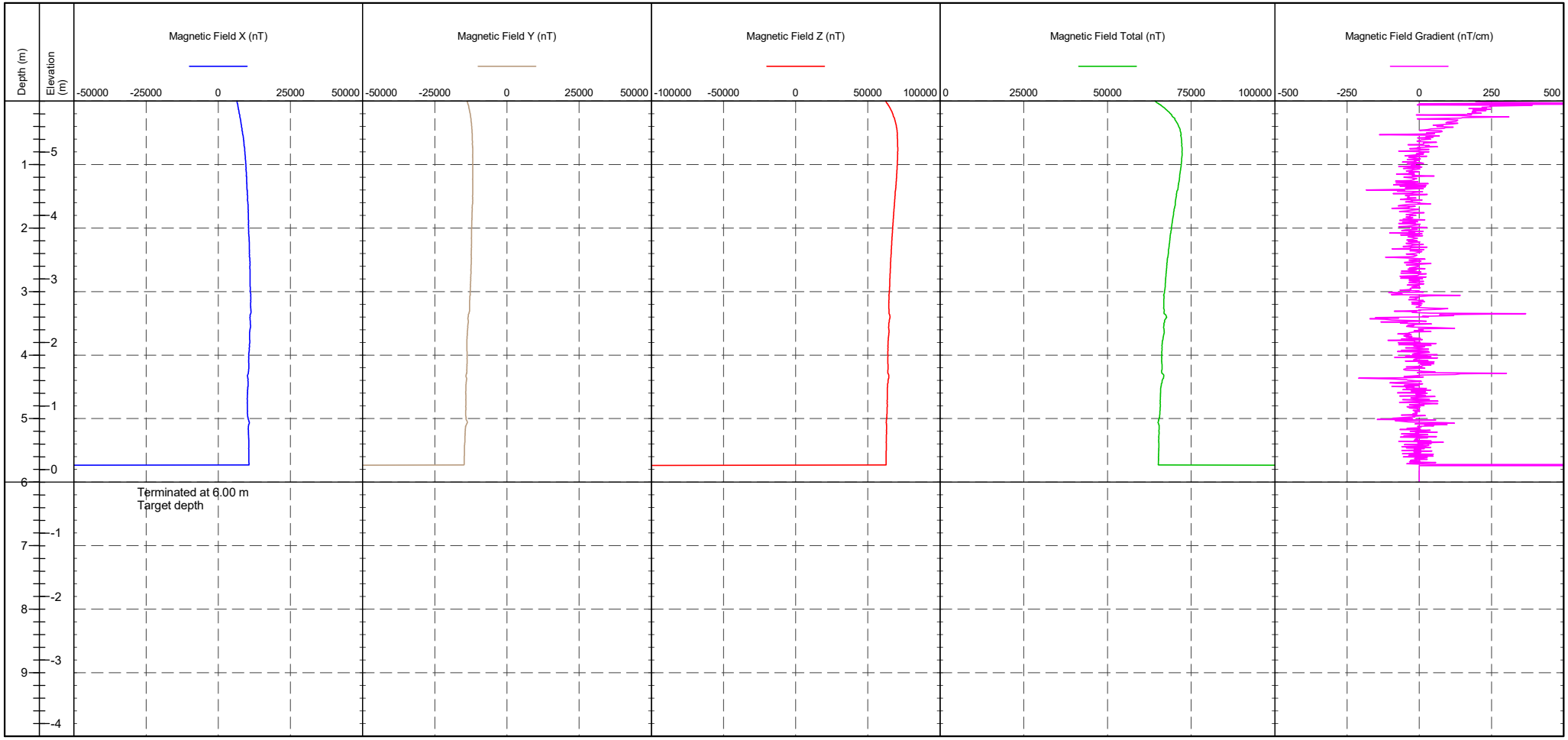
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:47 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP144**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500394.417 m<br>NORTHING : 102005.626 m<br>ELEVATION : 5.802 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



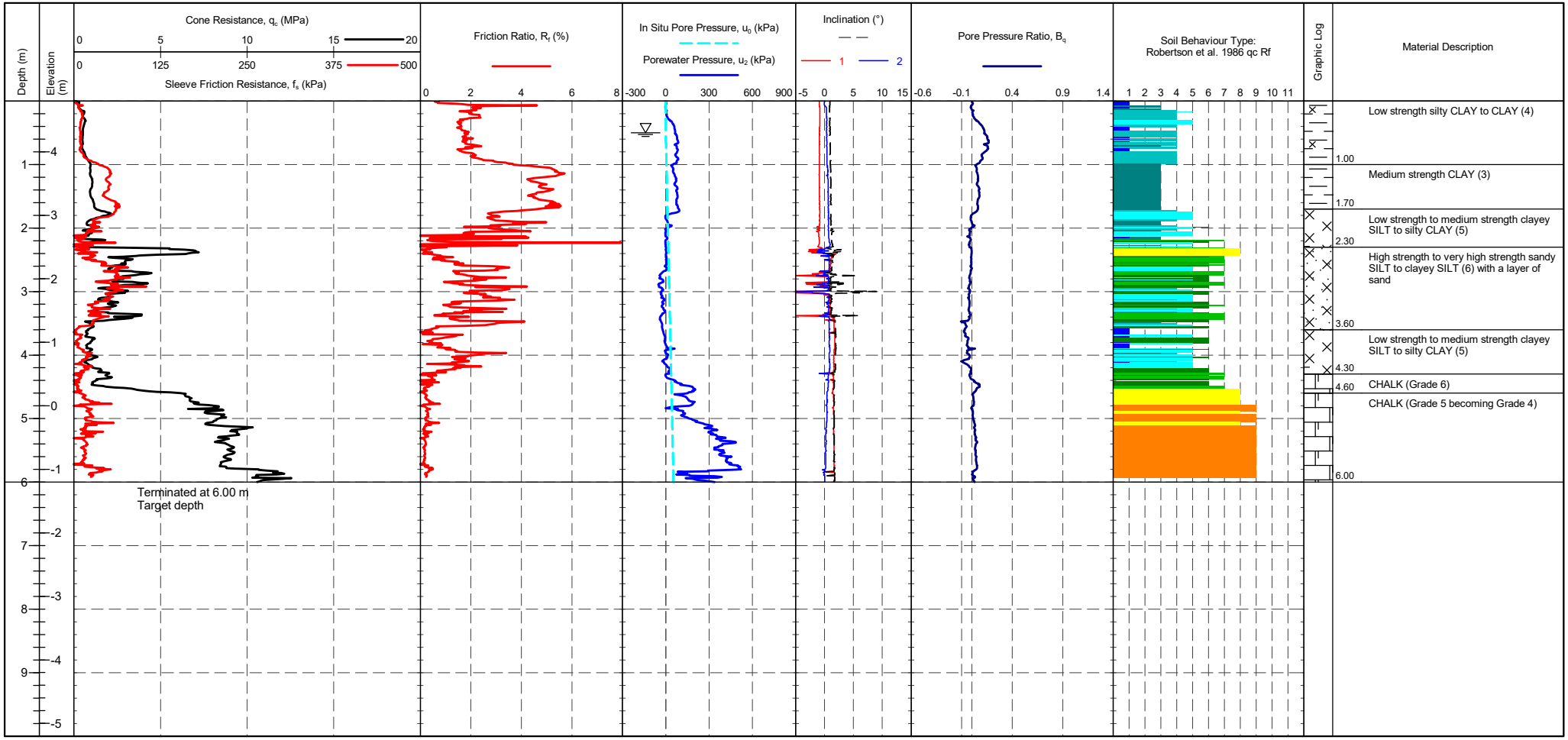

| | | | | |
|---|---|---|---|---|
| CONE ID : S15-CFIP.1186<br>CONE MODEL : Subtraction | RIG : CPT 017 - Griffen<br>OPERATOR : DHo | CPTU ZERO VALUES | | |
| | | Transducer | Pre | Post | Difference |
| | | Tip | 221 mV | 213 mV | -0.088 MPa |
| | | Sleeve | 218 mV | 209 mV | -0.006 kPa |
| | | Pore Pressure 2 | 268 mV | 244 mV | -0.007 kPa |
| | | X-Y Inclinometer | 2355 mV | 2355 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID **DP148**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500187.265 m<br>NORTHING : 102241.311 m<br>ELEVATION : 4.799 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 | | |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen | | |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo | | |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None | | |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold | | |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 219 mV | -0.033 MPa |
| Sleeve | 219 mV | 216 mV | -0.002 kPa |
| Pore Pressure 2 | 264 mV | 261 mV | -0.001 kPa |
| X-Y Inclinometer | 2389 mV | 2403 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

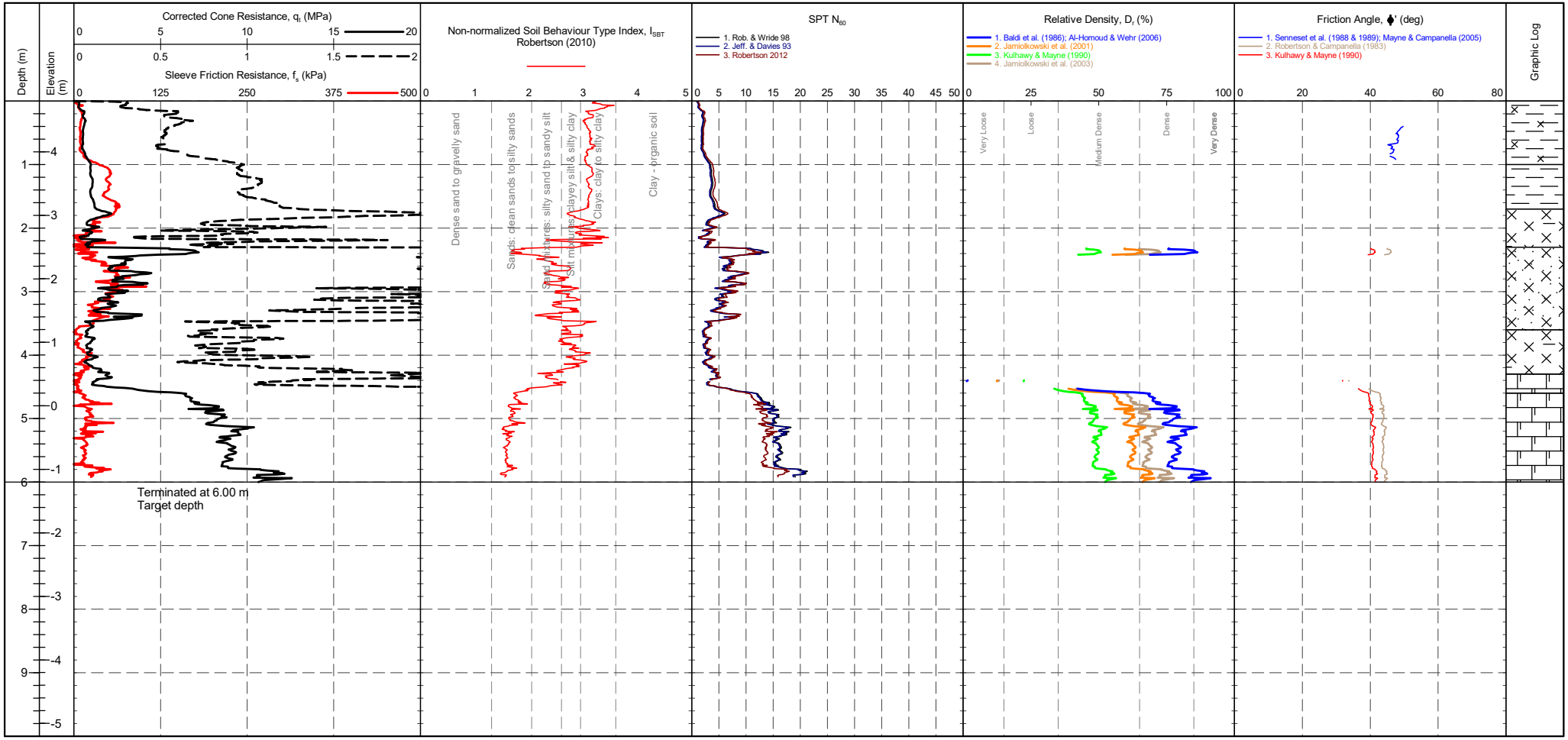
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP148**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500187.265 m<br>NORTHING : 102241.311 m<br>ELEVATION : 4.799 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 222 mV | 219 mV |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 219 mV | 216 mV |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 264 mV | 261 mV |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2389 mV | 2403 mV |

| Transducer | Difference |
|---|---|
| Tip | -0.033 MPa |
| Sleeve | -0.002 kPa |
| Pore Pressure 2 | -0.001 kPa |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

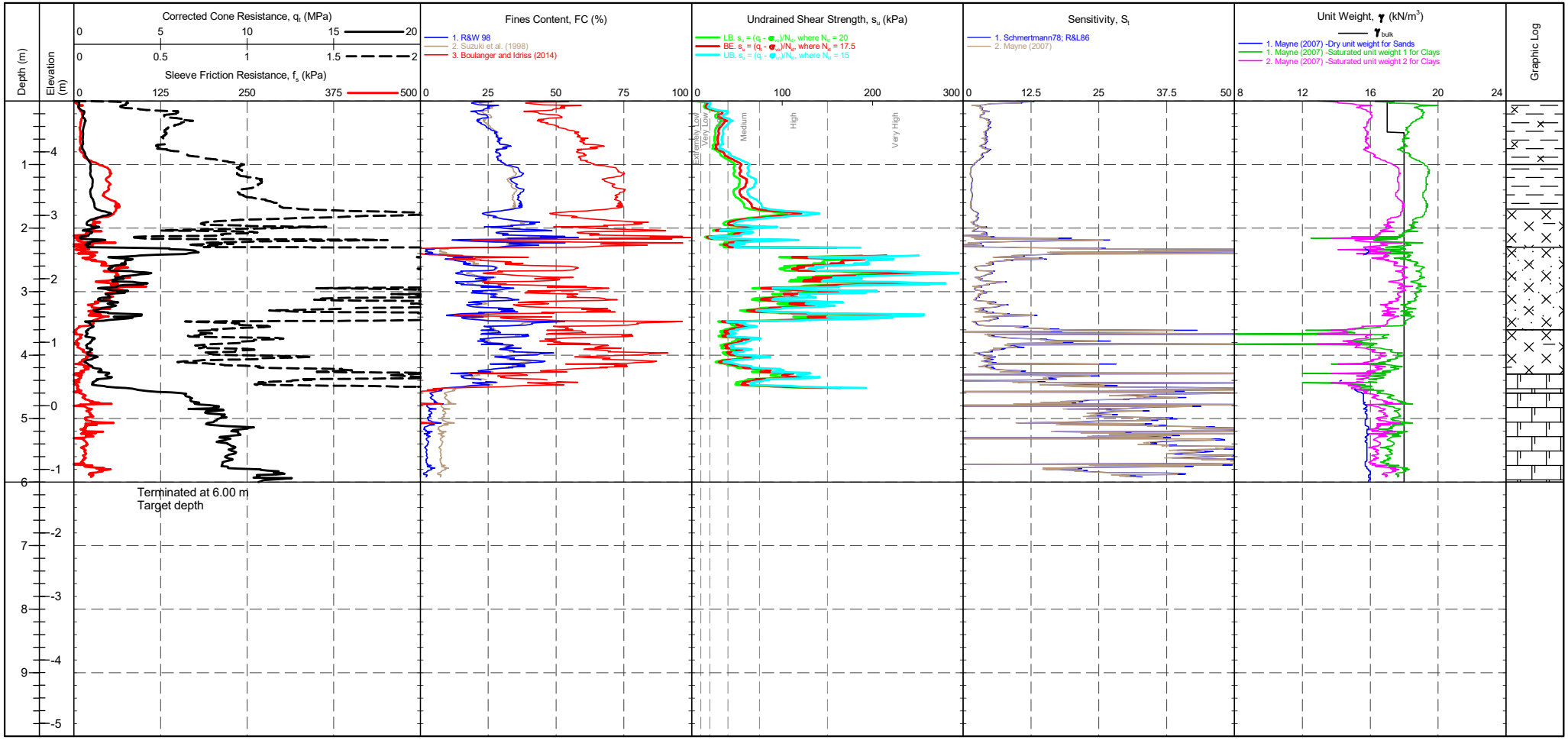
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP148**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500187.265 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102241.311 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.799 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | | |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 219 mV | -0.033 MPa |
| Sleeve | 219 mV | 216 mV | -0.002 kPa |
| Pore Pressure 2 | 264 mV | 261 mV | -0.001 kPa |
| X-Y Inclinometer | 2389 mV | 2403 mV | |

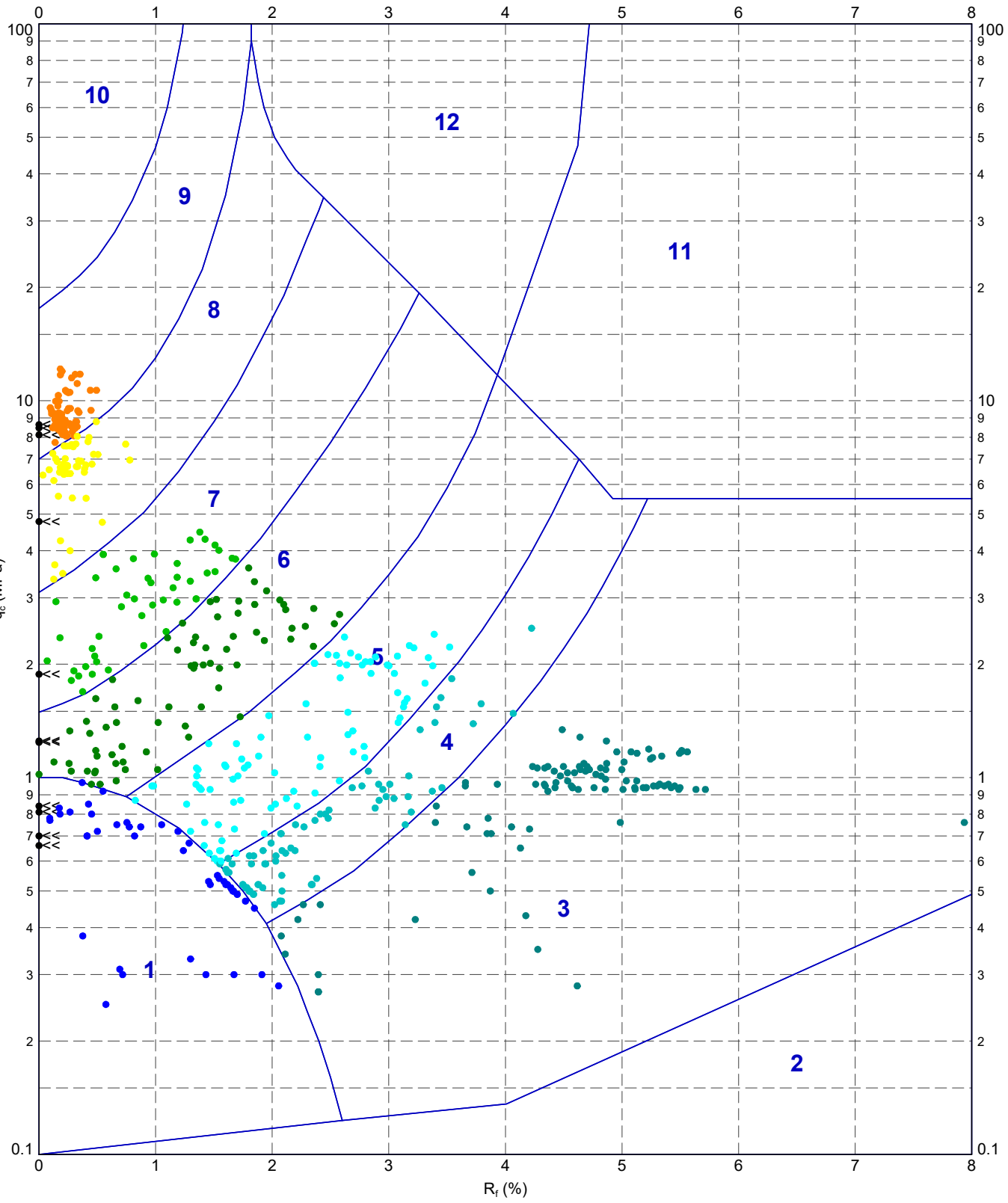
COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) |
|---|---|
| Extremely low strength | <10 |
| Very low strength | 10-20 |
| Low strength | 20-40 |

| Term based on measurement | su (kPa) |
|---|---|
| Medium strength | 40-75 |
| High strength | 75-150 |
| Very high strength | 150-300 |
| Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP148

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

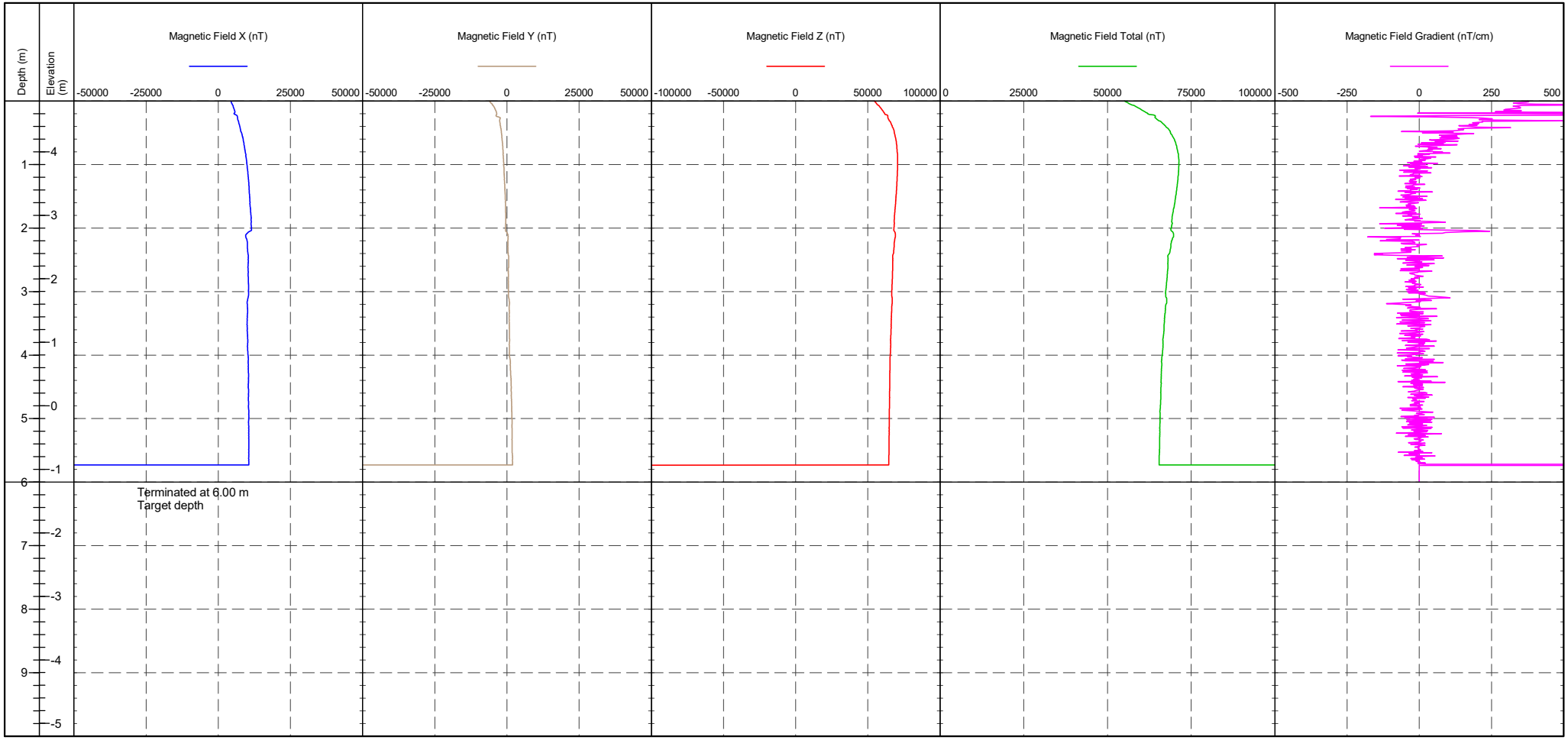
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:48 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP148**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500187.265 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102241.311 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.799 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



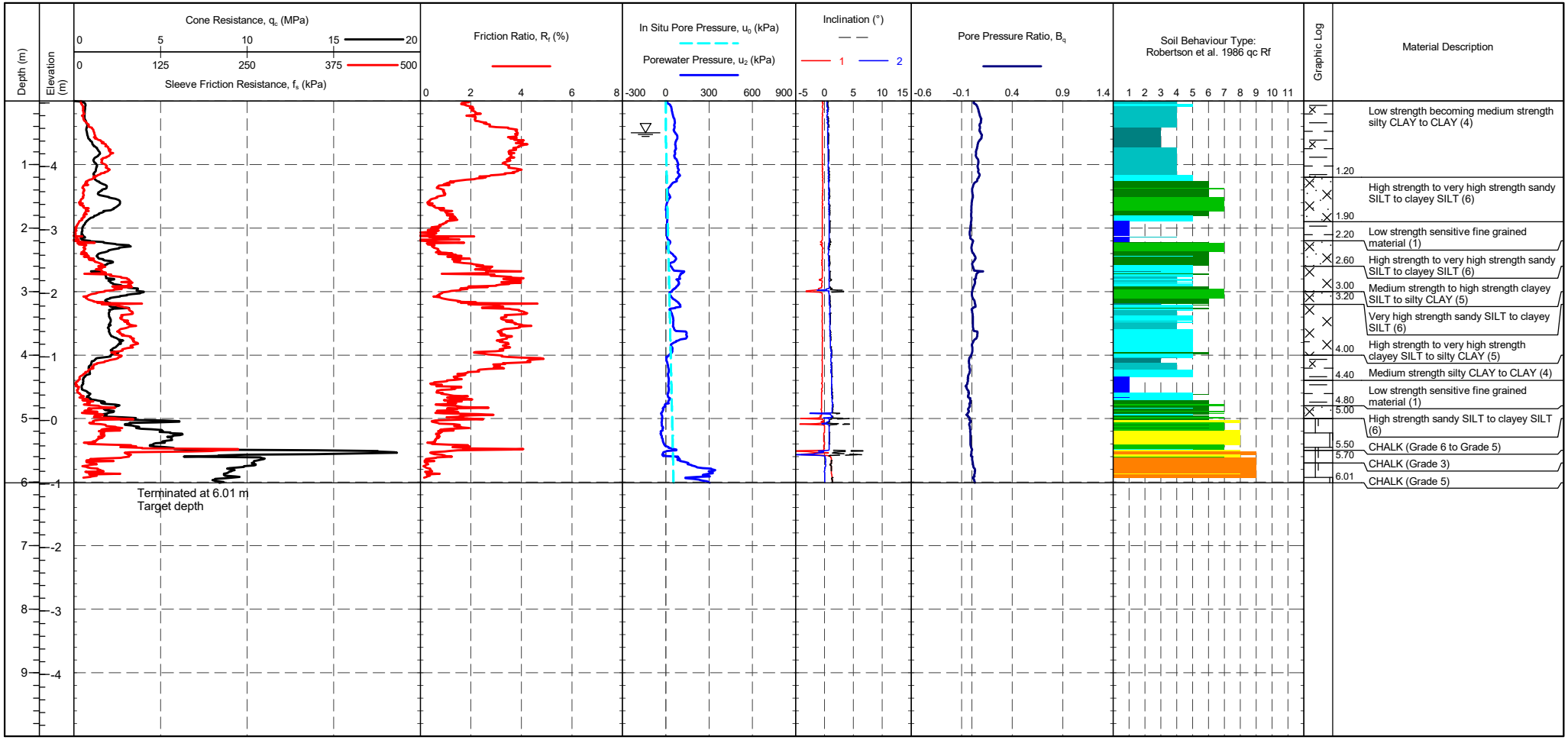

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 222 mV | 219 mV | -0.033 MPa |
| | | | | Sleeve | 219 mV | 216 mV | -0.002 kPa |
| | | | | Pore Pressure 2 | 264 mV | 261 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2389 mV | 2403 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP149**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500244.256 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102263.602 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.029 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 220 mV | -0.011 MPa |
| Sleeve | 218 mV | 217 mV | -0.001 kPa |
| Pore Pressure 2 | 256 mV | 268 mV | 0.004 kPa |
| X-Y Inclinometer | 2459 mV | 2455 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

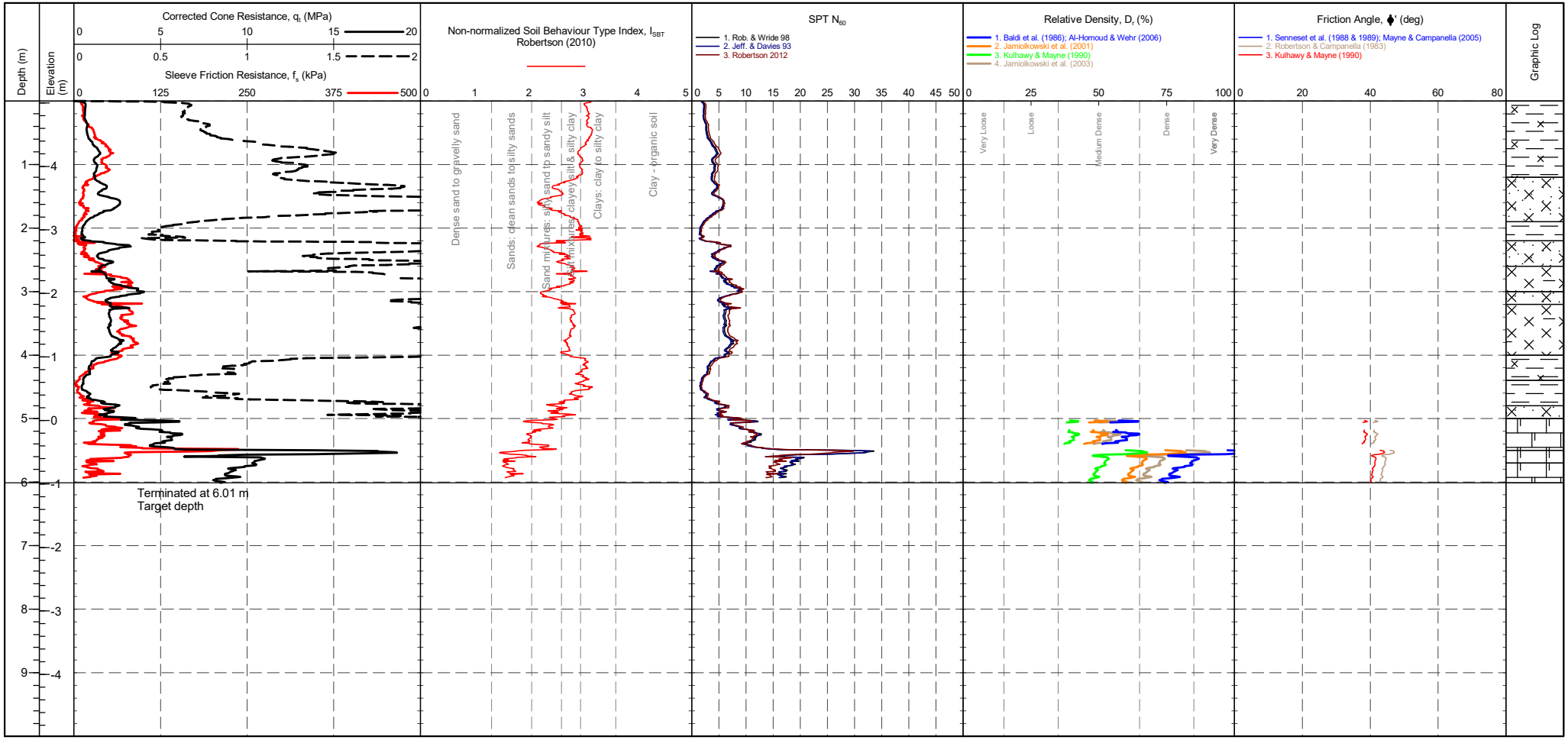
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP149**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500244.256 m<br>NORTHING : 102263.602 m<br>ELEVATION : 5.029 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | |

CPTU ZERO VALUES

| | Pre | Post | Difference |
|---|---|---|---|
| Transducer | | | |
| Tip | 221 mV | 220 mV | -0.011 MPa |
| Sleeve | 218 mV | 217 mV | -0.001 kPa |
| Pore Pressure 2 | 256 mV | 268 mV | 0.004 kPa |
| X-Y Inclinometer | 2459 mV | 2455 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

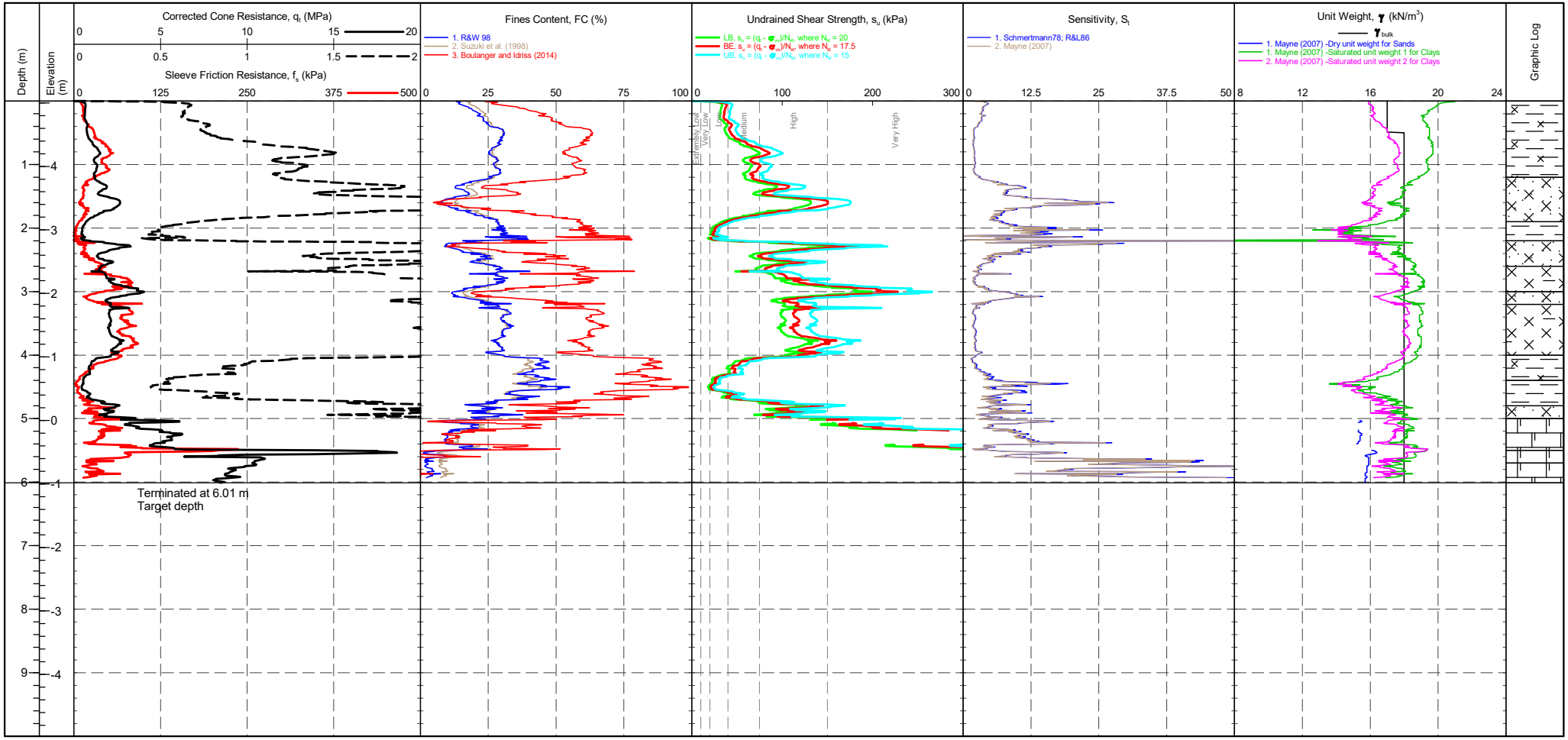
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP149**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500244.256 m<br>NORTHING : 102263.602 m<br>ELEVATION : 5.029 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



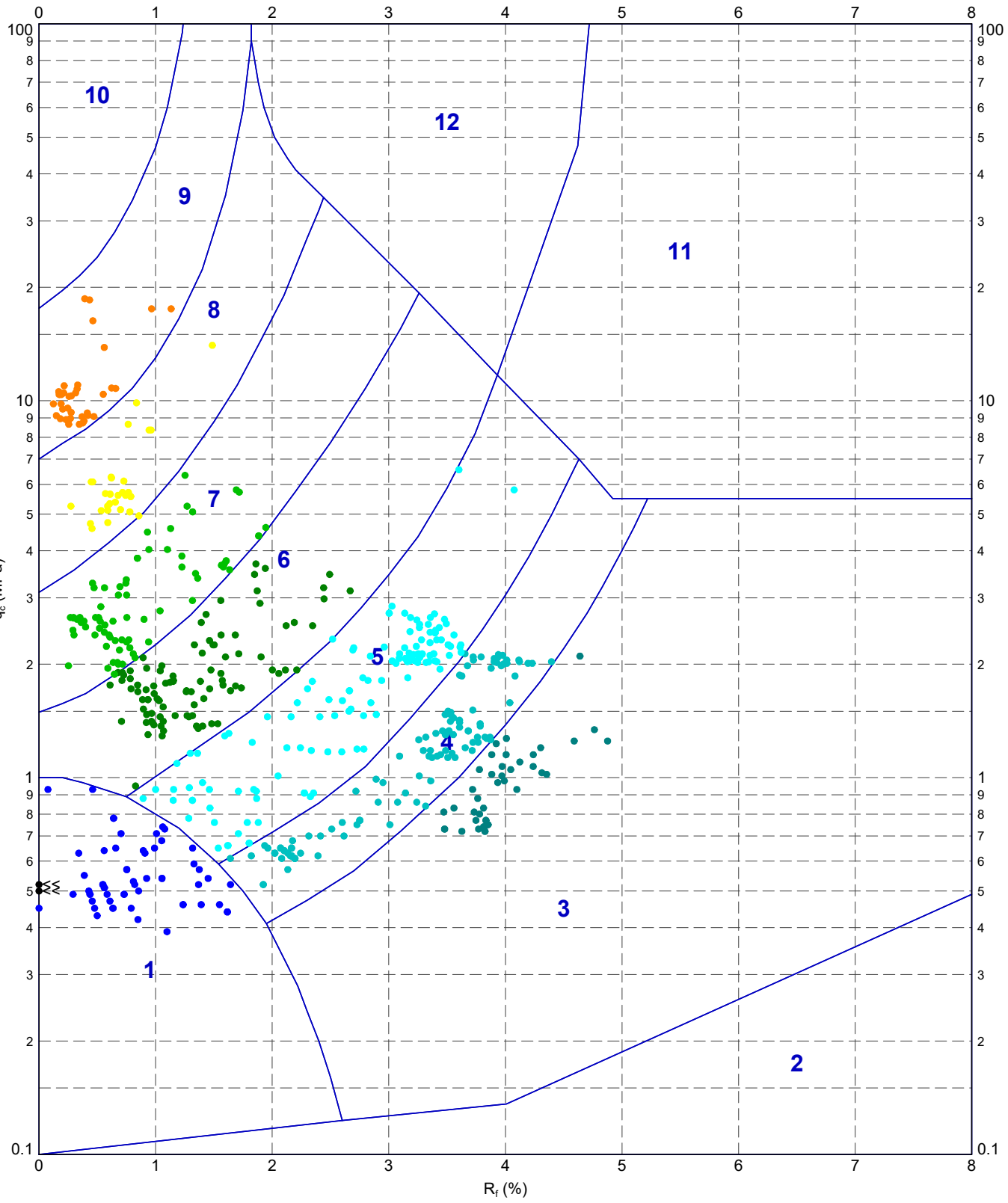

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 221 mV | 220 mV | -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 218 mV | 217 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 256 mV | 268 mV | 0.004 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2459 mV | 2455 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP149

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

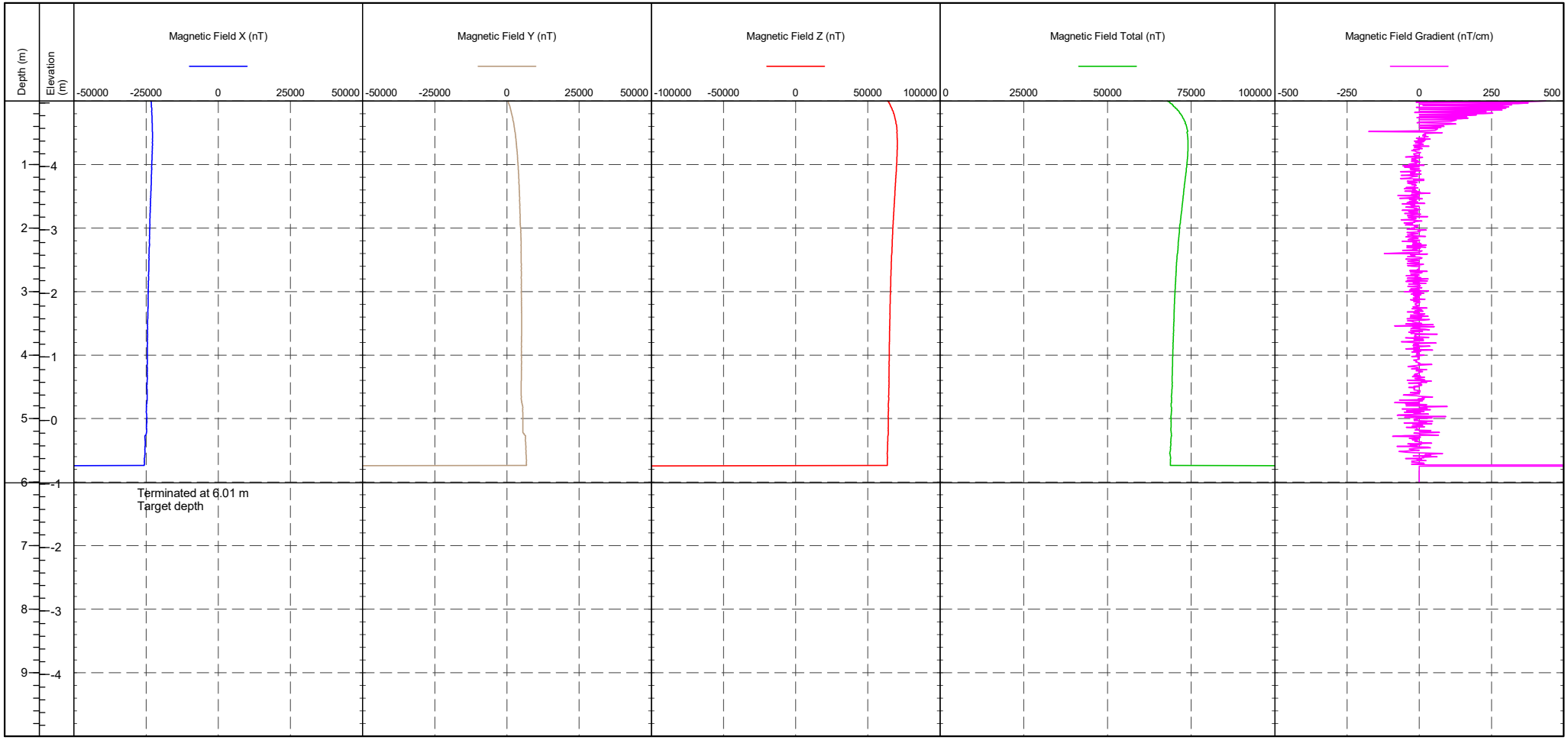
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:48 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID **DP149**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500244.256 m<br>NORTHING : 102263.602 m<br>ELEVATION : 5.029 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



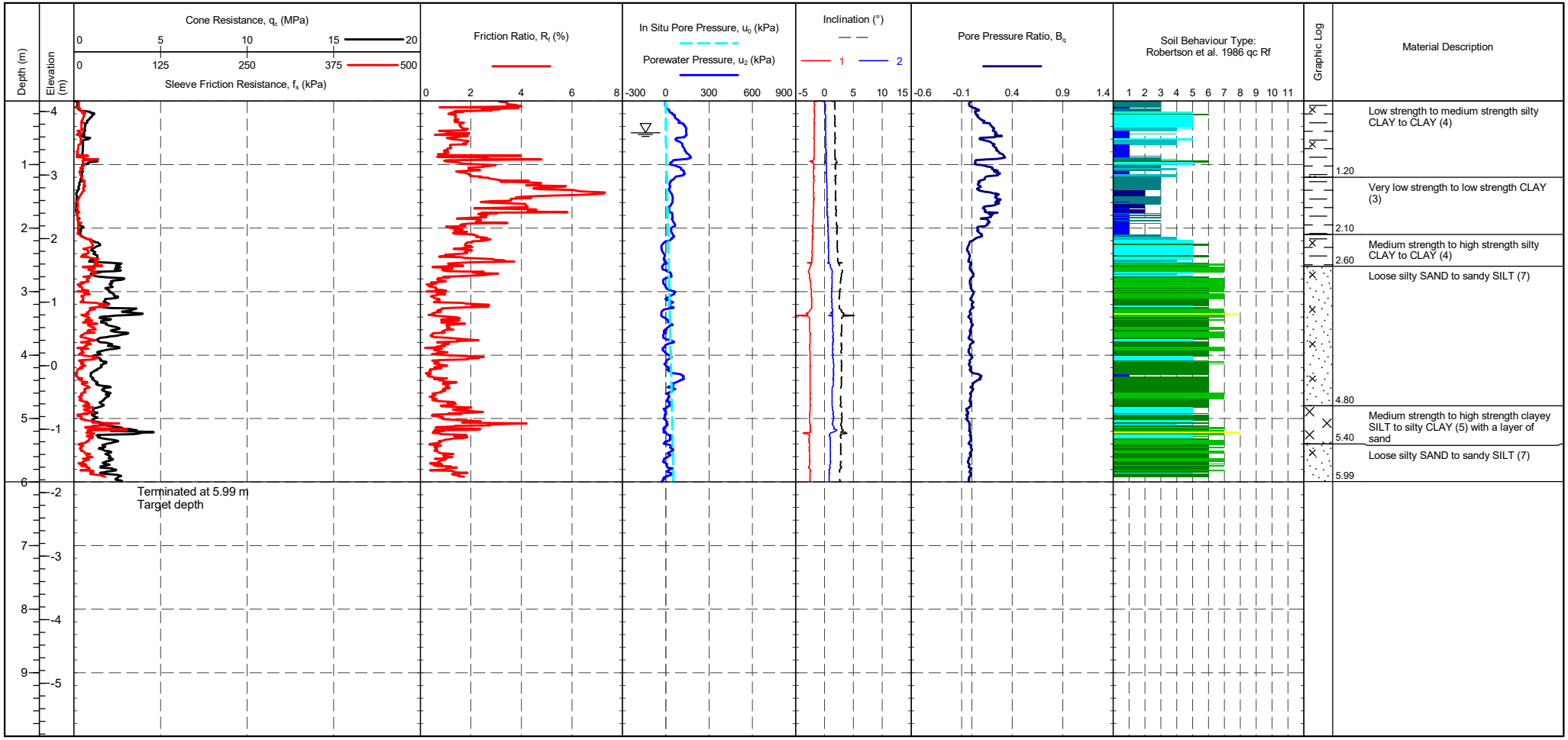

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 221 mV | 220 mV | -0.011 MPa |
| | | | | Sleeve | 218 mV | 217 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 256 mV | 268 mV | 0.004 kPa |
| | | | | X-Y Inclinometer | 2459 mV | 2455 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP150**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500309.623 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102280.764 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.166 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 222 mV | 221 mV | -0.011 MPa |
| Sleeve | 222 mV | 221 mV | -0.001 kPa |
| Pore Pressure 2 | 273 mV | 269 mV | -0.001 kPa |
| X-Y Inclinometer | 2390 mV | 2321 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

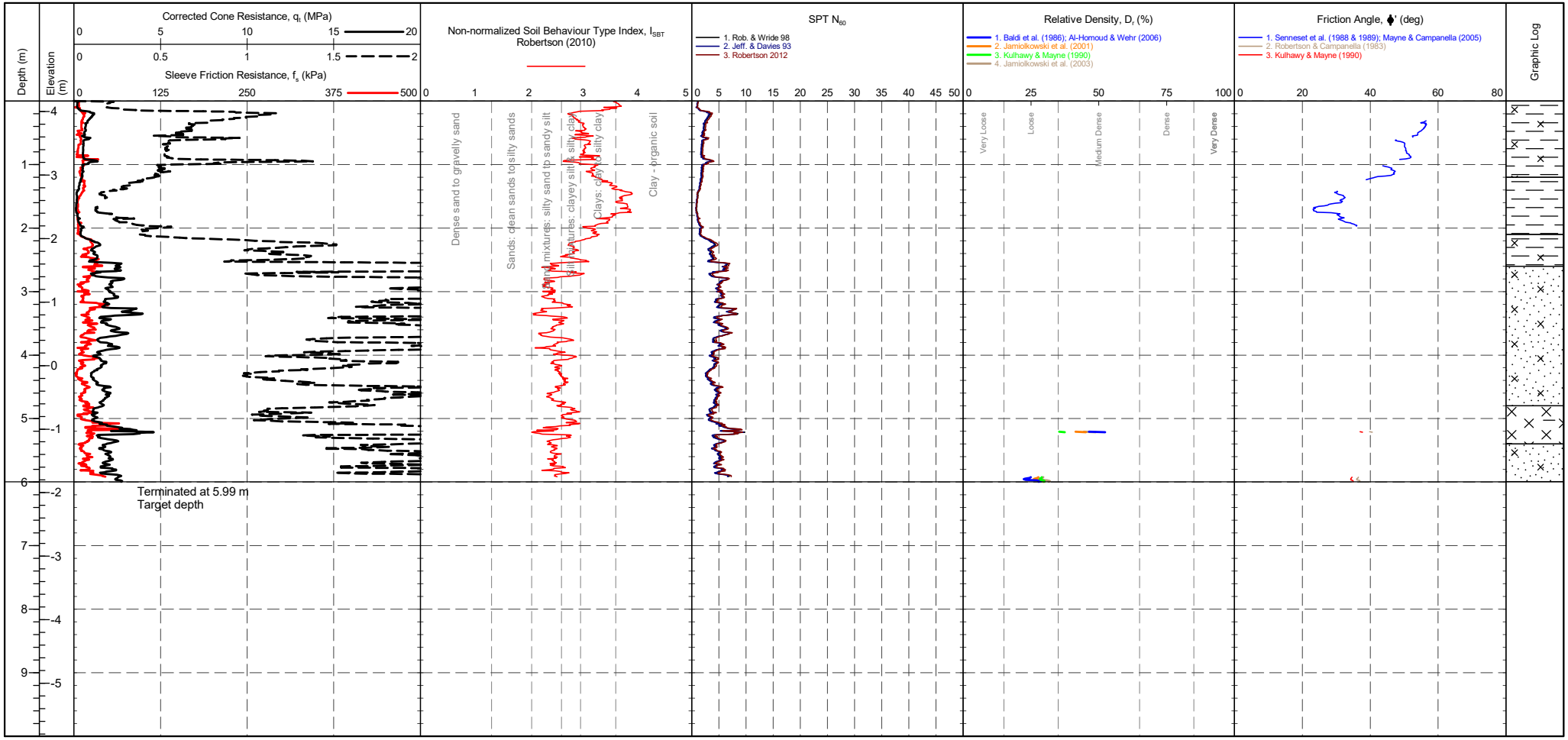
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP150**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500309.623 m<br>NORTHING : 102280.764 m<br>ELEVATION : 4.166 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 222 mV | 221 mV |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 222 mV | 221 mV |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 273 mV | 269 mV |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2390 mV | 2321 mV |

| Transducer | Difference |
|---|---|
| Tip | -0.011 MPa |
| Sleeve | -0.001 kPa |
| Pore Pressure 2 | -0.001 kPa |
| X-Y Inclinometer | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

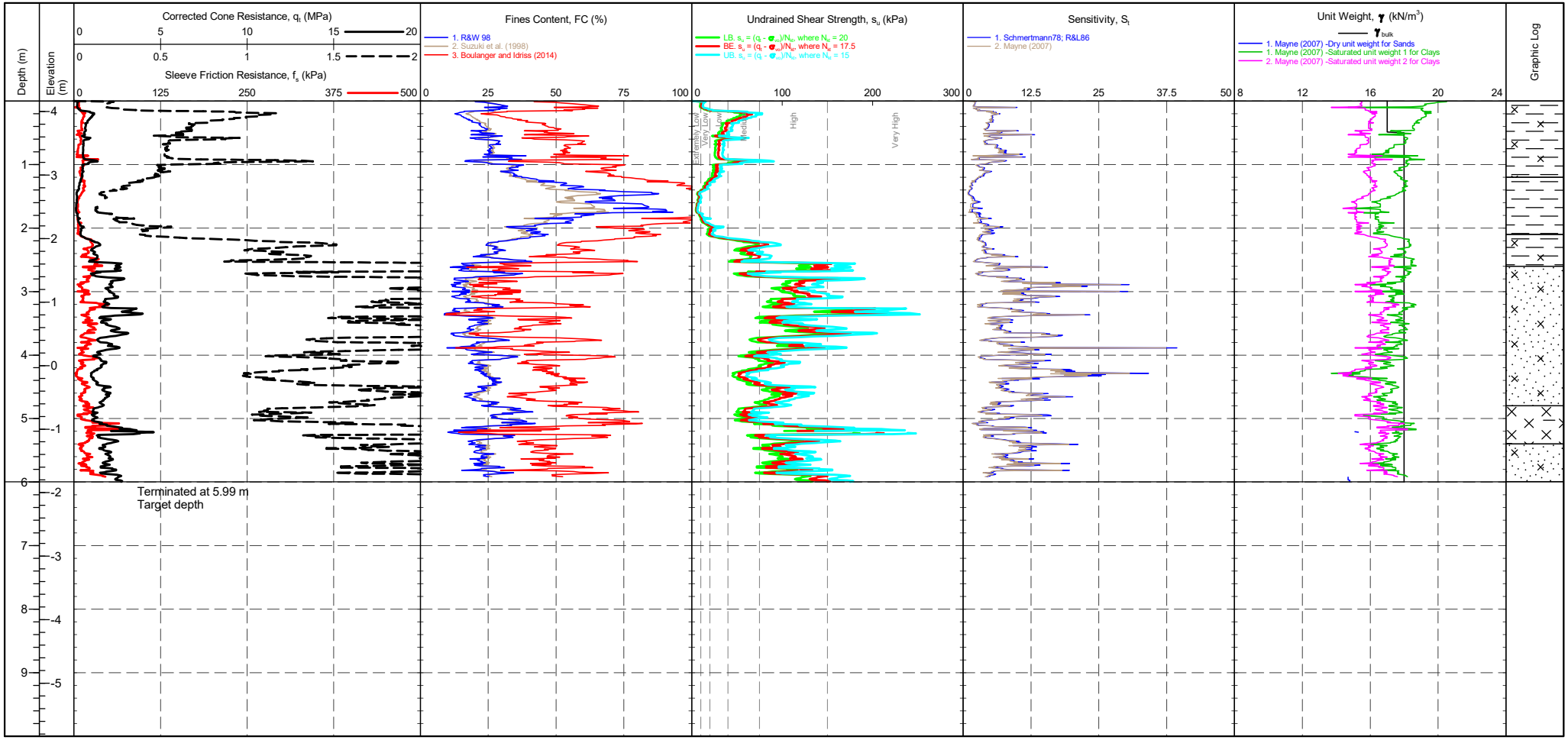
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP150**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500309.623 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102280.764 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.166 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



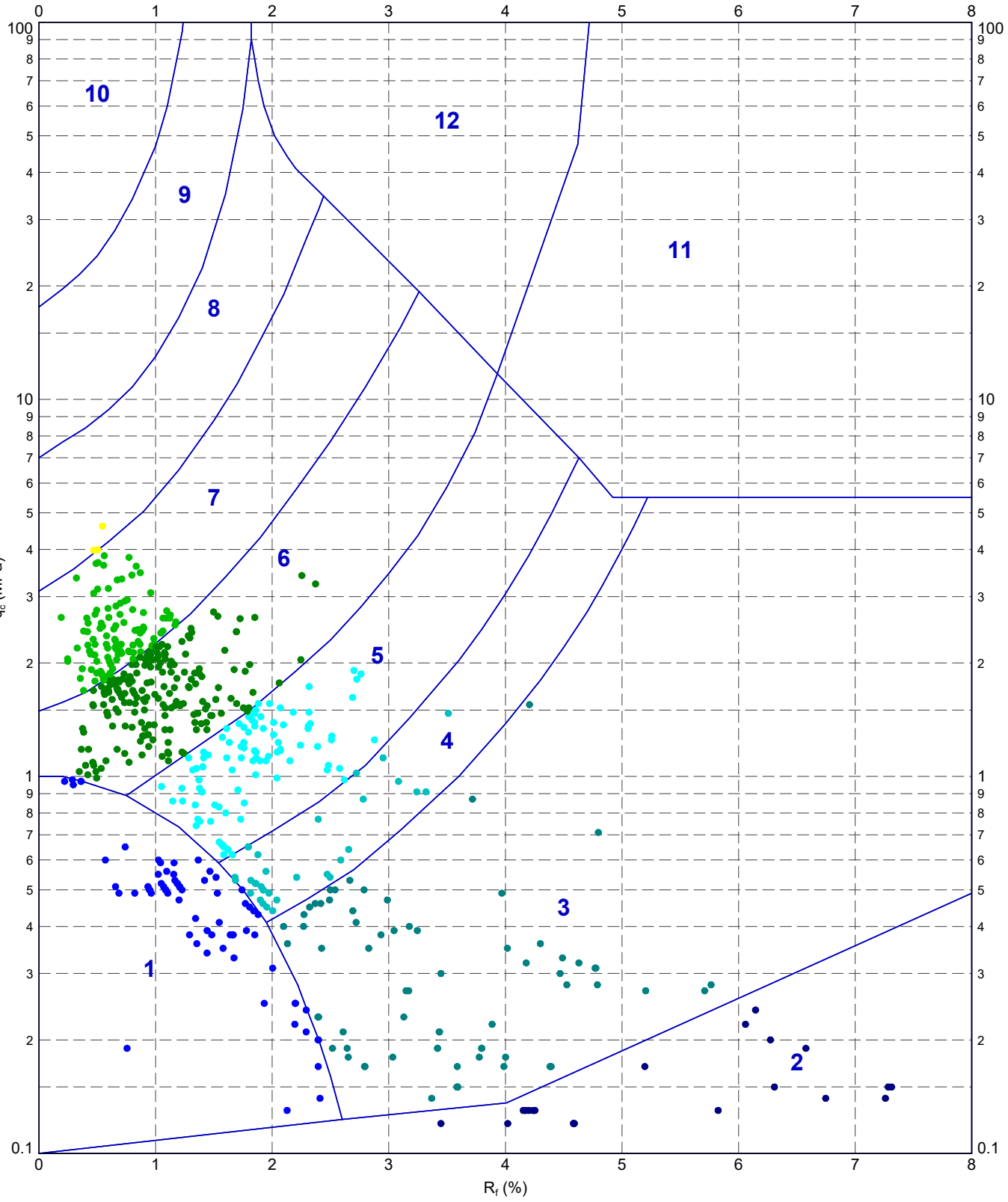

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 222 mV | 221 mV | -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 222 mV | 221 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 273 mV | 269 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2390 mV | 2321 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP150

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

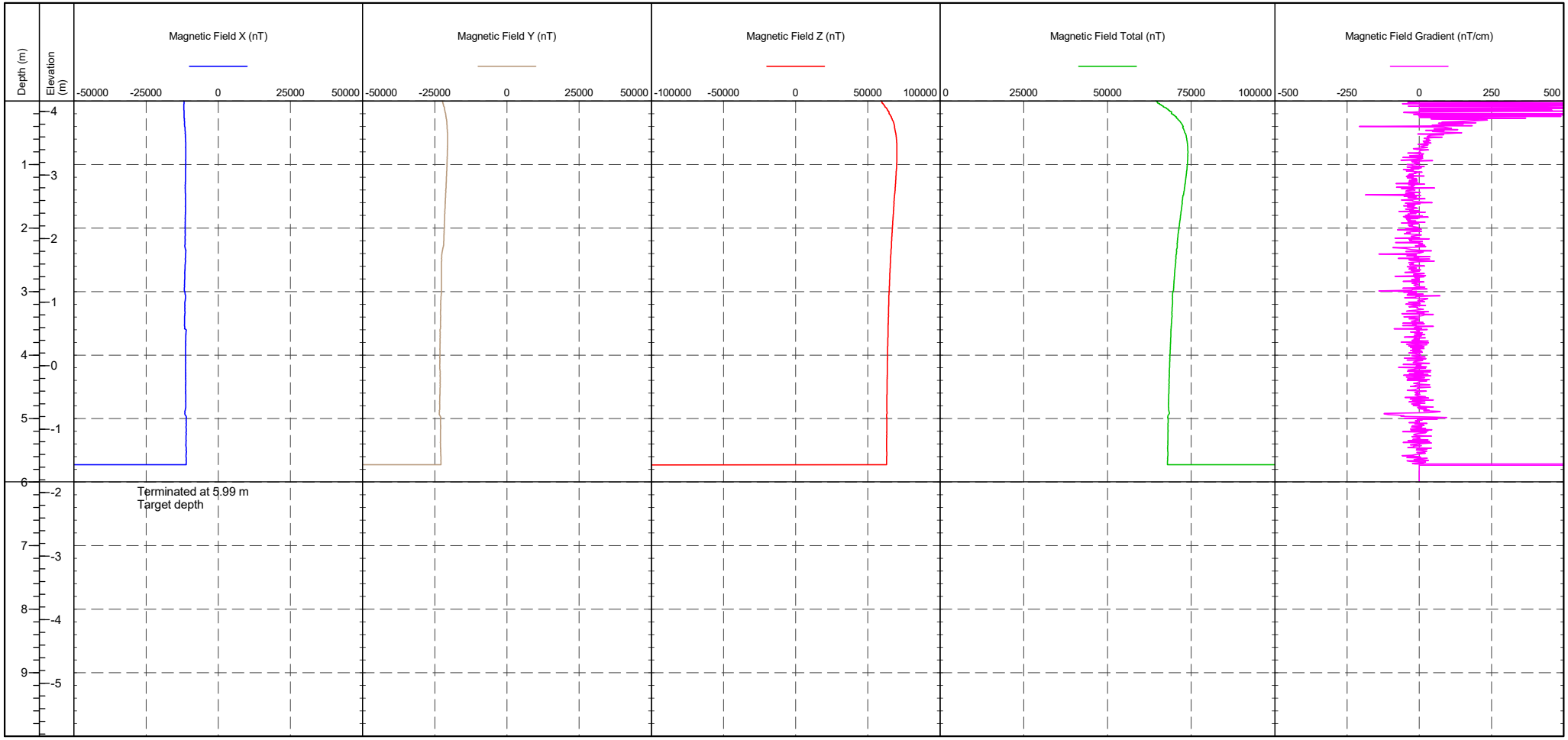
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:49 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID **DP150**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500309.623 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102280.764 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.166 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



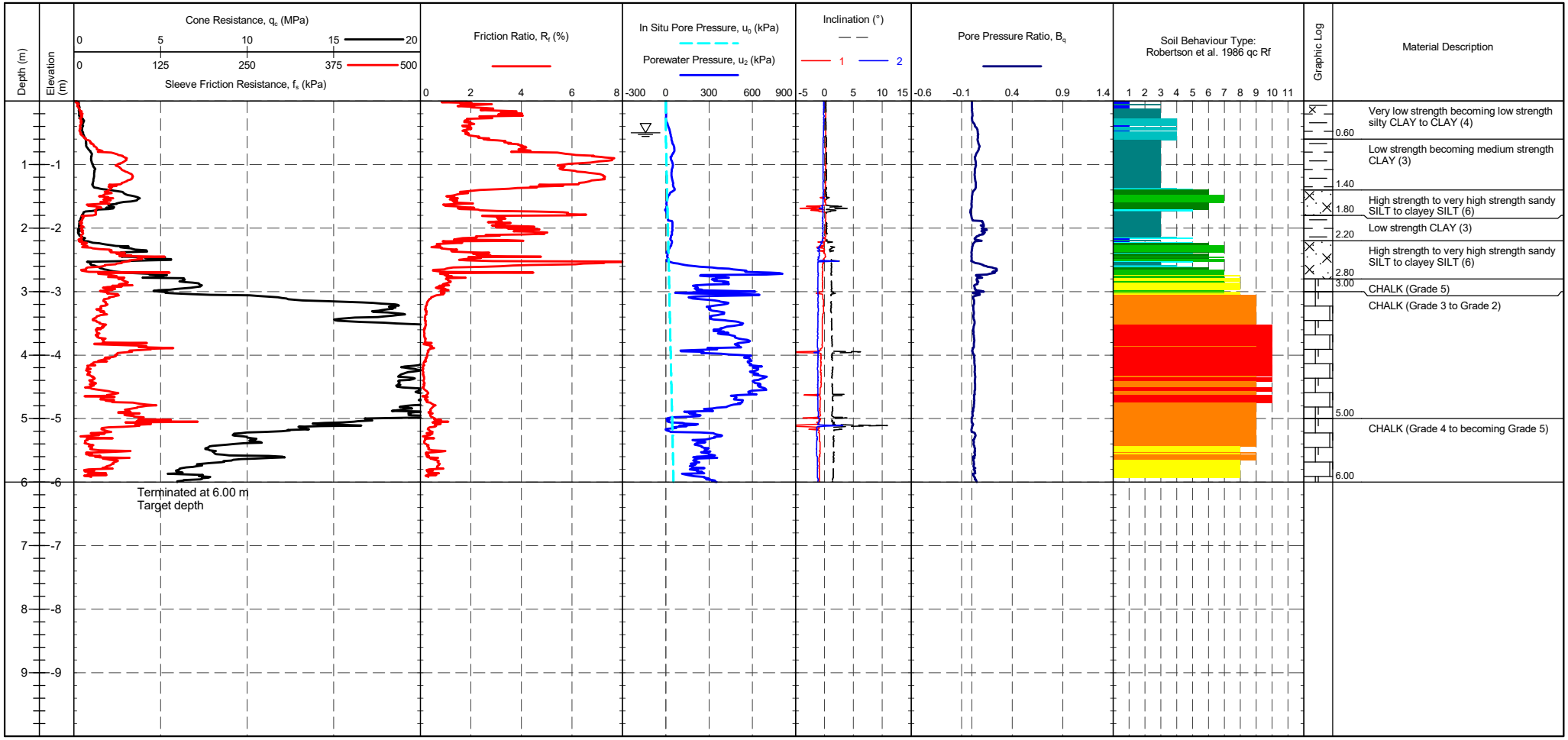

| | | | | CPTU ZERO VALUES | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | Transducer | Pre | Post | Difference |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Tip | 222 mV | 221 mV | -0.011 MPa |
| | | | | Sleeve | 222 mV | 221 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 273 mV | 269 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2390 mV | 2321 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP151**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 0.000 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 0.000 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 0.000 m OD | | TEST DATE : 13/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 16/09/2022 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 287 mV | 283 mV | -0.046 MPa |
| Sleeve | 257 mV | 256 mV | -0.001 kPa |
| Pore Pressure 2 | 241 mV | 239 mV | -0.001 kPa |
| X-Y Inclinometer | 2416 mV | 2398 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

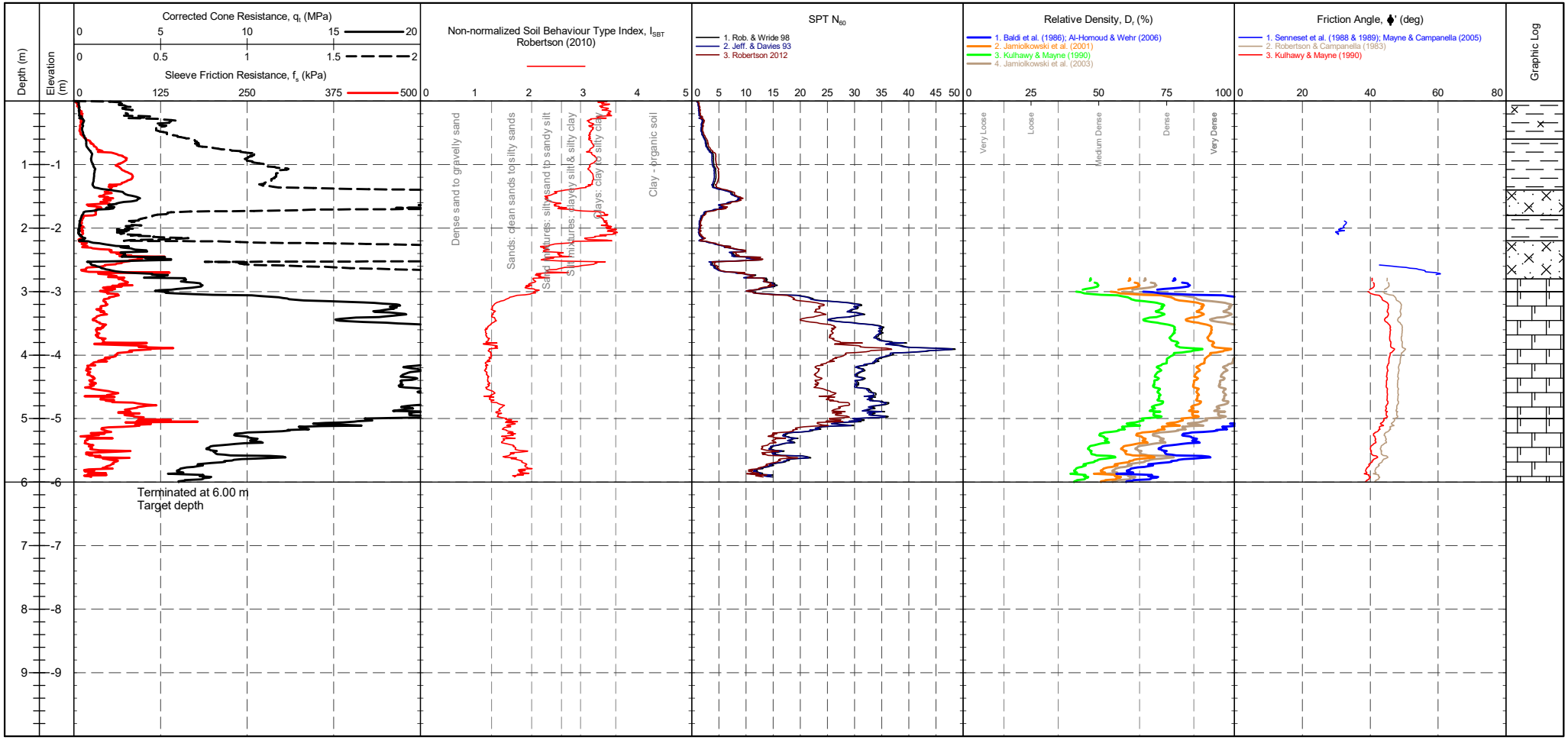
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP151**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 0.000 m<br>NORTHING : 0.000 m<br>ELEVATION : 0.000 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 287 mV | 283 mV | -0.046 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 257 mV | 256 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 241 mV | 239 mV | -0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2416 mV | 2398 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

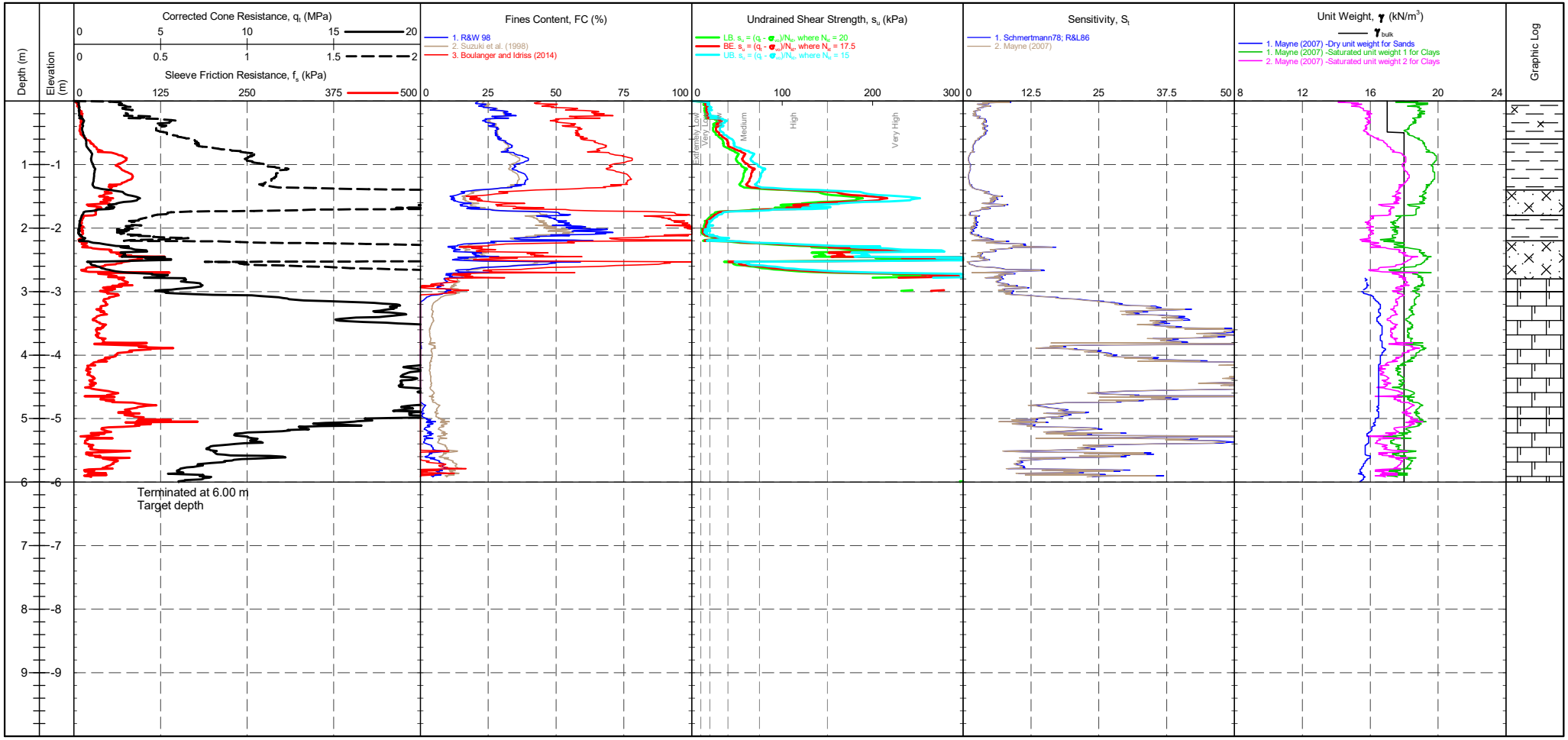
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP151**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 0.000 m<br>NORTHING : 0.000 m<br>ELEVATION : 0.000 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | | | |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | | | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | | | |

CPTU ZERO VALUES

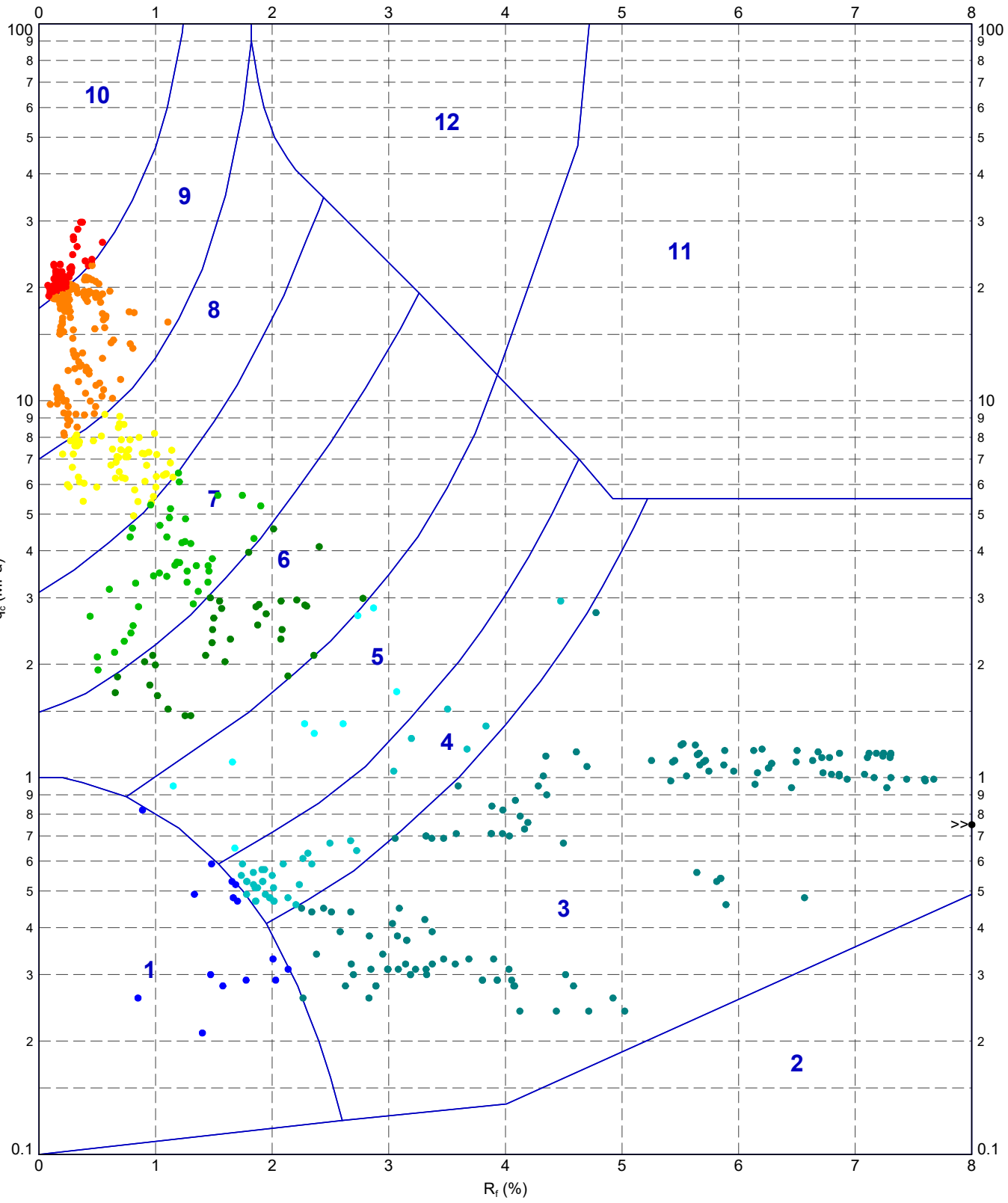
| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 287 mV | 283 mV | -0.046 MPa |
| Sleeve | 257 mV | 256 mV | -0.001 kPa |
| Pore Pressure 2 | 241 mV | 239 mV | -0.001 kPa |
| X-Y Inclinometer | 2416 mV | 2398 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) |
|---|---|
| Extremely low strength | <10 |
| Very low strength | 10-20 |
| Low strength | 20-40 |
| Medium strength | 40-75 |
| High strength | 75-150 |
| Very high strength | 150-300 |
| Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP151

| | | |
|---|---|---|
| DRAWN | DATE 12/04/2024 | |
| CHECKED | DATE 12/04/2024 | |
| SCALE Not To Scale | | A4 |
| PROJECT No 1240182 | FIGURE No | |

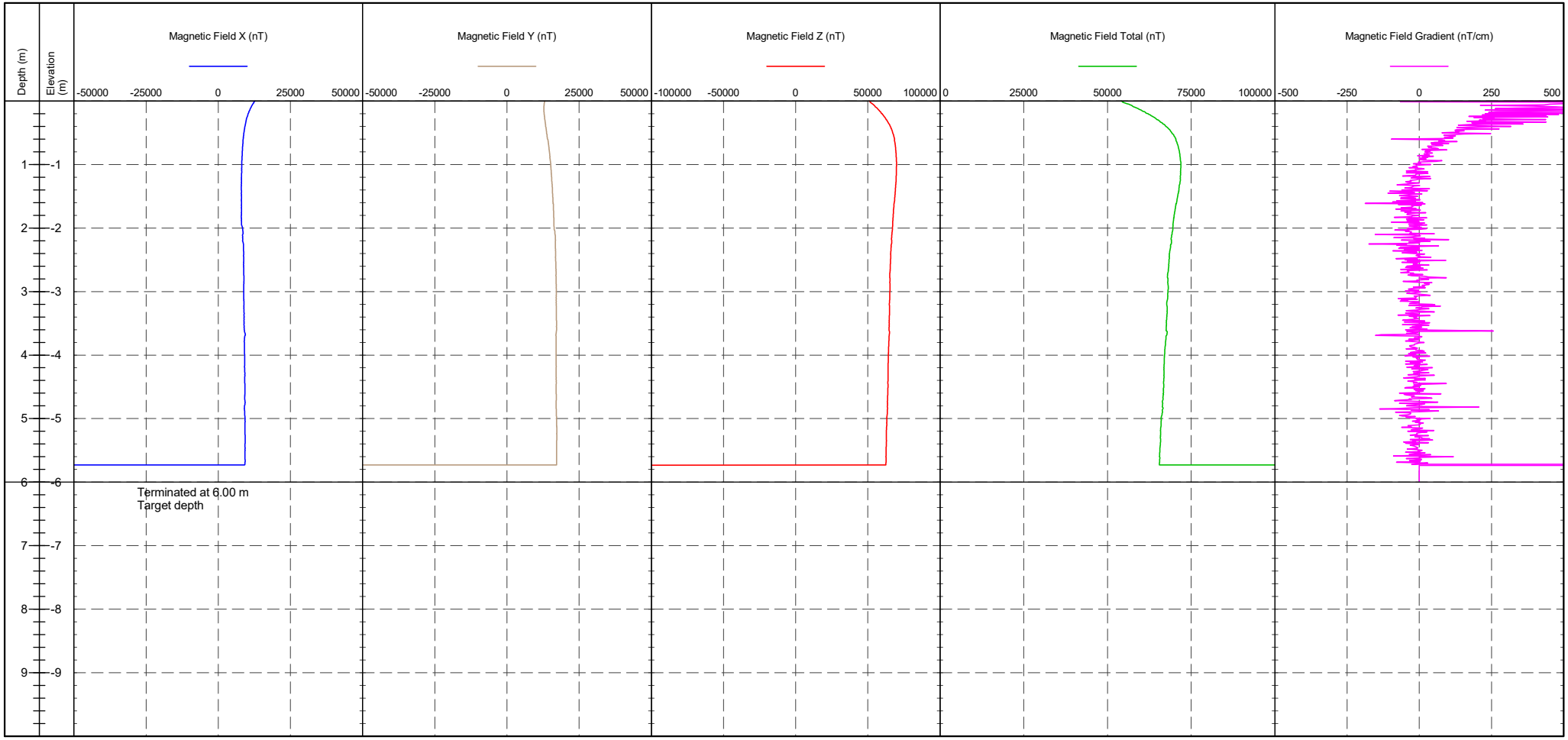
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:50 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Plt: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP151**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 0.000 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 0.000 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 0.000 m OD | | TEST DATE : 13/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



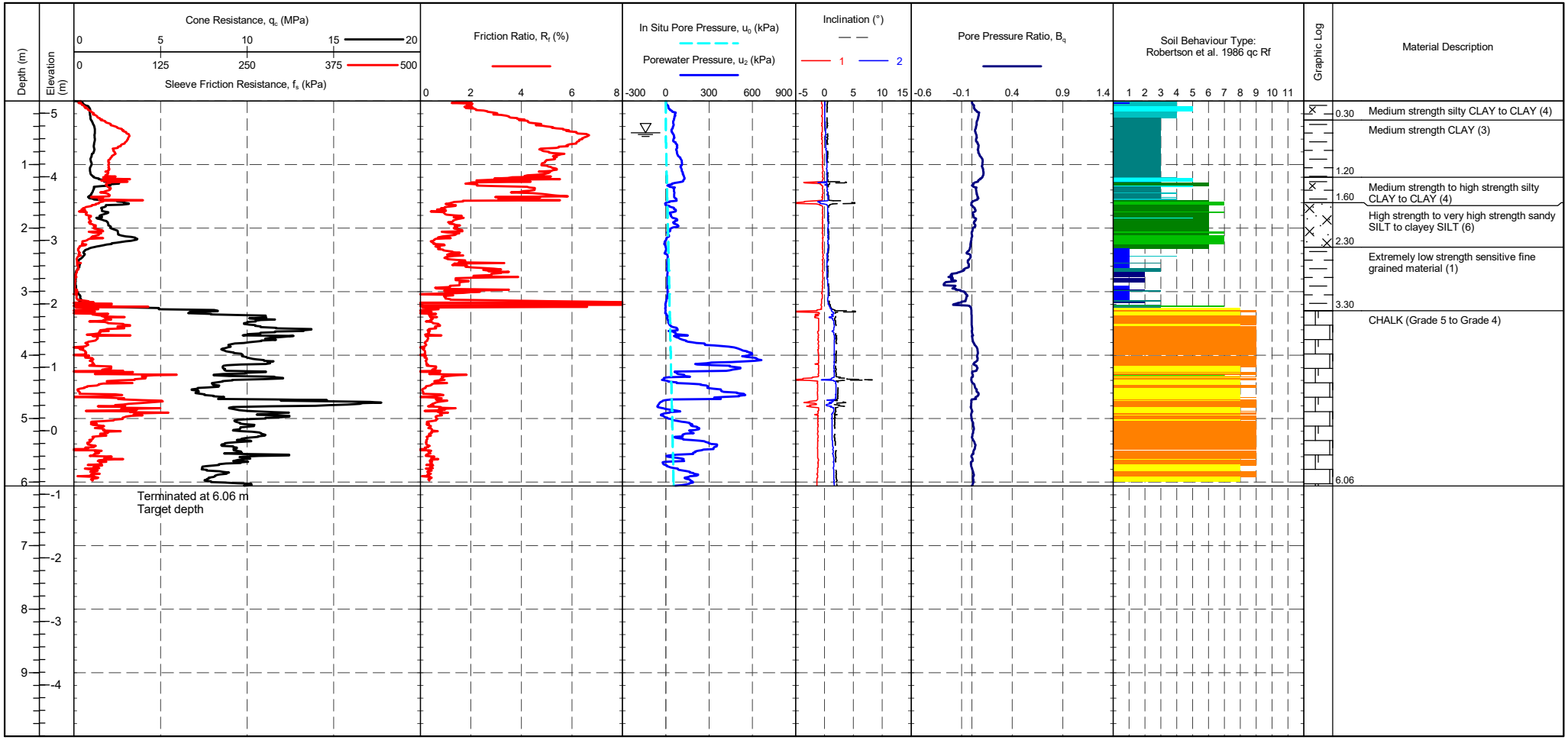

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 287 mV | 283 mV | -0.046 MPa |
| | | | | Sleeve | 257 mV | 256 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 241 mV | 239 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2416 mV | 2398 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP152**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500164.234 m<br>NORTHING : 102301.405 m<br>ELEVATION : 5.192 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 | | |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen | | |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo | | |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None | | |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold | | |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 219 mV | -0.022 MPa |
| Sleeve | 218 mV | 216 mV | -0.001 kPa |
| Pore Pressure 2 | 261 mV | 251 mV | -0.003 kPa |
| X-Y Inclinometer | 2432 mV | 2431 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

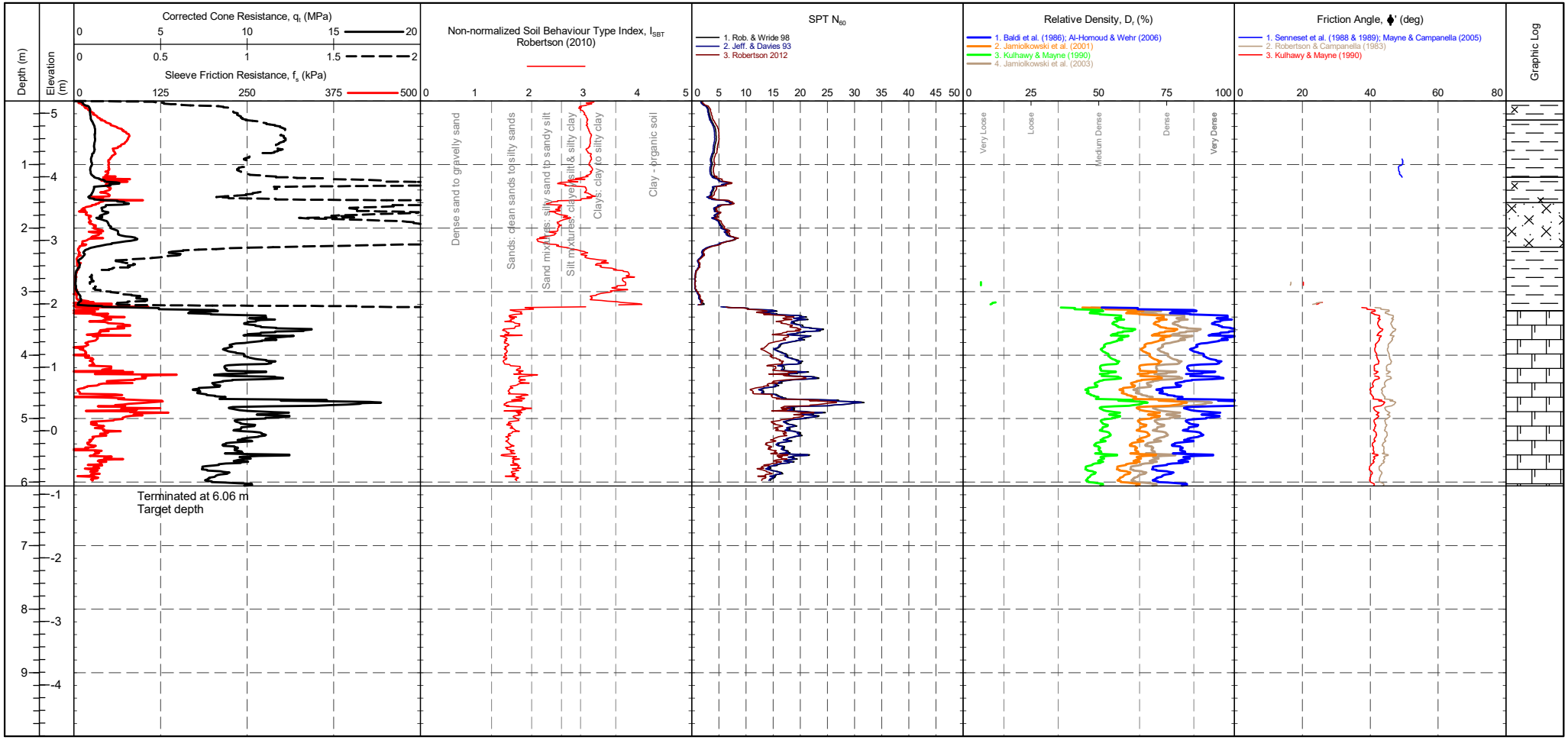
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP152**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500164.234 m<br>NORTHING : 102301.405 m<br>ELEVATION : 5.192 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | |
|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | | |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | | |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | | |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | | |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | | |

CPTU ZERO VALUES

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 221 mV | 219 mV | -0.022 MPa |
| Sleeve | 218 mV | 216 mV | -0.001 kPa |
| Pore Pressure 2 | 261 mV | 251 mV | -0.003 kPa |
| X-Y Inclinometer | 2432 mV | 2431 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

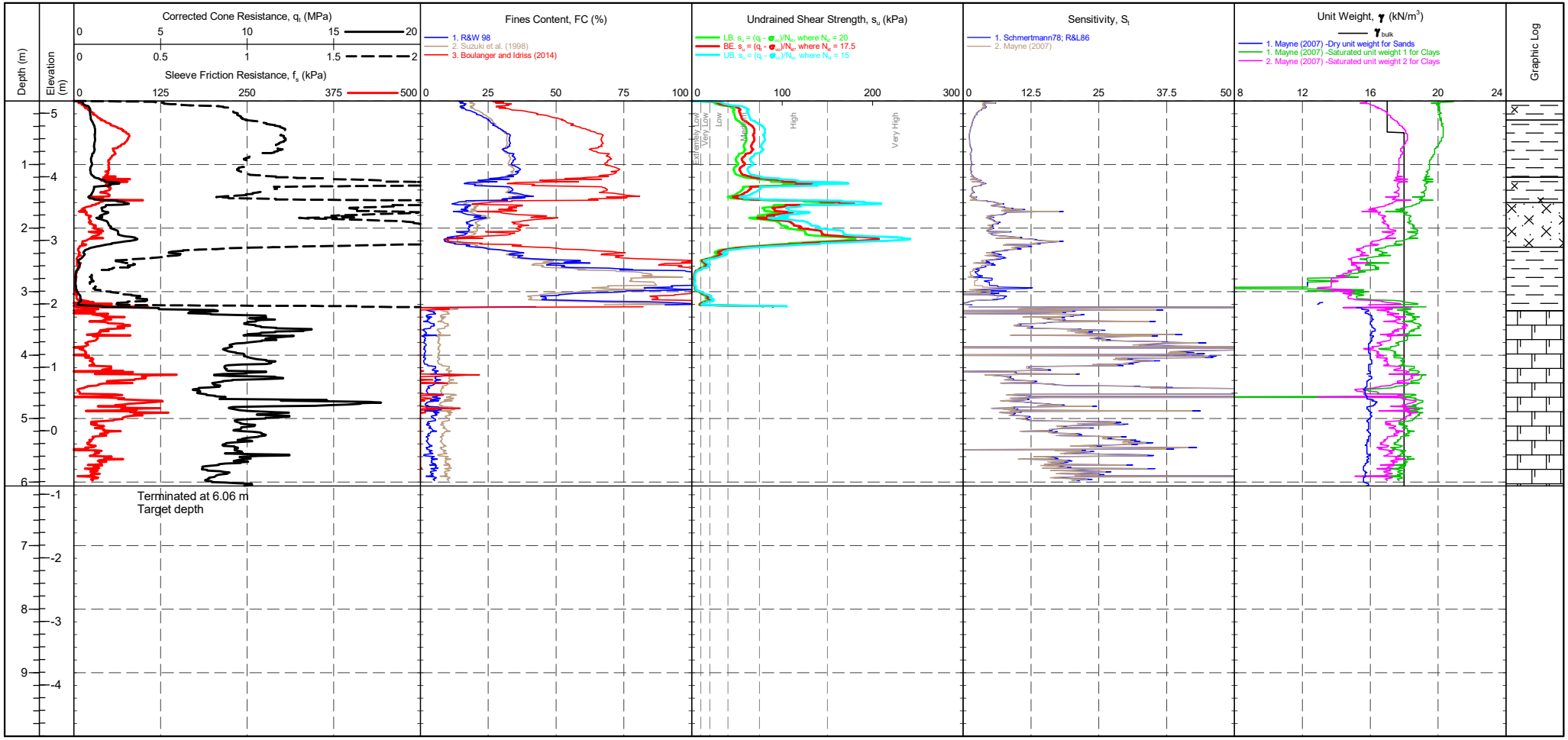
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP152**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500164.234 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102301.405 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.192 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



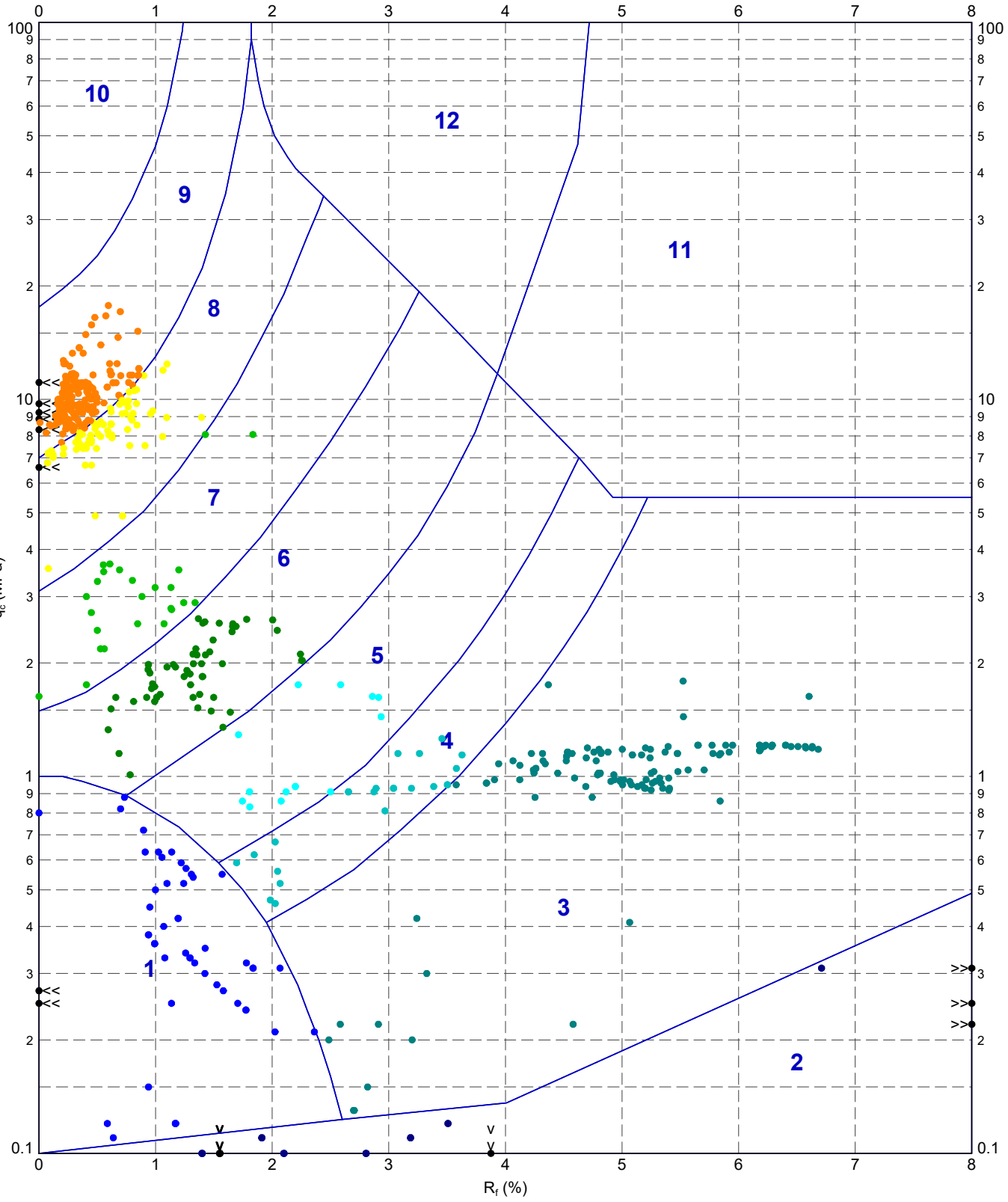

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 221 mV | 219 mV | -0.022 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 218 mV | 216 mV | -0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 261 mV | 251 mV | -0.003 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2432 mV | 2431 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

| | | | |
|---|---|---|---|
| 1 - Sensitive fine grained material | 4 - Silty CLAY to CLAY | 7 - Silty SAND to sandy SILT | 10 - Gravelly SAND to SAND |
| 2 - Organic material | 5 - Clayey SILT to silty CLAY | 8 - SAND to silty SAND | 11 - Very stiff fine grained |
| 3 - CLAY | 6 - Sandy SILT to clayey SILT | 9 - SAND | 12 - SAND to clayey SAND |

IN SITU
SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP152

| | | | |
|---|---|---|---|
| DRAWN | | DATE | 12/04/2024 |
| CHECKED | | DATE | 12/04/2024 |
| SCALE | Not To Scale | | A4 |
| PROJECT No | 1240182 | FIGURE No | |

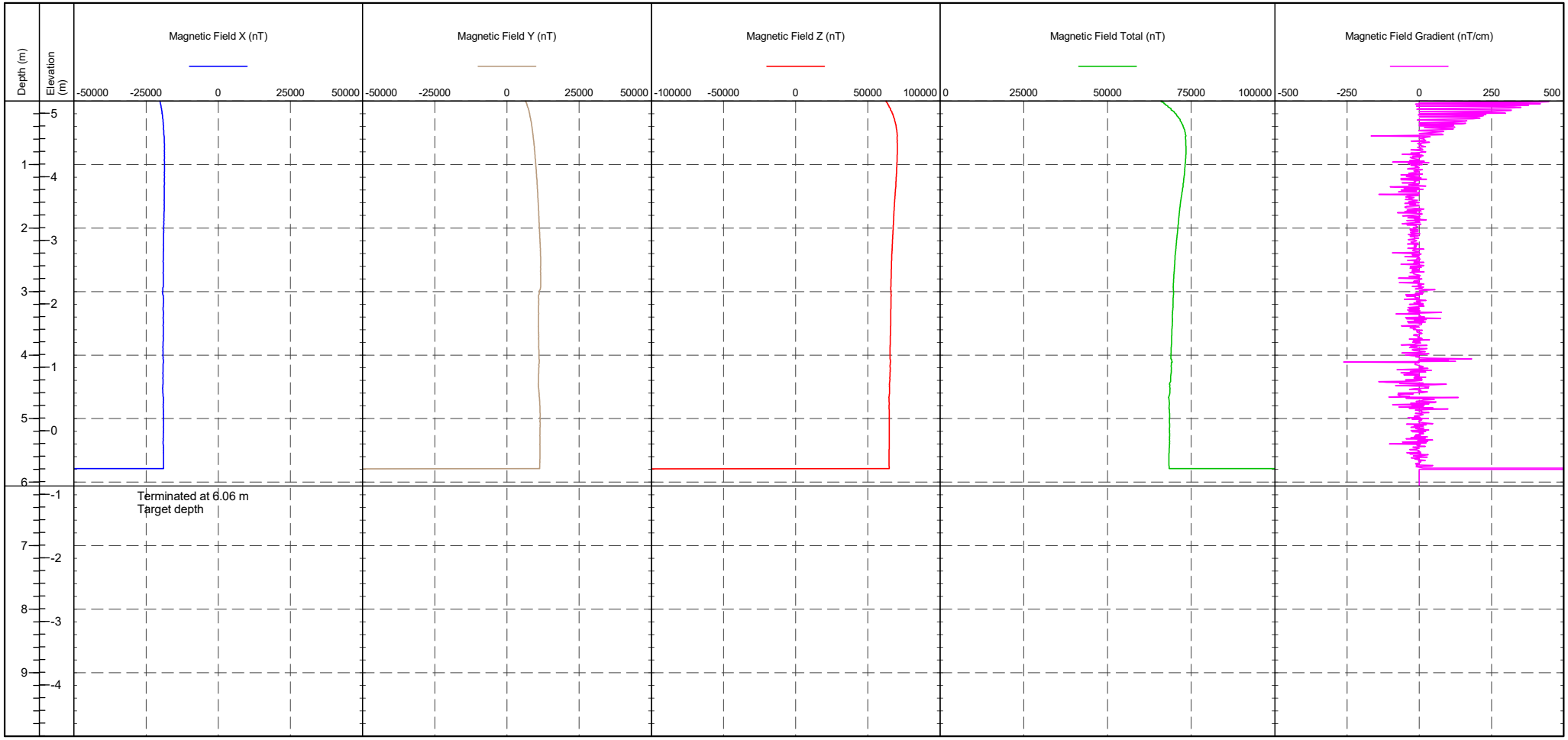
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:51 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP152**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500164.234 m<br>NORTHING : 102301.405 m<br>ELEVATION : 5.192 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



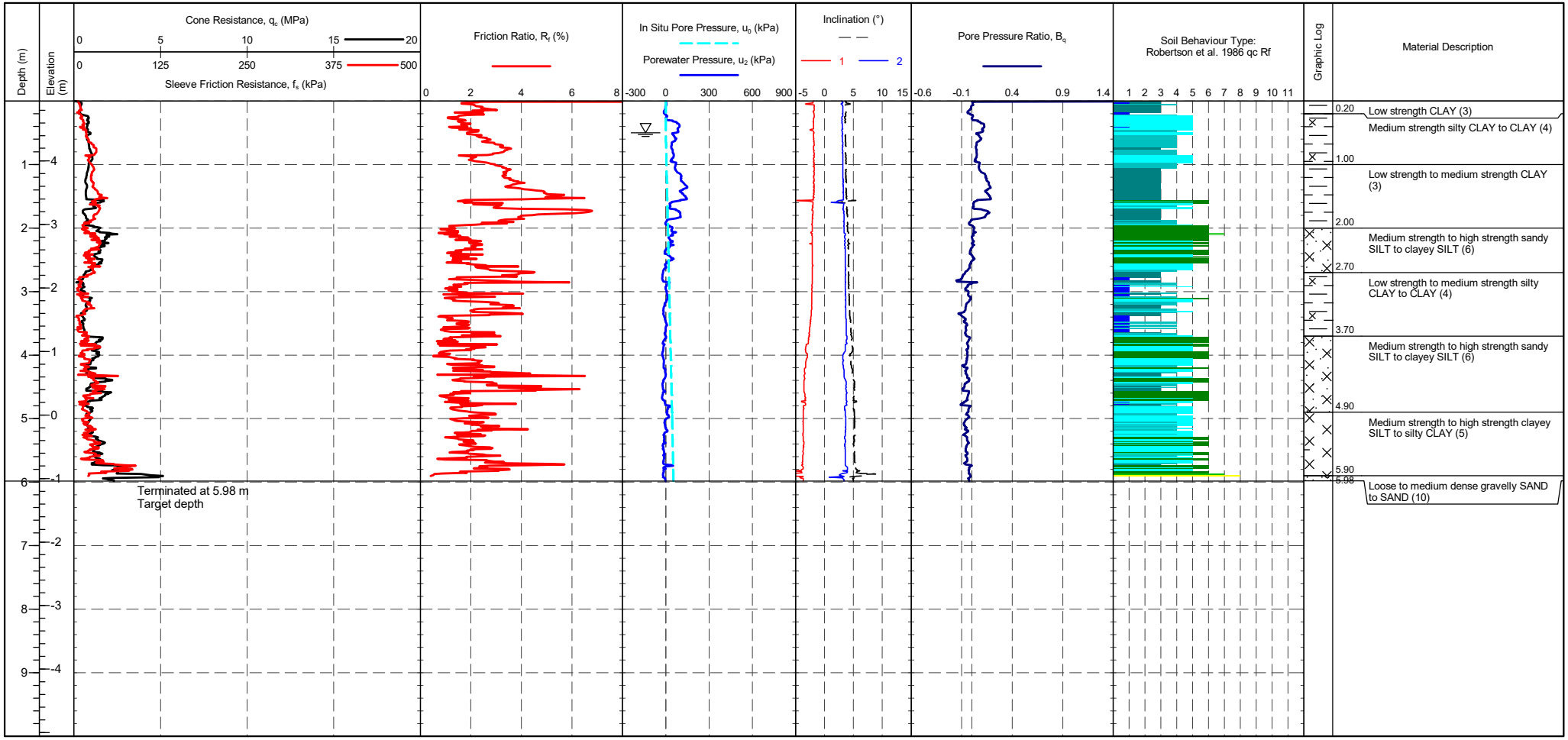

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 221 mV | 219 mV | -0.022 MPa |
| | | | | Sleeve | 218 mV | 216 mV | -0.001 kPa |
| | | | | Pore Pressure 2 | 261 mV | 251 mV | -0.003 kPa |
| | | | | X-Y Inclinometer | 2432 mV | 2431 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP153**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500233.910 m<br>NORTHING : 102304.408 m<br>ELEVATION : 4.944 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 |
| CALIBRATION DATE | : 09/08/2021 | APPLICATION CLASS | : 2 |
| CONE MODEL | : Subtraction | RIG | : CPT 017 - Griffen |
| CONE AREA | : 15cm$^2$ | OPERATOR | : DHo |
| CONE AREA RATIO | : 0.79 | FRICTION REDUCER | : None |
| FILTER POSITION | : u2 | WEATHER | : Overcast & Cold |
| FILTER TYPE | : HDPE | GROUNDWATER DEPTH | : Assumed for calculation purposes. |

CPTU ZERO VALUES

| | Pre | Post | Difference |
|---|---|---|---|
| Transducer | | | |
| Tip | 221 mV | 221 mV | 0 MPa |
| Sleeve | 221 mV | 221 mV | 0 kPa |
| Pore Pressure 2 | 275 mV | 272 mV | -0.001 kPa |
| X-Y Inclinometer | 2282 mV | 2282 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

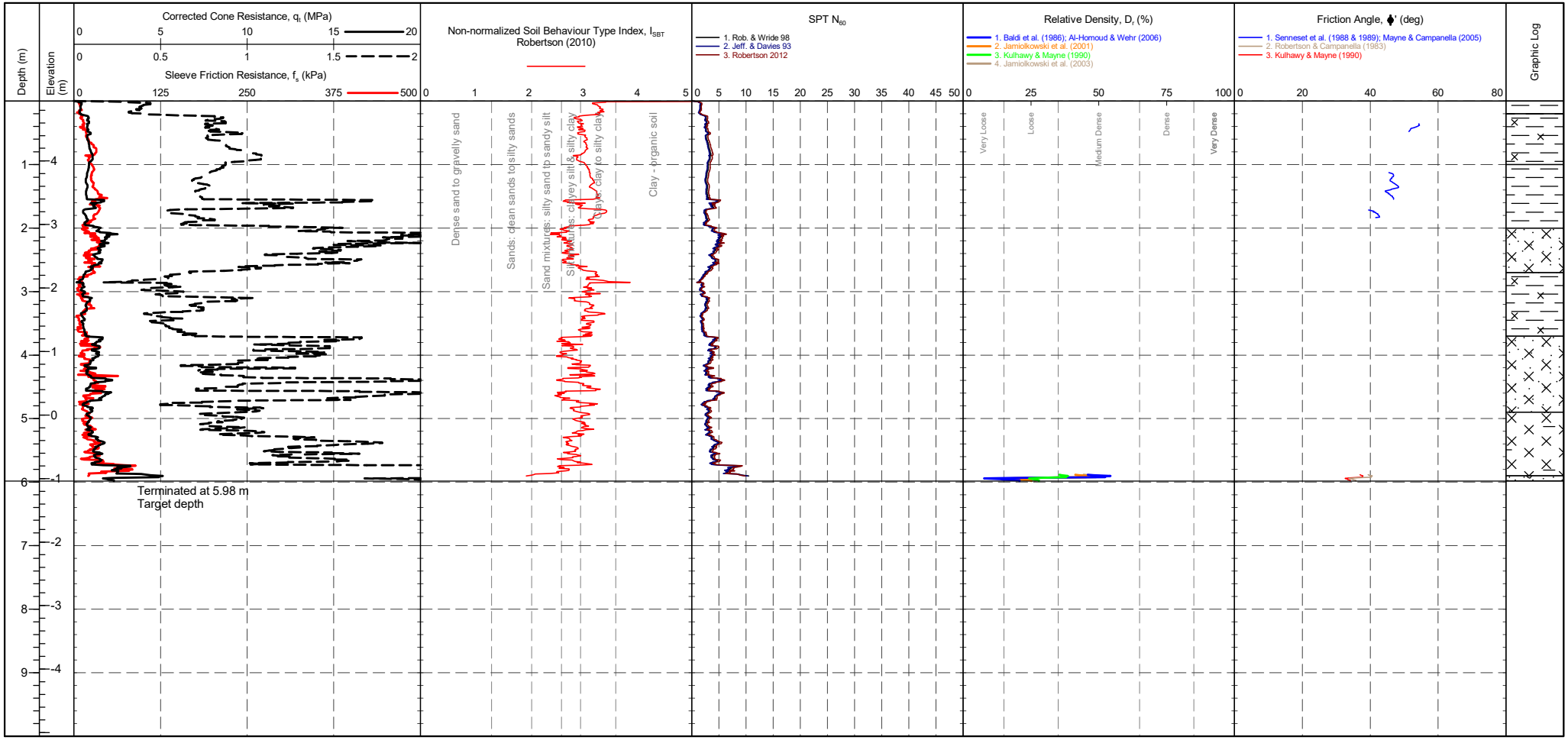
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP153**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500233.910 m<br>NORTHING : 102304.408 m<br>ELEVATION : 4.944 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 221 mV | 221 mV |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 221 mV | 221 mV |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 275 mV | 272 mV |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2282 mV | 2282 mV |

| Difference |
|---|
| 0 MPa |
| 0 kPa |
| -0.001 kPa |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic |
|---|---|
| Clays | 2.95-3.60 |
| Silt mixtures | 2.60-2.95 |
| Sand mixtures | 2.05-2.60 |
| Sands | 1.31-2.05 |
| Gravelly sand | <1.31 |

| Description | SPT N value, NSPT |
|---|---|
| Very Loose | 0 - 4 |
| Loose | 4 - 10 |
| Medium Dense | 10 - 30 |
| Dense | 30 - 50 |
| Very Dense | >50 |

| Description | Relative Density Dr (%) |
|---|---|
| Very Loose | 0 - 15 |
| Loose | 15 - 35 |
| Medium Dense | 35 - 65 |
| Dense | 65 - 85 |
| Very Dense | >85 |

Groundwater Level

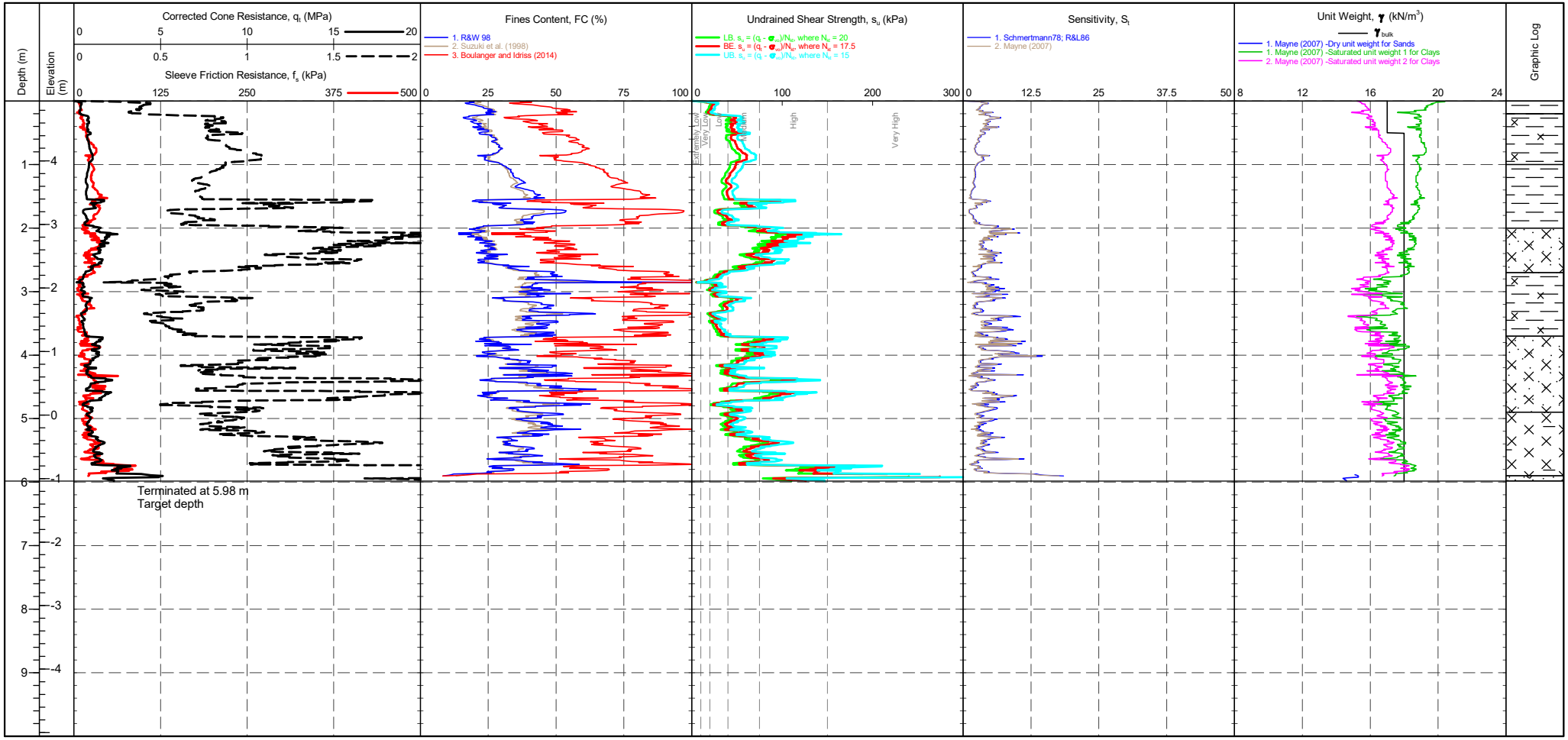
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP153**

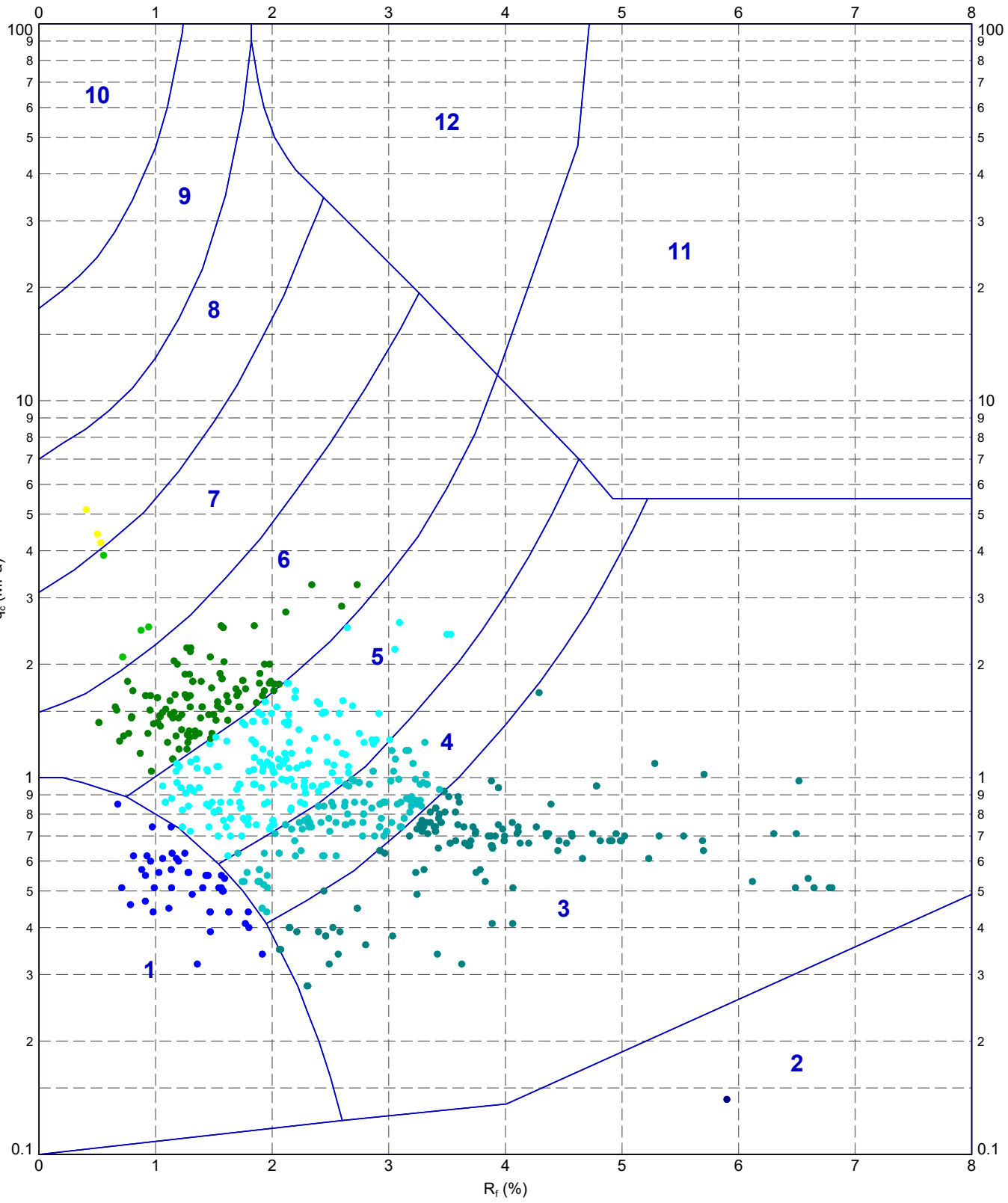
| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500233.910 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102304.408 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 4.944 m OD | | TEST DATE : 14/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | | COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference | Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 221 mV | 221 mV | 0 MPa | Extremely low strength | <10 | Medium strength | 40-75 |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 221 mV | 221 mV | 0 kPa | Very low strength | 10-20 | High strength | 75-150 |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 275 mV | 272 mV | -0.001 kPa | Low strength | 20-40 | Very high strength | 150-300 |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2282 mV | 2282 mV | | | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP153

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

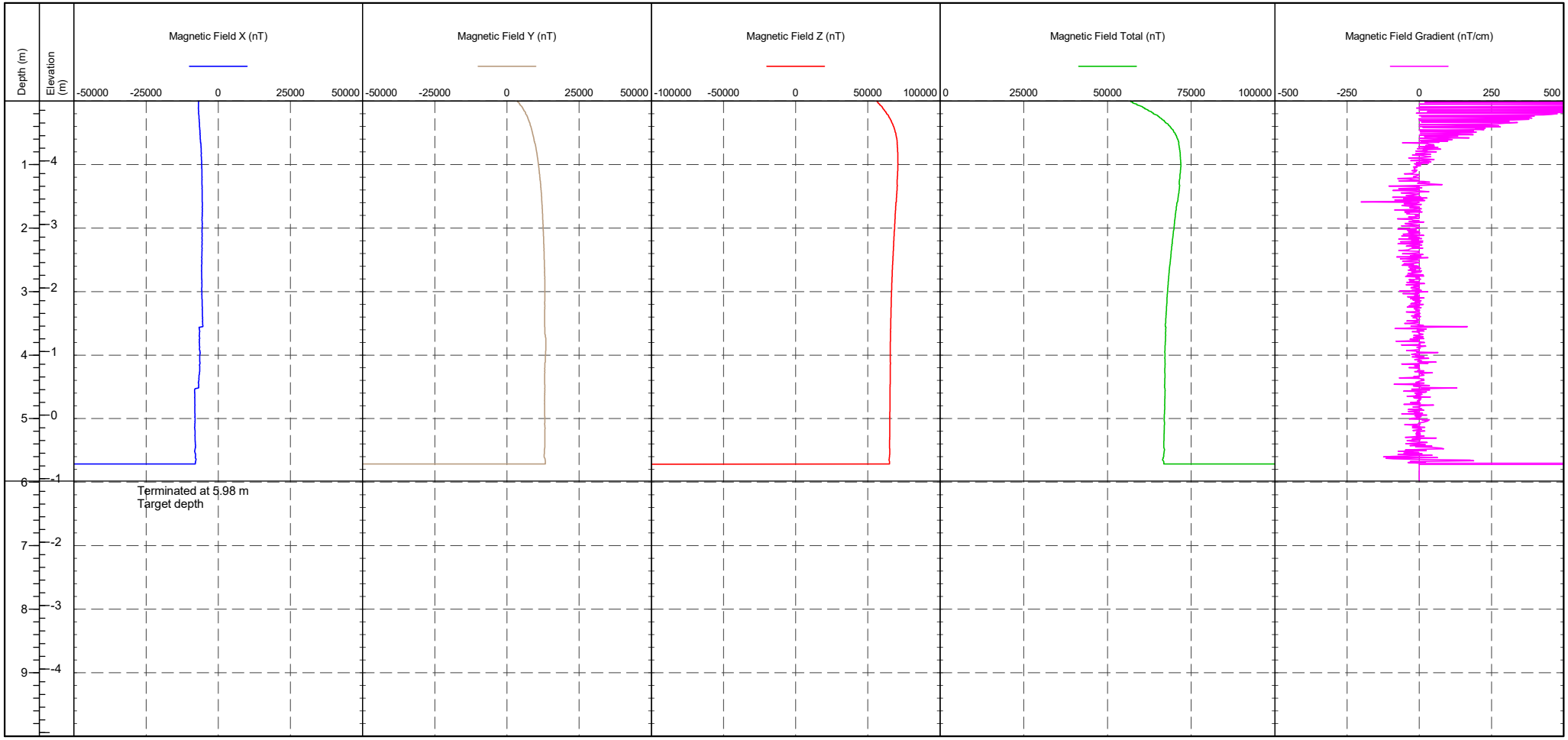
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:51 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prg: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP153**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500233.910 m<br>NORTHING : 102304.408 m<br>ELEVATION : 4.944 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 14/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |



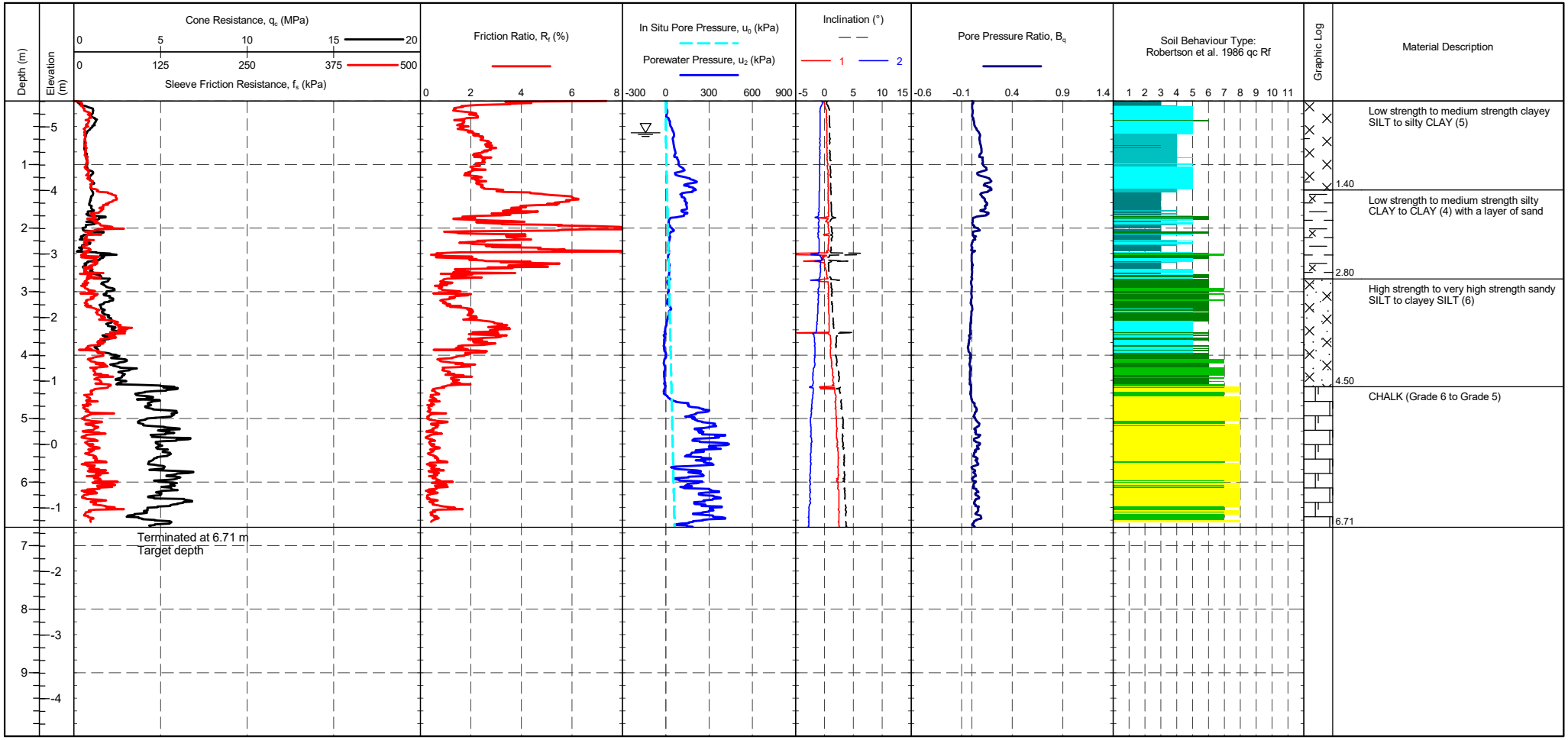

| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1186 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 221 mV | 221 mV | 0 MPa |
| | | | | Sleeve | 221 mV | 221 mV | 0 kPa |
| | | | | Pore Pressure 2 | 275 mV | 272 mV | -0.001 kPa |
| | | | | X-Y Inclinometer | 2282 mV | 2282 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP154**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500119.880 m<br>NORTHING : 102321.943 m<br>ELEVATION : 5.408 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1983<br>CALIBRATION DATE : 16/09/2022<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES | |

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 288 mV | 287 mV | -0.011 MPa |
| Sleeve | 255 mV | 257 mV | 0.001 kPa |
| Pore Pressure 2 | 238 mV | 249 mV | 0.003 kPa |
| X-Y Inclinometer | 2421 mV | 2416 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

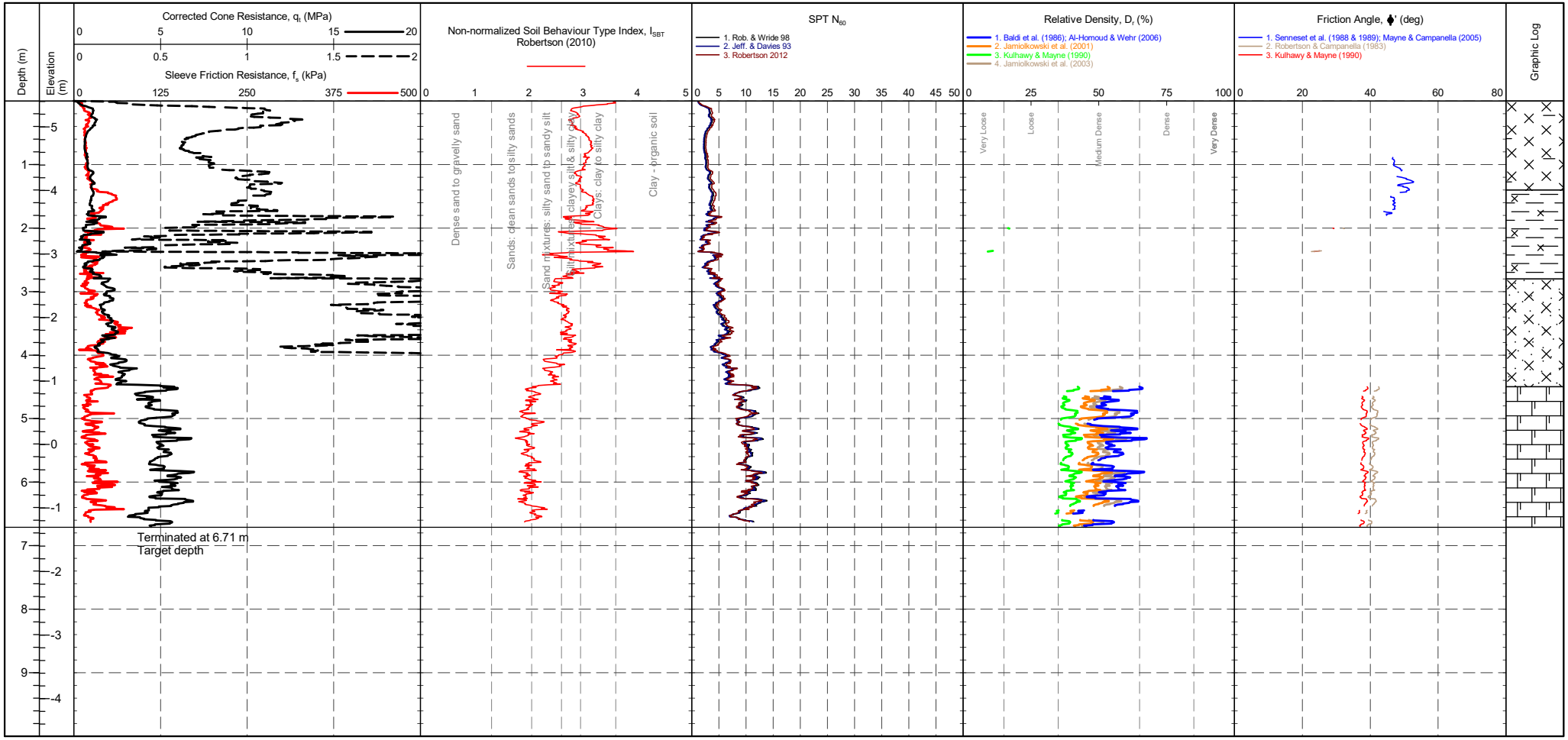
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID **DP154**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500119.880 m<br>NORTHING : 102321.943 m<br>ELEVATION : 5.408 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post / Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 288 mV | 287 mV / -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 255 mV | 257 mV / 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 238 mV | 249 mV / 0.003 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2421 mV | 2416 mV |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

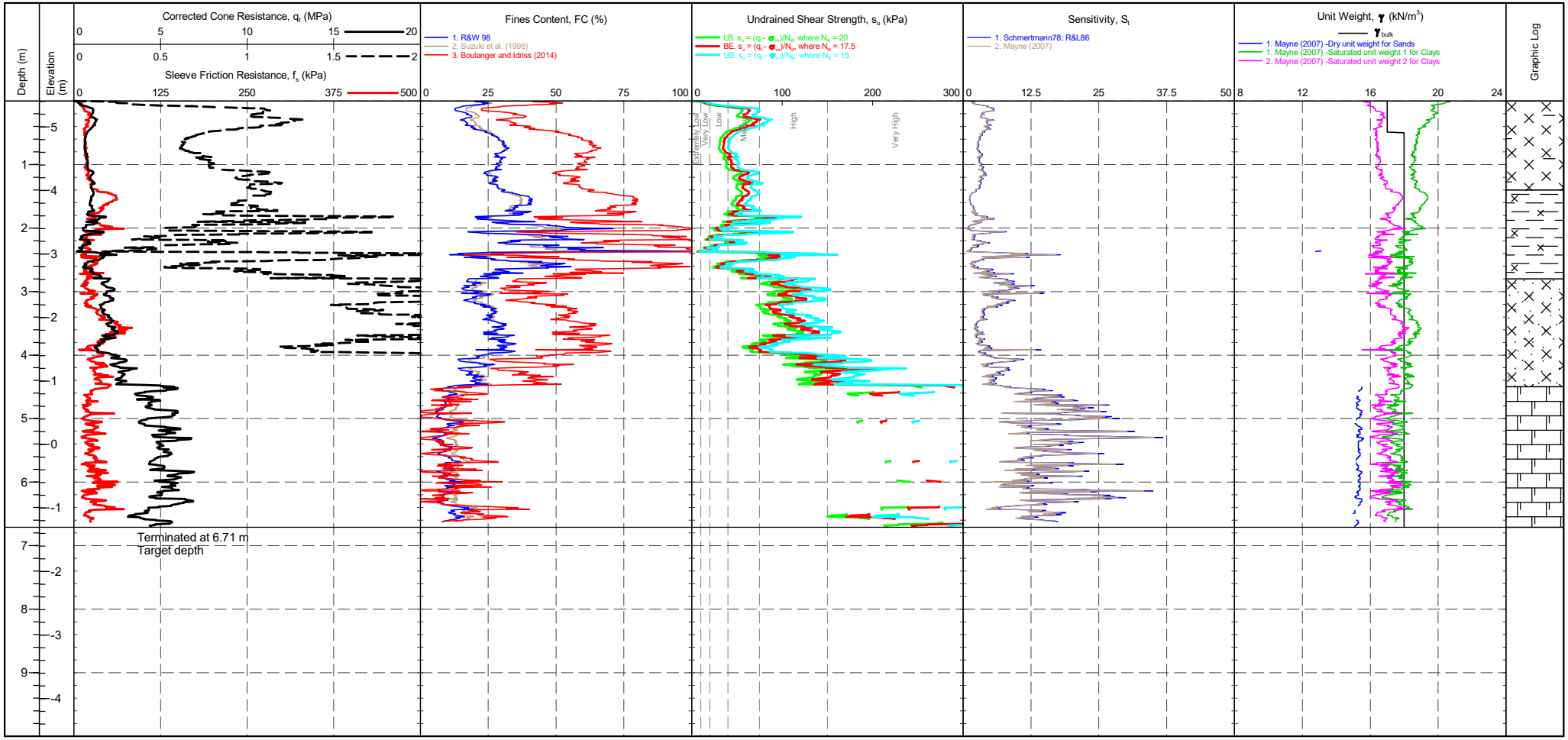
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID: **DP154**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water | EASTING : 500119.880 m | Remark: | SHEET : 1 OF 1 |
| PROJECT : Church Lane | NORTHING : 102321.943 m | Test completed at target depth. | STATUS : Final |
| LOCATION : Climping, West Sussex | ELEVATION : 5.408 m OD | | TEST DATE : 13/03/2024 |
| PROJECT No. : 1240182 | CHECKED BY : DW | | PLOT DATE : 12/04/2024 |
| | TERMINATION REASON : Target depth | | METHOD : ISO 22476-1:2022 |



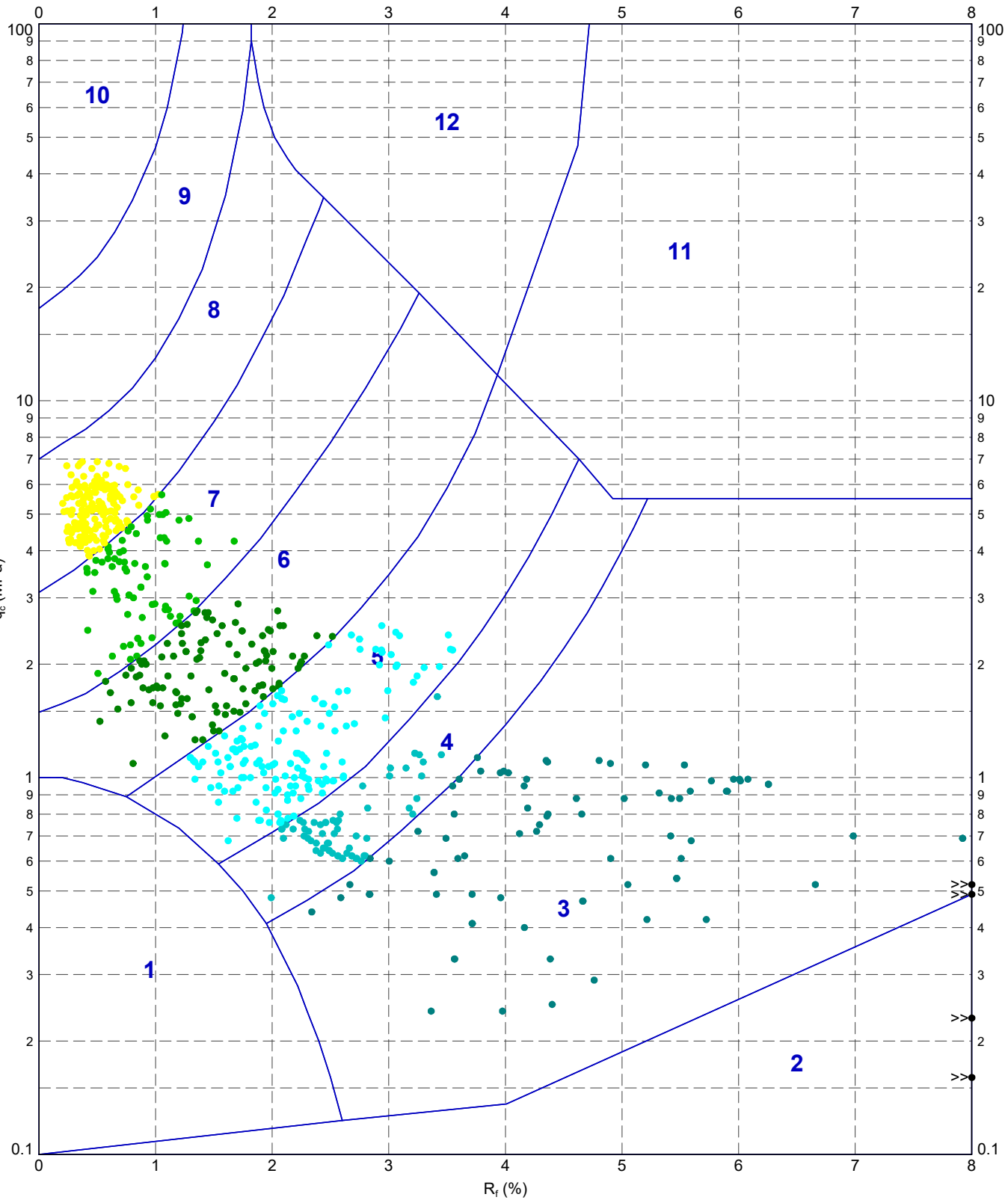

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 288 mV | 287 mV | -0.011 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 255 mV | 257 mV | 0.001 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 238 mV | 249 mV | 0.003 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2421 mV | 2416 mV | |

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

| Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
|---|---|---|---|
| Extremely low strength | <10 | Medium strength | 40-75 |
| Very low strength | 10-20 | High strength | 75-150 |
| Low strength | 20-40 | Very high strength | 150-300 |
| | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP154

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

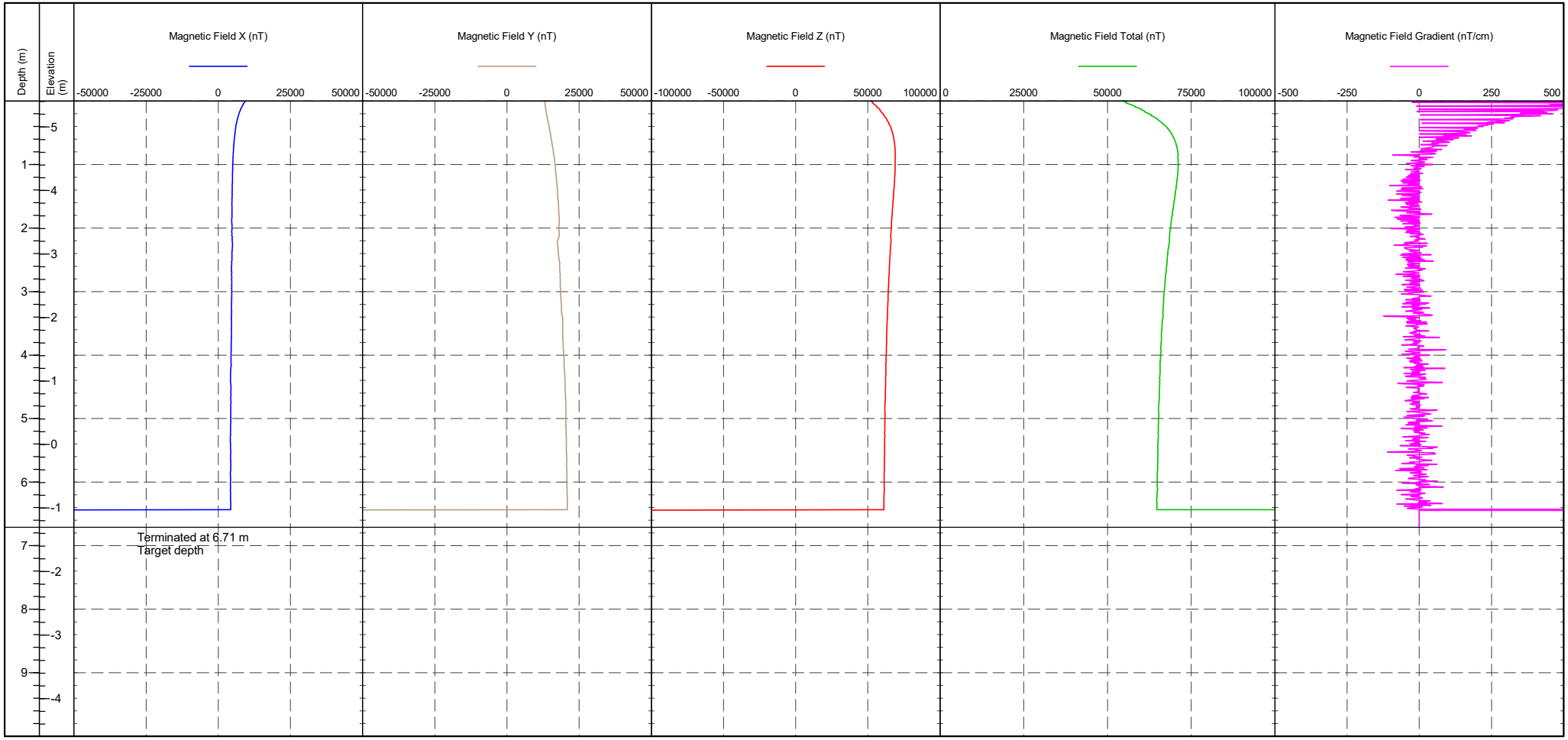
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:52 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID **DP154**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500119.880 m<br>NORTHING : 102321.943 m<br>ELEVATION : 5.408 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | |
|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | RIG | : CPT 017 - Griffen | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | |

CPTU ZERO VALUES

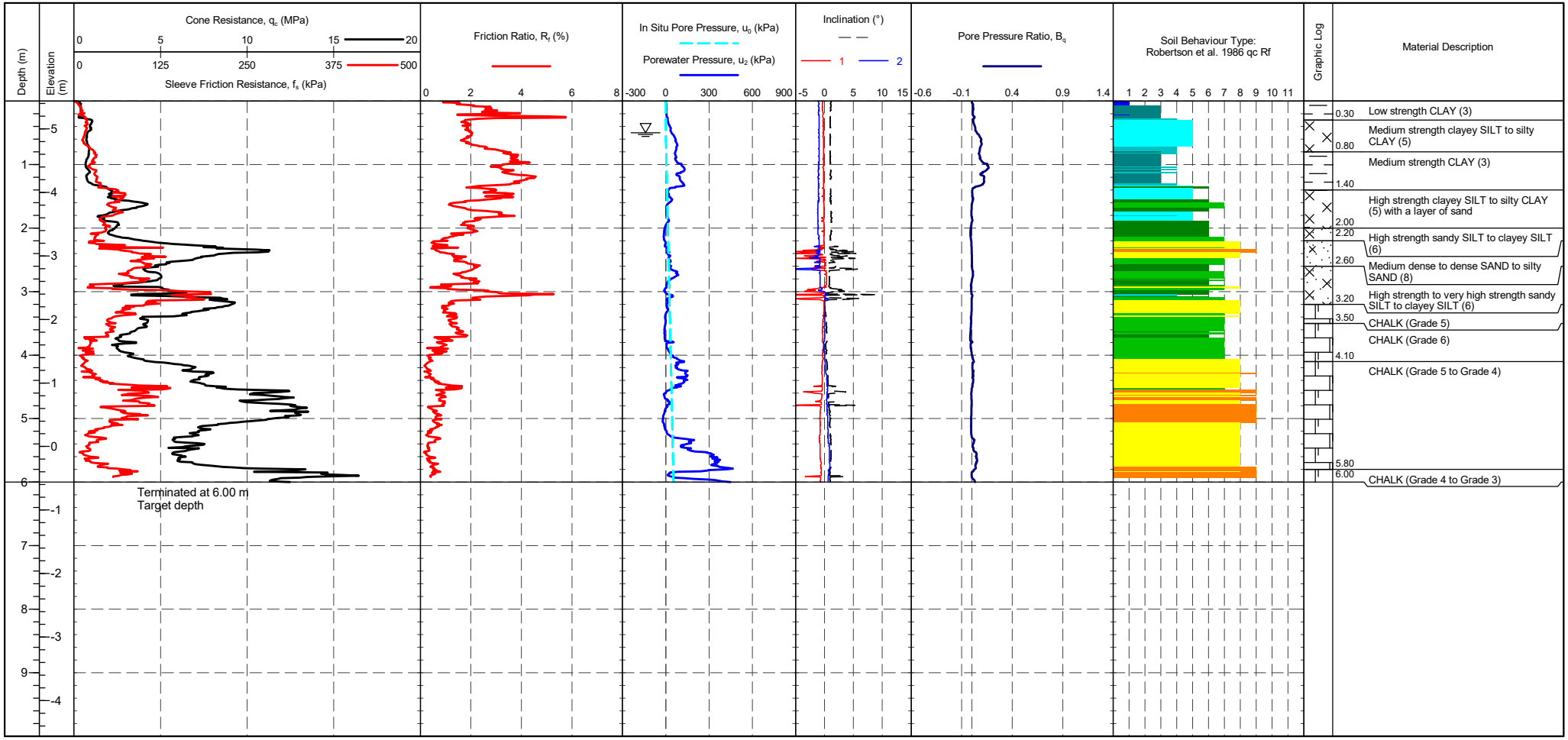
| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 288 mV | 287 mV | -0.011 MPa |
| Sleeve | 255 mV | 257 mV | 0.001 kPa |
| Pore Pressure 2 | 238 mV | 249 mV | 0.003 kPa |
| X-Y Inclinometer | 2421 mV | 2416 mV | |

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 01

PointID: **DP155**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500132.622 m<br>NORTHING : 102333.858 m<br>ELEVATION : 5.439 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | |
|---|---|---|---|
| CONE ID : S15-CFIP.1983<br>CALIBRATION DATE : 16/09/2022<br>CONE MODEL : Subtraction<br>CONE AREA : 15cm²<br>CONE AREA RATIO : 0.79<br>FILTER POSITION : u2<br>FILTER TYPE : HDPE | TEST TYPE : TE2<br>APPLICATION CLASS : 2<br>RIG : CPT 017 - Griffen<br>OPERATOR : DHo<br>FRICTION REDUCER : None<br>WEATHER : Overcast & Cold<br>GROUNDWATER DEPTH : Assumed for calculation purposes. | CPTU ZERO VALUES | |

| Transducer | Pre | Post | Difference |
|---|---|---|---|
| Tip | 288 mV | 284 mV | -0.046 MPa |
| Sleeve | 259 mV | 255 mV | -0.003 kPa |
| Pore Pressure 2 | 240 mV | 244 mV | 0.001 kPa |
| X-Y Inclinometer | 2354 mV | 2363 mV | |

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

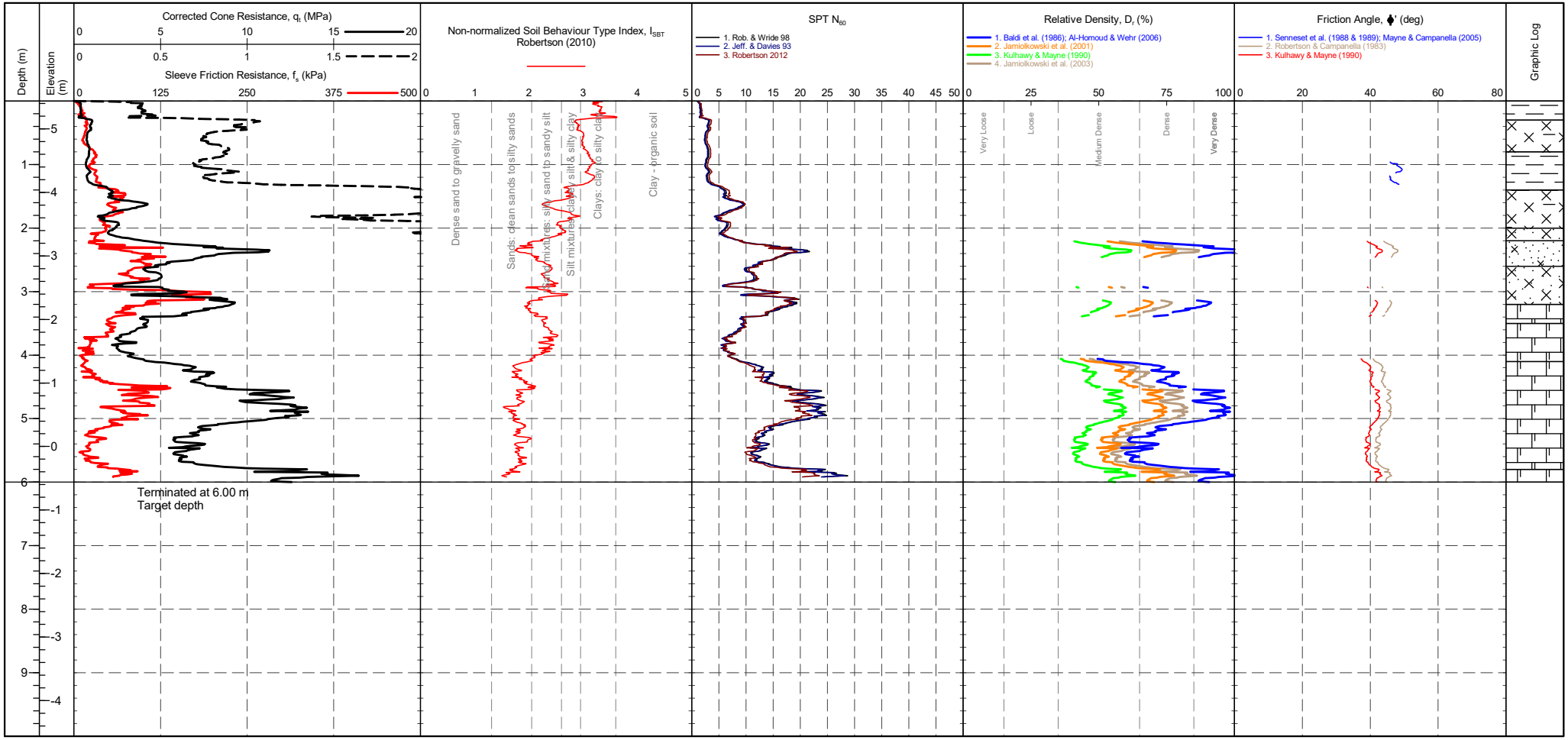
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 02

PointID: **DP155**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500132.622 m<br>NORTHING : 102333.858 m<br>ELEVATION : 5.439 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference |
| CONE AREA | : 15cm² | RIG | : CPT 017 - Griffen | Tip | 288 mV | 284 mV | -0.046 MPa |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 259 mV | 255 mV | -0.003 kPa |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 240 mV | 244 mV | 0.001 kPa |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2354 mV | 2363 mV | |

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

| Description | SBT Index, Ic | Description | SPT N value, NSPT | Description | Relative Density Dr (%) |
|---|---|---|---|---|---|
| Clays | 2.95-3.60 | Very Loose | 0 - 4 | Very Loose | 0 - 15 |
| Silt mixtures | 2.60-2.95 | Loose | 4 - 10 | Loose | 15 - 35 |
| Sand mixtures | 2.05-2.60 | Medium Dense | 10 - 30 | Medium Dense | 35 - 65 |
| Sands | 1.31-2.05 | Dense | 30 - 50 | Dense | 65 - 85 |
| Gravelly sand | <1.31 | Very Dense | >50 | Very Dense | >85 |

Groundwater Level

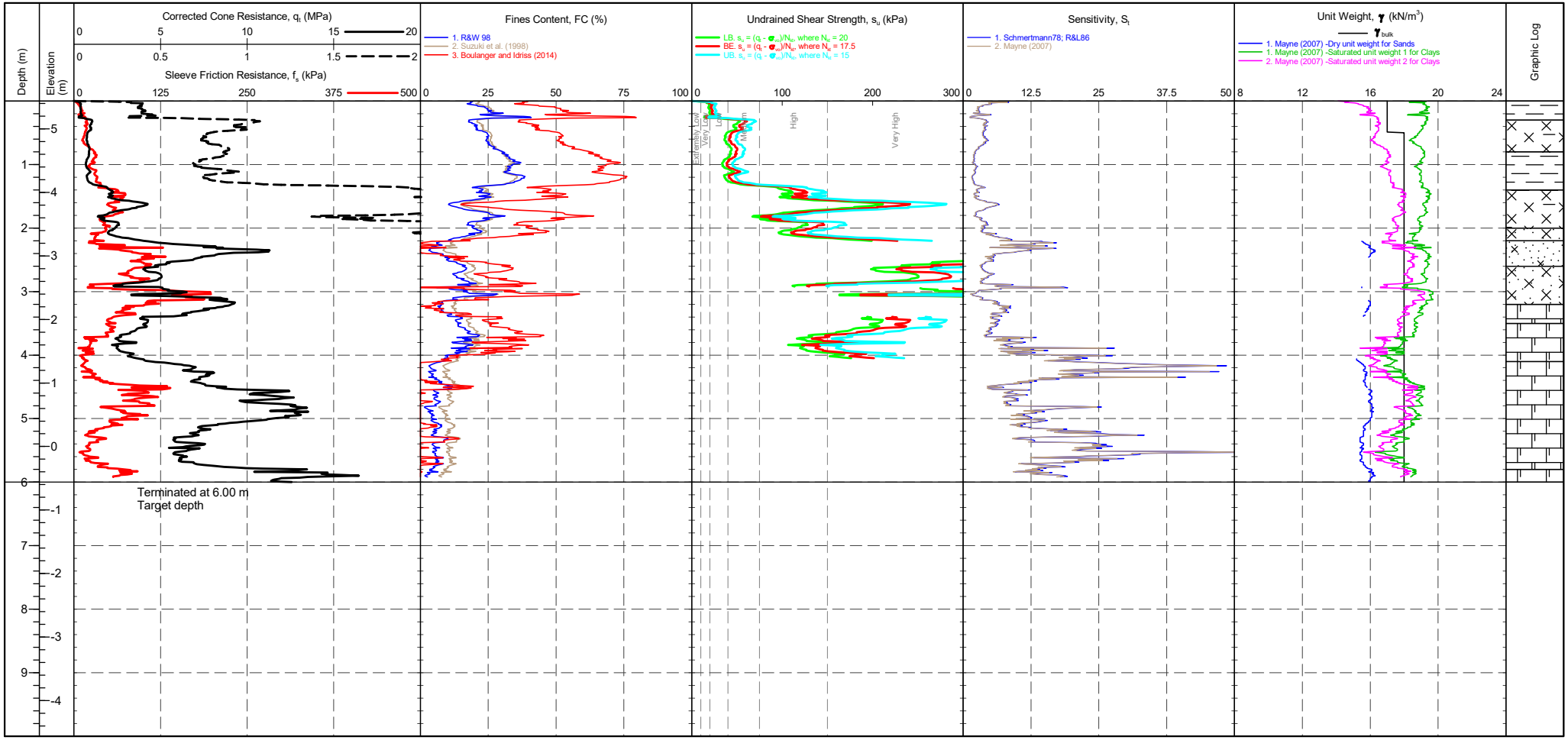
Dissipation Test

IN SITU SITE INVESTIGATION Working with: gw

# CPT LOG 03

PointID **DP155**

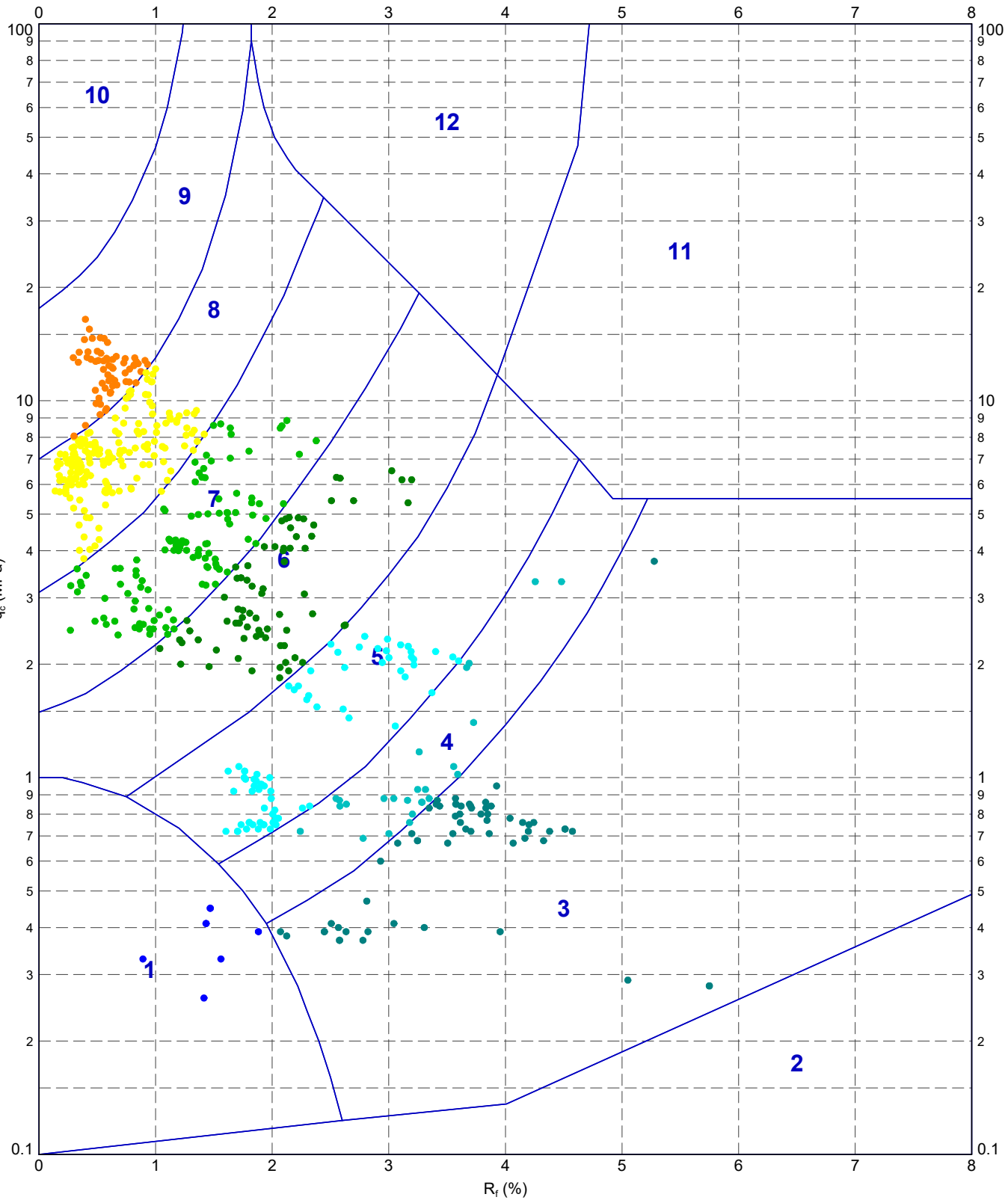
| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500132.622 m<br>NORTHING : 102333.858 m<br>ELEVATION : 5.439 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | TEST TYPE | : TE2 | CPTU ZERO VALUES | | | | COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11 | | | |
| CONE MODEL | : Subtraction | APPLICATION CLASS | : 2 | Transducer | Pre | Post | Difference | Term based on measurement | su (kPa) | Term based on measurement | su (kPa) |
| CONE AREA | : 15cm$^2$ | RIG | : CPT 017 - Griffen | Tip | 288 mV | 284 mV | -0.046 MPa | Extremely low strength | <10 | Medium strength | 40-75 |
| CONE AREA RATIO | : 0.79 | OPERATOR | : DHo | Sleeve | 259 mV | 255 mV | -0.003 kPa | Very low strength | 10-20 | High strength | 75-150 |
| FILTER POSITION | : u2 | FRICTION REDUCER | : None | Pore Pressure 2 | 240 mV | 244 mV | 0.001 kPa | Low strength | 20-40 | Very high strength | 150-300 |
| FILTER TYPE | : HDPE | WEATHER | : Overcast & Cold | X-Y Inclinometer | 2354 mV | 2363 mV | | | | Extremely high strength | >300 |

Groundwater Level

Dissipation Test




METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Ground and Water
Climping, West Sussex
Church Lane
Robertson et al. 1986 $q_c$ vs. $R_f$ - DP155

| | |
|---|---|
| DRAWN | DATE 12/04/2024 |
| CHECKED | DATE 12/04/2024 |
| SCALE Not To Scale | A4 |
| PROJECT No 1240182 | FIGURE No |

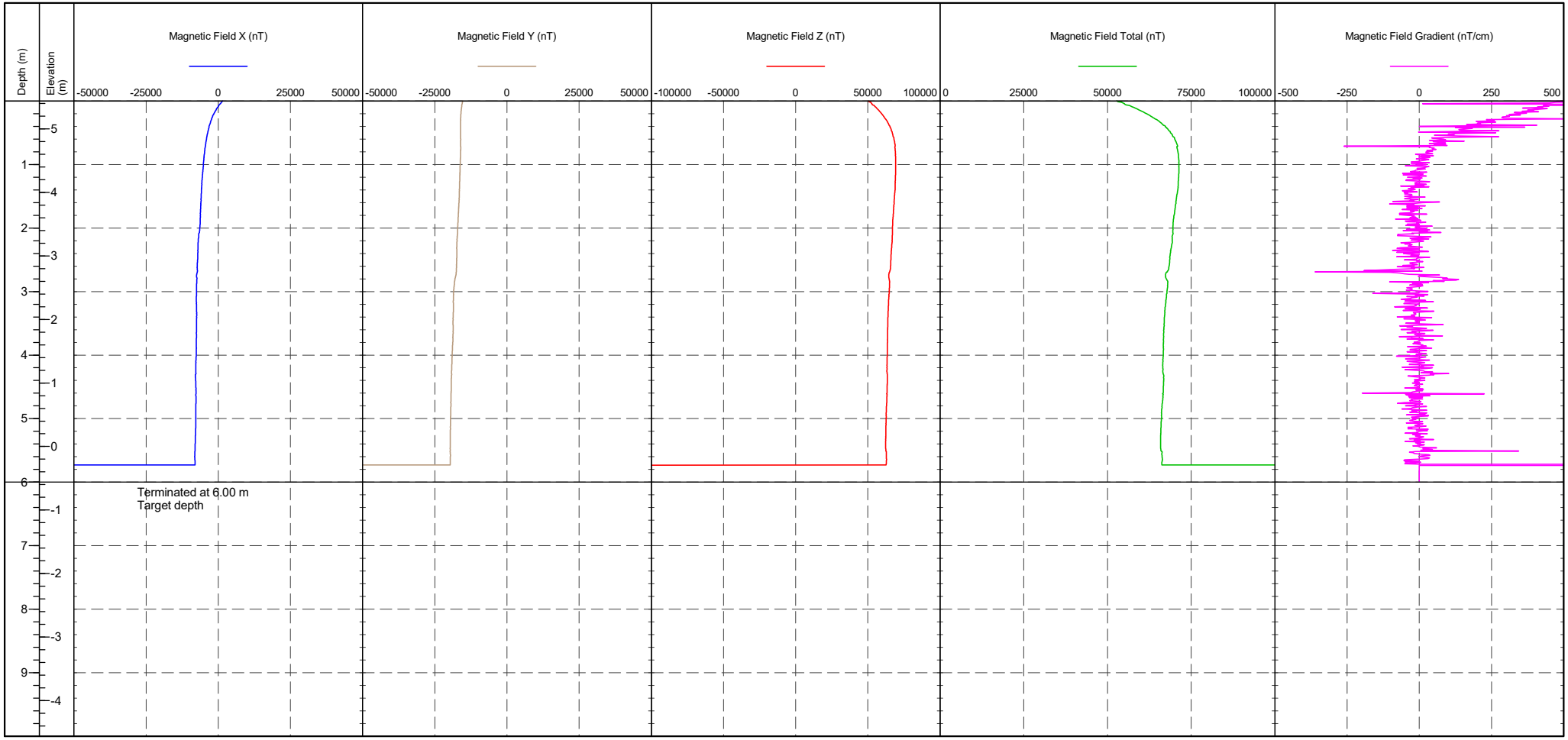
220829-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240182 CHURCH LANE CLIMPING WEST SUSSEX GROUND AND WATER.GPJ <<DrawingFile>> 12/04/2024 09:53 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prp: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: gw

# MAG LOG

PointID: **DP155**

| | | | |
|---|---|---|---|
| CLIENT : Ground and Water<br>PROJECT : Church Lane<br>LOCATION : Climping, West Sussex<br>PROJECT No. : 1240182 | EASTING : 500132.622 m<br>NORTHING : 102333.858 m<br>ELEVATION : 5.439 m OD<br>CHECKED BY : DW<br>TERMINATION REASON : Target depth | Remark:<br>Test completed at target depth. | SHEET : 1 OF 1<br>STATUS : Final<br>TEST DATE : 13/03/2024<br>PLOT DATE : 12/04/2024<br>METHOD : ISO 22476-1:2022 |




| | | | | | | |
|---|---|---|---|---|---|---|
| CONE ID | : S15-CFIP.1983 | RIG | : CPT 017 - Griffen | CPTU ZERO VALUES | | |
| CONE MODEL | : Subtraction | OPERATOR | : DHo | Transducer | Pre | Post | Difference |
| | | | | Tip | 288 mV | 284 mV | -0.046 MPa |
| | | | | Sleeve | 259 mV | 255 mV | -0.003 kPa |
| | | | | Pore Pressure 2 | 240 mV | 244 mV | 0.001 kPa |
| | | | | X-Y Inclinometer | 2354 mV | 2363 mV | |



*IN SITU SITE INVESTIGATION*

Unit 23 Hastings Innovation
Centre,
Highfield Drive
St. Leonards on Sea, East Sussex,
TN38 9UH, U.K.

Company No.: 6339499
VAT No.: 922 3561 41

# APPENDIX F: Geotechnical Laboratory Testing

[redacted]

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

# NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
## ( BS 1377:1990 - Part 2 : 4.3 & 5.3 )

| | |
|---|---|
| Contract Number | 72006 |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG |
| Date Tested | 24.04.2024 |

## DESCRIPTIONS

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| CBR8 | | | 1.50 | - | | Brown fine to medium gravelly silty sandy CLAY |
| CBR20 | | | 0.80 | - | | Brown fine to medium gravelly silty CLAY |
| CBR22 | | | 1.00 | - | | Brown fine to medium gravelly silty CLAY |
| CBR14 | | | 1.00 | - | | Brown fine to medium gravelly silty CLAY |
| CBR12 | | | 0.80 | - | | Brown fine to medium gravelly silty sandy CLAY |
| CBR18 | | | 1.00 | - | | Brown fine to medium gravelly silty CLAY |
| CBR15 | | | 1.50 | - | | Brown fine to medium gravelly silty CLAY |
| CBR2 | | | 0.80 | - | | Brown fine to medium gravelly silty sandy CLAY |
| CBR16 | | | 1.00 | - | | Orange brown fine to medium gravelly silty sandy CLAY |
| CBR9 | | | 0.50 | - | | Brown fine to medium gravelly silty CLAY |
| CBR17 | | | 0.50 | - | | Brown fine to medium gravelly silty CLAY |
| CBR7 | | | 0.50 | - | | Brown fine to medium gravelly silty sandy CLAY |
| CBR5 | | | 0.50 | - | | Brown fine to medium gravelly silty CLAY |
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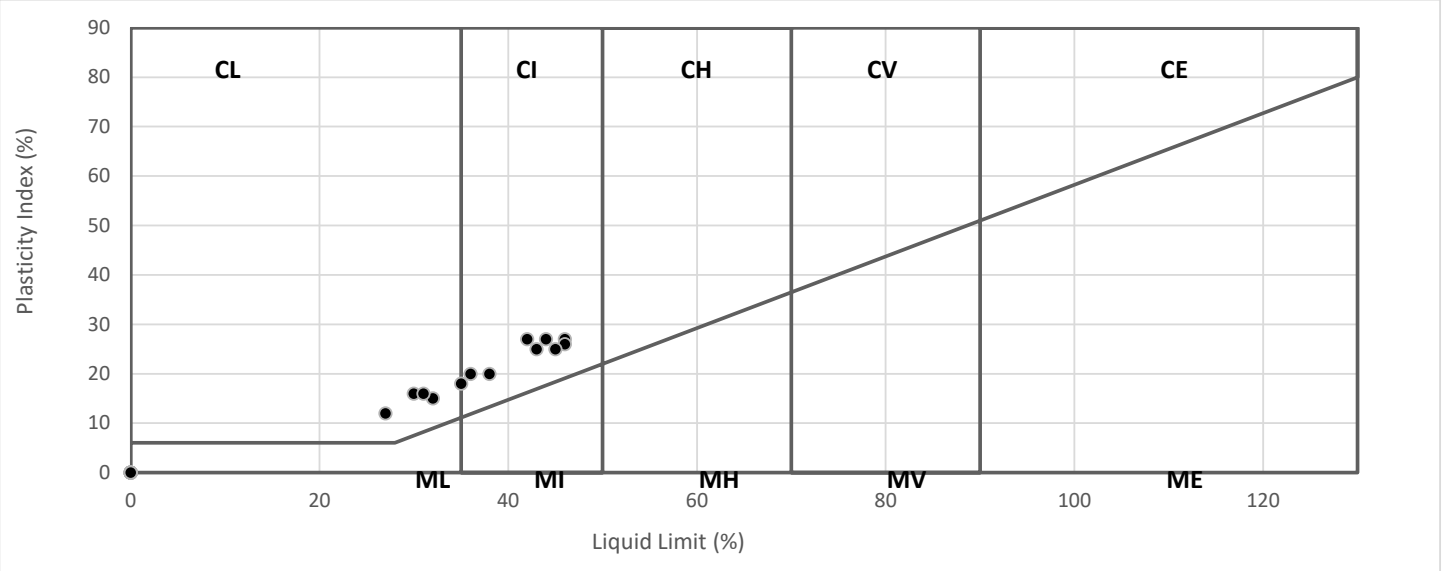
| Operator |
|---|
| Jason Smith |

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 72006 | |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG | |
| Date Tested | 24.04.2024 | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CBR8 | | | 1.50 | - | | 21 | 32 | 17 | 15 | 94 | CL Low Plasticity |
| CBR20 | | | 0.80 | - | | 22 | 42 | 15 | 27 | 96 | CI Intermediate Plasticity |
| CBR22 | | | 1.00 | - | | 22 | 46 | 19 | 27 | 96 | CI Intermediate Plasticity |
| CBR14 | | | 1.00 | - | | 20 | 38 | 18 | 20 | 95 | CI Intermediate Plasticity |
| CBR12 | | | 0.80 | - | | 16 | 30 | 14 | 16 | 96 | CL Low Plasticity |
| CBR18 | | | 1.00 | - | | 24 | 46 | 20 | 26 | 94 | CI Intermediate Plasticity |
| CBR15 | | | 1.50 | - | | 22 | 44 | 17 | 27 | 96 | CI Intermediate Plasticity |
| CBR2 | | | 0.80 | - | | 18 | 35 | 17 | 18 | 93 | CL/I Low/Inter. Plasticity |
| CBR16 | | | 1.00 | - | | 20 | 27 | 15 | 12 | 94 | CL Low Plasticity |
| CBR9 | | | 0.50 | - | | 22 | 43 | 18 | 25 | 94 | CI Intermediate Plasticity |
| CBR17 | | | 0.50 | - | | 21 | 45 | 20 | 25 | 93 | CI Intermediate Plasticity |
| CBR7 | | | 0.50 | - | | 21 | 31 | 15 | 16 | 94 | CL Low Plasticity |
| CBR5 | | | 0.50 | - | | 18 | 36 | 16 | 20 | 94 | CI Intermediate Plasticity |
| | | | | - | | | | | | | |
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:2015+A1:2020**




| Operator |
|---|
| Jason Smith |

UKAS TESTING
2788

# Laboratory Report

UKAS TESTING 2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

## Contract Number: 72173

Client Ref: **GWPR5921**
Client PO: **GWPR5921**

Date Received: **08-04-2024**
Date Completed: **17-04-2024**
Report Date: **17-04-2024**

Client: **Ground and Water Limited**

This report has been checked and approved by:

Contract Title: **Land adj. to Church Lane Climping, West sussex BN17 5GG**
For the attention of: **Alex Stratford**

[redacted]

**Brendan Evans**
Office Administrator

| Description | Qty |
|---|---|
| **Moisture Content**<br>BS 1377:1990 - Part 2 : 3.2 - * UKAS | 1 |
| **1 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.4 & 5.3 - * UKAS | 1 |
| **PSD Wet Sieve method**<br>BS 1377:1990 - Part 2 : 9.2 - * UKAS | 2 |
| **Saturated Moisture Content of chalk (SMC)**<br>BS 1377:1990 - Part 2 : 3.3 - * UKAS | 2 |
| **Disposal of samples for job** | 1 |

**Notes:** **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
**# - denotes test carried out by approved contractor**
**@ - denotes non accredited tests**

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

**Approved Signatories:**
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN

[redacted]

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.4 & 5.3 )** | |
|---|---|---|
| Contract Number | 72173 | |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG | |
| Date Tested | 12/04/2024 | |
| | **DESCRIPTIONS** | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| WS1 | | D | 1.50 | - | | Brown fine to medium gravelly silty sandy CLAY |
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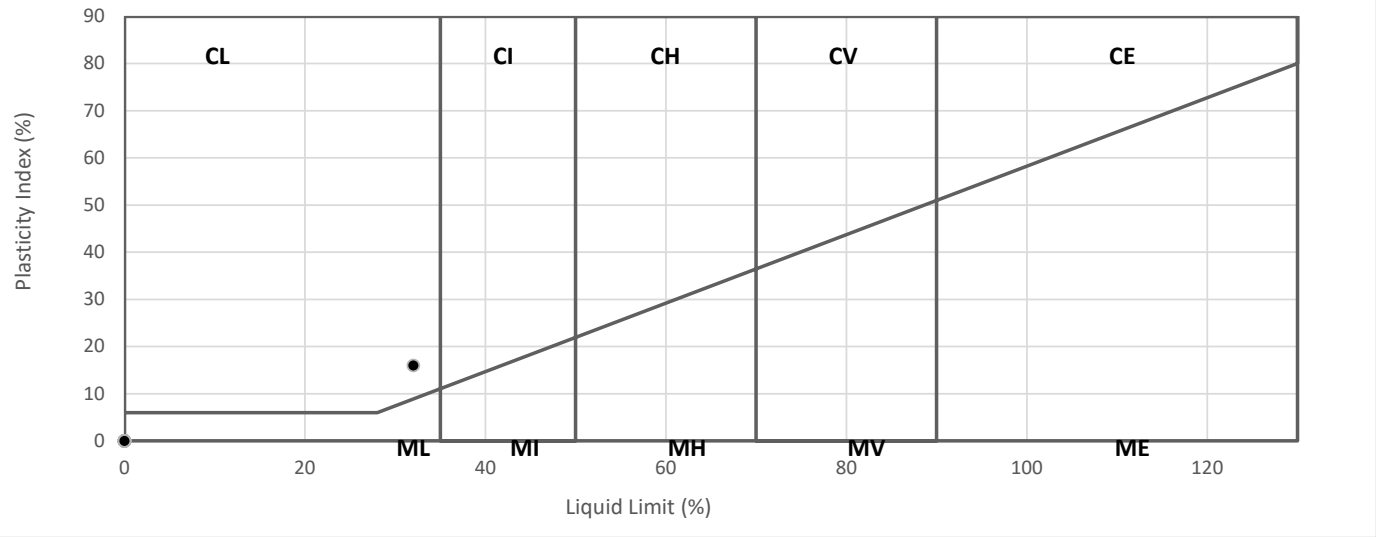
| Operator |
|---|
| Clayton Jenkins |

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.4 & 5.3 ) | |
|---|---|---|
| Contract Number | 72173 | |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG | |
| Date Tested | 12/04/2024 | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WS1 | | D | 1.50 | - | | 20 | 32 | 16 | 16 | 93 | CL Low Plasticity |
| | | | | - | | | | | | | |
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

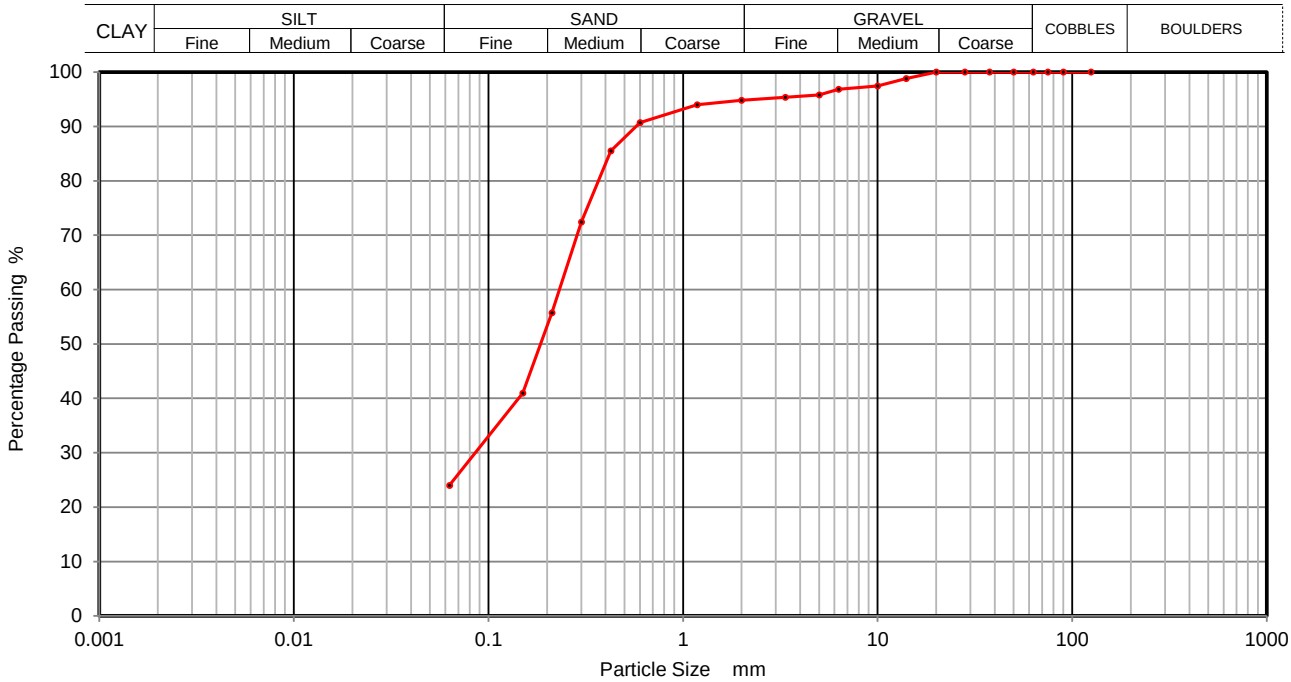
**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:2015+A1:2020**




| Operator |
|---|
| Clayton Jenkins |

UKAS TESTING
2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 72173 |
| | | Borehole/Pit No. | WS4 |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG | Sample No. | |
| Soil Description | Brown slightly fine to medium gravelly silty/clayey fine to coarse SAND | Depth Top | 2.50 |
| | | Depth Base | |
| Date Tested | 12/04/2024 | Sample Type | D |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 99 | | |
| 10 | 97 | | |
| 6.3 | 97 | | |
| 5 | 96 | | |
| 3.35 | 95 | | |
| 2 | 95 | | |
| 1.18 | 94 | | |
| 0.6 | 91 | | |
| 0.425 | 86 | | |
| 0.3 | 72 | | |
| 0.212 | 56 | | |
| 0.15 | 41 | | |
| 0.063 | 24 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 5 |
| Sand | 71 |
| Silt and Clay | 24 |
| | |
| | |

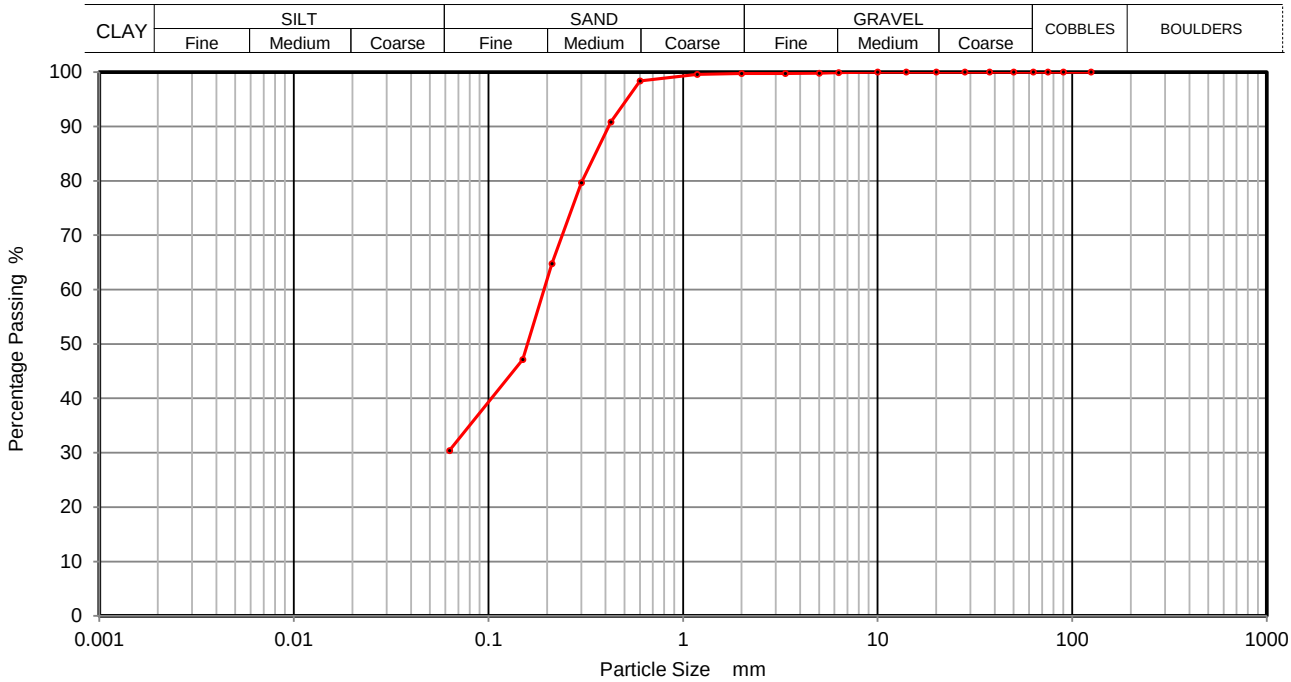
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING
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| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 72173 |
| | | Borehole/Pit No. | WS7 |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG | Sample No. | |
| Soil Description | Brown silty/clayey fine to coarse SAND | Depth Top | 4.00 |
| | | Depth Base | |
| Date Tested | 12/04/2024 | Sample Type | D |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 98 | | |
| 0.425 | 91 | | |
| 0.3 | 80 | | |
| 0.212 | 65 | | |
| 0.15 | 47 | | |
| 0.063 | 30 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 70 |
| Silt and Clay | 30 |
| | |
| | |

Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

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GEOTECHNICAL SITE & TESTING LABORATORIES

# Saturation Moisture Content of Chalk
## BS 1377 : Part 2 : 1990 Section 3.3

| | |
|---|---|
| Contract Number | 72173 |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG |
| Date Tested | 08/04/2024 |

| Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content | Bulk Density | Dry Density | Saturated Moisture Content | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| WS2 | | D | 5.00 | - | | 26 | 2.00 | 1.60 | 26 | NON-STANDARD |
| WS5 | | D | 2.50 | - | | 19 | 2.10 | 1.77 | 20 | NON-STANDARD |
| | | | | - | | | | | | |
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| Key | Reported As | Clause |
|---|---|---|
| Moisture Content | % | 3.2 |
| Bulk Density | $Mg/m^3$ | 7.2 |
| Dry Density | $Mg/m^3$ | 7.2 |
| SMC | % | 3.3.6 |

If there is a NON-STANDARD in the remarks next to the reported SMC result this means there was no lump of chalk of sufficient volume (300mL-500mL) present in the samples received to meet the testing requirements of the stated standard.

| Operator |
|---|
| Julian Jones |

UKAS TESTING
2788

# Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

## Contract Number: 73370

Client Ref: **GWPR6003**
Client PO: **GWPR6003**

Date Received: **19-06-2024**
Date Completed: **09-07-2024**
Report Date: **09-07-2024**

Client: **Ground and Water Limited**

This report has been checked and approved by:

Contract Title: **Land adj. to Church Lane Climping, West Sussex. BN17 5GG**
For the attention of: **Alex Stratford**

[redacted]

**Brendan Evans**
Office Administrator

| Description | Qty |
|---|---|
| **Moisture Content**<br>BS 1377:1990 - Part 2 : 3.2 - * UKAS | 12 |
| **4 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 12 |
| **Soil Suction - Filter Paper Method of determining the state of desiccation in clay soils**<br>BRE Information Paper 4/93 Crilly, M. S. and Chandler, R. J. - * UKAS | 12 |
| **BRE Suite B Greenfield Site (pyrite present)**<br>**includes pH, water & acid soluble sulphate and total sulphur**<br>Sub-contracted Test | 20 |
| **Disposal of samples for job** | 1 |

**Notes:** **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
**# - denotes test carried out by approved contractor**
**@ - denotes non accredited tests**

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

**Approved Signatories:**
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
[redacted]

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 73370 | |
| Project Name | Land adj. to Church Lane Climping, West Sussex, BN17 5GG | |
| Date Tested | 27/06/2024 | |
| | **DESCRIPTIONS** | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| BH2 | | B | 1.00 | - | | Brown fine to medium gravelly silty sandy CLAY |
| BH2 | | B | 2.70 | - | | Brown silty sandy CLAY |
| BH4 | | B | 0.80 | - | | Brown silty sandy CLAY |
| BH4 | | B | 2.70 | - | | Off white/ brown fine to medium gravelly silty chalky CLAY |
| BH5 | | B | 1.00 | - | | Brown fine to medium gravelly silty CLAY |
| BH5 | | B | 1.70 | - | | Brown fine to medium gravelly sandy silty CLAY |
| BH6 | | B | 1.00 | - | | Brown fine to medium gravelly silty CLAY |
| BH6 | | B | 3.70 | - | | Brown fine to medium gravelly silty sandy CLAY |
| BH6 | | B | 5.90 | - | | Brown fine to medium gravelly silty sandy CLAY |
| BH7 | | B | 0.80 | - | | Brown fine to medium gravelly sandy silty CLAY |
| BH7 | | B | 2.70 | - | | Grey/ brown fine to medium gravelly silty sandy CLAY |
| BH7 | | B | 4.70 | - | | Brown fine to medium gravelly silty sandy CLAY |
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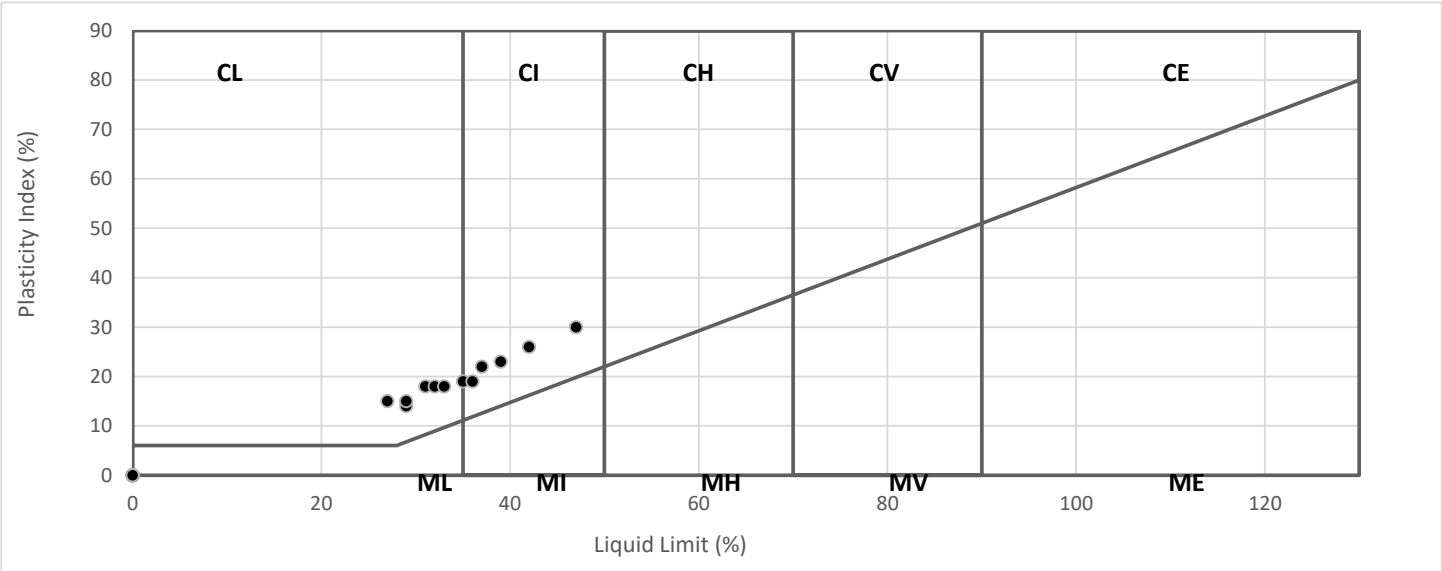
| Operator |
|---|
| Owain Davies |

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 73370 | |
| Project Name | Land adj. to Church Lane Climping, West Sussex, BN17 5GG | |
| Date Tested | 27/06/2024 | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH2 | | B | 1.00 | - | | 16 | 31 | 13 | 18 | 94 | CL Low Plasticity |
| BH2 | | B | 2.70 | - | | 17 | 32 | 14 | 18 | 96 | CL Low Plasticity |
| BH4 | | B | 0.80 | - | | 21 | 35 | 16 | 19 | 96 | CL/I Low/Inter. Plasticity |
| BH4 | | B | 2.70 | - | | 23 | 36 | 17 | 19 | 91 | CI Intermediate Plasticity |
| BH5 | | B | 1.00 | - | | 22 | 47 | 17 | 30 | 96 | CI Intermediate Plasticity |
| BH5 | | B | 1.70 | - | | 20 | 37 | 15 | 22 | 96 | CI Intermediate Plasticity |
| BH6 | | B | 1.00 | - | | 20 | 42 | 16 | 26 | 93 | CI Intermediate Plasticity |
| BH6 | | B | 3.70 | - | | 18 | 33 | 15 | 18 | 96 | CL Low Plasticity |
| BH6 | | B | 5.90 | - | | 15 | 27 | 12 | 15 | 94 | CL Low Plasticity |
| BH7 | | B | 0.80 | - | | 18 | 39 | 16 | 23 | 90 | CI Intermediate Plasticity |
| BH7 | | B | 2.70 | - | | 17 | 29 | 15 | 14 | 96 | CL Low Plasticity |
| BH7 | | B | 4.70 | - | | 17 | 29 | 14 | 15 | 94 | CL Low Plasticity |
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:2015+A1:2020**




| Operator |
|---|
| Owain Davies |

UKAS TESTING
2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

# SUMMARY OF SOIL CLASSIFICATION TESTS
## BRE Information Paper IP 4/93 February 1993 (CI/SfB p1)

Date Tested

| | | |
|---|---|---|
| Contract Number | **73370** | 26/06/2024 |
| Project Name | **Land adj. to Church Lane Climping, West Sussex, BN17 5GG** | |
| Test Performed by | **Jason Smith** | |
| Remarks | D - Disturbed (Recompacted 2.5kg Rammer), U - Undisturbed Sample | |

| BH Trial Hole | Depth (m) | Filter Paper Location | Filter Paper | Sample Prep Method | Test Duration (Days) | Water Content (%) | Soil Suction Pk (kPa) | Average Soil Suction Pk (kPa) | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| BH2 | 1.00 | Top | I | D | 5 | 90.0 | 16 | 16.8 | |
| BH2 | 1.00 | Middle | II | D | 5 | 84.4 | 19 | | |
| BH2 | 1.00 | Bottom | III | D | 5 | 90.7 | 16 | | |
| BH2 | 2.70 | Top | I | D | 5 | 101.0 | 12 | 11.8 | |
| BH2 | 2.70 | Middle | II | D | 5 | 102.0 | 12 | | |
| BH2 | 2.70 | Bottom | III | D | 5 | 102.0 | 12 | | |
| BH4 | 0.80 | Top | I | D | 5 | 104.0 | 11 | 11.1 | |
| BH4 | 0.80 | Middle | II | D | 5 | 104.0 | 11 | | |
| BH4 | 0.80 | Bottom | III | D | 5 | 105.0 | 11 | | |
| BH4 | 2.70 | Top | I | D | 5 | 99.9 | 12 | 12.3 | |
| BH4 | 2.70 | Middle | II | D | 5 | 100.0 | 12 | | |
| BH4 | 2.70 | Bottom | III | D | 5 | 100.0 | 12 | | |
| BH5 | 1.00 | Top | I | D | 5 | 71.7 | 28 | 27.8 | |
| BH5 | 1.00 | Middle | II | D | 5 | 71.9 | 28 | | |
| BH5 | 1.00 | Bottom | III | D | 5 | 72.2 | 28 | | |
| BH5 | 1.70 | Top | I | D | 5 | 77.5 | 23 | 22.9 | |
| BH5 | 1.70 | Middle | II | D | 5 | 77.8 | 23 | | |
| BH5 | 1.70 | Bottom | III | D | 5 | 78.1 | 23 | | |
| BH6 | 1.00 | Top | I | D | 5 | 65.5 | 35 | 34.7 | |
| BH6 | 1.00 | Middle | II | D | 5 | 66.0 | 35 | | |
| BH6 | 1.00 | Bottom | III | D | 5 | 66.0 | 35 | | |
| BH6 | 3.70 | Top | I | D | 5 | 83.7 | 19 | 18.9 | |
| BH6 | 3.70 | Middle | II | D | 5 | 84.1 | 19 | | |
| BH6 | 3.70 | Bottom | III | D | 5 | 84.5 | 19 | | |
| BH6 | 5.90 | Top | I | D | 5 | 118.0 | 8 | 8.14 | |
| BH6 | 5.90 | Middle | II | D | 5 | 118.0 | 8 | | |
| BH6 | 5.90 | Bottom | III | D | 5 | 119.0 | 8 | | |
| BH7 | 0.80 | Top | I | D | 5 | 110.0 | 10 | 9.7 | |
| BH7 | 0.80 | Middle | II | D | 5 | 110.0 | 10 | | |
| BH7 | 0.80 | Bottom | III | D | 5 | 111.0 | 10 | | |
| BH7 | 2.70 | Top | I | D | 5 | 60.7 | 43 | 42.1 | |
| BH7 | 2.70 | Middle | II | D | 5 | 60.9 | 42 | | |
| BH7 | 2.70 | Bottom | III | D | 5 | 61.1 | 42 | | |
| BH7 | 4.70 | Top | I | D | 5 | 128.0 | 7 | 7.89 | |
| BH7 | 4.70 | Middle | II | D | 5 | 129.0 | 7 | | |
| BH7 | 4.70 | Bottom | III | D | 5 | 107.0 | 10 | | |
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| Test Operator | | | | |
| Jason Smith | | | | |

UKAS TESTING
2788

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

**GSTL**
Unit 3-4 Heol Aur
Dafen Ind Estate
Dafen
SA14 8QN

**Analytical Test Report: L24/05841/GSL - 24-46860**

| | | | |
|---|---|---|---|
| Your Project Reference: | **Land adj. to Church Lane Climping West Sussex BN17 5GG** | | |
| Your Order Number: | 73370 | Samples Received / Instructed: | 28/06/2024 / 28/06/2024 |
| Report Issue Number: | 1 | Sample Tested: | 28/06 to 09/07/2024 |
| Samples Analysed: | 20 soil samples | Report issued: | 09/07/2024 |

[redacted]

**James Gane**
Analytical Services Manager
CTS Group

Notes:

**General**

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

**Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.**

**Uncertainty of measurement values are available on request.**

Samples were supplied by customer, results apply to the samples as received.

**Deviating Samples**

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

**Accreditation Key**

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test, subMCERTS - Subcontracted to a laboratory MCERTS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 29.05.2024

Issued by: J. Gane

Issue No: 4

Rev No: 10

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping**
**West Sussex BN17 5GG**

**Analytical Test Results - Chemical Analysis**

| Lab Reference | | | 377169 | 377170 | 377171 | 377172 | 377173 | 377174 |
|---|---|---|---|---|---|---|---|---|
| Client Sample ID | | | - | - | - | - | - | - |
| Client Sample Location | | | BH02 | BH02 | BH02 | BH02 | BH04 | BH04 |
| Client Sample Type | | | - | - | - | - | - | - |
| Client Sample Number | | | - | - | - | - | - | - |
| Depth - Top (m) | | | 1.70 | 4.70 | 8.90 | 13.40 | 1.00 | 3.70 |
| Depth - Bottom (m) | | | 1.70 | 4.70 | 8.90 | 13.40 | 1.00 | 3.70 |
| Date of Sampling | | | - | - | - | - | - | - |
| Time of Sampling | | | - | - | - | - | - | - |
| Sample Matrix | | | Clay | Clay | Clay | Clay | Clay | Clay |
| **Determinant** | **Units** | **Accreditation** | | | | | | |
| Water soluble sulphate (as $SO_4$) | (mg/l) | u | < 10 | < 10 | 14 | 95 | 11 | 20 |
| Acid Soluble Sulphate | (%) | u | < 0.01 | < 0.01 | 0.04 | 0.05 | 0.01 | 0.03 |
| Total Sulphur | (%) | UKAS | < 0.01 | < 0.01 | 0.01 | 0.06 | < 0.01 | 0.01 |
| pH Value | pH Units | MCERTS | 8.5 | 8.4 | 9.0 | 8.8 | 8.6 | 9.0 |

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping**
**West Sussex BN17 5GG**

**Analytical Test Results - Chemical Analysis**

| Lab Reference | | | 377175 | 377176 | 377177 | 377178 | 377179 | 377180 |
|---|---|---|---|---|---|---|---|---|
| Client Sample ID | | | - | - | - | - | - | - |
| Client Sample Location | | | BH04 | BH04 | BH05 | BH05 | BH05 | BH05 |
| Client Sample Type | | | - | - | - | - | - | - |
| Client Sample Number | | | - | - | - | - | - | - |
| Depth - Top (m) | | | 5.90 | 8.70 | 0.80 | 3.70 | 7.40 | 11.90 |
| Depth - Bottom (m) | | | 5.90 | 8.70 | 0.80 | 3.70 | 7.40 | 11.90 |
| Date of Sampling | | | - | - | - | - | - | - |
| Time of Sampling | | | - | - | - | - | - | - |
| Sample Matrix | | | Clay | Clay | Clay | Clay | Clay | Clay |
| **Determinant** | **Units** | **Accreditation** | | | | | | |
| Water soluble sulphate (as $SO_4$) | (mg/l) | u | 33 | 13 | < 10 | 12 | < 10 | 14 |
| Acid Soluble Sulphate | (%) | u | 0.05 | 0.05 | 0.01 | 0.04 | 0.04 | 0.05 |
| Total Sulphur | (%) | UKAS | 0.01 | 0.02 | < 0.01 | 0.02 | 0.02 | 0.02 |
| pH Value | pH Units | MCERTS | 9.0 | 9.0 | 8.5 | 9.0 | 9.0 | 9.0 |

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping**
**West Sussex BN17 5GG**

**Analytical Test Results - Chemical Analysis**

| Lab Reference | | | 377181 | 377182 | 377183 | 377184 | 377185 | 377186 |
|---|---|---|---|---|---|---|---|---|
| Client Sample ID | | | - | - | - | - | - | - |
| Client Sample Location | | | BH06 | BH06 | BH06 | BH06 | BH07 | BH07 |
| Client Sample Type | | | - | - | - | - | - | - |
| Client Sample Number | | | - | - | - | - | - | - |
| Depth - Top (m) | | | 0.80 | 2.70 | 7.20 | 10.20 | 1.70 | 3.70 |
| Depth - Bottom (m) | | | 0.80 | 2.70 | 7.20 | 10.20 | 1.70 | 3.70 |
| Date of Sampling | | | - | - | - | - | - | - |
| Time of Sampling | | | - | - | - | - | - | - |
| Sample Matrix | | | Clay | Clay | Clay | Other | Clay | Clay |
| **Determinant** | **Units** | **Accreditation** | | | | | | |
| Water soluble sulphate (as $SO_4$) | (mg/l) | u | < 10 | < 10 | 14 | 21 | < 10 | < 10 |
| Acid Soluble Sulphate | (%) | u | 0.01 | < 0.01 | 0.05 | 0.02 | < 0.01 | 0.02 |
| Total Sulphur | (%) | UKAS | < 0.01 | < 0.01 | 0.02 | 0.02 | < 0.01 | 0.01 |
| pH Value | pH Units | MCERTS | 8.3 | 8.6 | 9.1 | 9.1 | 8.7 | 8.7 |

7 - 11 Harding Street
Leicester
LE1 4DH

**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping**
**West Sussex BN17 5GG**

**Analytical Test Results - Chemical Analysis**

| Lab Reference | | | 377187 | 377188 |
|---|---|---|---|---|
| Client Sample ID | | | - | - |
| Client Sample Location | | | BH07 | BH07 |
| Client Sample Type | | | - | - |
| Client Sample Number | | | - | - |
| Depth - Top (m) | | | 7.20 | 11.70 |
| Depth - Bottom (m) | | | 7.20 | 11.70 |
| Date of Sampling | | | - | - |
| Time of Sampling | | | - | - |
| Sample Matrix | | | Clay | Other |
| **Determinant** | **Units** | **Accreditation** | | |
| Water soluble sulphate (as $SO_4$) | (mg/l) | u | 69 | 49 |
| Acid Soluble Sulphate | (%) | u | 0.05 | 0.03 |
| Total Sulphur | (%) | UKAS | 0.03 | 0.04 |
| pH Value | pH Units | MCERTS | 8.8 | 8.9 |

7 - 11 Harding Street
Leicester
LE1 4DH

**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping West Sussex BN17 5GG**

**Sample Descriptions**

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Description | Moisture Content (%) | Stone Content (%) | Passing 2mm test sieve (%) |
|---|---|---|---|---|---|---|---|---|
| 377169 | - | BH02 | - | - | Brown slightly gravelly sandy silty clay | - | - | 100 |
| 377170 | - | BH02 | - | - | Brown slightly gravelly sandy silty clay | - | - | 100 |
| 377171 | - | BH02 | - | - | Light brownish white slightly gravelly silty clay | - | - | 100 |
| 377172 | - | BH02 | - | - | Mottled white grey clayey gravel | - | - | 22 |
| 377173 | - | BH04 | - | - | Brown sandy silty clay | - | - | 100 |
| 377174 | - | BH04 | - | - | Light brownish white slightly gravelly silty clay | - | - | 100 |
| 377175 | - | BH04 | - | - | Light brownish white slightly gravelly silty clay | - | - | 100 |
| 377176 | - | BH04 | - | - | Light brownish white slightly gravelly silty clay | - | - | 100 |
| 377177 | - | BH05 | - | - | Brown slightly gravelly silty clay | - | - | 100 |
| 377178 | - | BH05 | - | - | Light brownish white gravelly silty clay | - | - | 96 |
| 377179 | - | BH05 | - | - | Light brownish white gravelly silty clay | - | - | 100 |
| 377180 | - | BH05 | - | - | Light brownish white gravelly silty clay | - | - | 100 |
| 377181 | - | BH06 | - | - | Brown slightly gravelly silty clay | - | - | 100 |
| 377182 | - | BH06 | - | - | Brown slightly gravelly silty clay | - | - | 100 |
| 377183 | - | BH06 | - | - | Light brownish white gravelly silty clay | - | - | 100 |
| 377184 | - | BH06 | - | - | Mottled white grey clayey gravel | - | - | 13 |
| 377185 | - | BH07 | - | - | Brown slightly gravelly sandy silty clay | - | - | 100 |
| 377186 | - | BH07 | - | - | Brown sandy silty clay | - | - | 100 |
| 377187 | - | BH07 | - | - | Light brownish grey very gravelly silty clay | - | - | 100 |
| 377188 | - | BH07 | - | - | Mottled white grey clayey gravel | - | - | 36 |

7 - 11 Harding Street
Leicester
LE1 4DH

**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping West Sussex BN17 5GG**

**Sample Comments**

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Comments |
|---|---|---|---|---|---|
| 377169 | - | BH02 | - | - | |
| 377170 | - | BH02 | - | - | |
| 377171 | - | BH02 | - | - | |
| 377172 | - | BH02 | - | - | |
| 377173 | - | BH04 | - | - | |
| 377174 | - | BH04 | - | - | |
| 377175 | - | BH04 | - | - | |
| 377176 | - | BH04 | - | - | |
| 377177 | - | BH05 | - | - | |
| 377178 | - | BH05 | - | - | |
| 377179 | - | BH05 | - | - | |
| 377180 | - | BH05 | - | - | |
| 377181 | - | BH06 | - | - | |
| 377182 | - | BH06 | - | - | |
| 377183 | - | BH06 | - | - | |
| 377184 | - | BH06 | - | - | |
| 377185 | - | BH07 | - | - | |
| 377186 | - | BH07 | - | - | |
| 377187 | - | BH07 | - | - | |
| 377188 | - | BH07 | - | - | |

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**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping West Sussex BN17 5GG**

**Analysis Methodologies**

| Test Code | Test Name / Reference | Sample condition for analysis | Sample Preperation | Test Details |
|---|---|---|---|---|
| ANIONSS | MS - CL - Anions by Aquakem (2:1Extract) | Oven dried | Passing 2mm test sieve | Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio |
| PHS | MS - CL - pH in Soils | As received | Passing 10mm test sieve | Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction) |
| ASSO4S | MS - CL - Acid Soluble Sulphate | Oven Dried | Passing 2mm test sieve | Determination of total sulphate in soils by acid extraction followed by ICP analysis |
| SAMPLEPREP | MS - CL - Sample Preparation | - | - | Preparation of samples (including determination of moisture content) to allow for subsequent analysis |
| 1377TS-ELT | BS1377 Total Sulphur Content by HTC | Oven dried | BS1377 : Part 1 : 2016 | Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser) |

7 - 11 Harding Street
Leicester
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**L24/05841/GSL - 24-46860**

**Project Reference - Land adj. to Church Lane Climping West Sussex BN17 5GG**

**Sample Deviations**

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

**Observations on receipt**

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

**Observations whilst in laboratory**

X - Exceeds sampling to extraction or analysis timescales

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Test | Deviations |
|---|---|---|---|---|---|---|
| 377169 | - | BH02 | - | - | | A |
| 377170 | - | BH02 | - | - | | A |
| 377171 | - | BH02 | - | - | | A |
| 377172 | - | BH02 | - | - | | A |
| 377173 | - | BH04 | - | - | | A |
| 377174 | - | BH04 | - | - | | A |
| 377175 | - | BH04 | - | - | | A |
| 377176 | - | BH04 | - | - | | A |
| 377177 | - | BH05 | - | - | | A |
| 377178 | - | BH05 | - | - | | A |
| 377179 | - | BH05 | - | - | | A |
| 377180 | - | BH05 | - | - | | A |
| 377181 | - | BH06 | - | - | | A |
| 377182 | - | BH06 | - | - | | A |
| 377183 | - | BH06 | - | - | | A |
| 377184 | - | BH06 | - | - | | A |
| 377185 | - | BH07 | - | - | | A |
| 377186 | - | BH07 | - | - | | A |
| 377187 | - | BH07 | - | - | | A |
| 377188 | - | BH07 | - | - | | A |

# Laboratory Report

UKAS TESTING 2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

# Contract Number: 73375

Client Ref: **GWPR6003**
Client PO: **GWPR6003**

Date Received: **21-06-2024**
Date Completed: **03-07-2024**
Report Date: **03-07-2024**

Client: **Ground and Water Limited**

Contract Title: **Land adj. to Church Lane Climping, [redacted]G**
For the attention of: **Alex Stratford**

This report has been checked and approved by:

[redacted]

**Brendan Evans**
Office Administrator

| Description | Qty |
|---|---|
| **Moisture Content**<br>BS 1377:1990 - Part 2 : 3.2 - * UKAS | 6 |
| **4 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 6 |
| **Soil Suction - Filter Paper Method of determining the state of desiccation in clay soils**<br>BRE Information Paper 4/93 Crilly, M. S. and Chandler, R. J. - * UKAS | 6 |
| **Disposal of samples for job** | 1 |

**Notes:** **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
**# - denotes test carried out by approved contractor**
**@ - denotes non accredited tests**

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

**Approved Signatories:**
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
[redacted]

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 73375 | |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG | |
| Date Tested | 27/06/2024 | |
| | **DESCRIPTIONS** | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| BH1 | | B | 1.70 | - | | Brown fine to medium gravelly silty CLAY |
| BH1 | | B | 2.70 | - | | Brown fine to medium gravelly silty CLAY |
| BH1 | | B | 4.70 | - | | Brown silty sandy fine to medium gravelly CLAY |
| BH3 | | B | 0.80 | - | | Brown fine to medium gravelly sandy silty CLAY |
| BH3 | | B | 2.70 | - | | Brown fine to medium gravelly sandy silty CLAY |
| BH3 | | B | 3.70 | - | | Brown silty fine to medium gravelly sandy CLAY |
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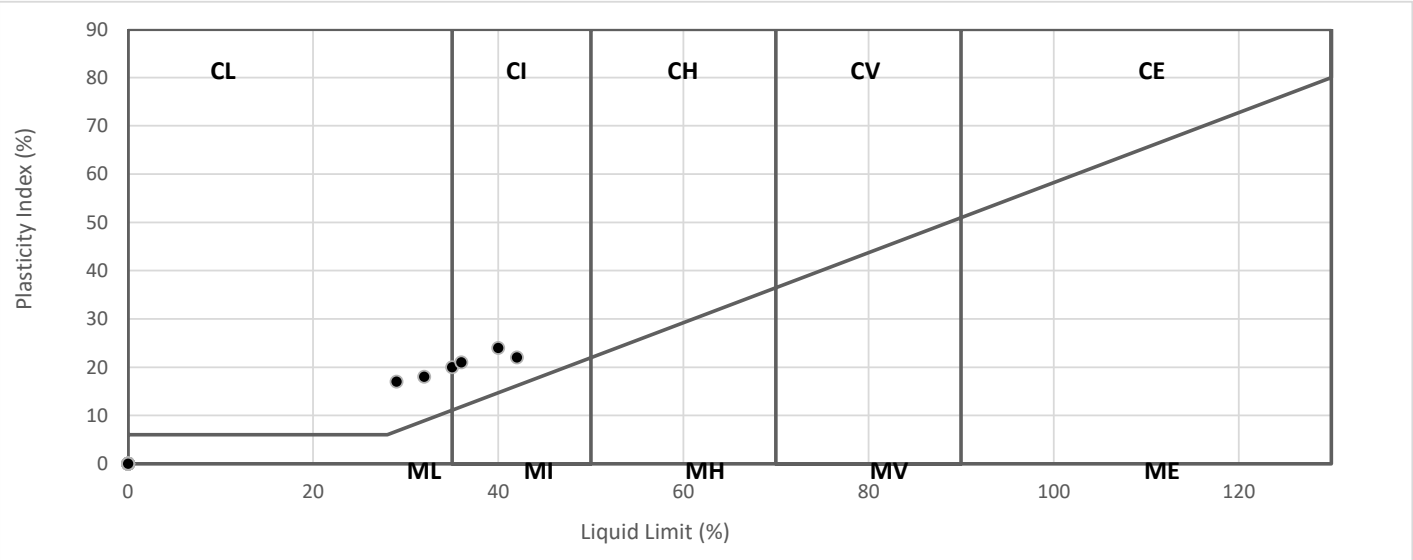
| Operator |
|---|
| Owain Davies |

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 73375 | |
| Project Name | Land adj. to Church Lane Climping, West sussex BN17 5GG | |
| Date Tested | 27/06/2024 | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BH1 | | B | 1.70 | - | | 22 | 40 | 16 | 24 | 92 | CI Intermediate Plasticity |
| BH1 | | B | 2.70 | - | | 26 | 42 | 20 | 22 | 96 | CI Intermediate Plasticity |
| BH1 | | B | 4.70 | - | | 16 | 32 | 14 | 18 | 84 | CL Low Plasticity |
| BH3 | | B | 0.80 | - | | 20 | 35 | 15 | 20 | 94 | CL/I Low/Inter. Plasticity |
| BH3 | | B | 2.70 | - | | 21 | 36 | 15 | 21 | 94 | CI Intermediate Plasticity |
| BH3 | | B | 3.70 | - | | 13 | 29 | 12 | 17 | 85 | CL Low Plasticity |
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:2015+A1:2020**




| Operator |
|---|
| Owain Davies |

UKAS TESTING
2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

# SUMMARY OF SOIL CLASSIFICATION TESTS
## BRE Information Paper IP 4/93 February 1993 (CI/SfB p1)

Date Tested

| | |
|---|---|
| Contract Number | **73375** |
| Project Name | **Land adj. to Church Lane Climping, West sussex BN17 5GG** |
| Test Performed by | **Jason Smith** |
| Remarks | D - Disturbed (Recompacted 2.5kg Rammer), U - Undisturbed Sample |

| Trial Hole | Depth (m) | Filter Paper Location | Filter Paper | Sample Prep Method | Test Duration (Days) | Water Content (%) | Soil Suction Pk (kPa) | Average Soil Suction Pk (kPa) | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| BH01 | 1.70 | Top | I | B | 5 | 115.0 | 9 | 8.64 | |
| BH01 | 1.70 | Middle | II | B | 5 | 115.0 | 9 | | |
| BH01 | 1.70 | Bottom | III | B | 5 | 116.0 | 9 | | |
| BH01 | 2.70 | Top | I | B | 5 | 89.2 | 16 | 16.2 | |
| BH01 | 2.70 | Middle | II | B | 5 | 89.6 | 16 | | |
| BH01 | 2.70 | Bottom | III | B | 5 | 89.9 | 16 | | |
| BH01 | 4.70 | Top | I | B | 5 | 135.0 | 6 | 5.79 | |
| BH01 | 4.70 | Middle | II | B | 5 | 136.0 | 6 | | |
| BH01 | 4.70 | Bottom | III | B | 5 | 136.0 | 6 | | |
| BH03 | 0.80 | Top | I | B | 5 | 94.7 | 14 | 13.9 | |
| BH03 | 0.80 | Middle | II | B | 5 | 95.1 | 14 | | |
| BH03 | 0.80 | Bottom | III | B | 5 | 95.5 | 14 | | |
| BH03 | 2.70 | Top | I | B | 5 | 126.0 | 7 | 6.88 | |
| BH03 | 2.70 | Middle | II | B | 5 | 126.0 | 7 | | |
| BH03 | 2.70 | Bottom | III | B | 5 | 127.0 | 7 | | |
| BH03 | 3.70 | Top | I | B | 5 | 127.0 | 7 | 6.75 | |
| BH03 | 3.70 | Middle | II | B | 5 | 127.0 | 7 | | |
| BH03 | 3.70 | Bottom | III | B | 5 | 128.0 | 7 | | |

| Test Operator | | | | |
|---|---|---|---|---|
| Jason Smith | | | | |

UKAS TESTING
2788

# APPENDIX G: Chemical Laboratory Testing

2 The Long Barn, Norton Farm, Selborne Road, Alton, Hampshire GU34 3NB
0333 600 1221 enquiries@groundandwater.co.uk **groundandwater.co.uk**

Registered Office: Kineton House, 31 Horse Fair, Banbury, Oxfordshire OX16 0AE Registered in England No. 07032001

Ground and Water Ltd
2 The Long Barn
Norton Farm
Selbourne Road
Alton
Hampshire
GU34 3NB

**e:** alex.stratford@groundandwater.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS
[redacted]

# Analytical Report Number : 24-012660

| | | | |
|---|---|---|---|
| **Project / Site name:** | Land Adj. To Church Lane Climping West Sussex BN17 5GG | **Samples received on:** | 04/04/2024 |
| **Your job number:** | GWPR5921 | **Samples instructed on/ Analysis started on:** | 08/04/2024 |
| **Your order number:** | GWPR5921 | **Analysis completed by:** | 12/04/2024 |
| **Report Issue Number:** | 1 | **Report issued on:** | 12/04/2024 |
| **Samples Analysed:** | 5 soil samples | | |

**Signed** [redacted]

Joanna Szwagrzak
Reporting Specialist
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 24-012660**
**Project / Site name: Land Adj. To Church Lane Climping West Sussex BN17 5GG**
**Your Order No: GWPR5921**

| Lab Sample Number | | | | 163296 | 163297 | 163298 | 163299 | 163300 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | WS2 | WS3 | WS4 | WS5 | WS7 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 2.00 | 2.50 | 4.50 | 3.00 | 5.00 |
| Date Sampled | | | | 27/03/2024 | 27/03/2024 | 27/03/2024 | 27/03/2024 | 27/03/2024 |
| Time Taken | | | | 1200 | 1200 | 1200 | 1200 | 1200 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 16 | 13 | 18 | 11 | 12 |
| Total mass of sample received | kg | 0.1 | NONE | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 8.6 | 8.4 | 8.9 | 8.3 | 9.1 |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | 0.039 | - | 0.044 | - | 0.019 |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 33 | 20 | 28 | 680 | 100 |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 16.4 | 9.83 | 13.8 | 339 | 52.1 |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | 3.6 | - | 5.4 | - | 2.7 |
| Total Sulphur | mg/kg | 50 | MCERTS | 160 | - | 160 | - | 56 |
| Total Sulphur | % | 0.005 | MCERTS | 0.016 | - | 0.016 | - | 0.006 |
| Ammoniacal Nitrogen as $NH_4^+$ | mg/kg | 0.5 | MCERTS | < 0.5 | - | < 0.5 | - | < 0.5 |
| Ammonium as $NH_4^+$ (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | < 0.05 | - | < 0.05 | - | < 0.05 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | 2.6 | - | < 2.0 | - | < 2.0 |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | < 2.0 | - | < 2.0 | - | < 2.0 |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | 3.2 | - | < 2.5 | - | < 2.5 |
| Magnesium (water soluble) | mg/kg | 5 | NONE | 6.3 | - | < 5.0 | - | < 5.0 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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The results included within the report relate only to the sample(s) submitted for testing.

**Analytical Report Number : 24-012660**
**Project / Site name: Land Adj. To Church Lane Climping West Sussex BN17 5GG**

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description * |
|---|---|---|---|---|
| 163296 | WS2 | None Supplied | 2 | Brown clay and sand with vegetation |
| 163297 | WS3 | None Supplied | 2.5 | Brown sand with gravel |
| 163298 | WS4 | None Supplied | 4.5 | Beige clay and sand with gravel |
| 163299 | WS5 | None Supplied | 3 | Brown clay and sand with gravel |
| 163300 | WS7 | None Supplied | 5 | Brown sand with gravel |

**Analytical Report Number : 24-012660**
**Project / Site name: Land Adj. To Church Lane Climping West Sussex BN17 5GG**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Moisture Content | Moisture content, determined gravimetrically (up to 30°C) | In-house method | L019B | W | NONE |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight | In-house method based on British Standard Methods and MCERTS requirements. | L019B | D | NONE |
| Magnesium, water soluble, in soil | Determination of water soluble magnesium by extraction with water followed by ICP-OES | In-house method based on TRL 447 | L038B | D | NONE |
| Total sulphate (as SO4 in soil) | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES | In-house method | L038B | D | MCERTS |
| Sulphate, water soluble, in soil (16hr extraction) | Sulphate, water soluble, in soil (16hr extraction) | In-house method | L038B | D | MCERTS |
| Total Sulphur in soil | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES | In-house method | L038B | D | MCERTS |
| Water Soluble Nitrate (2:1) as N in soil | Determination of nitrate by reaction with sodium salicylate and colorimetry | In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction | L078B | W | NONE |
| Chloride, water soluble, in soil | Determination of Chloride colorimetrically by discrete analyser | In-house method | L082B | D | MCERTS |
| Ammonium as NH4 in soil | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082B | W | MCERTS |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement | In-house method | L099 | D | MCERTS |

**For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).**
**For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).**
**For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.**
**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**
**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

Ground and Water Ltd
2 The Long Barn
Norton Farm
Selbourne Road
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GU34 3NB

**e:** alex.stratford@groundandwater.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

# Analytical Report Number : 24-011076

| | | | |
|---|---|---|---|
| **Project / Site name:** | Land adj to Church Lane Climping West Sussex BN17 5GG | **Samples received on:** | 26/03/2024 |
| **Your job number:** | GWPR5921 | **Samples instructed on/ Analysis started on:** | 26/03/2024 |
| **Your order number:** | GWPR5921 | **Analysis completed by:** | 04/04/2024 |
| **Report Issue Number:** | 1 | **Report issued on:** | 04/04/2024 |
| **Samples Analysed:** | 11 soil samples | | |

**Signed**

Anna Goc
PL Head of Reporting Team
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**
**Your Order No: GWPR5921**

| Lab Sample Number | | | | 155604 | 155605 | 155606 | 155607 | 155608 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CBR1 | CBR3 | CBR7 | CBR15 | CBR20 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.00-1.00 | 1.00-1.00 | 1.50-1.50 | 2.00-2.00 | 2.00-2.00 |
| **Date Sampled** | | | | 22/03/2024 | 19/03/2024 | 19/03/2024 | 21/03/2024 | 22/03/2024 |
| **Time Taken** | | | | 1200 | 1200 | 1200 | 1200 | 1200 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | 44.7 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 9.3 | 17 | 17 | 18 | 14 |
| Total mass of sample received | kg | 0.1 | NONE | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| **Asbestos** | | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos Analyst ID | N/A | N/A | N/A | - | - | - | - | - |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 7.9 | 7.8 | 7.9 | 8.9 | 8.2 |
| Total Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | - | - | - | 0.036 | 0.048 |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 330 | 34 | 430 | 19 | 340 |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 164 | 16.8 | 215 | 9.66 | 170 |
| Water Soluble $SO_4$ 16hr extraction (2:1) | mg/l | 1.25 | MCERTS | - | - | - | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | 1 | 1 |
| Total Sulphur | mg/kg | 50 | MCERTS | - | - | - | 120 | 130 |
| Total Sulphur | % | 0.005 | MCERTS | - | - | - | 0.012 | 0.013 |
| Ammoniacal Nitrogen as $NH_4^+$ | mg/kg | 0.5 | MCERTS | - | - | - | < 0.5 | < 0.5 |
| Ammonium as $NH_4^+$ (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - | - | - | < 0.05 | < 0.05 |
| Organic Matter (automated) | % | 0.1 | MCERTS | - | - | - | - | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | - | - | < 2.0 | < 2.0 |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | < 2.0 | < 2.0 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | - | - | - | - | - |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | - | - | - | - | - |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | - | - | - | - | - |

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**Analytical Report Number: 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**
**Your Order No: GWPR5921**

| **Lab Sample Number** | | | | 155604 | 155605 | 155606 | 155607 | 155608 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CBR1 | CBR3 | CBR7 | CBR15 | CBR20 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.00-1.00 | 1.00-1.00 | 1.50-1.50 | 2.00-2.00 | 2.00-2.00 |
| **Date Sampled** | | | | 22/03/2024 | 19/03/2024 | 19/03/2024 | 21/03/2024 | 22/03/2024 |
| **Time Taken** | | | | 1200 | 1200 | 1200 | 1200 | 1200 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | - | - | - | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | - | - | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | 3.3 | 8.3 |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | 6.5 | 17 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPHCWG - Aliphatic >C5 - C6 HS_1D_AL | mg/kg | 0.02 | NONE | - | - | - | - | - |
| TPHCWG - Aliphatic >C6 - C8 HS_1D_AL | mg/kg | 0.02 | NONE | - | - | - | - | - |
| TPHCWG - Aliphatic >C8 - C10 HS_1D_AL | mg/kg | 0.05 | NONE | - | - | - | - | - |
| TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL | mg/kg | 1 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL | mg/kg | 2 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL | mg/kg | 8 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL | mg/kg | 8 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >C35 - C40 EH_CU_1D_AL | mg/kg | 10 | NONE | - | - | - | - | - |
| TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL | mg/kg | 10 | NONE | - | - | - | - | - |
| TPHCWG - Aliphatic >C5 - C40 EH_CU+HS_1D_AL | mg/kg | 10 | NONE | - | - | - | - | - |
| TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR | mg/kg | 0.01 | NONE | - | - | - | - | - |
| TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR | mg/kg | 0.01 | NONE | - | - | - | - | - |
| TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR | mg/kg | 0.05 | NONE | - | - | - | - | - |
| TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR | mg/kg | 1 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR | mg/kg | 2 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC35 - EC40 EH_CU_1D_AR | mg/kg | 10 | NONE | - | - | - | - | - |
| TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR | mg/kg | 10 | NONE | - | - | - | - | - |
| TPHCWG - Aromatic >EC5 - EC40 EH_CU+HS_1D_AR | mg/kg | 10 | NONE | - | - | - | - | - |
| TPH Total >C5 - C40 EH_CU+HS_1D_TOTAL | mg/kg | 10 | NONE | - | - | - | - | - |
| **VOCs** | | | | | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | NONE | - | - | - | - | - |
| Benzene | µg/kg | 5 | MCERTS | - | - | - | - | - |
| Toluene | µg/kg | 5 | MCERTS | - | - | - | - | - |
| Ethylbenzene | µg/kg | 5 | MCERTS | - | - | - | - | - |
| p & m-Xylene | µg/kg | 5 | MCERTS | - | - | - | - | - |
| o-Xylene | µg/kg | 5 | MCERTS | - | - | - | - | - |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number: 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**
**Your Order No: GWPR5921**

| Lab Sample Number | | | | 155609 | 155610 | 155611 | 155612 | 155613 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | CBR23 | CBR2 | CBR4 | CBR9 | CBR14 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.50-1.50 | 0.20-0.20 | 0.50-0.50 | 0.20-0.20 | 0.50-0.50 |
| Date Sampled | | | | 20/03/2024 | 21/03/2024 | 19/03/2024 | 21/03/2024 | 21/03/2024 |
| Time Taken | | | | 1200 | 1200 | 1200 | 1200 | 1200 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 16 | 16 | 17 | 16 | 15 |
| Total mass of sample received | kg | 0.1 | NONE | 0.5 | 0.8 | 0.8 | 0.8 | 0.8 |
| **Asbestos** | | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | - | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | - | PDO | PDO | PDO | PDO |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 8.4 | 7.9 | 7.8 | 7.9 | 7.5 |
| Total Cyanide | mg/kg | 1 | MCERTS | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | 0.015 | - | - | - | - |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 28 | 30 | 20 | 23 | 24 |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 13.8 | - | - | - | - |
| Water Soluble $SO_4$ 16hr extraction (2:1) | mg/l | 1.25 | MCERTS | - | 15.1 | 9.96 | 11.7 | 12 |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | 2.9 | - | - | - | - |
| Total Sulphur | mg/kg | 50 | MCERTS | < 50 | - | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | < 0.005 | - | - | - | - |
| Ammoniacal Nitrogen as $NH_4^+$ | mg/kg | 0.5 | MCERTS | < 0.5 | - | - | - | - |
| Ammonium as $NH_4^+$ (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | < 0.05 | - | - | - | - |
| Organic Matter (automated) | % | 0.1 | MCERTS | - | 1.8 | 0.4 | 0.4 | 0.7 |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | - | 1 | 0.3 | 0.2 | 0.4 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | < 2.0 | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | < 2.0 | - | - | - | - |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | - | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | - | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | 0.09 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | - | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | 0.28 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | - | 0.27 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | 0.12 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | - | 0.16 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | - | 0.17 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | - | 0.1 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | - | 0.16 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | - | 0.13 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | - | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | - | 0.13 | < 0.05 | < 0.05 | < 0.05 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | - | 1.61 | < 0.80 | < 0.80 | < 0.80 |

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**Analytical Report Number: 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**
**Your Order No: GWPR5921**

| Lab Sample Number | | | | 155609 | 155610 | 155611 | 155612 | 155613 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | CBR23 | CBR2 | CBR4 | CBR9 | CBR14 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.50-1.50 | 0.20-0.20 | 0.50-0.50 | 0.20-0.20 | 0.50-0.50 |
| Date Sampled | | | | 20/03/2024 | 21/03/2024 | 19/03/2024 | 21/03/2024 | 21/03/2024 |
| Time Taken | | | | 1200 | 1200 | 1200 | 1200 | 1200 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 11 | 15 | 12 | 9.7 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | - | 0.3 | 0.6 | < 0.2 | 0.6 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | - | < 1.8 | < 1.8 | < 1.8 | < 1.8 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 21 | 33 | 26 | 20 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 16 | 14 | 11 | 8 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 21 | 14 | 10 | 12 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 14 | 23 | 20 | 13 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 35 | 48 | 42 | 33 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 61 | 52 | 41 | 37 |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | 3.9 | - | - | - | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | 7.8 | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPHCWG - Aliphatic >C5 - C6 HS_1D_AL | mg/kg | 0.02 | NONE | - | - | < 0.020 | < 0.020 | - |
| TPHCWG - Aliphatic >C6 - C8 HS_1D_AL | mg/kg | 0.02 | NONE | - | - | < 0.020 | < 0.020 | - |
| TPHCWG - Aliphatic >C8 - C10 HS_1D_AL | mg/kg | 0.05 | NONE | - | - | < 0.050 | < 0.050 | - |
| TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL | mg/kg | 1 | MCERTS | - | - | < 1.0 | < 1.0 | - |
| TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL | mg/kg | 2 | MCERTS | - | - | < 2.0 | < 2.0 | - |
| TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL | mg/kg | 8 | MCERTS | - | - | < 8.0 | < 8.0 | - |
| TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL | mg/kg | 8 | MCERTS | - | - | < 8.0 | < 8.0 | - |
| TPHCWG - Aliphatic >C35 - C40 EH_CU_1D_AL | mg/kg | 10 | NONE | - | - | < 10 | < 10 | - |
| TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL | mg/kg | 10 | NONE | - | - | < 10 | < 10 | - |
| TPHCWG - Aliphatic >C5 - C40 EH_CU+HS_1D_AL | mg/kg | 10 | NONE | - | - | < 10 | < 10 | - |
| TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR | mg/kg | 0.01 | NONE | - | - | < 0.010 | < 0.010 | - |
| TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR | mg/kg | 0.01 | NONE | - | - | < 0.010 | < 0.010 | - |
| TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR | mg/kg | 0.05 | NONE | - | - | < 0.050 | < 0.050 | - |
| TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR | mg/kg | 1 | MCERTS | - | - | < 1.0 | < 1.0 | - |
| TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR | mg/kg | 2 | MCERTS | - | - | < 2.0 | < 2.0 | - |
| TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR | mg/kg | 10 | MCERTS | - | - | < 10 | < 10 | - |
| TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR | mg/kg | 10 | MCERTS | - | - | < 10 | < 10 | - |
| TPHCWG - Aromatic >EC35 - EC40 EH_CU_1D_AR | mg/kg | 10 | NONE | - | - | < 10 | < 10 | - |
| TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR | mg/kg | 10 | NONE | - | - | < 10 | < 10 | - |
| TPHCWG - Aromatic >EC5 - EC40 EH_CU+HS_1D_AR | mg/kg | 10 | NONE | - | - | < 10 | < 10 | - |
| TPH Total >C5 - C40 EH_CU+HS_1D_TOTAL | mg/kg | 10 | NONE | - | - | < 10 | < 10 | - |
| **VOCs** | | | | | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | NONE | - | - | < 5.0 | < 5.0 | - |
| Benzene | µg/kg | 5 | MCERTS | - | - | < 5.0 | < 5.0 | - |
| Toluene | µg/kg | 5 | MCERTS | - | - | < 5.0 | < 5.0 | - |
| Ethylbenzene | µg/kg | 5 | MCERTS | - | - | < 5.0 | < 5.0 | - |
| p & m-Xylene | µg/kg | 5 | MCERTS | - | - | < 5.0 | < 5.0 | - |
| o-Xylene | µg/kg | 5 | MCERTS | - | - | < 5.0 | < 5.0 | - |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number: 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**
**Your Order No: GWPR5921**

| | | | | |
|---|---|---|---|---|
| **Lab Sample Number** | | | | 155614 |
| **Sample Reference** | | | | CBR23 |
| **Sample Number** | | | | None Supplied |
| **Depth (m)** | | | | 0.20-0.50 |
| **Date Sampled** | | | | 20/03/2024 |
| **Time Taken** | | | | 1200 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | |
| Stone Content | % | 0.1 | NONE | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 17 |
| Total mass of sample received | kg | 0.1 | NONE | 0.8 |

**Asbestos**

| | | | | |
|---|---|---|---|---|
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | PDO |

**General Inorganics**

| | | | | |
|---|---|---|---|---|
| pH (L099) | pH Units | N/A | MCERTS | 7.8 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | - |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 37 |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | - |
| Water Soluble $SO_4$ 16hr extraction (2:1) | mg/l | 1.25 | MCERTS | 18.3 |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - |
| Total Sulphur | mg/kg | 50 | MCERTS | - |
| Total Sulphur | % | 0.005 | MCERTS | - |
| Ammoniacal Nitrogen as $NH_4^+$ | mg/kg | 0.5 | MCERTS | - |
| Ammonium as $NH_4^+$ (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - |
| Organic Matter (automated) | % | 0.1 | MCERTS | 1.4 |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | 0.8 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - |

**Total Phenols**

| | | | | |
|---|---|---|---|---|
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 |

**Speciated PAHs**

| | | | | |
|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 0.06 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.19 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.16 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.08 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.1 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.11 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.08 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 |

**Total PAH**

| | | | | |
|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | < 0.80 |

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**Analytical Report Number: 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**
**Your Order No: GWPR5921**

| | | | | |
|---|---|---|---|---|
| **Lab Sample Number** | | | | 155614 |
| **Sample Reference** | | | | CBR23 |
| **Sample Number** | | | | None Supplied |
| **Depth (m)** | | | | 0.20-0.50 |
| **Date Sampled** | | | | 20/03/2024 |
| **Time Taken** | | | | 1200 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | |
| **Heavy Metals / Metalloids** | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 8.7 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.4 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 10 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 17 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 11 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 30 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 40 |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - |
| **Petroleum Hydrocarbons** | | | | |
| TPHCWG - Aliphatic >C5 - C6 HS_1D_AL | mg/kg | 0.02 | NONE | - |
| TPHCWG - Aliphatic >C6 - C8 HS_1D_AL | mg/kg | 0.02 | NONE | - |
| TPHCWG - Aliphatic >C8 - C10 HS_1D_AL | mg/kg | 0.05 | NONE | - |
| TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL | mg/kg | 1 | MCERTS | - |
| TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL | mg/kg | 2 | MCERTS | - |
| TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL | mg/kg | 8 | MCERTS | - |
| TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL | mg/kg | 8 | MCERTS | - |
| TPHCWG - Aliphatic >C35 - C40 EH_CU_1D_AL | mg/kg | 10 | NONE | - |
| TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL | mg/kg | 10 | NONE | - |
| TPHCWG - Aliphatic >C5 - C40 EH_CU+HS_1D_AL | mg/kg | 10 | NONE | - |
| TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR | mg/kg | 0.01 | NONE | - |
| TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR | mg/kg | 0.01 | NONE | - |
| TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR | mg/kg | 0.05 | NONE | - |
| TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR | mg/kg | 1 | MCERTS | - |
| TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR | mg/kg | 2 | MCERTS | - |
| TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR | mg/kg | 10 | MCERTS | - |
| TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR | mg/kg | 10 | MCERTS | - |
| TPHCWG - Aromatic >EC35 - EC40 EH_CU_1D_AR | mg/kg | 10 | NONE | - |
| TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR | mg/kg | 10 | NONE | - |
| TPHCWG - Aromatic >EC5 - EC40 EH_CU+HS_1D_AR | mg/kg | 10 | NONE | - |
| TPH Total >C5 - C40 EH_CU+HS_1D_TOTAL | mg/kg | 10 | NONE | - |
| **VOCs** | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | NONE | - |
| Benzene | µg/kg | 5 | MCERTS | - |
| Toluene | µg/kg | 5 | MCERTS | - |
| Ethylbenzene | µg/kg | 5 | MCERTS | - |
| p & m-Xylene | µg/kg | 5 | MCERTS | - |
| o-Xylene | µg/kg | 5 | MCERTS | - |

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**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description * |
|---|---|---|---|---|
| 155604 | CBR1 | None Supplied | 1.00-1.00 | Brown clay and sand with stones |
| 155605 | CBR3 | None Supplied | 1.00-1.00 | Brown clay and sand |
| 155606 | CBR7 | None Supplied | 1.50-1.50 | Brown clay and sand |
| 155607 | CBR15 | None Supplied | 2.00-2.00 | Light brown clay with chalk |
| 155608 | CBR20 | None Supplied | 2.00-2.00 | Brown clay and sand |
| 155609 | CBR23 | None Supplied | 1.50-1.50 | Brown clay and sand |
| 155610 | CBR2 | None Supplied | 0.20-0.20 | Brown sand with vegetation |
| 155611 | CBR4 | None Supplied | 0.50-0.50 | Brown clay |
| 155612 | CBR9 | None Supplied | 0.20-0.20 | Brown clay and sand |
| 155613 | CBR14 | None Supplied | 0.50-0.50 | Brown clay and sand |
| 155614 | CBR23 | None Supplied | 0.20-0.50 | Brown clay and sand |

**Analytical Report Number : 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Asbestos identification in Soil | Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques | In-house method based on HSG 248, 2021 | A001B | D | ISO 17025 |
| Organic matter (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method) | In-house method | L009B | D | MCERTS |
| Total organic carbon (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method) | In-house method | L009B | D | MCERTS |
| Moisture Content | Moisture content, determined gravimetrically (up to 30°C) | In-house method | L019B | W | NONE |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight | In-house method based on British Standard Methods and MCERTS requirements. | L019B | D | NONE |
| Metals in soil by ICP-OES | Determination of metals in soil by aqua-regia digestion followed by ICP-OES | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil | L038B | D | MCERTS |
| Boron, water soluble, in soil | Determination of water soluble boron in soil by hot water extract followed by ICP-OES | In-house method based on Second Site Properties version 3 | L038B | D | MCERTS |
| Magnesium, water soluble, in soil | Determination of water soluble magnesium by extraction with water followed by ICP-OES | In-house method based on TRL 447 | L038B | D | NONE |
| Total sulphate (as SO4 in soil) | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES | In-house method | L038B | D | MCERTS |
| Sulphate, water soluble, in soil (16hr extraction) | Sulphate, water soluble, in soil (16hr extraction) | In-house method | L038B | D | MCERTS |
| Total Sulphur in soil | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES | In-house method | L038B | D | MCERTS |
| Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil | Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS | In-house method based on USEPA 8270 | L064B | D | MCERTS |
| BTEX and/or Volatile organic compounds in soil | Determination of volatile organic compounds in soil by headspace GC-MS | In-house method based on USEPA 8260 | L073B | W | MCERTS |
| Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil | Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic | In-house method | L076B/L088 | D/W | MCERTS |
| Water Soluble Nitrate (2:1) as N in soil | Determination of nitrate by reaction with sodium salicylate and colorimetry | In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction | L078B | W | NONE |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry | In-house method | L080 | W | MCERTS |

**Analytical Report Number : 24-011076**
**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080 | W | MCERTS |
| Total cyanide in soil | Determination of total cyanide by distillation followed by colorimetry | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080 | W | MCERTS |
| Chloride, water soluble, in soil | Determination of Chloride colorimetrically by discrete analyser | In-house method | L082B | D | MCERTS |
| Ammonium as NH4 in soil | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082B | W | MCERTS |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement | In-house method | L099 | D | MCERTS |

**For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).**
**For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).**
**For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.**
**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**
**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions |
|---|---|
| HS | Headspace Analysis |
| MS | Mass spectrometry |
| FID | Flame Ionisation Detector |
| GC | Gas Chromatography |
| EH | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU | Clean-up - e.g. by Florisil®, silica gel |
| 1D | GC - Single coil/column gas chromatography |
| 2D | GC-GC - Double coil/column gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics |
| AR | Aromatics |
| #1 | EH_2D_Total but with humics mathematically subtracted |
| #2 | EH_2D_Total but with fatty acids mathematically subtracted |
| _ | Operator - understore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |

# Sample Deviation Report

**Analytical Report Number : 24-011076**

**Project / Site name: Land adj to Church Lane Climping West Sussex BN17 5GG**

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name | Test Ref | Test Deviation |
|---|---|---|---|---|---|---|---|
| CBR4 | N/A | S | 155611 | c | Total cyanide in soil | L080 | c |

# APPENDIX H:
# Soil
# Assessment

[redacted]

**Ground and Water Limited**

**Soil Guideline Values and Generic Assessment Criteria**

The Contaminated Land Regime reflects the UK Government's stated objectives of achieving sustainable development through the 'suitable for use approach'. At preliminary risk assessment stage, risks are evaluated qualitatively. As the site investigation progresses to a generic or detailed quantitative risk assessment, data is collected and assessment criteria are utilised to evaluate whether the contaminants represent an unacceptable risk to the identified receptors.

## 1. Contaminated Land Exposure Assessment Model (CLEA)

Current United Kingdom risk assessment practice is based on the Contaminated Land Exposure Assessment Model (CLEA).

The CLEA Guidance comprises the following documents:

1) EA Science Report SC050021/SR2: Human health toxicological assessment of contaminants in soil.
2) EA Science Report SC050021/SR3: Updated technical background to the CLEA model.
3) EA CLEA Bulletin (2009).
4) CLEA software version 1.07 (2015)
5) Toxicological reports and SGV technical notes.

The CLEA guidance and tools:

- Do not cover other types of risk to humans, such as fire, suffocation or explosion, or short-term and acute exposures;
- Do not cover risks to the environment, such as groundwater, ecosystems or buildings;
- Do not provide a definitive test for telling when human health risks are significant; and
- Are not a legal requirement in assessing land contamination risks. They are not part of the legal regime for Part 2A of the Environmental Protection Act 1990.

The CLEA guidance derives soil concentrations of contaminants above which (in the opinion of the EA) there may be a concern that warrants further investigation. It does not provide a definitive test for establishing that the risk is significant.

### 1.1. Land-use Scenarios

The CLEA model uses a range of standard land-use scenarios to develop conceptual exposure models outlined in the following sections.

#### 1.1.1. Residential (with home grown produce) (RwHP)

Generic scenario assumes a typical two-storey house built on a ground bearing slab with a private garden having a lawn, flowerbeds and a small fruit and vegetable patch.

- Critical receptor is a young female child (zero to six years old)
- Exposure duration is six years.
- Exposure pathways include direct soil and indoor dust ingestion, consumption of homegrown produce and any adhering soil, skin contact with soils and indoor dust and inhalation of indoor and outdoor dust and vapours.
- Building type is a two-storey small-terraced house.

A sub-set of this land-use is residential apartments with communal landscaped gardens where the consumption of home grown vegetables will not occur. (Residential without homegrown produce (RwoHP)).

### 1.1.2. Allotments

Provision of open space (about 250sq.m) commonly made available to tenants by the local authority to grow fruit and vegetable for their own consumption. Typically, there are a number of plots to a site which may have a total area of up to 1 hectare. The tenants are assumed to be adults and that young children make occasional accompanied visits.

Although some allotment holders may choose to keep animals including rabbits, hens, and ducks, potential exposure to contaminated meat and eggs is not considered.

- Critical receptor is a young female child (zero to six years old)
- Exposure duration is six years.
- Exposure pathways include direct soil ingestion, consumption of homegrown produce and any adhering soil, skin contact with soils and inhalation of outdoor dust and vapours.
- There is no building.

### 1.1.3. Commercial/Industrial

The generic scenario assumes a typical commercial or light industrial property comprising a three-storey building at which employees spend most time indoors and are involved in office-based or relatively light physical work.

- Critical receptor is a working female adult (aged 16 to 65 years old).
- Exposure duration is a working lifetime of 49 years.
- Exposure pathways include direct soil and indoor dust ingestion, skin contact with soils and dusts and inhalation of dust and vapours.
- Building type is a three-storey office (pre 1970).

## 2. LQM/CIEH Suitable 4 Use Levels (S4UL)

For derivation of these S4UL reference must be made to:

Nathanial, P., McCaffrey, C., Gillet, A., Ogden, R., Nathanial, J., *The LQM/CIEH S4UL's for Human Health Risk Assessment*. **Land Quality Press**. 2015

### 2.1. S4UL Background

The Land Quality Management/Chartered Institute of Environmental Health (LQM/CIEH) S4UL for a given land use is the concentration of the contaminant in soil at which the predicted daily exposure,

as calculated by the CLEA software, equals the Health Criteria Value. The S4ULs have been derived for substances based on various generic land use and soil organic matter contents.

The final output for each contaminant represents a synthesis of new toxicological (and fate and transport) reviews published since the preparation of the 2nd edition LQM/CIEH GAC's (Nathanial et al., 2009).

In the derivation of LQM/CIEH S4UL's the principles of 'minimal' or 'tolerable' risk enshrined in SR2, which has not been withdrawn, has been maintained.

### 2.2. S4UL Land-use

S4UL's have been derived for the basic CLEA land-uses, as described in section 1.2, and for two new land uses:

- Public Open Spaces near Residential Housing (POSresi).
- Public Park (POSpark).

#### 2.2.1. Public Open Spaces near Residential Housing (POSresi)

Includes the predominantly grassed areas adjacent to high density housing, the central green area on many 1930's – 1970's housing estates, and smaller areas commonly incorporated in newer developments as informal grassed areas or more formal landscaped areas with a mixture of open space and covered soils with planting. It is assumed that the close proximity to the place of residence will allow tracking back of soil to occur.

#### 2.2.2. Public Park (POSpark)

An area of open space, usually owned and maintained by the local authority, provided for recreational uses including family visists and picnics, children's play area, informal sporting activities (not a dedicated sports pitch), and dog walking. It is assumed that tracking back of soils into places of residence will be negligible.

The following LQM/CIEH S4Uls (Copyright Land Quality Management Limited) have been reproduced with permission, to the publication number S4UL3072.

## 3. Category 4 Screening Levels (C4SLs)

In the case of Lead, no SGV or GAC has been published to date. This is likely to be due to the toxicity review that is currently being undertaken by the Environment Agency. In the absence of updated toxicity information the SGV derived using CLEA 1.07 methodology and related toxicity will be used.

The overall objective of the C4SLs research project was to assist the provision of technical guidance in support of Defra's revised Statutory Guidance (SG) for Part 2A of the Environmental Protection Act 1990 (Part 2A) (Defra, 2012a). Specifically, the project aimed to deliver:

- A methodology for deriving C4SLs for four generic land-uses comprising residential, commercial, allotments and public open space; and
- A demonstration of the methodology, via the derivation of C4SLs for six substances – arsenic, benzene, benzo(a)pyrene, cadmium, chromium (VI) and lead.

To help achieve a more targeted approach to identifying and managing contaminated land in relation to the risk (or possibility) of harm to human health, the revised SG presented a new four category

system for considering land under Part 2A, ranging from Category 4, where there is no risk that land poses a significant possibility of significant harm (SPOSH), or the level of risk is low, to Category 1, where the risk that land poses a significant possibility of significant harm (SPOSH) is unacceptably high. More specific guidance on what type of land should be considered as Category 4 (Human Health) is provided in Paragraphs 4.21 and 4.22 of the revised SG, as follows:

> *"4.21 The local authority should consider that the following types of land should be placed into Category 4: Human Health:*
> *(a) Land where no relevant contaminant linkage has been established.*
> *(b) Land where there are only normal levels of contaminants in soil, as explained in Section 3 of this Guidance.*
> *(c) Land that has been excluded from the need for further inspection and assessment because contaminant levels do not exceed relevant generic assessment criteria in accordance with Section 3 of this Guidance, or relevant technical tools or advice that may be developed in accordance with paragraph 3.30 of this Guidance.*
> *(d) Land where estimated levels of exposure to contaminants in soil are likely to form only a small proportion of what a receptor might be exposed to anyway through other sources of environmental exposure (e.g. in relation to average estimated national levels of exposure to substances commonly found in the environment, to which receptors are likely to be exposed in the normal course of their lives).*
>
> *4.22 The local authority may consider that land other than the types described in paragraph 4.21 should be placed into Category 4: Human Health if following a detailed quantitative risk assessment it is satisfied that the level of risk posed is sufficiently low."*

The C4SLs are intended as "relevant technical tools" (in relation to Paragraph 4.21(c)) to help local authorities and others when deciding to stop further assessment of a site, on the grounds that it falls within Category 4 (Human Health).

The Impact Assessment (IA), which accompanied the revised SG (Defra, 2012b) provides further information on the nature and potential role of the C4SLs. Paragraph 47(h) of the IA states that:

> *"The new statutory guidance will bring about a situation where the current SGVs/GACs are replaced with more pragmatic (but still strongly precautionary) Category 4 screening levels (C4SLs) which will provide a higher simple test for deciding that land is suitable for use and definitely not contaminated land."*

A key distinction between the Soil Guideline Values (SGVs) and the C4SLs is the level of risk that they describe. As described by the Environment Agency (2009a):

> *"SGVs are guidelines on the level of long-term human exposure to individual chemicals in soil that, unless stated otherwise, are tolerable or pose a minimal risk to human health."*

The implication of Paragraph 47(h) of the IA is that minimal risk is well within Category 4 and that the C4SLs should describe a higher level of risk which, whilst not minimal, can still be considered low enough to allow a judgement to be made that land containing substances at, or below, the C4SLs would typically fall within Category 4. This reflects Paragraph 4.20 of the revised SG, which states:

> *"4.20 The local authority should not assume that land poses a significant possibility of significant harm if it considers that there is no risk or that the level of risk posed is low. For the purposes of this Guidance, such land is referred to as a "Category 4: Human Health" case. The authority may decide that the land is a Category 4: Human Health case as soon as it considers it has evidence to this effect, and this may happen at any stage during risk assessment including the early stages."*

C4SLs, therefore, should not be viewed as "SPOSH levels" and they should not be used as a legal trigger for the determination of land under Part 2A.

The generic screening values referred to before usually take the form of risk-based Soil Guideline Values (SGVs) or other Generic Assessment Criteria (GACs) that are most typically derived using the Environment Agency's Contaminated Land Exposure Assessment (CLEA) model, as described in the Environment Agency's SR2, SR3 and SR7 reports (EA, 2009b & c; EA, 2008). It is anticipated that C4SLs will be used in a similar manner; as generic screening criteria that can be used within a GQRA, albeit describing a higher level of risk than the SGVs.

The suggested approach to the development of C4SLs consists of the retention and use of the CLEA framework, modified according to considerations of the underlying science within the context of Defra's policy objectives relating to the revised SG. Within this context, it is suggested that the development of C4SLs may be achieved in one of three ways, namely:

- By modifying the toxicological parameters used within CLEA (while maintaining current exposure parameters);
- By modifying the exposure parameters embedded within CLEA (while maintaining current toxicological "minimal risk" interpretations); and
- By modifying both toxicological and exposure parameters.

There is also a suggested check on "other considerations" (e.g., background levels, epidemiological data, sources of uncertainty) within the approach, applicable to all three options.

It is suggested that a new term is defined for the toxicological guidance values associated with the derivation of C4SLs – a Low Level of Toxicological Concern (LLTC). A LLTC should represent an intake of low concern that remains suitably protective of health, and definitely does not approach an intake level that could be defined as SPOSH.

## 4. CL:AIRE Generic Assessment Criteria (GAC)

For derivation of the CL:AIRE Generic Assessment Criteria (GAC) reference should be made to the following report:

> CL:AIRE, *The Soil Generic Assessment Criteria for Human Health Risk Assessment.* **Contaminated Land: Applications in the Real Environment**. 2009.

Within this report, Contaminated Land: Applications in Real Environments (CL:AIRE) provided Generic Assessment Criteria (GAC) in accordance with the CLEA software and the principles outlined previously for a further 35 contaminants sometimes encountered on land affected by contamination.

## 5. SoBRA Acute GAC

The Society of Brownfield Risk Assessment (SoBRA) identified that most human health risk assessments focus on the chronic risks arising from long-term exposure to specific substances. As chronic risks often occur at lower doses than acute risks, they are often the key drivers, however, in some instances the acute dose may also be an important consideration within risk assessments.

The methodology for deriving the acute GAC were related to two distinct receptor groups:

- Members of the public, where the 'critical' receptor for this group will typically be a female child, which is consistent with CLEA residential and Public Open Space/allotments land-uses;
- Workers involved with excavations. The critical receptor for this group is assumed to be a female working adult, without the use of PPE.

The acute GACs relate to short term exposure of high concentrations of a substance that lead to acute effects. They are not considered to be average exposures across a specific / defined area. As a result, the GACs should be normally be compared with the maximum likely concentration that the individual may be exposed to, and not the average concentration within a specific area.

The SoBRA acute GAC will primarily be used for contaminants that do not currently have any GAC, most notably Cyanide.

## 6. Detailed Quantitative Risk Assessments (DQRA)

Where the adoption of a GAC is not appropriate, for instance when the intended land-use is at variance the CLEA standard land-uses, then a DQRA may be undertaken to develop site specific values for relevant soil contaminants.

- Establishing the plausibility that generic exposure pathways exist in practice by measurement and observation.
- Developing more accurate parameters using site data.

## 7. Phytotoxicity

CLEA guidance only addresses human health toxicity; assessment of plant toxicity (phytotoxicity) is based on threshold trigger values obtained from the following source:

- BS3882:2015 – *Specification for Topsoil*

The trigger values are relevant only to those contaminants, where present in excess, have the potential to inhibit plant growth, or kill plants (Cu, Ni and Zn). The criteria have been based on a wide range of planting that are common within a multi-purpose topsoil.

## 8. Statistical Tests

DEFRA R&D Publication CLR 7 (DOE 1994) addressed the statistical treatment of test results and their comparison to Soil Guideline Values.

Consideration must be given to the appropriate area of land to be considered termed the critical averaging area.

For a communal open space or commercial land-use, the critical averaging area will depend on the proposed layout. For a residential use with private gardens the averaging area is the individual plot.

It may be appropriate to compare the upper 95$^{th}$ percentile concentration with the Soil Guideline Value, subject to applying a statistical test to establish that the range of concentrations are reasonably consistent and belonging to the same underlying distribution of data.

CL:AIRE published guidance in 2020, *Guidance in comparing soil contamination data with a critical concentration,* superseding the CL:AIRE/CIEH 2008 report of the same name. The guidance provides ways to assist land contamination stakeholders to apply statistical methods to their data to enable decisions under the legislative framework; either planning system or Part 2A of the Environmental Protection Act 1990.

The use of the statistical tests should only be applied if the following statements are valid for the datasets:

- Averaging areas, as well as the smallest area of concern have been identified on the basis of the CSM, including the desk study and/or the site walkover;
- The sample locations were chosen using a simple random, stratified random or stratified systematic (square, herringbone or triangular grid) sampling pattern, rather than being targeted to locations suspected of being contaminated;
- The sample locations are relatively evenly spread across the area and are not clustered, to avoid giving undue weight to some parts of the site over others in the calculated statistics;
- The analyses do not suggest a hotspot or outlier of contamination that should be treated as a separate zone. This has been established by a histogram and/or a names statistical test;
- The sample locations are all taken from one population (i.e. the same material);
- Where an averaging zone encompasses several averaging areas, analyses do not show a spatial trend or other spatial pattern across that zone; and
- The number of samples has been shown to be sufficient for a statistical analysis.

Any included statistical spreadsheet is based on an in-house method of statistical analysis, in line with those outlined within the CL:AIRE guidance (2020).

**Treatment of Hot-Spots**

- A statistical test is applied to establish whether the data is a part of a single set, or whether data outliers are present.
- Provided that the data is based on random sampling and no distinct contamination source was present at the sampling location, the hot-spot(s) may be excluded and the mean of the remaining data assessed.

## 9. Ground and Water Limited Soil Assessment Criteria

The Soil Assessment Criteria used in the preparation of the Generic Quantitative Risk Assessment are tabulated in the following pages, where the source of each has been outlined in the previous sections.

## 9.1. Inorganics

| SoBRA – Acute Generic Assessment Criteria | | | | | | |
|---|---|---|---|---|---|---|
| **Determinand** | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **Cyanide** | 24 | 24 | 24 | 1400 | 24 | 24 |

## 9.2. Metals

| C4SL Low Level of Toxicological Concern | | | | | | |
|---|---|---|---|---|---|---|
| **Determinand** | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **Lead** | < 200 | < 310 | < 80 | < 2300 | < 630 | < 1300 |

| LQM/CIEH Suitable 4 Use Levels – Metals and Semi-metals | | | | | | |
|---|---|---|---|---|---|---|
| **Determinand** | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **Arsenic** | 37 | 40 | 43 | 640 | 79 | 170 |
| **Beryllium** | 1.7 | 1.7 | 35 | 12 | 2.2 | 63 |
| **Boron** | 290 | 11000 | 45 | 240000 | 21000 | 46000 |
| **Cadmium** | 11 | 85 | 1.9 | 190 | 120 | 532 |
| **Chromium (III)** | 910 | 910 | 18000 | 8600 | 1500 | 33000 |
| **Chromium (VI)** | 6 | 6 | 1.8 | 33 | 7.7 | 220 |
| **Copper** | 2400 | 7100 | 520 | 68000 | 12000 | 44000 |
| **Elemental Mercury** | 1.2 | 1.2 | 21 | 58 | 16 | 30 |
| **Inorganic Mercury** | 40 | 56 | 19 | 1100 | 120 | 240 |
| **Methylmercury** | 11 | 15 | 6 | 320 | 40 | 68 |
| **Nickel** | 130 | 180 | 53 | 980 | 230 | 800 |
| **Selenium** | 250 | 430 | 88 | 12000 | 1100 | 1800 |
| **Vanadium** | 410 | 1200 | 91 | 9000 | 2000 | 5000 |
| **Zinc** | 3700 | 40000 | 620 | 730000 | 81000 | 170000 |

| Phytotoxicity (Harmful to Plants) Threshold Trigger Values | | | |
|---|---|---|---|
| **Determinand** | **Soil pH < 6.0 (mg/kg)** | **Soil pH 6.0 – 7.0 (mg/kg)** | **Soil pH > 7.0 (mg/kg)** |
| **Copper** | 100 | 135 | 200 |
| **Nickel** | 60 | 75 | 110 |
| **Zinc** | 200 | 200 | 300 |
| **Notes:**<br>BS3882:2015 – *Specification for Topsoil*. Based on a wide range of common plants that will be exposed to multi-purpose topsoil. Toxicity of contaminant may also be impacted by pH of soils.<br>Site observation of plant vitality may give additional guidance. | | | |

| CL:AIRE Soil Generic Assessment Criteria | | | | |
|---|---|---|---|---|
| **Determinand** | **Residential (mg/kg)** | **Residential without plant uptake (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** |
| **Antimony** | ND | 550 | ND | 7500 |
| **Barium** | ND | 1300 | ND | 22000 |
| **Molybdenum** | ND | 670 | ND | 17000 |
| ND – Not derived | | | | |

## 9.3. Total Petroleum Hydrocarbons (TPHs)

### 9.3.1. BTEX Compounds

| LQM/CIEH Suitable 4 Use Levels – BTEX Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Determinand** | **Soil Organic Matter** | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **Benzene** | 1.0% SOM | 0.087 | 0.38 | 0.017 | 27 | 72 | 90 |
| | 2.5% SOM | 0.170 | 0.70 | 0.034 | 47 | 72 | 100 |
| | 6.0% SOM | 0.370 | 1.40 | 0.075 | 90 | 73 | 110 |
| **Toluene** | 1.0% SOM | 130 | 880 | 22 | 56000 | 56000 | 87000 |
| | 2.5% SOM | 290 | 1900 | 51 | 110000 | 56000 | 95000 |
| | 6.0% SOM | 660 | 3900 | 120 | 180000 | 56000 | 100000 |
| **Ethylbenzene** | 1.0% SOM | 47 | 83 | 16 | 5700 | 24000 | 17000 |
| | 2.5% SOM | 110 | 190 | 39 | 13000 | 24000 | 22000 |
| | 6.0% SOM | 260 | 440 | 91 | 27000 | 25000 | 27000 |
| **o-Xylene** | 1.0% SOM | 60 | 88 | 28 | 6600 | 41000 | 17000 |
| | 2.5% SOM | 140 | 210 | 67 | 15000 | 42000 | 24000 |
| | 6.0% SOM | 330 | 480 | 160 | 33000 | 43000 | 33000 |
| **m-Xylene** | 1.0% SOM | 59 | 82 | 31 | 6200 | 41000 | 17000 |
| | 2.5% SOM | 140 | 190 | 74 | 14000 | 42000 | 24000 |
| | 6.0% SOM | 320 | 450 | 170 | 31000 | 43000 | 33000 |
| **p-Xylene** | 1.0% SOM | 56 | 79 | 29 | 5900 | 41000 | 17000 |
| | 2.5% SOM | 130 | 180 | 69 | 14000 | 42000 | 23000 |
| | 6.0% SOM | 310 | 430 | 160 | 30000 | 43000 | 31000 |
| *SOM = Soil Organic Matter Content (%)* | | | | | | | |

### 9.3.2. Total Petroleum Hydrocarbons – Aliphatic

| LQM/CIEH Suitable 4 Use Levels For TPH | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Aliphatic** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **EC 5-6** | 1.0% SOM | 42 | 42 | 730 | 3,200 (304) [sol] | 570,000 (304) [sol] | 95,000 (304) [sol] |
| | 2.5% SOM | 78 | 78 | 1,700 | 5,900 (558) [sol] | 590,000 | 130,000 (558) [sol] |
| | 6.0% SOM | 160 | 160 | 3,900 | 12,000 (1150) [sol] | 600,000 (1150)[sol] | 180,000 (1150) [sol] |
| **EC >6-8** | 1.0% SOM | 100 | 100 | 2,300 | 7,800 (144) [sol] | 600,000 | 150,000 (144) [sol] |
| | 2.5% SOM | 230 | 230 | 5,600 | 17,000 (322) [sol] | 610,000 | 220,000 (322) [sol] |
| | 6.0% SOM | 530 | 530 | 13,000 | 40,000 (736) [sol] | 620,000 | 320,000 (736) [sol] |
| **EC >8-10** | 1.0% SOM | 27 | 27 | 320 | 2,000 (78) [sol] | 13,000 | 14,000 (78) [sol] |
| | 2.5% SOM | 65 | 65 | 770 | 4,800 (118) [vap] | 13,000 | 18,000 (118) [vap] |
| | 6.0% SOM | 150 | 150 | 1,700 | 11,000 (451) [vap] | 13,000 | 21,000 (451) [vap] |
| **EC >10-12** | 1.0% SOM | 130 (48) [vap] | 130 (48) [vap] | 2,200 | 9,700 (48) [sol] | 13,000 | 21,000 (48) [sol] |
| | 2.5% SOM | 330 (118) [vap] | 330 (118) [vap] | 4,400 | 23,000 (118) [vap] | 13,000 | 23,000 (118) [vap] |
| | 6.0% SOM | 760 (283) [vap] | 760 (283) [vap] | 7,300 | 47,000 (283) [vap] | 13,000 | 24,000 (283) [vap] |
| **EC >12-16** | 1.0% SOM | 1,100 (24) [sol] | 1,100 (24) [sol] | 11,000 | 59,000 (24) [sol] | 13,000 | 25,000 (24) [sol] |
| | 2.5% SOM | 2,400 (59) [sol] | 2,400 (59) [sol] | 13,000 | 82,000 (59) [sol] | 13,000 | 25,000 (59) [sol] |
| | 6.0% SOM | 4,300 (142) [sol] | 4,400 (142) [sol] | 13,000 | 90,000 (142) [sol] | 13,000 | 26,000 (142) [sol] |
| **EC >16-35** | 1.0% SOM | 65,000 (8.48) [sol] | 65,000 (8.48) [sol] | 260,000 | 1,600,000 | 250,000 | 450,000 |
| | 2.5% SOM | 92,000 (21) [sol] | 92,000 (21) [sol] | 270,000 | 1,700,000 | 250,000 | 480,000 |
| | 6.0% SOM | 110,000 | 110,000 | 270,000 | 1,800,000 | 250,000 | 490,000 |
| **EC >35-44** | 1.0% SOM | 65,000 (8.48) [sol] | 65,000 (8.48) [sol] | 260,000 | 1,600,000 | 250,000 | 450,000 |
| | 2.5% SOM | 92,000 (21) [sol] | 92,000 (21) [sol] | 270,000 | 1,700,000 | 250,000 | 480,000 |
| | 6.0% SOM | 110,000 | 110,000 | 270,000 | 1,800,000 | 250,000 | 490,000 |

*SOM = Soil Organic Matter Content (%)*

[vap] – GAC presented exceeds the vapour saturation limit, which is presented in brackets.

[sol] – GAC presented exceeds the soil saturation limit, which is presented in brackets.

### 9.3.3. Total Petroleum Hydrocarbons – Aromatic

| LQM/CIEH Suitable 4 Use Levels For TPH | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Aromatic** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **EC 5-7 (Benzene)** | 1.0% SOM | 70 | 370 | 13 | 26,000 (1220) [sol] | 56,000 | 76,000 (1220 [sol] |
| | 2.5% SOM | 140 | 690 | 27 | 46,000 (2260) [sol] | 56,000 | 84,000 (2260) [sol] |
| | 6.0% SOM | 300 | 1,400 | 57 | 86,000 (4710) [sol] | 56,000 | 92,000 (4710) [sol] |
| **EC >7-8 (Toluene)** | 1.0% SOM | 130 | 860 | 22 | 56,000 (869) [vap] | 56,000 | 87,000 (869) [sol] |
| | 2.5% SOM | 290 | 1,800 | 51 | 110,000 (1920) [sol] | 56,000 | 95,000 (1920) [sol] |
| | 6.0% SOM | 660 | 3,900 | 120 | 180,000 (4360) [vap] | 56,000 | 100,000 (4360) [vap] |
| **EC >8-10** | 1.0% SOM | 34 | 47 | 8.6 | 3,500 (613) [vap] | 5,000 | 7,200 (613) [vap] |
| | 2.5% SOM | 83 | 110 | 21 | 8,100 (1500) [vap] | 5,000 | 8,500 (1500) [vap] |
| | 6.0% SOM | 190 | 270 | 51 | 17,000 (3850) [vap] | 5,000 | 9,300 (3580) [vap] |
| **EC >10-12** | 1.0% SOM | 74 | 250 | 13 | 16,000 (364) [sol] | 5,000 | 9,200 (364) [sol] |
| | 2.5% SOM | 180 | 590 | 31 | 28,000 (899) [sol] | 5,000 | 9,700 (889) [sol] |
| | 6.0% SOM | 380 | 1,200 | 74 | 34,000 (2150) [sol] | 5,000 | 10,000 |
| **EC >12-16** | 1.0% SOM | 140 | 1,800 | 23 | 36,000 (169) [sol] | 5,100 | 10,000 |
| | 2.5% SOM | 330 | 2,300 (419) [sol] | 57 | 37,000 | 5,100 | 10,000 |
| | 6.0% SOM | 660 | 2,500 | 130 | 38,000 | 5,000 | 10,000 |
| **EC >16-21** | 1.0% SOM | 260 | 1,900 | 46 | 28,000 | 3,800 | 7,600 |
| | 2.5% SOM | 540 | 1,900 | 110 | 28,000 | 3,800 | 7,700 |
| | 6.0% SOM | 930 | 1,900 | 260 | 28,000 | 3,800 | 7,800 |
| **EC >21-35** | 1.0% SOM | 1,100 | 1,900 | 370 | 28,000 | 3,800 | 7,800 |
| | 2.5% SOM | 1,500 | 1,900 | 820 | 28,000 | 3,800 | 7,800 |
| | 6.0% SOM | 1,700 | 1,900 | 1,600 | 28,000 | 3,800 | 7,900 |
| **EC >35-44** | 1.0% SOM | 1,100 | 1,900 | 370 | 28,000 | 3,800 | 7,800 |
| | 2.5% SOM | 1,500 | 1,900 | 820 | 28,000 | 3,800 | 7,800 |
| | 6.0% SOM | 1,700 | 1,900 | 1,600 | 28,000 | 3,800 | 7,900 |
| **EC >44-70** | 1.0% SOM | 1,600 | 1,900 | 1,200 | 28,000 | 3,800 | 7,800 |
| | 2.5% SOM | 1,800 | 1,900 | 2,100 | 28,000 | 3,800 | 7,800 |
| | 6.0% SOM | 1,900 | 1,900 | 3,000 | 28,000 | 3,800 | 7,900 |

*SOM = Soil Organic Matter Content (%)*

[vap] – GAC presented exceeds the vapour saturation limit, which is presented in brackets.

[sol] – GAC presented exceeds the soil saturation limit, which is presented in brackets.

## 9.4. Polycyclic Aromatic Hydrocarbons (PAHs)

| LQM/CIEH Suitable 4 Use Levels For Polycyclic Aromatic Hydrocarbons (PAHs) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Determinands** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **Acenapthene** | 1.0% SOM | 210 | 3,000 (57.0) [sol] | 34 | 84,000(57.0) [sol] | 15,000 | 29,000 |
| | 2.5% SOM | 510 | 4,700(141) [sol] | 85 | 97,000(141) [sol] | 15,000 | 30,000 |
| | 6.0% SOM | 1100 | 6,000(336) [sol] | 200 | 100,000 | 15,000 | 30,000 |
| **Acenapthylene** | 1.0% SOM | 170 | 2,900(86.1) [sol] | 28 | 83,000(86.1) [sol] | 15,000 | 29,000 |
| | 2.5% SOM | 420 | 4,600(212) [sol] | 69 | 97,000(212) [sol] | 15,000 | 30,000 |
| | 6.0% SOM | 920 | 6,000(506) [sol] | 160 | 100,000 | 15,000 | 30,000 |
| **Anthracene** | 1.0% SOM | 2,400 | 31,000(1.17) [vap] | 380 | 520,000 | 74,000 | 150,000 |
| | 2.5% SOM | 5,400 | 35,000 | 950 | 540,000 | 74,000 | 150,000 |
| | 6.0% SOM | 11,000 | 37,000 | 2,200 | 540,000 | 74,000 | 150,000 |
| **Benzo(a)anthracene** | 1.0% SOM | 7.20 | 11 | 2.90 | 170 | 29 | 49 |
| | 2.5% SOM | 11 | 14 | 6.50 | 170 | 29 | 56 |
| | 6.0% SOM | 13 | 15 | 13 | 180 | 29 | 62 |
| **Benzo(a)pyrene** | 1.0% SOM | 2.20 | 3.20 | 0.97 | 35 | 5.70 | 11 |
| | 2.5% SOM | 2.70 | 3.20 | 2.00 | 35 | 5.70 | 12 |
| | 6.0% SOM | 3.00 | 3.20 | 3.50 | 36 | 5.70 | 13 |
| **Benzo(b)flouranthene** | 1.0% SOM | 2.60 | 3.90 | 0.99 | 44 | 7.10 | 13 |
| | 2.5% SOM | 3.30 | 4.00 | 2.10 | 44 | 7.20 | 15 |
| | 6.0% SOM | 3.70 | 4.00 | 3.90 | 45 | 7.20 | 16 |
| **Benzo(ghi)perylene** | 1.0% SOM | 320 | 360 | 290 | 3,900 | 640 | 1,400 |
| | 2.5% SOM | 340 | 360 | 470 | 4,000 | 640 | 1,500 |
| | 6.0% SOM | 350 | 360 | 640 | 4,000 | 640 | 1,600 |
| **Benzo(k)flouranthene** | 1.0% SOM | 77 | 110 | 37 | 1,200 | 190 | 370 |
| | 2.5% SOM | 93 | 110 | 75 | 1,200 | 190 | 410 |
| | 6.0% SOM | 100 | 110 | 130 | 1,200 | 190 | 440 |
| **Chrysene** | 1.0% SOM | 15 | 30 | 4.10 | 350 | 57 | 93 |
| | 2.5% SOM | 22 | 31 | 9.40 | 350 | 57 | 110 |
| | 6.0% SOM | 27 | 32 | 19 | 350 | 57 | 120 |
| **Dibenzo(ah)anthracene** | 1.0% SOM | 0.24 | 0.31 | 0.14 | 3.50 | 0.57 | 1.10 |
| | 2.5% SOM | 0.28 | 0.32 | 0.27 | 3.50 | 0.57 | 1.30 |
| | 6.0% SOM | 0.30 | 0.32 | 0.43 | 3.60 | 0.58 | 1.40 |
| **Flouranthene** | 1.0% SOM | 280 | 1,500 | 52 | 23,000 | 3,100 | 6,300 |
| | 2.5% SOM | 560 | 1,600 | 130 | 23,000 | 3,100 | 6,300 |
| | 6.0% SOM | 890 | 1,600 | 290 | 23,000 | 3,100 | 6,300 |
| **Flourene** | 1.0% SOM | 170 | 2,800 (30.9) [sol] | 27 | 63,000(30.9) [sol] | 9,900 | 20,000 |
| | 2.5% SOM | 400 | 3,800(76.5) [sol] | 67 | 68,000 | 9,900 | 20,000 |
| | 6.0% SOM | 860 | 4,500(183) [sol] | 160 | 71,000 | 9,900 | 20,000 |
| **Indeno(123-cd)pyrene** | 1.0% SOM | 27 | 45 | 9.50 | 500 | 82 | 150 |
| | 2.5% SOM | 36 | 46 | 21 | 510 | 82 | 170 |
| | 6.0% SOM | 41 | 46 | 39 | 510 | 82 | 180 |
| **Napthalene** | 1.0% SOM | 15 | 36 | 65 | 1,600 | 11,000 | 800 |
| | 2.5% SOM | 36 | 36 | 130 | 3,700 | 15,000 | 1,200 |
| | 6.0% SOM | 85 | 85 | 200 | 8,400 | 17,000 | 1,900 |
| **Phenanthrene** | 1.0% SOM | 95 | 1,300(183) [sol] | 15 | 22,000 | 3,100 | 6,200 |
| | 2.5% SOM | 220 | 1,500 | 38 | 22,000 | 3,100 | 6,200 |
| | 6.0% SOM | 440 | 1,500 | 90 | 23,000 | 3,100 | 6,300 |
| **Pyrene** | 1.0% SOM | 620 | 3,700 | 110 | 54,000 | 7,400 | 15,000 |
| | 2.5% SOM | 1200 | 3,800 | 270 | 54,000 | 7,400 | 15,000 |
| | 6.0% SOM | 2000 | 3,800 | 620 | 54,000 | 7,400 | 15,000 |
| **Coal Tar (Benzo(a)pyrene used as marker compound)** | 1.0% SOM | 0.79 | 1.2 | 0.32 | 15 | 2.20 | 4.40 |
| | 2.5% SOM | 0.98 | 1.2 | 0.67 | 15 | 2.20 | 4.70 |
| | 6.0% SOM | 1.10 | 1.2 | 1.20 | 15 | 2.20 | 4.80 |

*SOM = Soil Organic Matter Content (%)*

[vap] – GAC presented exceeds the vapour saturation limit, which is presented in brackets.

[sol] – GAC presented exceeds the soil saturation limit, which is presented in brackets.

## 9.5. Volatile and Semi-volatile Organic Compounds

| LQM CIEH General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Determinands** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| ***Chloroalkanes & alkenes*** | | | | | | | |
| **1,2 Dichloroethane** | 1.0% SOM | 0.0071 | 0.0092 | 0.0046 | 0.67 | 29 | 21 |
| | 2.5% SOM | 0.011 | 0.013 | 0.0083 | 0.97 | 29 | 24 |
| | 6.0% SOM | 0.019 | 0.023 | 0.016 | 1.70 | 29 | 28 |
| **1,1,2,2 Tetrachloroethane** | 1.0% SOM | 1.60 | 3.90 | 0.41 | 270 | 1,400 | 1,800 |
| | 2.5% SOM | 3.40 | 8.00 | 0.89 | 550 | 1,400 | 2,100 |
| | 6.0% SOM | 7.50 | 17 | 2.00 | 1,100 | 1,400 | 2,300 |
| **1,1,1,2 Tetrachloroethane** | 1.0% SOM | 1.20 | 1.50 | 0.79 | 110 | 1,400 | 1,500 |
| | 2.5% SOM | 2.80 | 3.50 | 1.90 | 250 | 1,400 | 1,800 |
| | 6.0% SOM | 6.40 | 8.20 | 4.40 | 560 | 1,400 | 2,100 |
| **Tetrachloroethene** | 1.0% SOM | 0.18 | 0.18 | 0.65 | 19 | 1,400 | 810 [sol](424) |
| | 2.5% SOM | 0.39 | 0.40 | 1.50 | 42 | 1,400 | 1,100 [sol](951) |
| | 6.0% SOM | 0.90 | 0.92 | 3.60 | 95 | 1,400 | 1,500 |
| **1,1,1 Trichloroethane** | 1.0% SOM | 8.80 | 9.00 | 48 | 660 | 140,000 | 57,000 [vap](1425) |
| | 2.5% SOM | 18 | 18 | 110 | 1,300 | 140,000 | 76,000 [vap](2915) |
| | 6.0% SOM | 39 | 40 | 240 | 3,000 | 140,000 | 100,000 [vap] (6392) |
| **Tetrachloromethene** | 1.0% SOM | 0.026 | 0.026 | 0.45 | 2.90 | 890 | 190 |
| | 2.5% SOM | 0.056 | 0.056 | 1.00 | 6.30 | 920 | 270 |
| | 6.0% SOM | 0.130 | 0.130 | 2.40 | 14 | 950 | 400 |
| **Trichloroethene** | 1.0% SOM | 0.016 | 0.017 | 0.041 | 1.20 | 120 | 70 |
| | 2.5% SOM | 0.034 | 0.036 | 0.091 | 2.60 | 120 | 91 |
| | 6.0% SOM | 0.075 | 0.080 | 0.210 | 5.70 | 120 | 120 |
| **Trichloromethane** | 1.0% SOM | 0.91 | 1.20 | 0.42 | 99 | 2,500 | 2,600 |
| | 2.5% SOM | 1.70 | 2.10 | 0.83 | 170 | 2,500 | 2,800 |
| | 6.0% SOM | 3.40 | 4.20 | 1.70 | 350 | 2,500 | 3,100 |
| **Vinyl Chloride** | 1.0% SOM | 0.00064 | 0.00077 | 0.00055 | 0.059 | 3.50 | 4.80 |
| | 2.5% SOM | 0.00087 | 0.00100 | 0.00100 | 0.077 | 3.50 | 5.00 |
| | 6.0% SOM | 0.00014 | 0.00150 | 0.00180 | 0.120 | 3.50 | 5.40 |
| ***Explosives*** | | | | | | | |
| **2,4,6 Trinitrotoluene** | 1.0% SOM | 1.60 | 65 | 0.24 | 1,000 | 130 | 260 |
| | 2.5% SOM | 3.70 | 66 | 0.58 | 1,000 | 130 | 270 |
| | 6.0% SOM | 8.10 | 66 | 1.40 | 1,000 | 130 | 270 |
| **RDX (Hexogen/Cyclonite/1,3,5-trinitro-1,3,5-triazacyclohexane)** | 1.0% SOM | 120 | 13,000 | 17 | 210,000 | 26,000 | 49,000(18.7)[sol] |
| | 2.5% SOM | 250 | 13,000 | 38 | 210,000 | 26,000 | 51,000 |
| | 6.0% SOM | 540 | 13,000 | 85 | 210,000 | 27,000 | 53,000 |
| **HMX (Octogen/1,3,5,7-tetrenitro-1,3,5,7-tetrazacyclo-octane)** | 1.0% SOM | 5.70 | 67,00 | 0.86 | 110,000 | 13,000 | 23,000(0.35)[vap] |
| | 2.5% SOM | 13 | 67,00 | 1.90 | 110,000 | 13,000 | 23,000(0.39)[vap] |
| | 6.0% SOM | 26 | 67,00 | 3.90 | 110,000 | 13,000 | 24,000(0.48)[vap] |
| **Atrazine** | 1.0% SOM | 3.30 | 610 | 0.50 | 9,300 | 1,200 | 2,300 |
| | 2.5% SOM | 7.60 | 620 | 1.20 | 9,400 | 1,200 | 2,400 |
| | 6.0% SOM | 17.40 | 620 | 2.70 | 9,400 | 1,200 | 2,400 |

[vap] – GAC presented exceeds the vapour saturation limit, which is presented in brackets.
[sol] – GAC presented exceeds the soil saturation limit, which is presented in brackets.

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

| LQM CIEH General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Determinands** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| ***Pesticides*** | | | | | | | |
| **Aldrin** | 1.0% SOM | 5.70 | 7.30 | 3.20 | 170 | 18 | 30 |
| | 2.5% SOM | 6.60 | 7.40 | 6.10 | 170 | 18 | 31 |
| | 6.0% SOM | 7.10 | 7.50 | 9.60 | 170 | 18 | 31 |
| **Dieldrin** | 1.0% SOM | 0.97 | 7.00 | 0.17 | 170 | 18 | 30 |
| | 2.5% SOM | 2.00 | 7.30 | 0.41 | 170 | 18 | 30 |
| | 6.0% SOM | 3.50 | 7.40 | 0.96 | 170 | 18 | 31 |
| **Dichlorvos** | 1.0% SOM | 0.032 | 6.40 | 0.0049 | 140 | 16 | 26 |
| | 2.5% SOM | 0.066 | 6.50 | 0.0100 | 140 | 16 | 26 |
| | 6.0% SOM | 0.140 | 6.60 | 0.0220 | 140 | 16 | 27 |
| **Alpha - Endosulfan** | 1.0% SOM | 7.40 | 160(0.003)[vap] | 1.20 | 5,600(0.003)[vap] | 1,200 | 2,400 |
| | 2.5% SOM | 18 | 280(0.007)[vap] | 2.90 | 7,400(0.007)[vap] | 1,200 | 2,400 |
| | 6.0% SOM | 41 | 410(0.016)[vap] | 6.80 | 8,400(0.016)[vap] | 1,200 | 2,400 |
| **Beta - Endosulfan** | 1.0% SOM | 7.00 | 190(0.00007)[vap] | 1.10 | 6,300(0.00007)[vap] | 1,200 | 2,400 |
| | 2.5% SOM | 17 | 320(0.0002)[vap] | 2.70 | 7,800(0.0002)[vap] | 1,200 | 2,400 |
| | 6.0% SOM | 39 | 440(0.0004)[vap] | 6.40 | 8700 | 1,200 | 2,500 |
| **Alpha - Hexachlorocyclohexanes** | 1.0% SOM | 0.23 | 6.90 | 0.035 | 170 | 24 | 47 |
| | 2.5% SOM | 0.55 | 9.20 | 0.087 | 180 | 24 | 48 |
| | 6.0% SOM | 1.20 | 11 | 0.210 | 180 | 24 | 48 |
| **Beta - Hexachlorocyclohexanes** | 1.0% SOM | 0.085 | 3.70 | 0.013 | 65 | 8.10 | 15 |
| | 2.5% SOM | 0.200 | 3.80 | 0.032 | 65 | 8.10 | 15 |
| | 6.0% SOM | 0.460 | 3.80 | 0.077 | 65 | 8.10 | 16 |
| **Gamma - Hexachlorocyclohexanes** | 1.0% SOM | 0.06 | 2.90 | 0.0092 | 67 | 8.2 | 14 |
| | 2.5% SOM | 0.14 | 3.30 | 0.0230 | 69 | 8.2 | 15 |
| | 6.0% SOM | 0.33 | 3.50 | 0.0540 | 70 | 8.2 | 15 |
| ***Chlorobenzenes*** | | | | | | | |
| **Chlorobenzene** | 1.0% SOM | 0.46 | 0.46 | 5.90 | 56 | 11,000 | 1,300(675)[sol] |
| | 2.5% SOM | 1.00 | 1.00 | 14 | 130 | 13,000 | 2,000(1520)[sol] |
| | 6.0% SOM | 2.40 | 2.40 | 32 | 290 | 14,000 | 2,900 |
| **1,2-Dichlorobenzene** | 1.0% SOM | 23 | 24 | 94 | 2,000 (571) [sol] | 90,000 | 24,000(571)[sol] |
| | 2.5% SOM | 55 | 57 | 230 | 4,800 (1370) [sol] | 95,000 | 36,000(1370)[sol] |
| | 6.0% SOM | 130 | 130 | 540 | 11,000 (3240) [sol] | 98,000 | 51,000(3240)[sol] |
| **1,3-Dichlorobenzene** | 1.0% SOM | 0.40 | 0.44 | 0.25 | 30 | 300 | 390 |
| | 2.5% SOM | 1.00 | 1.10 | 0.60 | 73 | 300 | 440 |
| | 6.0% SOM | 2.30 | 2.50 | 1.50 | 170 | 300 | 470 |
| **1,4-Dichlorobenzene** | 1.0% SOM | 61 | 61 | 15 | 4,400 (224)[vap] | 17,000[g] | 36,000 (224)[vap] |
| | 2.5% SOM | 150 | 150 | 37 | 10,000 (540)[vap] | 17,000[g] | 36,000 (540)[vap] |
| | 6.0% SOM | 350 | 350 | 88[g] | 25,000 (1280)[vap] | 17,000[g] | 36,000 (1280)[vap] |
| **1,2,3,-Trichlorobenzene** | 1.0% SOM | 1.50 | 1.50 | 4.70 | 102 | 1,800 | 770(134)[vap] |
| | 2.5% SOM | 3.60 | 3.70 | 12 | 250 | 1,800 | 1,100(330)[vap] |
| | 6.0% SOM | 8.60 | 8.80 | 28 | 590 | 1,800 | 1,600(789)[vap] |
| **1,2,4,-Trichlorobenzene** | 1.0% SOM | 2.60 | 2.60 | 55 | 220 | 15,000 | 1,700(318)[vap] |
| | 2.5% SOM | 6.40 | 6.40 | 140 | 530 | 17,000 | 2,600(786)[vap] |
| | 6.0% SOM | 15 | 15 | 320 | 1,300 | 19,000 | 4,000(1880)[vap] |
| **1,3,5,-Trichlorobenzene** | 1.0% SOM | 0.33 | 0.33 | 4.70 | 23 | 1,700 | 380(36.7)[vap] |
| | 2.5% SOM | 0.81 | 0.81 | 12 | 55 | 1,700 | 590(90.8)[vap] |
| | 6.0% SOM | 1.90 | 1.90 | 140 | 130 | 1,800 | 860(217)[vap] |

[vap] – GAC presented exceeds the vapour saturation limit, which is presented in brackets.
[sol] – GAC presented exceeds the soil saturation limit, which is presented in brackets.

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

| LQM CIEH General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Determinands** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| ***Chlorobenzenes (cont.)*** | | | | | | | |
| **1,2,3,4,- Tetrachlorobenzene** | 1.0% SOM | 15 | 24 | 4.40 | 1,700(122)$^{vap}$ | 830 | 1,500(122)$^{vap}$ |
| | 2.5% SOM | 36 | 56 | 11 | 3,080(304)$^{vap}$ | 830 | 1,600 |
| | 6.0% SOM | 78 | 120 | 26 | 4,400(728)$^{vap}$ | 830 | 1,600 |
| **1,2,3,5,- Tetrachlobenzene** | 1.0% SOM | 0.66 | 0.75 | 0.38 | 49(39.4)$^{vap}$ | 78 | 110(39)$^{vap}$ |
| | 2.5% SOM | 1.60 | 1.90 | 0.90 | 120(98.1)$^{vap}$ | 79 | 120 |
| | 6.0% SOM | 3.70 | 4.30 | 2.20 | 240(235)$^{vap}$ | 79 | 130 |
| **1,2,4, 5,- Tetrachlobenzene** | 1.0% SOM | 0.33 | 0.73 | 0.06 | 42(19.7)$^{sol}$ | 13 | 25 |
| | 2.5% SOM | 0.77 | 1.70 | 0.16 | 72(49.1)$^{sol}$ | 13 | 26 |
| | 6.0% SOM | 1.60 | 3.50 | 0.37 | 96 | 13 | 26 |
| **Pentachlrobenzene** | 1.0% SOM | 5.80 | 19 | 1.20 | 640(43.0)$^{sol}$ | 100 | 190 |
| | 2.5% SOM | 12 | 30 | 3.10 | 770(107)$^{sol}$ | 100 | 190 |
| | 6.0% SOM | 22 | 38 | 7.00 | 830 | 100 | 190 |
| **Hexachlorobenzene** | 1.0% SOM | 1.80(0.20)$^{vap}$ | 4.10 (0.20)$^{vap}$ | 0.47 | 110(0.20)$^{vap}$ | 16 | 30 |
| | 2.5% SOM | 3.30(0.50)$^{vap}$ | 5.70 (0.50)$^{vap}$ | 1.10 | 120 | 16 | 30 |
| | 6.0% SOM | 4.90 | 6.70 (1.2)$^{vap}$ | 2.50 | 120 | 16 | 30 |
| ***Phenols & Chlorophenols*** | | | | | | | |
| ***BTEX*** | 1.0% SOM | 280 | 750 | 66 | 760$^{dir}$(31,000) | 760$^{dir}$(11,000) | 760$^{dir}$(8,600) |
| | 2.5% SOM | 550 | 1,300 | 140 | 1,500$^{dir}$(35,000) | 1,500$^{dir}$(11,000) | 1,500$^{dir}$(9,700) |
| | 6.0% SOM | 1100 | 2,300 | 280 | 3,200$^{dir}$(37,000) | 3,200$^{dir}$(11,000) | 3,200$^{dir}$(11,000) |
| **Chlorophenols (4 Congeners)** | 1.0% SOM | 0.87 | 94 | 0.13 | 3,500 | 620 | 1,100 |
| | 2.5% SOM | 2.00 | 150 | 0.30 | 4,000 | 620 | 1,100 |
| | 6.0% SOM | 4.50 | 210 | 0.70 | 4,300 | 620 | 1,100 |
| **Pentachlorophenols** | 1.0% SOM | 0.22 | 27(16.4)$^{vap}$ | 0.03 | 400 | 60 | 110 |
| | 2.5% SOM | 0.52 | 29 | 0.08 | 400 | 60 | 120 |
| | 6.0% SOM | 1.20 | 31 | 0.19 | 400 | 60 | 120 |
| ***Others*** | | | | | | | |
| **Carbon Disulphide** | 1.0% SOM | 0.14 | 0.14 | 4.80 | 11 | 11,000 | 1,300 |
| | 2.5% SOM | 0.29 | 0.29 | 10 | 22 | 11,000 | 1,900 |
| | 6.0% SOM | 0.62 | 0.62 | 23 | 47 | 12,000 | 2,700 |
| **Hexachloro-1,3-Butadiene** | 1.0% SOM | 0.29 | 0.32 | 0.25 | 31 | 25 | 48 |
| | 2.5% SOM | 0.70 | 0.78 | 0.61 | 68 | 25 | 50 |
| | 6.0% SOM | 1.60 | 1.80 | 1.40 | 120 | 25 | 51 |

$^{vap}$ – GAC presented exceeds the vapour saturation limit, which is presented in brackets.
$^{sol}$ – GAC presented exceeds the soil saturation limit, which is presented in brackets.

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

| CL:AIRE General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds | | | | | |
|---|---|---|---|---|---|
| **Determinands** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** |
| **1,1,2 Trichloroethane** | 1.0% SOM | 0.60 | 0.88 | 0.28 | 94 |
| | 2.5% SOM | 1.20 | 1.8 | 0.61 | 190 |
| | 6.0% SOM | 2.70 | 3.9 | 1.40 | 400 |
| **1,1-Dichloroethane** | 1.0% SOM | 2.40 | 2.50 | 9.20 | 280 |
| | 2.5% SOM | 3.90 | 4.10 | 17 | 450 |
| | 6.0% SOM | 7.40 | 7.70 | 35 | 850 |
| **1,1-Dichloroethene** | 1.0% SOM | 0.23 | 0.23 | 2.80 | 26 |
| | 2.5% SOM | 0.40 | 0.41 | 5.60 | 46 |
| | 6.0% SOM | 0.82 | 0.82 | 12 | 92 |
| **1,2,4-Trimethylbenzene** | 1.0% SOM | 0.35 | 0.41 | 0.38 | 42 |
| | 2.5% SOM | 0.85 | 0.99 | 0.93 | 99 |
| | 6.0% SOM | 2.00 | 2.30 | 2.20 | 220 |
| **1,2-Dichloropropane** | 1.0% SOM | 0.024 | 0.024 | 0.62 | 3.3 |
| | 2.5% SOM | 0.042 | 0.042 | 1.20 | 5.9 |
| | 6.0% SOM | 0.084 | 0.085 | 2.60 | 12 |
| **2,4-Dimethylphenol** | 1.0% SOM | 19 | 210 | 3.10 | 16000* |
| | 2.5% SOM | 43 | 410 | 7.20 | 24000* |
| | 6.0% SOM | 97 | 730 | 17 | 30000* |
| **2,4-Dinitrotoluene** | 1.0% SOM | 1.50 | 170* | 0.22 | 3700* |
| | 2.5% SOM | 3.20 | 170 | 0.49 | 3700* |
| | 6.0% SOM | 7.20 | 170 | 1.10 | 3800* |
| **2,6-Dinitrotoluene** | 1.0% SOM | 0.78 | 78 | 0.12 | 1900* |
| | 2.5% SOM | 1.70 | 84 | 0.27 | 1900* |
| | 6.0% SOM | 3.90 | 87 | 0.61 | 1900* |
| **2-Chloronapthalene** | 1.0% SOM | 3.70 | 3.80 | 40 | 390* |
| | 2.5% SOM | 9.20 | 9.30 | 98 | 960* |
| | 6.0% SOM | 22 | 22 | 230 | 2200* |
| **Biphenyl** | 1.0% SOM | 66* | 220* | 14 | 18000* |
| | 2.5% SOM | 160 | 500* | 35 | 33000* |
| | 6.0% SOM | 360 | 980* | 83 | 48000* |
| **Bis (2-ethylhexyl) phthalate** | 1.0% SOM | 280* | 2700* | 47* | 85000* |
| | 2.5% SOM | 610* | 2800* | 120* | 86000* |
| | 6.0% SOM | 1100* | 2800* | 280* | 86000* |
| **Bromobenzene** | 1.0% SOM | 0.87 | 0.91 | 3.2 | 97 |
| | 2.5% SOM | 2.0 | 2.1 | 7.6 | 220 |
| | 6.0% SOM | 4.7 | 4.9 | 18 | 520 |
| **Bromodichloromethane** | 1.0% SOM | 0.016 | 0.019 | 0.016 | 2.1 |
| | 2.5% SOM | 0.030 | 0.034 | 0.032 | 3.7 |
| | 6.0% SOM | 0.061 | 0.070 | 0.068 | 7.6 |
| **Bromoform** | 1.0% SOM | 2.8 | 5.2 | 0.95 | 760 |
| | 2.5% SOM | 5.9 | 11 | 2.1 | 1500 |
| | 6.0% SOM | 13 | 23 | 4.6 | 3100 |
| **Butyl benzyl phthalate** | 1.0% SOM | 1400* | 42000* | 220* | 940000* |
| | 2.5% SOM | 3300* | 44000* | 550* | 940000* |
| | 6.0% SOM | 7200* | 44000* | 1300* | 950000* |

*soil concentration above saturation limit

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

| CL:AIRE General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds | | | | | |
|---|---|---|---|---|---|
| **Determinands** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** |
| **Chloroethane** | 1.0% SOM | 8.3 | 8.4 | 110 | 960 |
| | 2.5% SOM | 11 | 11 | 200 | 1300 |
| | 6.0% SOM | 18 | 18 | 380 | 2100 |
| **Chloromethane** | 1.0% SOM | 0.0083 | 0.0085 | 0.066 | 1.0 |
| | 2.5% SOM | 0.0098 | 0.0099 | 0.13 | 1.2 |
| | 6.0% SOM | 0.013 | 0.013 | 0.23 | 1.6 |
| ***Cis* 1,2 Dichloroethene** | 1.0% SOM | 0.11 | 0.12 | 0.26 | 14 |
| | 2.5% SOM | 0.19 | 0.20 | 0.50 | 24 |
| | 6.0% SOM | 0.37 | 0.39 | 1.0 | 47 |
| **Dichloromethane** | 1.0% SOM | 0.58 | 2.10 | 0.10 | 270 |
| | 2.5% SOM | 0.98 | 2.80 | 0.19 | 360 |
| | 6.0% SOM | 1.70 | 4.50 | 0.34 | 560 |
| **Diethyl Phthalate** | 1.0% SOM | 120* | 1800* | 19* | 150000* |
| | 2.5% SOM | 260* | 3500* | 41* | 220000* |
| | 6.0% SOM | 570* | 6300* | 94* | 290000* |
| **Di-*n*-butyl phthalate** | 1.0% SOM | 13* | 450* | 2.00 | 15000* |
| | 2.5% SOM | 31* | 450* | 5.00 | 15000* |
| | 6.0% SOM | 67* | 450* | 12 | 15000* |
| **Di-*n*-octyl phthalate** | 1.0% SOM | 2300* | 3400* | 940* | 89000* |
| | 2.5% SOM | 2800* | 3400* | 2100* | 89000* |
| | 6.0% SOM | 3100* | 3400* | 3900* | 89000* |
| **Hexachloroethane** | 1.0% SOM | 0.20 | 0.22 | 0.27 | 22* |
| | 2.5% SOM | 0.48 | 0.54 | 0.67 | 53* |
| | 6.0% SOM | 1.10 | 1.30 | 1.60 | 120* |
| **Isopropylbenzene** | 1.0% SOM | 11 | 12 | 32 | 1400* |
| | 2.5% SOM | 27 | 28 | 79 | 3300* |
| | 6.0% SOM | 64 | 67 | 190 | 7700* |
| **Methyl *tert*-butyl ether (MTBE)** | 1.0% SOM | 49 | 73 | 23 | 7900 |
| | 2.5% SOM | 84 | 120 | 44 | 13000 |
| | 6.0% SOM | 160 | 220 | 90 | 24000 |
| **Propylbenzene** | 1.0% SOM | 34 | 40 | 34 | 4100* |
| | 2.5% SOM | 82 | 97 | 83 | 9700* |
| | 6.0% SOM | 190 | 230 | 200 | 21000* |
| **Styrene** | 1.0% SOM | 8.10 | 35 | 1.60 | 3300* |
| | 2.5% SOM | 19 | 78 | 3.70 | 6500* |
| | 6.0% SOM | 43 | 170 | 8.70 | 11000* |
| **Total Cresols (2-, 3-, and 4-methylphenol)** | 1.0% SOM | 80 | 3700 | 12 | 160000 |
| | 2.5% SOM | 180 | 5400 | 27 | 180000* |
| | 6.0% SOM | 400 | 6900 | 63 | 180000* |
| ***Trans* 1,2 Dichloroethene** | 1.0% SOM | 0.19 | 0.19 | 0.93 | 22 |
| | 2.5% SOM | 0.34 | 0.35 | 1.90 | 40 |
| | 6.0% SOM | 0.70 | 0.71 | 0.24 | 81 |
| **Tributyl tin oxide** | 1.0% SOM | 0.25 | 1.40 | 0.042 | 130* |
| | 2.5% SOM | 0.59 | 3.10 | 0.100 | 180* |
| | 6.0% SOM | 1.30 | 5.70 | 0.240 | 200* |

*soil concentration above saturation limit

| C4SL Low Level of Toxicological Concern | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Determinands** | | **RwHP (mg/kg)** | **RwoHP (mg/kg)** | **Allotment (mg/kg)** | **Commercial (mg/kg)** | **POSresi (mg/kg)** | **POSpark (mg/kg)** |
| **1,2-Dichloroethane (Ethylene Dichloride)** | 1.0% SOM | 0.11 | 0.16 | 0.054 | 12 | 300 | 300 |
| | 2.5% SOM | 0.18 | 0.24 | 0.10 | 17 | 310 | 330 |
| | 6.0% SOM | 0.31 | 0.41 | 0.19 | 29 | 310 | 380 |
| **Cis-1,2-Dichloroethene** | 1.0% SOM | 0.46 | 0.50 | 0.89 | 38 | 3,800 | 2,000 |
| | 2.5% SOM | 0.78 | 0.84 | 1.7 | 64 | 3,800 | 2,400 |
| | 6.0% SOM | 1.5 | 1.6 | 3.6 | 120 | 3,900 | 3,100 |
| **Tetrachloroethene (PCE)** | 1.0% SOM | 0.31 | 0.32 | 2 | 24 | 3,200 | 1,400 |
| | 2.5% SOM | 0.70 | 0.71 | 4.8 | 55 | 3,300 | 1,900 |
| | 6.0% SOM | 1.60 | 1.60 | 11 | 130 | 3,400 | 2,500 |
| **Trans-1,2-Dichloroethene** | 1.0% SOM | 0.90 | 0.93 | 3.70 | 69 | 13,000 | 5,600 |
| | 2.5% SOM | 1.60 | 1.70 | 7.50 | 120 | 13,000 | 7,000 |
| | 6.0% SOM | 3.30 | 3.40 | 16 | 260 | 13,000 | 9,100 |
| **Trichloroethene (TCE)** | 1.0% SOM | 0.0093 | 0.0097 | 0.032 | 0.73 | 76 | 41 |
| | 2.5% SOM | 0.020 | 0.020 | 0.072 | 1.5 | 78 | 54 |
| | 6.0% SOM | 0.043 | 0.045 | 0.16 | 3.4 | 79 | 69 |
| **Vinyl Chloride (Chloroethene)** | 1.0% SOM | 0.0064 | 0.015 | 0.0017 | 1.1 | 7.8 | 18 |
| | 2.5% SOM | 0.010 | 0.019 | 0.0031 | 1.4 | 7.8 | 19 |
| | 6.0% SOM | 0.017 | 0.029 | 0.0058 | 2.2 | 7.8 | 19 |

### 9.6. Asbestos

No asbestos or asbestos containing materials (ACM's) are considered acceptable on-site from a human health perspective. Therefore the GAC for asbestos & ACM's within any imported material should be none detected (ND).

# APPENDIX I:
# Waste Hazard Assessment

[redacted]

# Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

## Job name

Land adj. to Church Lane Climping West Sussex BN17 5GG

## Description/Comments

## Project

GWPR5921 Land adj. to Church Lane Climping West Sussex BN17 5GG

## Site

Land adj. to Church Lane Climping West Sussex BN17 5GG

## Classified by

Name:
**Alex Stratford**
Date:
**26 Apr 2024 13:57 GMT**
Telephone:

Company:
**Ground and Water**
**2 The Long Barn, Norton Farm, Selborne Road**
**Alton**
**GU34 3NB**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

| HazWasteOnline™ Certification: | - |
|---|---|
| **Course** | **Date** |
| Hazardous Waste Classification | - |

## Purpose of classification

2 - Material Characterisation

## Address of the waste

Land adj. to Church Lane Climping West Sussex **Post Code** BN17 5GG

## SIC for the process giving rise to the waste

## Description of industry/producer giving rise to the waste

Construction of Residential Housing development

## Description of the specific process, sub-process and/or activity that created the waste

Waste created during construction and excavations

## Description of the waste

Topsoil and River Terrace Deposits

## Job summary

| # | Sample name | Depth [m] | Classification Result | Hazard properties | Page |
|---|---|---|---|---|---|
| 1 | CBR2--21032024-0.20 | | Non Hazardous | | 3 |
| 2 | CBR4--19032024-0.50 | | Non Hazardous | | 5 |
| 3 | CBR9--21032024-0.20 | | Non Hazardous | | 8 |
| 4 | CBR14--21032024-0.50 | | Non Hazardous | | 11 |
| 5 | CBR23--20032024-0.20 | | Non Hazardous | | 13 |

## Related documents

| # | Name | Description |
|---|---|---|
| 1 | 24-011076_HWOL.hwol | i2 Analytical .hwol file used to populate the Job |

## Report

Created by: Alex Stratford

Created date: 26 Apr 2024 13:57 GMT


| Appendices | Page |
|---|---|
| Appendix A: Classifier defined and non GB MCL determinands | 15 |
| Appendix B: Rationale for selection of metal species | 16 |
| Appendix C: Version | 17 |

## Classification of sample: CBR2--21032024-0.20

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**CBR2--21032024-0.20**
Moisture content:
**16%**
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | | | PH | | 7.9 | pH | | 7.9 | pH | 7.9 pH | | |
| 2 | chromium in chromium(VI) compounds { chromium(VI) oxide } | 024-001-00-0 | 215-607-8 | 1333-82-0 | | <1.8 | mg/kg | 1.923 | <3.462 | mg/kg | <0.000346 % | | <**LOD** |
| 3 | monohydric phenols | | | P1186 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 4 | arsenic { arsenic } | 033-001-00-X | 231-148-6 | 7440-38-2 | | 11 | mg/kg | | 9.24 | mg/kg | 0.000924 % | ✓ | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 | mg/kg | 1.285 | <0.257 | mg/kg | <0.00002 % | | <**LOD** |
| 6 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 16 | mg/kg | 1.126 | 15.132 | mg/kg | 0.00151 % | ✓ | |
| 7 | mercury { mercury } | 080-001-00-0 | 231-106-7 | 7439-97-6 | | <0.3 | mg/kg | | <0.3 | mg/kg | <0.00003 % | | <**LOD** |
| 8 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1]<br>234-348-1 [2] | 12054-48-7 [1]<br>11113-74-9 [2] | | 14 | mg/kg | 1.579 | 18.575 | mg/kg | 0.00186 % | ✓ | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 21 | mg/kg | | 17.64 | mg/kg | 0.00176 % | ✓ | |
| 10 | selenium { selenium } | 034-001-00-2 | 231-957-4 | 7782-49-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 11 | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8 | 215-239-8 | 1314-62-1 | | 35 | mg/kg | 1.785 | 52.484 | mg/kg | 0.00525 % | ✓ | |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 61 | mg/kg | 2.469 | 126.527 | mg/kg | 0.0127 % | ✓ | |
| 13 | fluoranthene | | 205-912-4 | 206-44-0 | | 0.28 | mg/kg | | 0.235 | mg/kg | 0.0000235 % | ✓ | |
| 14 | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 15 | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 0.13 | mg/kg | | 0.109 | mg/kg | 0.0000109 % | ✓ | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EU CLP index number | EC Number | CAS Number | | | | | | | | | |
| 16 | | naphthalene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 17 | | phenanthrene | | | | 0.09 | mg/kg | | 0.0756 | mg/kg | 0.00000756 % | ✓ | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 18 | | pyrene | | | | 0.27 | mg/kg | | 0.227 | mg/kg | 0.0000227 % | ✓ | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 19 | | acenaphthylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 20 | | acenaphthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 21 | | anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 22 | | benzo[a]anthracene | | | | 0.12 | mg/kg | | 0.101 | mg/kg | 0.0000101 % | ✓ | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 23 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.16 | mg/kg | | 0.134 | mg/kg | 0.0000134 % | ✓ | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 24 | | dibenz[a,h]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 25 | | benzo[b]fluoranthene | | | | 0.17 | mg/kg | | 0.143 | mg/kg | 0.0000143 % | ✓ | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 26 | | benzo[k]fluoranthene | | | | 0.1 | mg/kg | | 0.084 | mg/kg | 0.0000084 % | ✓ | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 27 | | benzo[ghi]perylene | | | | 0.13 | mg/kg | | 0.109 | mg/kg | 0.0000109 % | ✓ | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 28 | | chrysene | | | | 0.16 | mg/kg | | 0.134 | mg/kg | 0.0000134 % | ✓ | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 29 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <LOD |
| | | 006-007-00-5 | | | | | | | | | | | |
| 30 | | boron { boron tribromide } | | | | 0.3 | mg/kg | 23.173 | 5.84 | mg/kg | 0.000584 % | ✓ | |
| | | 005-003-00-0 | 233-657-9 | 10294-33-4 | | | | | | | | | |
| 31 | | chromium in chromium(III) compounds { chromium(III) oxide } | | | | 21 | mg/kg | 1.462 | 30.693 | mg/kg | 0.00307 % | | |
| | | | 215-160-9 | 1308-38-9 | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0286 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: CBR4--19032024-0.50

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**CBR4--19032024-0.50**
Moisture content:
**17%**
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | | | PH | | 7.8 | pH | | 7.8 | pH | 7.8 pH | | |
| 2 | chromium in chromium(VI) compounds { chromium(VI) oxide } | 024-001-00-0 | 215-607-8 | 1333-82-0 | | <1.8 | mg/kg | 1.923 | <3.462 | mg/kg | <0.000346 % | | <**LOD** |
| 3 | monohydric phenols | | | P1186 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 4 | arsenic { arsenic } | 033-001-00-X | 231-148-6 | 7440-38-2 | | 15 | mg/kg | | 12.45 | mg/kg | 0.00125 % | ✓ | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 | mg/kg | 1.285 | <0.257 | mg/kg | <0.00002 % | | <**LOD** |
| 6 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 14 | mg/kg | 1.126 | 13.083 | mg/kg | 0.00131 % | ✓ | |
| 7 | mercury { mercury } | 080-001-00-0 | 231-106-7 | 7439-97-6 | | <0.3 | mg/kg | | <0.3 | mg/kg | <0.00003 % | | <**LOD** |
| 8 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1]<br>234-348-1 [2] | 12054-48-7 [1]<br>11113-74-9 [2] | | 23 | mg/kg | 1.579 | 30.153 | mg/kg | 0.00302 % | ✓ | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 14 | mg/kg | | 11.62 | mg/kg | 0.00116 % | ✓ | |
| 10 | selenium { selenium } | 034-001-00-2 | 231-957-4 | 7782-49-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 11 | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8 | 215-239-8 | 1314-62-1 | | 48 | mg/kg | 1.785 | 71.122 | mg/kg | 0.00711 % | ✓ | |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 52 | mg/kg | 2.469 | 106.575 | mg/kg | 0.0107 % | ✓ | |
| 13 | fluoranthene | | 205-912-4 | 206-44-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 14 | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 15 | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 17 | | phenanthrene | | 201-581-5 | 85-01-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 18 | | pyrene | | 204-927-3 | 129-00-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 19 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 20 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 21 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 22 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 23 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 24 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 25 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 26 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 27 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 28 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 29 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <LOD |
| 30 | | boron { boron tribromide } | 005-003-00-0 | 233-657-9 | 10294-33-4 | | 0.6 | mg/kg | 23.173 | 11.54 | mg/kg | 0.00115 % | ✓ | |
| 31 | | benzene | 601-020-00-8 | 200-753-7 | 71-43-2 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 32 | | ethylbenzene | 601-023-00-4 | 202-849-4 | 100-41-4 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 33 | | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane | 603-181-00-X | 216-653-1 | 1634-04-4 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 34 | | xylene | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 35 | | o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4] | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 36 | | toluene | 601-021-00-3 | 203-625-9 | 108-88-3 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 37 | | TPH (C6 to C40) petroleum group | | | TPH | | <40 | mg/kg | | <40 | mg/kg | <0.004 % | | <LOD |
| 38 | | chromium in chromium(III) compounds { chromium(III) oxide } | | 215-160-9 | 1308-38-9 | | 33 | mg/kg | 1.462 | 48.231 | mg/kg | 0.00482 % | | |
| | | | | | | | | | | | Total: | 0.0353 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
|  | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: CBR9--21032024-0.20

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**CBR9--21032024-0.20**
Moisture content:
**16%**
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | | | PH | | 7.9 pH | | 7.9 pH | 7.9 pH | | |
| 2 | chromium in chromium(VI) compounds { chromium(VI) oxide } | 024-001-00-0 | 215-607-8 | 1333-82-0 | | <1.8 mg/kg | 1.923 | <3.462 mg/kg | <0.000346 % | | <LOD |
| 3 | monohydric phenols | | | P1186 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <LOD |
| 4 | arsenic { arsenic } | 033-001-00-X | 231-148-6 | 7440-38-2 | | 12 mg/kg | | 10.08 mg/kg | 0.00101 % | ✓ | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <LOD |
| 6 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 11 mg/kg | 1.126 | 10.403 mg/kg | 0.00104 % | ✓ | |
| 7 | mercury { mercury } | 080-001-00-0 | 231-106-7 | 7439-97-6 | | <0.3 mg/kg | | <0.3 mg/kg | <0.00003 % | | <LOD |
| 8 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1]<br>234-348-1 [2] | 12054-48-7 [1]<br>11113-74-9 [2] | | 20 mg/kg | 1.579 | 26.536 mg/kg | 0.00265 % | ✓ | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 10 mg/kg | | 8.4 mg/kg | 0.00084 % | ✓ | |
| 10 | selenium { selenium } | 034-001-00-2 | 231-957-4 | 7782-49-2 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <LOD |
| 11 | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8 | 215-239-8 | 1314-62-1 | | 42 mg/kg | 1.785 | 62.981 mg/kg | 0.0063 % | ✓ | |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 41 mg/kg | 2.469 | 85.043 mg/kg | 0.0085 % | ✓ | |
| 13 | fluoranthene | | 205-912-4 | 206-44-0 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 14 | fluorene | | 201-695-5 | 86-73-7 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 15 | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 17 | | phenanthrene | | 201-581-5 | 85-01-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 18 | | pyrene | | 204-927-3 | 129-00-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 19 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 20 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 21 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 22 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 23 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 24 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 25 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 26 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 27 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 28 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 29 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <LOD |
| 30 | | boron { boron tribromide } | 005-003-00-0 | 233-657-9 | 10294-33-4 | | <0.2 | mg/kg | 23.173 | <4.635 | mg/kg | <0.000463 % | | <LOD |
| 31 | | benzene | 601-020-00-8 | 200-753-7 | 71-43-2 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 32 | | ethylbenzene | 601-023-00-4 | 202-849-4 | 100-41-4 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 33 | | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane | 603-181-00-X | 216-653-1 | 1634-04-4 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 34 | | xylene | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 35 | | o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4] | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 36 | | toluene | 601-021-00-3 | 203-625-9 | 108-88-3 | | <5 | µg/kg | | <0.005 | mg/kg | <0.0000005 % | | <LOD |
| 37 | | TPH (C6 to C40) petroleum group | | | TPH | | <40 | mg/kg | | <40 | mg/kg | <0.004 % | | <LOD |
| 38 | | chromium in chromium(III) compounds { chromium(III) oxide } | | 215-160-9 | 1308-38-9 | | 26 | mg/kg | 1.462 | 38 | mg/kg | 0.0038 % | | |
| | | | | | | | | | | | Total: | 0.0295 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: CBR14--21032024-0.50

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**CBR14--21032024-0.50**
Moisture content:
**15%**
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | | | PH | | 7.5 | pH | | 7.5 | pH | 7.5 pH | | |
| 2 | chromium in chromium(VI) compounds { chromium(VI) oxide } | 024-001-00-0 | 215-607-8 | 1333-82-0 | | <1.8 | mg/kg | 1.923 | <3.462 | mg/kg | <0.000346 % | | <**LOD** |
| 3 | monohydric phenols | | | P1186 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 4 | arsenic { arsenic } | 033-001-00-X | 231-148-6 | 7440-38-2 | | 9.7 | mg/kg | | 8.245 | mg/kg | 0.000824 % | ✓ | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 | mg/kg | 1.285 | <0.257 | mg/kg | <0.00002 % | | <**LOD** |
| 6 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 8 | mg/kg | 1.126 | 7.656 | mg/kg | 0.000766 % | ✓ | |
| 7 | mercury { mercury } | 080-001-00-0 | 231-106-7 | 7439-97-6 | | <0.3 | mg/kg | | <0.3 | mg/kg | <0.00003 % | | <**LOD** |
| 8 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1]<br>234-348-1 [2] | 12054-48-7 [1]<br>11113-74-9 [2] | | 13 | mg/kg | 1.579 | 17.453 | mg/kg | 0.00175 % | ✓ | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 12 | mg/kg | | 10.2 | mg/kg | 0.00102 % | ✓ | |
| 10 | selenium { selenium } | 034-001-00-2 | 231-957-4 | 7782-49-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 11 | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8 | 215-239-8 | 1314-62-1 | | 33 | mg/kg | 1.785 | 50.074 | mg/kg | 0.00501 % | ✓ | |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 37 | mg/kg | 2.469 | 77.659 | mg/kg | 0.00777 % | ✓ | |
| 13 | fluoranthene | | 205-912-4 | 206-44-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 14 | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 15 | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EU CLP index number | EC Number | CAS Number | | | | | | | | | |
| 16 | | naphthalene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 17 | | phenanthrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 18 | | pyrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 19 | | acenaphthylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 20 | | acenaphthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 21 | | anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 22 | | benzo[a]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 23 | | benzo[a]pyrene; benzo[def]chrysene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 24 | | dibenz[a,h]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 25 | | benzo[b]fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 26 | | benzo[k]fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 27 | | benzo[ghi]perylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 28 | | chrysene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 29 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <LOD |
| | | 006-007-00-5 | | | | | | | | | | | |
| 30 | | boron { boron tribromide } | | | | 0.6 | mg/kg | 23.173 | 11.818 | mg/kg | 0.00118 % | ✓ | |
| | | 005-003-00-0 | 233-657-9 | 10294-33-4 | | | | | | | | | |
| 31 | | chromium in chromium(III) compounds { chromium(III) oxide } | | | | 20 | mg/kg | 1.462 | 29.231 | mg/kg | 0.00292 % | | |
| | | | 215-160-9 | 1308-38-9 | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0221 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: CBR23--20032024-0.20

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**CBR23--20032024-0.20**
Moisture content:
**17%**
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | | | PH | | 7.8 | pH | | 7.8 | pH | 7.8 pH | | |
| 2 | chromium in chromium(VI) compounds { chromium(VI) oxide } | 024-001-00-0 | 215-607-8 | 1333-82-0 | | <1.8 | mg/kg | 1.923 | <3.462 | mg/kg | <0.000346 % | | <**LOD** |
| 3 | monohydric phenols | | | P1186 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 4 | arsenic { arsenic } | 033-001-00-X | 231-148-6 | 7440-38-2 | | 8.7 | mg/kg | | 7.221 | mg/kg | 0.000722 % | ✓ | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 | mg/kg | 1.285 | <0.257 | mg/kg | <0.00002 % | | <**LOD** |
| 6 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 10 | mg/kg | 1.126 | 9.345 | mg/kg | 0.000934 % | ✓ | |
| 7 | mercury { mercury } | 080-001-00-0 | 231-106-7 | 7439-97-6 | | <0.3 | mg/kg | | <0.3 | mg/kg | <0.00003 % | | <**LOD** |
| 8 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1]<br>234-348-1 [2] | 12054-48-7 [1]<br>11113-74-9 [2] | | 11 | mg/kg | 1.579 | 14.421 | mg/kg | 0.00144 % | ✓ | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 17 | mg/kg | | 14.11 | mg/kg | 0.00141 % | ✓ | |
| 10 | selenium { selenium } | 034-001-00-2 | 231-957-4 | 7782-49-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 11 | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8 | 215-239-8 | 1314-62-1 | | 30 | mg/kg | 1.785 | 44.451 | mg/kg | 0.00445 % | ✓ | |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 40 | mg/kg | 2.469 | 81.981 | mg/kg | 0.0082 % | ✓ | |
| 13 | fluoranthene | | 205-912-4 | 206-44-0 | | 0.19 | mg/kg | | 0.158 | mg/kg | 0.0000158 % | ✓ | |
| 14 | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 15 | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 17 | | phenanthrene | | 201-581-5 | 85-01-8 | | 0.06 | mg/kg | | 0.0498 | mg/kg | 0.00000498 % | ✓ | |
| 18 | | pyrene | | 204-927-3 | 129-00-0 | | 0.16 | mg/kg | | 0.133 | mg/kg | 0.0000133 % | ✓ | |
| 19 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 20 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 21 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 22 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 0.08 | mg/kg | | 0.0664 | mg/kg | 0.00000664 % | ✓ | |
| 23 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 0.08 | mg/kg | | 0.0664 | mg/kg | 0.00000664 % | ✓ | |
| 24 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 25 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 0.11 | mg/kg | | 0.0913 | mg/kg | 0.00000913 % | ✓ | |
| 26 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 27 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 28 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 0.1 | mg/kg | | 0.083 | mg/kg | 0.0000083 % | ✓ | |
| 29 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| 30 | | boron { boron tribromide } | 005-003-00-0 | 233-657-9 | 10294-33-4 | | 0.4 | mg/kg | 23.173 | 7.693 | mg/kg | 0.000769 % | ✓ | |
| 31 | | chromium in chromium(III) compounds { chromium(III) oxide } | | 215-160-9 | 1308-38-9 | | 19 | mg/kg | 1.462 | 27.77 | mg/kg | 0.00278 % | | |
| | | | | | | | | | | | Total: | 0.0216 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Appendix A: Classifier defined and non GB MCL determinands

**pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

**monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 <= conc. < 3 % , Eye Irrit. 2; H319 1 <= conc. < 3 % , Aquatic Chronic 2; H411

**arsenic** (EC Number: 231-148-6, CAS Number: 7440-38-2)

GB MCL index number: 033-001-00-X
Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

**lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

GB MCL index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

**fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

**fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

**indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

**phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

**pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

**acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

**acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

**anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

**benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

**salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

**chromium(III) oxide** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from ECHA's C&L inventory database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 30 Apr 2020
Hazard Statements: Acute Tox. 4; H302 , Skin Sens. 1; H317 , Eye Irrit. 2; H319

**ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

**TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

## Appendix B: Rationale for selection of metal species

**chromium in chromium(VI) compounds {chromium(VI) oxide}**

Most likely worst case.

**arsenic {arsenic}**

Most likely worst case.

**cadmium {cadmium sulfide}**

Most likely worst case.

**copper {dicopper oxide; copper (I) oxide}**

Most likely worst case.

**mercury {mercury}**

Most likely worst case.

**nickel {nickel dihydroxide}**

Most likely worst case.

**lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}**

Most Likely Worst Case

**selenium {selenium}**

Most likely worst case.

**vanadium {divanadium pentaoxide; vanadium pentoxide}**

Most likely worst case.

**zinc {zinc sulphate}**

Most likely worst case.

**cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}**

Most likely worst case.

**boron {boron tribromide}**

Most likely worst case.

**chromium in chromium(III) compounds {chromium(III) oxide}**

Most likely worst case.

## Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2024.114.6027.11166 (23 Apr 2024)
HazWasteOnline Database: 2024.114.6027.11166 (23 Apr 2024)

This classification utilises the following guidance and legislation:
**WM3 v1.2.GB - Waste Classification** - 1st Edition v1.2.GB - Oct 2021
**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008
**1st ATP** - Regulation 790/2009/EC of 10 August 2009
**2nd ATP** - Regulation 286/2011/EC of 10 March 2011
**3rd ATP** - Regulation 618/2012/EU of 10 July 2012
**4th ATP** - Regulation 487/2013/EU of 8 May 2013
**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013
**5th ATP** - Regulation 944/2013/EU of 2 October 2013
**6th ATP** - Regulation 605/2014/EU of 5 June 2014
**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014
**Revised List of Waste 2014** - Decision 2014/955/EU of 18 December 2014
**7th ATP** - Regulation 2015/1221/EU of 24 July 2015
**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016
**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016
**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017
**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017
**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018
**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019
**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020
**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1567 of 16th December 2020
**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1540 of 16th December 2020
**GB MCL List** - version 1.1 of 09 June 2021
**GB MCL List v2.0** - version 2.0 of 20th October 2023
**GB MCL List v3.0** - version 3.0 of 11th January 2024
**GB MCL List v4.0** - version 4.0 of 2nd March 2024

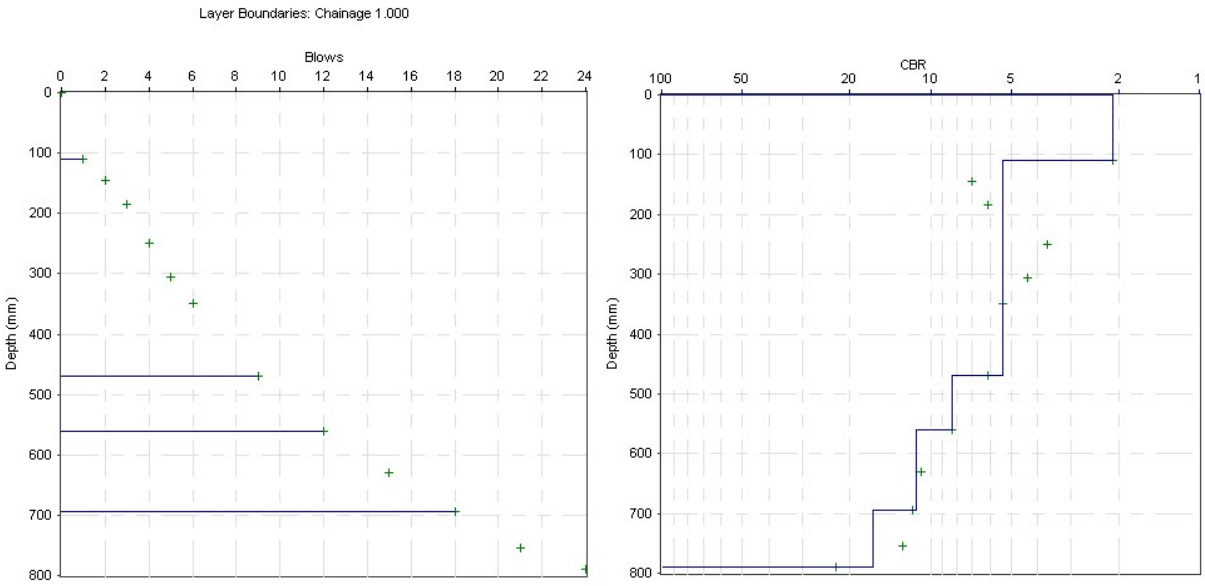
# APPENDIX J:
# DCP results

[redacted]

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 1.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 160 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 110.00 | 2 | 110 | 110 |
| 2 | 45.00 | 5 | 360 | 470 |
| 3 | 30.00 | 8 | 90 | 560 |
| 4 | 22.50 | 11 | 135 | 695 |
| 5 | 15.83 | 16 | 95 | 790 |

### CBR Relationship:

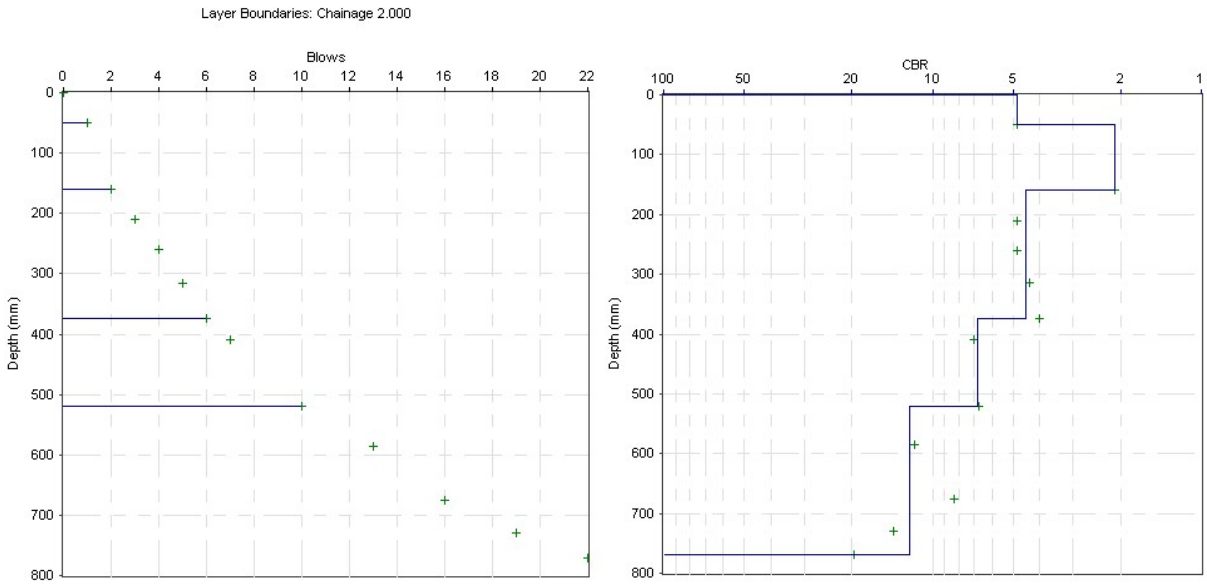
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 2.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 200 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 50.00 | 5 | 50 | 50 |
| 2 | 110.00 | 2 | 110 | 160 |
| 3 | 53.75 | 4 | 215 | 375 |
| 4 | 36.25 | 7 | 145 | 520 |
| 5 | 20.83 | 12 | 250 | 770 |

### CBR Relationship:

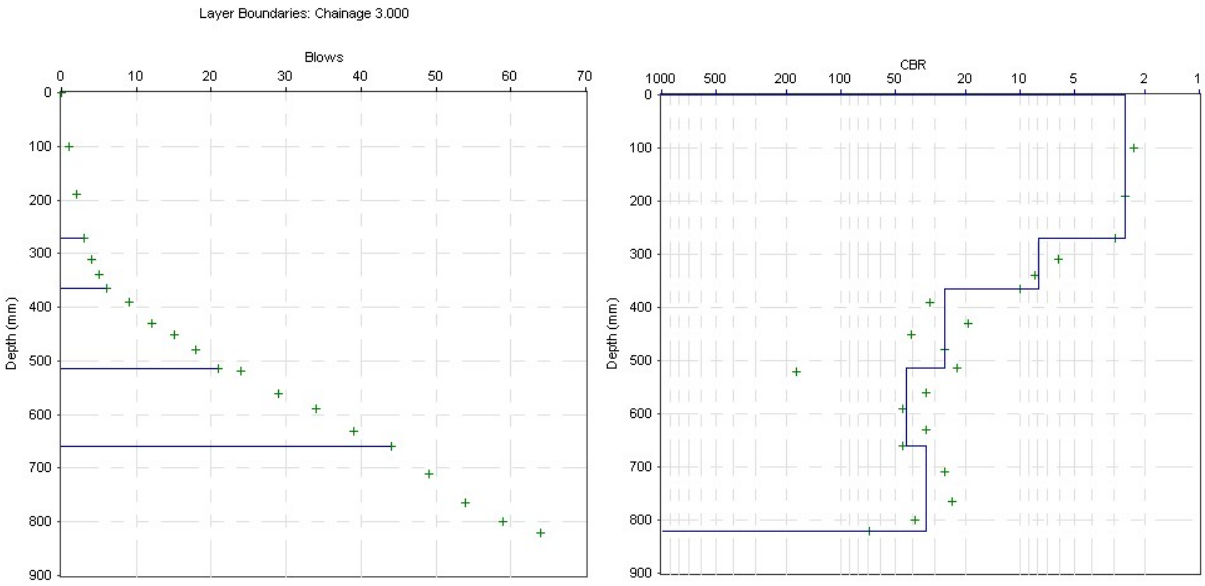
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 3.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 130 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 90.00 | 3 | 270 | 270 |
| 2 | 31.67 | 8 | 95 | 365 |
| 3 | 10.00 | 26 | 150 | 515 |
| 4 | 6.30 | 43 | 145 | 660 |
| 5 | 8.00 | 34 | 160 | 820 |

### CBR Relationship:

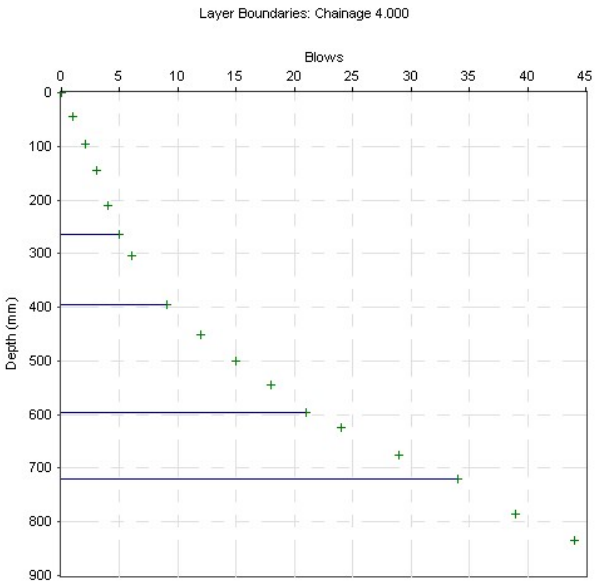
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

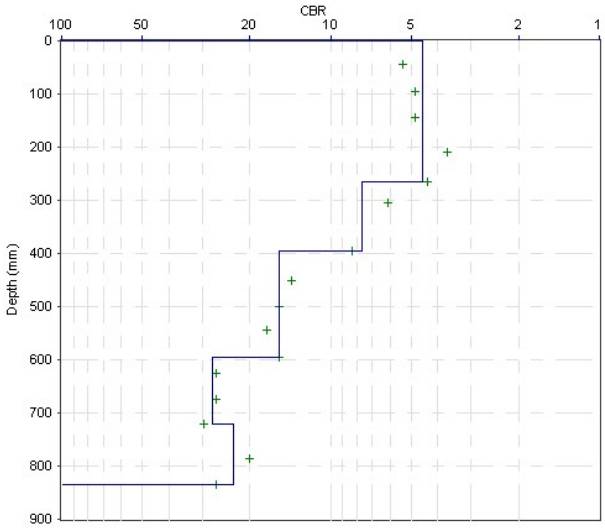
# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 4.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 125 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart




CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 53.00 | 5 | 265 | 265 |
| 2 | 32.50 | 8 | 130 | 395 |
| 3 | 16.67 | 15 | 200 | 595 |
| 4 | 9.62 | 28 | 125 | 720 |
| 5 | 11.50 | 23 | 115 | 835 |

### CBR Relationship:

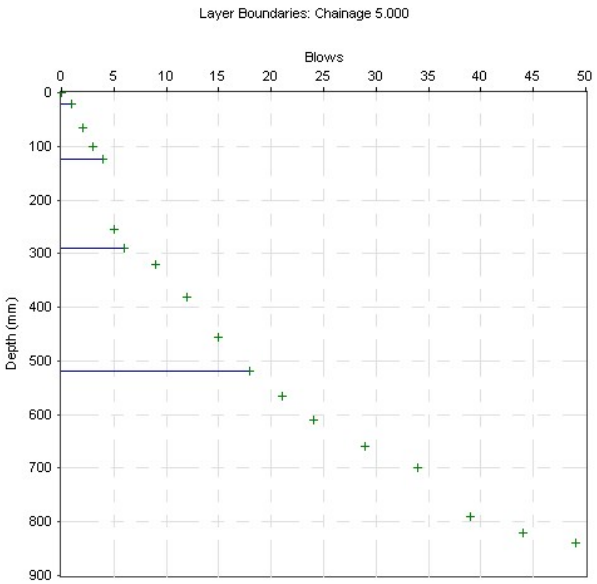
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

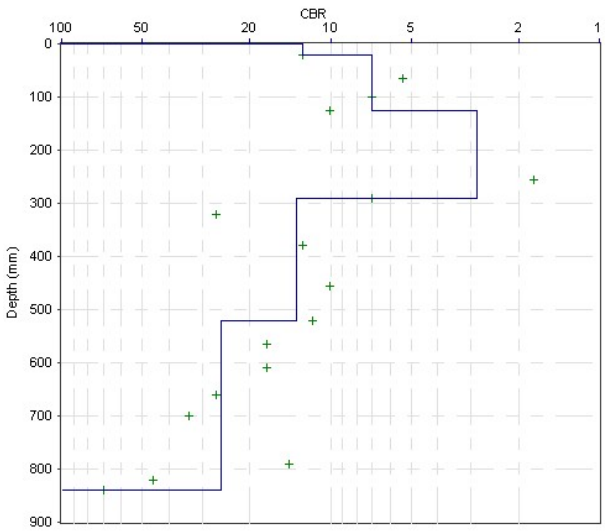
# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 5.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 130 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart




CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 20.00 | 13 | 20 | 20 |
| 2 | 35.00 | 7 | 105 | 125 |
| 3 | 82.50 | 3 | 165 | 290 |
| 4 | 19.17 | 13 | 230 | 520 |
| 5 | 10.32 | 26 | 320 | 840 |

### CBR Relationship:

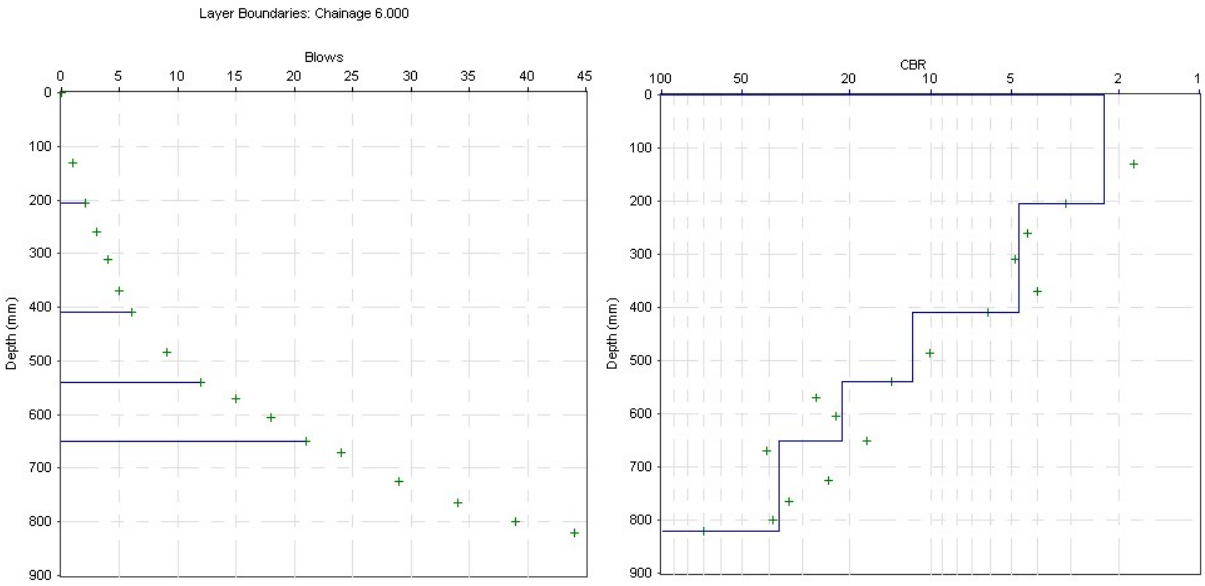
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 6.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 140 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 102.50 | 2 | 205 | 205 |
| 2 | 51.25 | 5 | 205 | 410 |
| 3 | 21.67 | 12 | 130 | 540 |
| 4 | 12.22 | 21 | 110 | 650 |
| 5 | 7.39 | 36 | 170 | 820 |

### CBR Relationship:

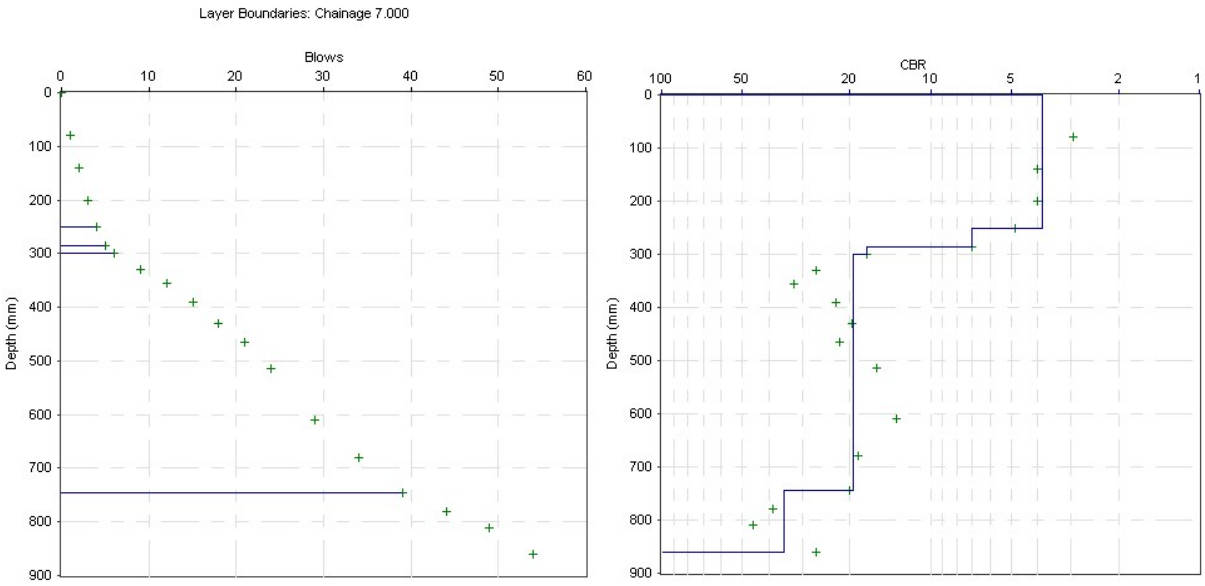
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 7.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 110 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 62.50 | 4 | 250 | 250 |
| 2 | 35.00 | 7 | 35 | 285 |
| 3 | 15.00 | 17 | 15 | 300 |
| 4 | 13.48 | 19 | 445 | 745 |
| 5 | 7.67 | 35 | 115 | 860 |

### CBR Relationship:

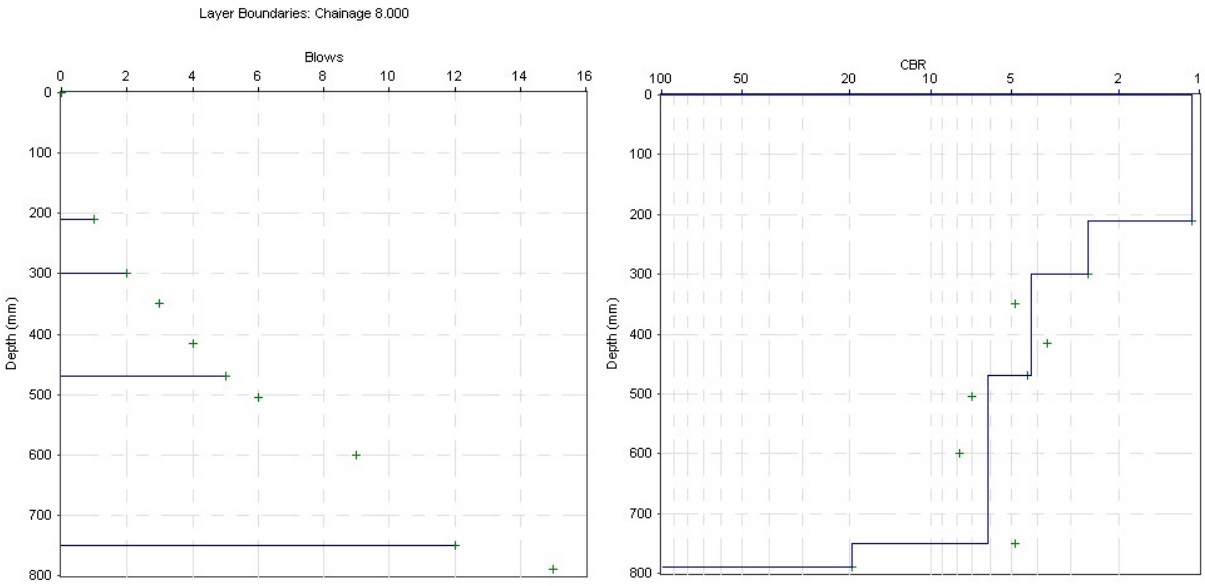
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 8.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 180 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 210.00 | 1 | 210 | 210 |
| 2 | 90.00 | 3 | 90 | 300 |
| 3 | 56.67 | 4 | 170 | 470 |
| 4 | 40.00 | 6 | 280 | 750 |
| 5 | 13.33 | 20 | 40 | 790 |

### CBR Relationship:

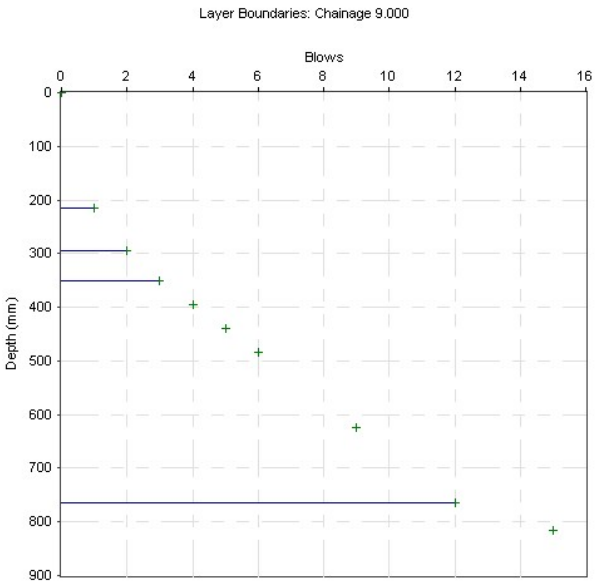
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

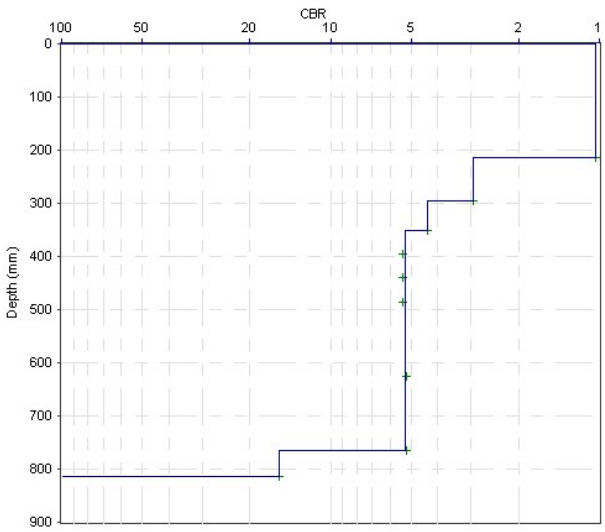
# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 9.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 155 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart




CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 215.00 | 1 | 215 | 215 |
| 2 | 80.00 | 3 | 80 | 295 |
| 3 | 55.00 | 4 | 55 | 350 |
| 4 | 46.11 | 5 | 415 | 765 |
| 5 | 16.67 | 15 | 50 | 815 |

### CBR Relationship:

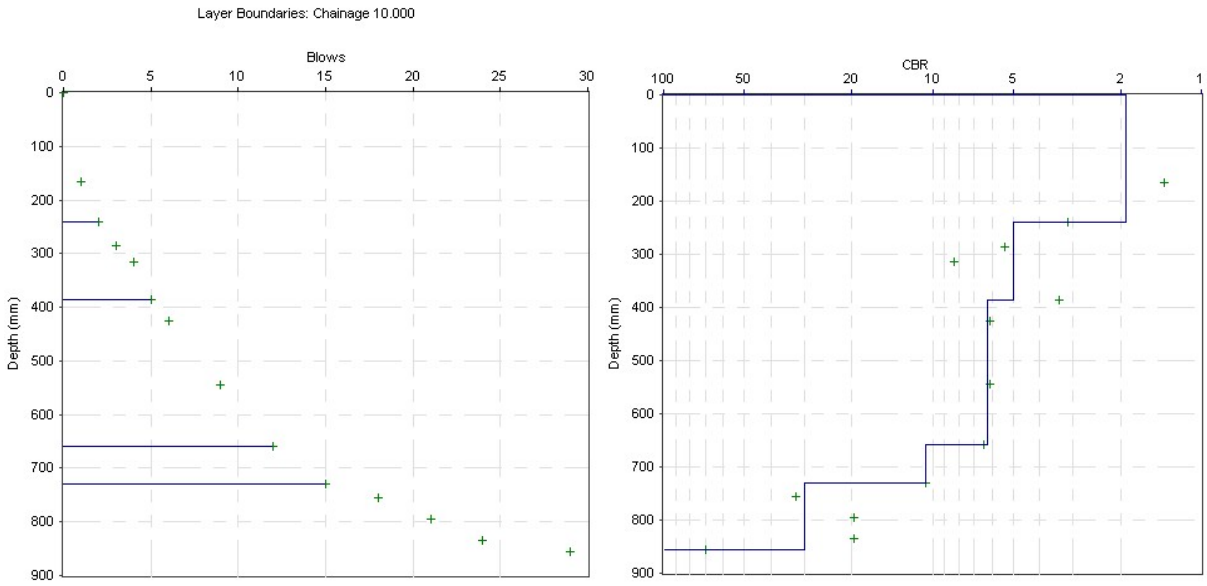
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 10.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 115 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 120.00 | 2 | 240 | 240 |
| 2 | 48.33 | 5 | 145 | 385 |
| 3 | 39.14 | 6 | 274 | 659 |
| 4 | 23.67 | 11 | 71 | 730 |
| 5 | 8.93 | 30 | 125 | 855 |

### CBR Relationship:

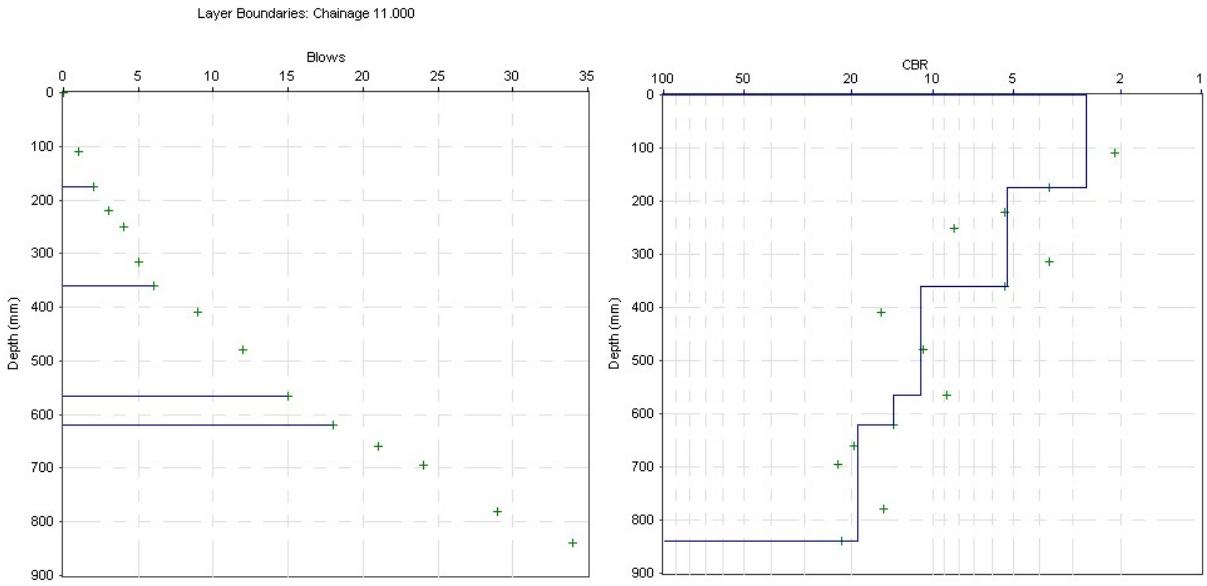
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 11.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 120 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 87.50 | 3 | 175 | 175 |
| 2 | 46.25 | 5 | 185 | 360 |
| 3 | 22.78 | 11 | 205 | 565 |
| 4 | 18.33 | 14 | 55 | 620 |
| 5 | 13.75 | 19 | 220 | 840 |

### CBR Relationship:

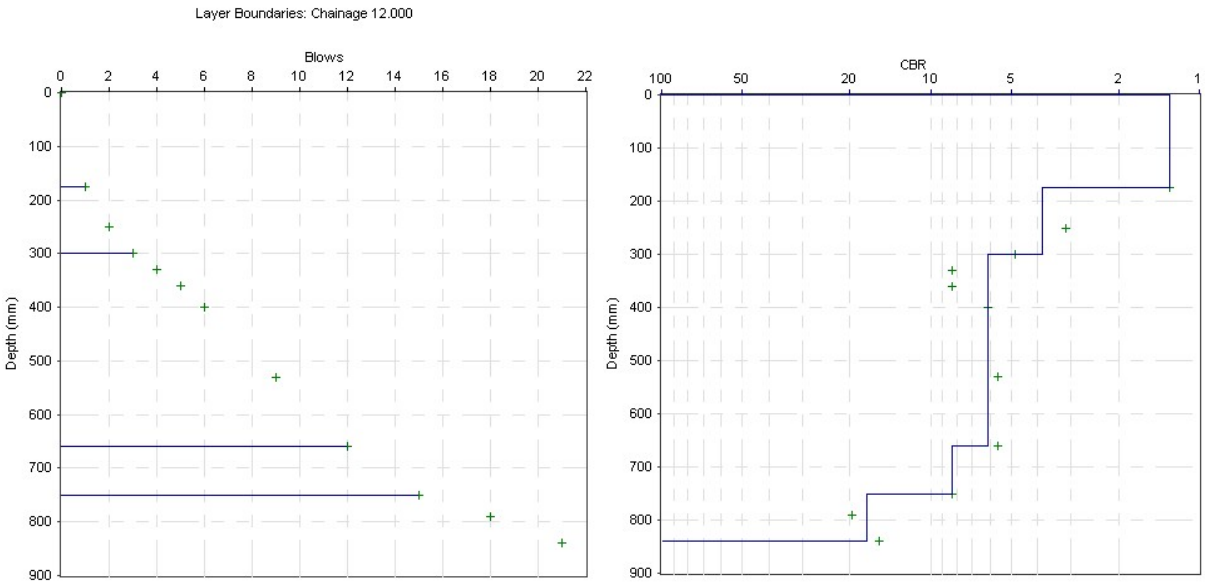
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 12.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 120 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 175.00 | 1 | 175 | 175 |
| 2 | 62.50 | 4 | 125 | 300 |
| 3 | 40.00 | 6 | 360 | 660 |
| 4 | 30.00 | 8 | 90 | 750 |
| 5 | 15.00 | 17 | 90 | 840 |

### CBR Relationship:

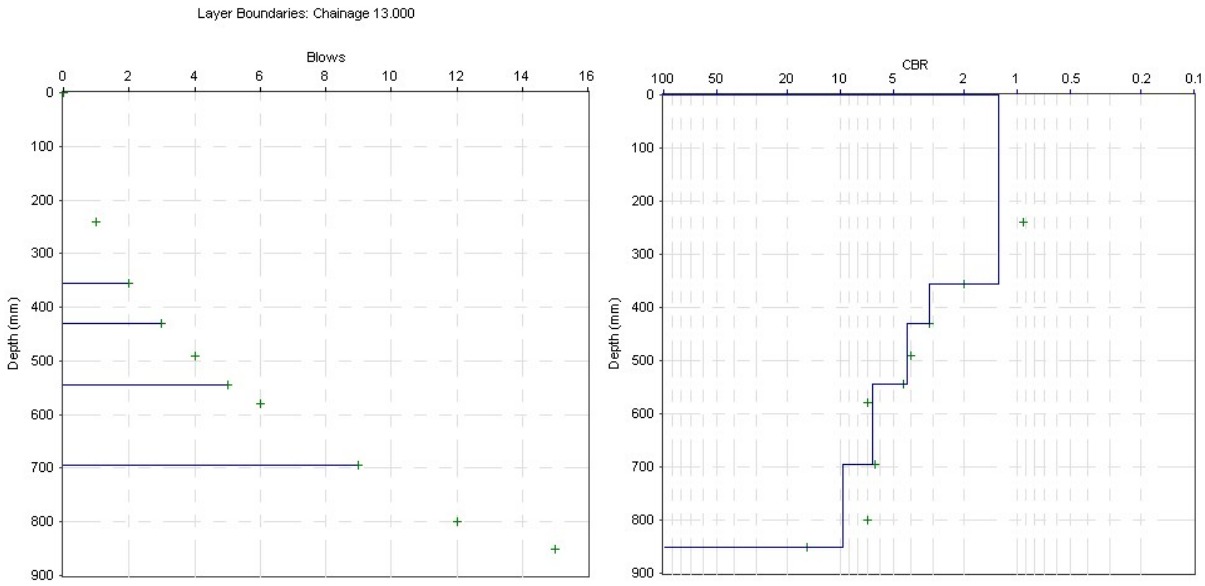
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 13.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 120 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 177.50 | 1 | 355 | 355 |
| 2 | 75.00 | 3 | 75 | 430 |
| 3 | 57.50 | 4 | 115 | 545 |
| 4 | 37.50 | 7 | 150 | 695 |
| 5 | 25.83 | 10 | 155 | 850 |

### CBR Relationship:

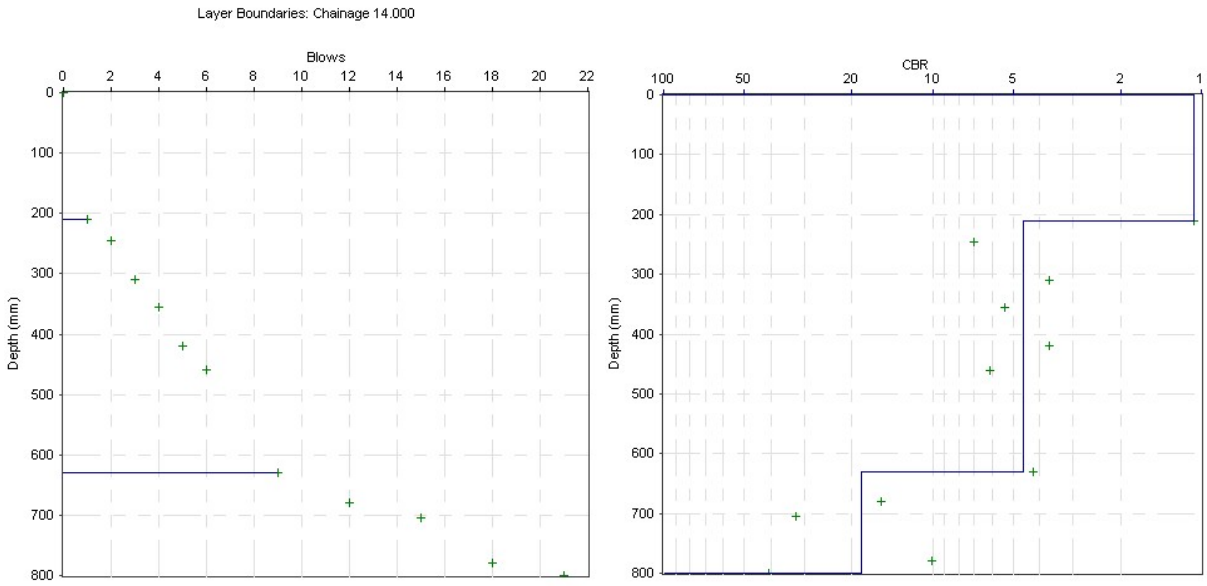
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 14.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 170 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 210.00 | 1 | 210 | 210 |
| 2 | 52.50 | 5 | 420 | 630 |
| 3 | 14.17 | 18 | 170 | 800 |

### CBR Relationship:

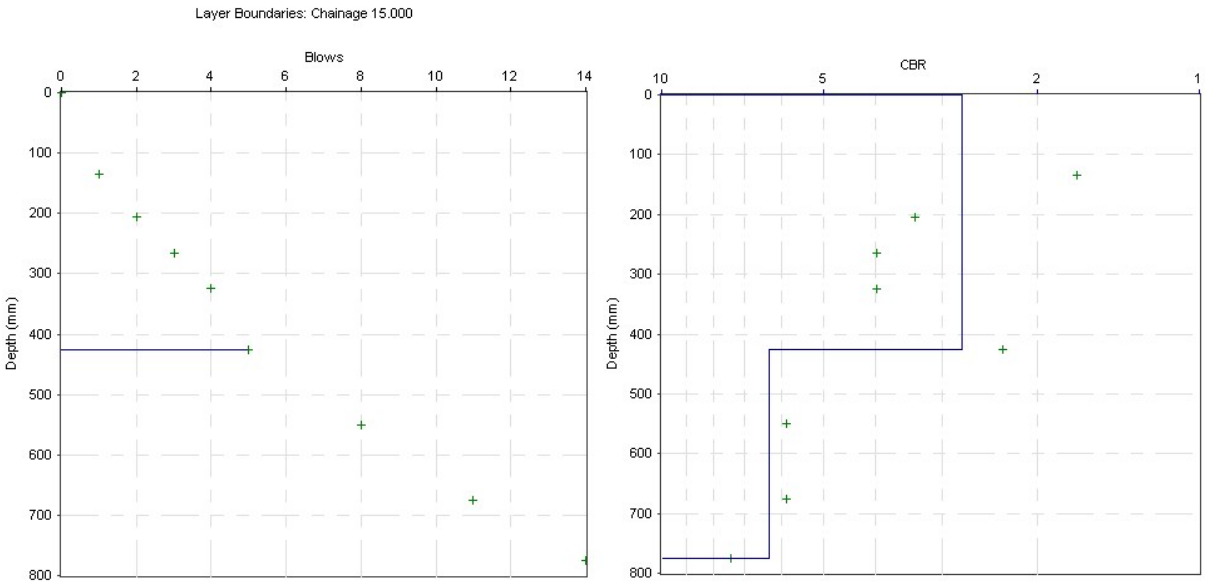
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 15.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 175 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 85.00 | 3 | 425 | 425 |
| 2 | 38.89 | 6 | 350 | 775 |

### CBR Relationship:

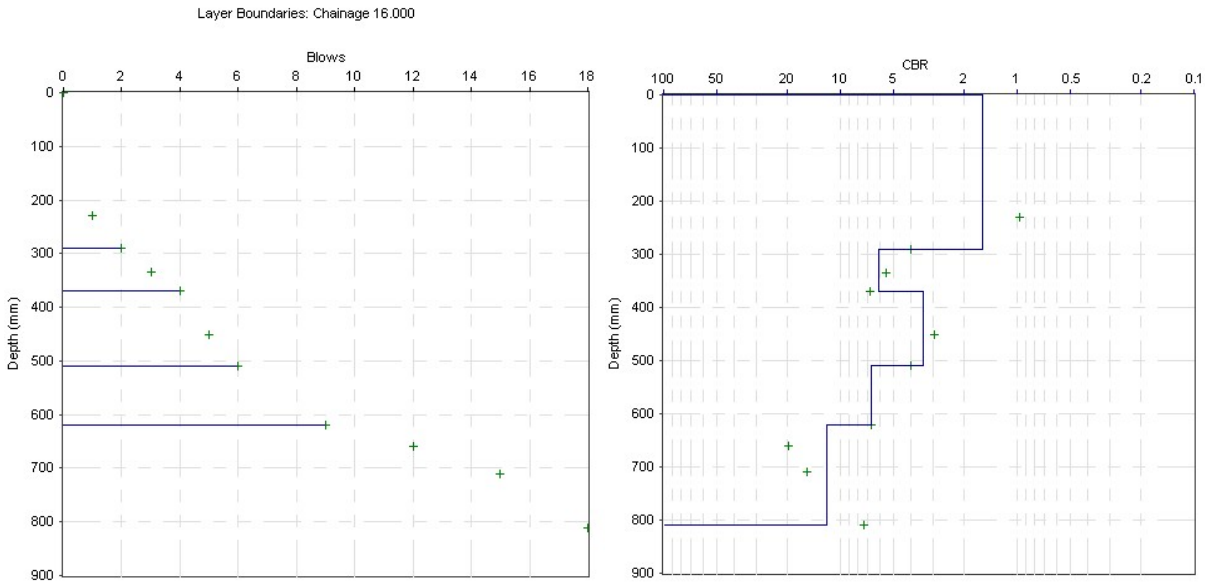
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 16.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 160 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 145.00 | 2 | 290 | 290 |
| 2 | 40.00 | 6 | 80 | 370 |
| 3 | 70.00 | 3 | 140 | 510 |
| 4 | 36.67 | 7 | 110 | 620 |
| 5 | 21.11 | 12 | 190 | 810 |

### CBR Relationship:

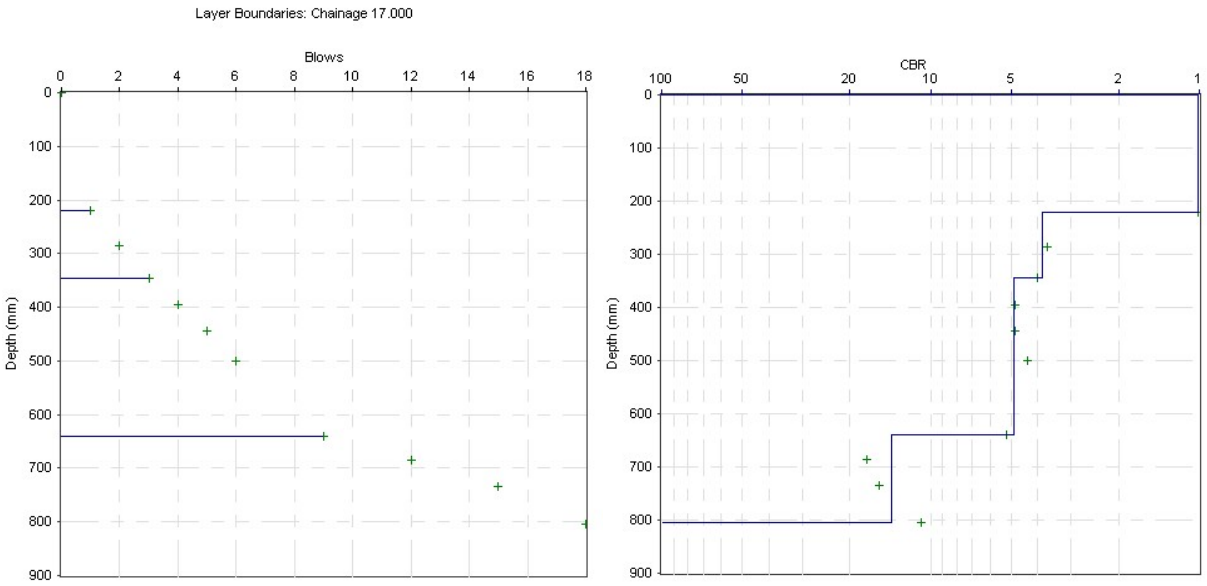
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 17.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 155 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 220.00 | 1 | 220 | 220 |
| 2 | 62.50 | 4 | 125 | 345 |
| 3 | 49.17 | 5 | 295 | 640 |
| 4 | 18.33 | 14 | 165 | 805 |

### CBR Relationship:

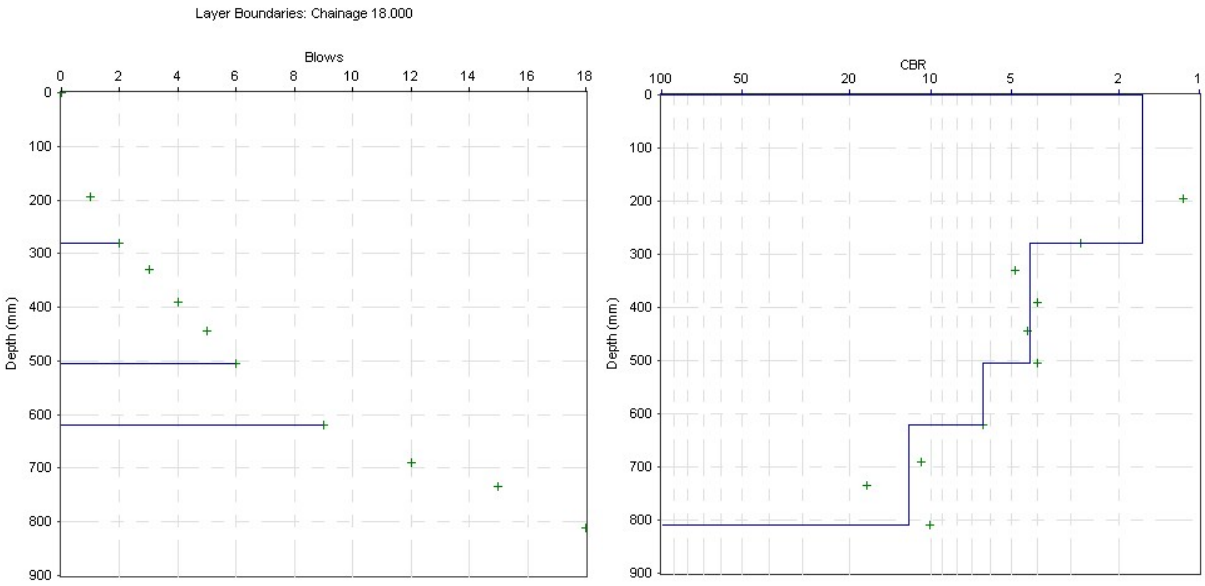
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 18.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 140 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 140.00 | 2 | 280 | 280 |
| 2 | 56.25 | 4 | 225 | 505 |
| 3 | 38.33 | 6 | 115 | 620 |
| 4 | 21.11 | 12 | 190 | 810 |

### CBR Relationship:

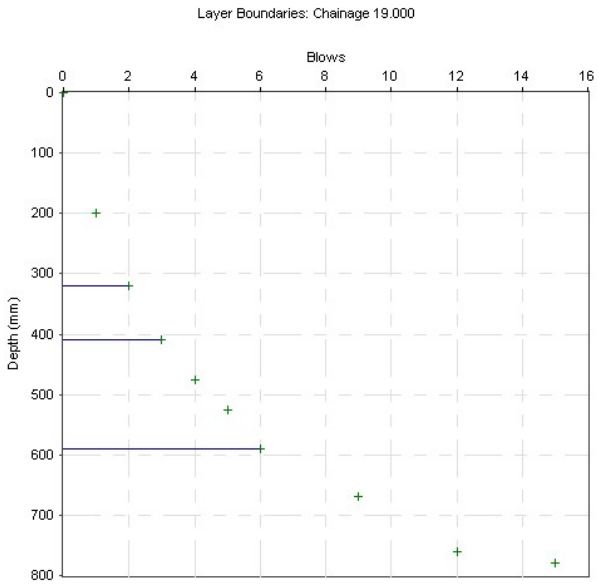
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

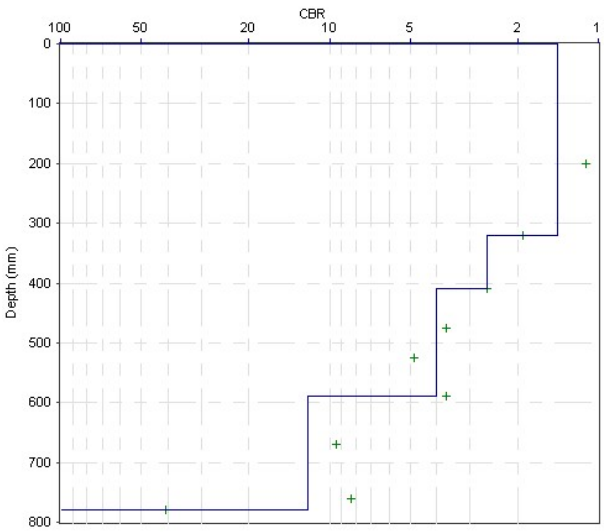
# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 19.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 190 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart




CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 160.00 | 1 | 320 | 320 |
| 2 | 90.00 | 3 | 90 | 410 |
| 3 | 60.00 | 4 | 180 | 590 |
| 4 | 21.11 | 12 | 190 | 780 |

### CBR Relationship:

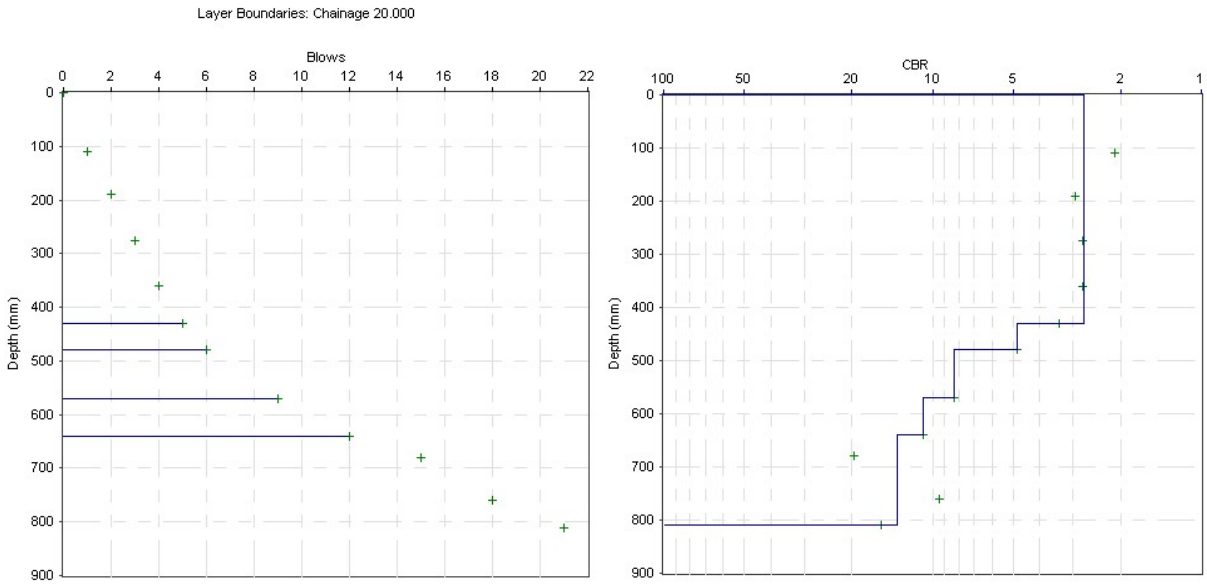
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 20.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 160 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 86.00 | 3 | 430 | 430 |
| 2 | 50.00 | 5 | 50 | 480 |
| 3 | 30.00 | 8 | 90 | 570 |
| 4 | 23.33 | 11 | 70 | 640 |
| 5 | 18.89 | 14 | 170 | 810 |

### CBR Relationship:

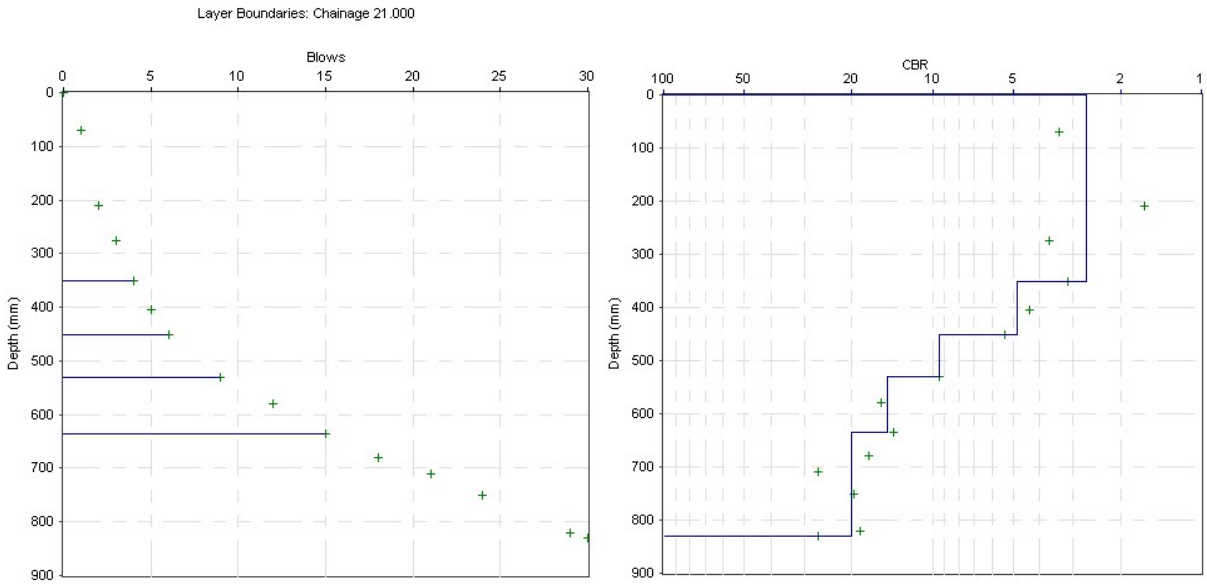
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 21.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 140 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 87.50 | 3 | 350 | 350 |
| 2 | 50.00 | 5 | 100 | 450 |
| 3 | 26.67 | 9 | 80 | 530 |
| 4 | 17.50 | 15 | 105 | 635 |
| 5 | 13.00 | 20 | 195 | 830 |

### CBR Relationship:

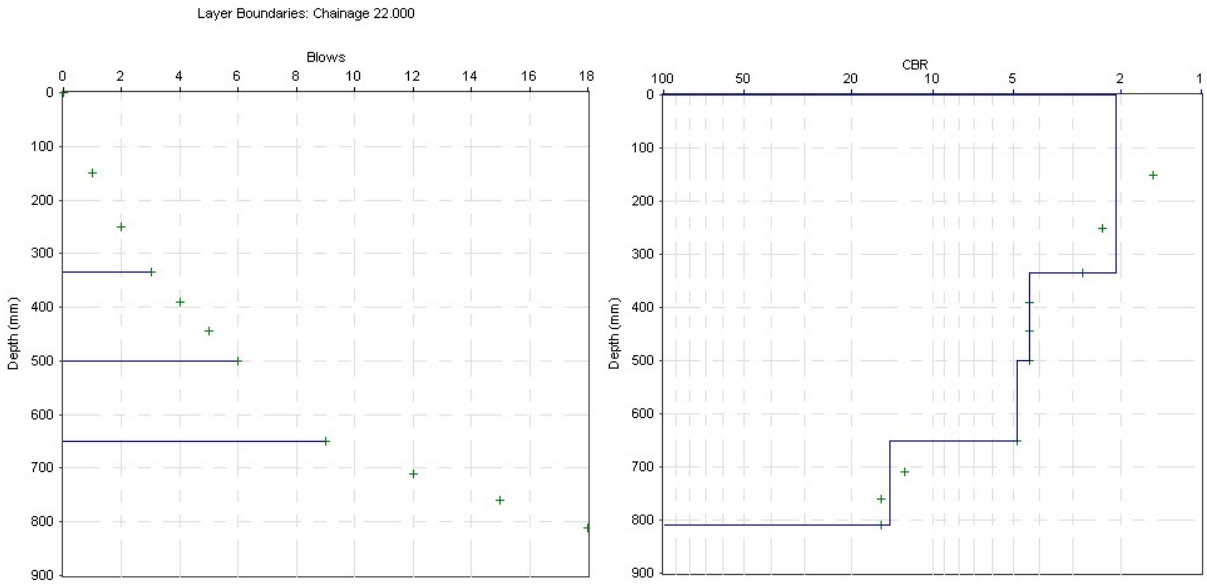
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 22.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 160 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 111.67 | 2 | 335 | 335 |
| 2 | 55.00 | 4 | 165 | 500 |
| 3 | 50.00 | 5 | 150 | 650 |
| 4 | 17.78 | 14 | 160 | 810 |

### CBR Relationship:

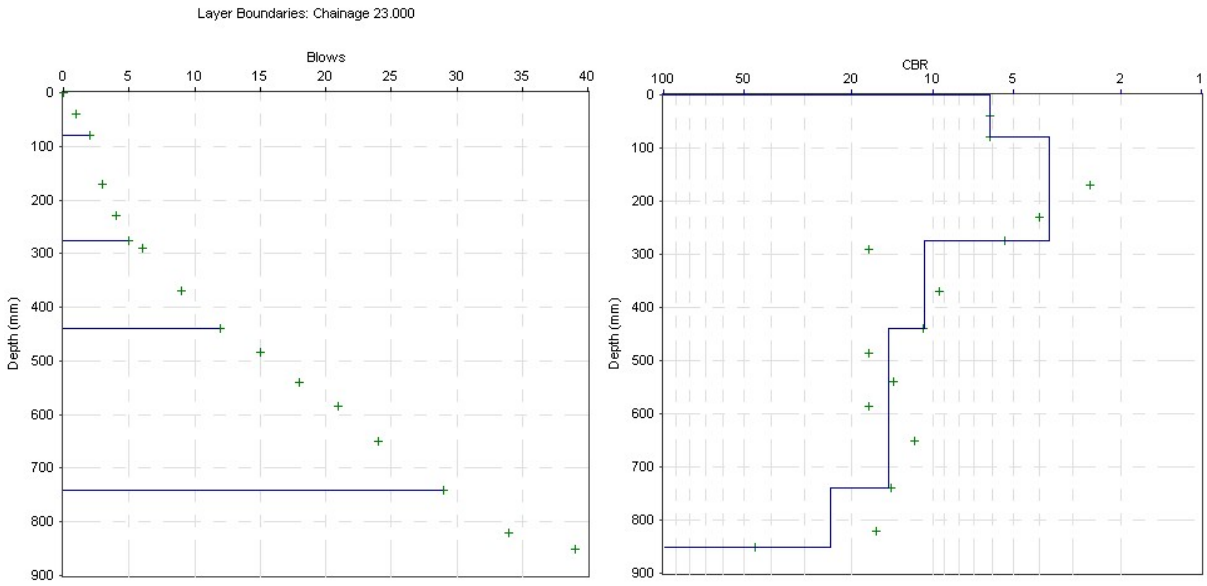
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# DCP Layer Strength Analysis Report

## Project Name: GWPR5921 DCP's

| | | | |
|---|---|---|---|
| Chainage (km): | 23.000 | Surface Type: | Unpaved |
| Direction: | | Thickness (mm): | 0 |
| Location/Offset: | Lay-by / other | Base Type: | |
| Cone Angle: | 60 degrees | Thickness (mm): | |
| Zero Error (mm): | 120 | Surface Moisture: | Unknown |
| Test Date: | 09/04/2024 | Moisture adjustment factor: | Not adjusted |




Layer Boundaries Chart

CBR Chart

### Layer Properties

| No. | Penetration Rate (mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|---|---|---|---|---|
| 1 | 40.00 | 6 | 80 | 80 |
| 2 | 65.00 | 4 | 195 | 275 |
| 3 | 23.57 | 11 | 165 | 440 |
| 4 | 17.65 | 15 | 300 | 740 |
| 5 | 11.00 | 24 | 110 | 850 |

### CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

# APPENDIX K:
# Third Party Site Investigation Report

[redacted]

Your Environment

# STAGE 2: SITE INVESTIGATION – LAND ADJACENT TO CHURCH LANE, CLIMPING, WEST SUSSEX, BN17 5GG

Bailifscourt Estate

*Your* Environment
Head Office, Chilgrove Business Centre, Chilgrove Park Road, Chilgrove, Nr Chichester, PO18 9HU
[redacted]

Report Number: YE6619, Date: February 2019

Daniel Speight
[redacted]

# Contents

1.0 Introduction ..... 5
2.0 Proposed Development ..... 5
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8.0 Geotechnical Soil Laboratory Testing ..... 7
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## Appendices

Appendix A: Current redevelopment plans
Appendix B: Site investigation plan
Appendix C: Borehole logs
Appendix D: Geotechnical laboratory results

| | Name | Position | Signature | Date |
|---|---|---|---|---|
| **Prepared by:** | Daniel Speight | Graduate Geotechnical Engineer | [redacted] | February 2019 |
| **Reviewed by:** | Rob Lewis | Principal Engineer | | February 2019 |
| **Approved:** | Colin Hiscock | Director | | February 2019 |
| **For and on behalf of *Your*Environment** | | | | |

| Issue | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| **00** | 06.02.2019 | Final Report | DS | RL | CH |
| | | | | | |
| | | | | | |
| | | | | | |

# Executive Summary

*Your*Environment (YE) was instructed by Bailifscourt Estate (Quote No: 6619, Dated: January 10th 2019) to conduct a Site Investigation (SI) at a site identified as Land Adjacent to Church Lane, Climping, West Sussex BN17 5GG. The purpose of this investigation was to provide a factual and interpretative report on our findings in respect to works completed at the site by YE, which comprised fifteen (15no.) windowless sampler boreholes with associated SPTs with geotechnical laboratory testing.

We understand from reference to information provided by the client, that the report is a preliminary feasibility investigation. Based on the current plans provided by the client the development of the site includes:

- Erection of multiple low-rise residential properties;
- Creation of a driveway, car parking hardstanding;
- Areas of public open space;
- Ponds: and amenity buildings;
- Construction of connector roads; and
- Realignment and construction of a roundabout.

The relevant British Geological Survey (BGS) online mapping information indicates the site to be underlain by raised beach superficial deposits on the eastern half of the site, and by river terrace deposits on the western side off the site. Underling these superficial deposits, the Lewes Nodular Chalk Formation is reported, comprising hard nodular chalks with regular flint seams.

A review of the ground conditions within the boreholes indicates the presence of variable Topsoil deposits to up to 0.75m depth. The Topsoil comprised sandy clays.

Underlying the topsoil, within boreholes WS03, WS08, WS11 and WS15, silty sandy gravelly clays were recorded to depths of boreholes at 4.45mbgl. Underlying these gravelly clays, within boreholes WS04, WS05, WS07 and WS12 gravelly sands were recorded between 1.68mbgl and 4.45mbg. It is likely that these deposits are representative of river terrace and raised beach superficial deposits as suggested by BGS mapping.

Underlying these superficial deposits, within Boreholes WS01, WS02, WS06, WS09, WS10, WS13 and WS14, Chalks - recovered as white gravelly silts - were reported from depths of 1.80mbgl to full depths of boreholes. It is likely that these deposits represent weathered sections of the Lewes Nodular Chalk Formation.

SPT N values within the superficial deposits were generally noted between 9 and 12. In view of this it is possible that shallow traditional foundations could be utilised at the site dependant on the presence of weak deposits noted above. These could generally be placed at depths from 1.00m in cohesive soils described in a firm in situ condition, however these may need to be increased in depth dependant on the presence of weaker zones.

Within areas of the site where sands are present at foundation depths strip or spread foundations placed within the sands (with a medium dense instiu condition) with a minimum width of 1m and constructed at depths from 1.0m, providing the bearing surface has been compacted, an allowable increase in stress of 90kN/m$^2$ should be achievable at this depth, with a factor of safety against general shear failure of in excess of 3. For narrower strip foundations it is suggested that the allowable increase in load be limited to say 60kN/m$^2$, Settlements at these loading intensities should remain within tolerable limits for the type of structure proposed, provided that the underlying soils are carefully inspected immediately after final trimming has taken place.

It should be appreciated that foundations should preferably be placed wholly in clay bearing strata or sand bearing strata due to the potential for excessive differential settlement occurring between foundations placed across the two soil types alternatively suitable reinforcement would be required.

Consideration may be directed to the use of piles to transfer the foundation loads through the weaker upper levels of the sands and clays to more competent soils at depth within the chalk.

In view of the above further investigation should be considered and a foundation schedule prepared for each structure planned across the site.

We trust this is sufficient for your requirements and should you have any questions please do not hesitate to contact the undersigned.

For *Your*Environment



Daniel Speight — Graduate Geotechnical Engineer

Colin Hiscock — Director

# 1.0 Introduction

*Your*Environment (YE) was instructed by Bailifscourt Estate (Quote No: 6619, Dated: January 10th 2019) to conduct a Site Investigation (SI) at a site identified as Land Adjacent to Church Lane, Climping, West Sussex BN17 5GG.

The purpose of this investigation was to provide a factual and interpretative report on our findings in respect to works completed at the site by YE, which comprised fifteen (15no.) windowless sampler boreholes with associated SPTs with geotechnical laboratory testing.

This report presents a full factual record of all site works carried out, the results of *insitu* testing and subsequent laboratory testing of selected samples obtained during these works. The report has been formulated in accordance with BS10175:2015 '*Investigation into Potentially Contaminated Sites – Code of Practice*' and CLR11 – '*Model Procedures for the Management of Land Contamination*' and from the National Planning Policy Framework.

YE take no responsibility for conditions which have not been revealed by the windowless sampler boreholes, or which occur between windowless sampler boreholes. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative, and liability cannot be accepted for its accuracy.

The information contained in this report is intended for the use of the named client (or their approved contractors). Should a third party rely on any part of this report, that party does so wholly at its own risk and YE disclaim any liability to such parties. Should the purposes for which the report is used, or the proposed use of the site change, this report may no longer be valid and further use of reliance upon the report in those circumstances shall be at the client's sole and own risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. YE should in all such altered circumstances be commissioned to review and update this report accordingly.

# 2.0 Proposed Development

We understand from reference to information provided by the client, that the report is a preliminary feasibility investigation. Based on the current plans provided by the client the development of the site includes:

- Erection of multiple low-rise residential properties;
- Creation of a driveway, car parking hardstanding;
- Areas of public open space;
- Ponds: and amenity buildings;
- Construction of connector roads; and
- Realignment and construction of a roundabout.

The proposed redevelopment plans for the site can be reviewed within **Appendix A.**

# 3.0 Physical Setting

## 3.1 Site Information

The site is located within the south-western limits of the village of Climping, approximately 7km northeast of Bognor Regis. The approximately L-shaped site is enclosed by Yapton Road (B233) forming the western site boundary, Church Lane forming the eastern site boundary and the Southern site boundary being formed by the A259. The northern site boundary is

formed by residential properties and their respective gardens. Mature scrubs and trees are growing on site, along the eastern, southern and western site boundaries. The site is currently occupied by agricultural land.

## 3.2 Geology

The relevant British Geological Survey (BGS) online mapping information indicates the site to be underlain by raised beach superficial deposits on the eastern half of the site, and by river terrace deposits on the western side off the site. Underling these superficial deposits, the Lewes Nodular Chalk Formation is reported, comprising hard nodular chalks with regular flint seams.

# 4.0 Fieldworks

## 4.1 Site Investigation

All SI works were completed on January 24th, 25th and 26th 2019 under the supervision of a Geo-Environmental Engineer contracted from YE. In summary the investigation included:

- A two man team ascertained the routes of any below ground services in close proximity to the proposed exploratory hole positions, using a CAT scan and lifting up of any man hole covers. Following the CAT scan, hand dug starter pits were completed to a depth of 1.2 metres below ground level (mbgl).
- Fifteen (15no.) windowless sampler boreholes (WS01 to WS15) were completed, by means of a competitor dart rig, to depths of 4.45mbgl. The locations of exploratory positions were selected relative to the historic land use and the current proposed redevelopment plans for the site.
- The windowless sampler boreholes were logged with any groundwater conditions noted and representative soil samples removed in accordance with current guidelines.
- Soil samples were removed from shallow sub surface locations, with further samples taken at depth at every 0.5mbgl or when the underlying stratum changed. Samples were subsequently placed in suitable containers including 1kg tubs and 250ml glass jars and placed in cool boxes with cool packs prior to storage within our *in-house* laboratory fridges and then subsequent forwarding to our designated laboratory for analysis.
- Standard Penetration Tests were undertaken during the drilling to provide an assessment of the strength of the underlying deposits with depth.
- Upon completion, all exploratory holes were back filled, compacted and made good to existing levels and finishes, with any surplus spoil bagged up and removed from site.

The positions of exploratory holes in relation to the existing site layout can be reviewed within **Appendix B**. Exploratory windowless sampler borehole logs are located in **Appendix C**.

# 5.0 Geology & Ground Conditions

A review of the ground conditions within the boreholes indicates the presence of variable Topsoil deposits to up to 0.75m depth. The Topsoil comprised sandy clays.

Underlying the topsoil, within boreholes WS03, WS08, WS11 and WS15, silty sandy gravelly clays were recorded to depths of boreholes at 4.45mbgl. Underlying these gravelly clays, within boreholes WS04, WS05, WS07 and WS12 gravelly sands were recorded between

1.68mbgl and 4.45mbg. It is likely that these deposits are representative of river terrace and raised beach superficial deposits as suggested by BGS mapping.

Underlying these superficial deposits, within Boreholes WS01, WS02, WS06, WS09, WS10, WS13 and WS14, Chalks - recovered as white gravelly silts - were reported from depths of 1.80mbgl to full depths of boreholes. It is likely that these deposits represent weathered sections of the Lewes Nodular Chalk Formation.

Reference to the Standard Penetration Tests results also shows N values of between N=8 and N=12 were recorded at 1.2m depth, N=9 to 60 at 2.0m depth, N=7 to 45 at 3.0m depth and N=40 to 46 at 4.0m depth.

# 6.0 Groundwater Conditions

Groundwater was encountered at depths of 3.0mbgl within borehole WS01, depths of 3.1mbgl within borehole WS02, depths of 2.3mbgl within borehole WS03, depths of 3.4mbgl within borehole WS05, depths of 3.20mbgl within borehole WS07 and depths of 3.6mbgl within borehole WS13. However, it should be appreciated that a programme of ground water monitoring is currently being undertaken and will be reported at a later date.

It should be noted that groundwater levels are dependent upon seasonal variations and can change after periods of prolonged rainfall or drought.

# 7.0 Visual and Olfactory Observations

With the exception of general anthropogenic material identified, no visual and/or olfactory evidence of potential contamination was noted within any soils encountered as part of the investigative works undertaken.

# 8.0 Geotechnical Soil Laboratory Testing

Seven (7no.) soil samples were forwarded to a UKAS & MCERTS accredited laboratory facility (Messrs Chemtech) with sixteen (16no.) soil samples forwarded to *Your*Geotechnical Ltd (YG). The testing comprised the following:

## 8.1 Sulphates and pH

Seven (7no.) samples of the underlying naturally occurring deposits were submitted for assessment of water-soluble sulphate, total sulphate, pH value and total sulphur concentrations.

Water-soluble sulphate concentrations of between <10mg/l and 16mg/l were recorded, total (acid) sulphate concentrations of <0.01% and 0.03%, total sulphur concentrations of <0.01% to 0.22%, with pH values varying between 7.2 and 7.8 units. Total Potential Sulphates were between <0.03% and 0.66%.

## 8.2 Atterberg Limits and Natural Moisture Content

Sixteen (16no.) samples from the naturally occurring drift deposits were submitted for determination of their Natural Moisture Content and Plasticity Index.

Natural Moisture Contents of these samples were between 16% and 28%.

Modified Plasticity Indices of 6% and 26% were recorded for the results. As a consequence, the deposits encountered can be generally classed as being of medium volume change potential, in accordance with NHBC guidelines.

All geotechnical laboratory certificates can be reviewed within **Appendix D.**

# 9.0 Discussion of Ground Conditions

## 9.1 General

We understand that current redevelopment plans for the site are to include:

- Erection of multiple low-rise residential properties;
- Creation of a driveway, car parking hardstanding;
- Areas of public open space;
- Ponds: and amenity buildings;
- Construction of connector roads; and
- Realignment and construction of a roundabout.

The proposed redevelopment plans for the site can be reviewed within **Appendix A**

## 9.2 Construction Consideration

The topsoil is not considered suitable for the construction of shallow foundations due to the risk of unacceptable total and differential settlement occurring under moderately light surface loading.

The investigation recorded the presence of clays, sands (sometimes clayey), silts, silty sandy clays and are representative of the superficial geology recorded across the site. In some areas of the site these soils were noted to be relatively weak to depths of 3.0mbgl with SPT N values of 7 noted at this depth in WS02 recorded. Underlying these soils weathered chalk deposits were generally recorded. SPT N values within the superficial deposits were generally noted between 9 and 12. In view of this it is possible that shallow traditional foundations could be utilised at the site dependant on the presence of weak deposits noted above. These could generally be placed at depths from 1.00m in cohesive soils described in a firm in situ condition, however these may need to be increased in depth dependant on the presence of weaker zones. In view of this further investigation should be considered and a foundation schedule prepared for each structure planned across the site. In addition, final placement of foundations should be done in accordance with the guidance regards construction in shrinkable soils and taking cognisance of the clays of medium shrink potential recorded in the investigation. It is considered that spread foundations constructed within the underlying cohesive deposits could be designed assuming an allowable increase in load given below in Table 1: Allowable Increase in Stress. However, this should only be utilised as a guide for design purposes and further investigation is recommended.

| Foundation Type | Strip Foundations (m) | | | Spread Foundations (m) | | |
|---|---|---|---|---|---|---|
| Foundation Width | 0.6 | 1.0 | 1.5 | 1.0 | 2.0 | 3.0 |
| Foundation Depth | From 1.0m | | | From 1.0m | | |
| Allowable increase in stress (kN/m$^2$) | 100 | 95 | 90 | 145 | 135 | 130 |

*Table 1: Allowable Increase in Stress*

The allowable increase in stress given above assumes a factor of safety of 3 against general shear failure, with cohesion of 45kN/m$^2$ at the foundation depths. Settlements at the above loading intensities should remain within tolerable limits for the type of structure proposed provided that the underlying soils are carefully inspected immediately final trimming has taken place. Should any soft or weak material be encountered they should be locally removed and replaced with lean-mix concrete or compacted granular soil.

Within areas of the site where sands are present at foundation depths strip or spread foundations placed within the sands (with a medium dense instiu condition) with a minimum width of 1m and constructed at depths from 1.0m, providing the bearing surface has been compacted, an allowable increase in stress of 90kN/m$^2$ should be achievable at this depth, with a factor of safety against general shear failure of in excess of 3. For narrower strip foundations it is suggested that the allowable increase in load be limited to say 60kN/m$^2$, Settlements at these loading intensities should remain within tolerable limits for the type of structure proposed, provided that the underlying soils are carefully inspected immediately after final trimming has taken place. Should any very loose, cohesive or weak material be encountered they should be locally removed and replaced with lean-mix concrete or compacted granular soil. In addition, if the excavations are required to stand open for any period of time then a blinding layer of lean-mix concrete should be placed in the excavation bases. This expedient will reduce loosening of the sub-grade due to the ingress of surface water.

Any existing structures and foundations if found should be grubbed up and replaced with a suitable engineered granular backfill and should be compacted in layers.

The excavator must be set up with care and operated correctly to ensure trench walls are vertical and base horizontal as any slight inclination will result in eccentric loading on such deep trench fill footings.

It should be appreciated that foundations should preferably be placed wholly in clay bearing strata or sand bearing strata due to the potential for excessive differential settlement occurring between foundations placed across the two soil types alternatively suitable reinforcement would be required.

In view of the above, consideration may be directed to the use of piles to transfer the foundation loads through the weaker upper levels of the sands and clays to more competent soils at depth within the chalk. For preliminary design purposes it is considered that driven pre-cast concrete piles are likely to represent the most economical foundation solution. In order to formulate a suitable design, it is recommended that the advice of specialist piling contractors be sought. In addition, the pile design should include provision for negative skin friction within the made ground soils as these deposits may be subject to collapse compression if not treated.

In view of the relatively weak near surface soils, it may be necessary to construct a working platform for the piling rig and any other plant required during the works. Such a design should be undertaken in accordance with the procedures given in the BRE publication: Working platforms for tracked plant.

## 9.3 Floor Slabs

In view for the clays of medium shrink potential it is recommended that all floors are locally suspended.

## 9.4 Sulphates

Reference to BRE Special Digest 1 and the test results indicates the results from the fall within Design Sulphate Class DS-3. Consequently, concrete may be designed to AC-2s concrete classification.

## 9.5 Road Pavement

Any new pavements will require assessment of the existing sub grade in terms of its California Bearing Ratio (CBR) to facilitate the actual pavement design.

## 9.6 Sustainable Drainage

In accordance with PPS25 (2007) the Planning Authority are likely to insist that surface water drainage from any new-build or redevelopment complies with current design practices for Sustainable Urban Drainage (SUD's) with the construction of separate drainage systems for foul and surface water.

Based on the ground conditions encountered it is possible that sustainable drainage may be suitable at the site within the chalk deposits. If sustainable drainage is to be considered, it is recommended that soak-away testing is carried out in accordance with BRE 365 at the site to establish the sites suitability for sustainable drainage.

## 9.7 Excavations

Groundwater was encountered during the investigation. However, it should be appreciated that groundwater levels are subject to seasonal variation or changes on local drainage conditions.

Groundwater is may represent a particular problem to the construction of the development at this site particularly if encountered with excavations in the sand and further consideration should be made to groundwater upon completion of ground water monitoring being undertake. However, it should be recognized that slight seepages and minor water entries may combine in any long trench excavations to create a significant volume of water which may cause local problems during the construction phase. Any minor groundwater seepages or significant standing water within excavations made upon this site may be removed by using a simple form of de-watering. Such a system could include the excavation of sumps from which the water could be pumped. Advice on Groundwater Control is given in CIRIA Report No 515 – Groundwater Control Design and Practice.

The stability of the excavation faces cannot be guaranteed thus temporary support to the excavation faces may become necessary unless the foundations are constructed using trench-fill techniques. In this method the foundation trenches should be excavated, inspected and backfilled with concrete as a continuous operation. Under no circumstances should operatives be allowed to enter unsupported excavations.

Subject to space constraints, excavations could be battered back to a suitable angle of repose (typically 1:1 for a 2.00m deep excavation). Alternatively, if there is a requirement to protect nearby structures or services, appropriate supports may be required. Advice on excavation support is given in CIRIA Report No 97 – Trenching Practice.

As a consequence of the sands at shallow depth excavations may also be prone to rapid and unpredictable partial or more large-scale collapse in unsupported excavations. Therefore, consideration should be given to installing trench support/shoring or battering to maintain excavation stability during foundation construction/services installation. Due to the potential for unpredictable collapse excavations requiring man entry should be either battered back to a safe angle or adequately shored to provide safe working conditions within excavations.

Where trench support/shoring is utilised an appropriately qualified and experienced engineer should design the support system. The shoring/support will require regular

inspection in accordance with published guidelines to ensure that the support/shoring is adequate for the ground conditions present.

## 9.8 Groundworks Watching Brief

We would recommend that a watching brief be maintained during the course of the development, particularly during the ground works stage.

During construction works visual and olfactory appraisal of the underlying soils should be made. If during construction works any material is noted to show visual and/or olfactory signs of contamination an environmental consultant should be contacted to supervise/guide further works. This material should be stockpiled separately and tested prior to its appropriate removal off site or re-use as necessary.

If any landscaping materials are to be imported on site they should be tested to check that they are suitable for the intended use. Clean, uncontaminated rock, subsoil brick rubble, crushed concrete, ceramics and topsoil only should be permitted as infill material.

## 9.9 Services

Given that new services will be installed as part of the redevelopment of the site, we would recommend the local water board be contacted to determine their specification for the type of pipework, which should be used on this site.

All services and in particular potable water supply pipework should comprise of material that is resistant to attack and degradation to chemical attack.

Further information can be found within the published guidance for the '*Selection of Water Supply Pipes to be used in Brownfield Sites'*, issued in January 2011 by the UK Water Industry Research (UKWIR), this supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note – '*Laying Pipes in Contaminated Land*' which has been withdrawn.

## 9.10 Muckaway

If any soils are to be removed off site, a copy of the laboratory results should be given to the waste contractors and/or landfill operators involved to ascertain their requirements with regards to removal of soils from this area of the site and the acceptance of the waste at landfill. It may be prudent to undertake Waste Acceptance Criteria (WAC) analyses on the soils to be removed.

All materials must be transported in compliance with the Duty of Care Regulations by authorising movements with Carrier's individually numbered Duty of Care conveyance notes, complete with the appropriate EWC Codes. All relevant dockets will need to be kept to provide evidence of the removal as these may be required as part of a Validation Report.

# 10.0 Limitations

YE have prepared this report with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources.

The opinions given in this report have been dictated by the finite data on which are they based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and has accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, YE reserves the right to review such information and, if warranted, to alter the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed.

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time and as such are not a guarantee that the study site is free of hazardous conditions.

This report has been prepared solely for the use of the named client and may not be relied upon by other parties without written consent from YE. YE disclaim any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

# APPENDIX A: Proposed Redevelopment Plans

1. GENERAL
(i) THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.
(ii) THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.
(iii) ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.
(iv) THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.

OUTFALL TO WATERCOURSE

HYDROBRAKE MANHOLE LIMITING FLOWS TO QBar - 76.6l/s

TO BE READ IN CONJUNCTION WITH
AMBIENTAL SWDS REPORT 2322
AMBIENTAL FRA REPORT 2323

PRELIMINARY DRAWING
DRAWING FOR INFORMATION ONLY.
NOT FOR CONSTRUCTION.

KEY
- POTENTIAL LOCATION FOR PERMEABLE PAVING
- SURFACE WATER STORAGE AREAS
- SURFACE WATER DRAIN
- BIORETENTION
- OVERLAND FLOW

N
INDICATIVE ONLY

# FEASIBILITY ILLUSTRATIVE MASTERPLAN

| REV | DATE | BY | DESCRIPTION |
|---|---|---|---|
| - | - | - | - |

Graphic Scale
SCALE 1:1250 (A1)

Client
PARKER DANN

Ambiental Technical Solutions
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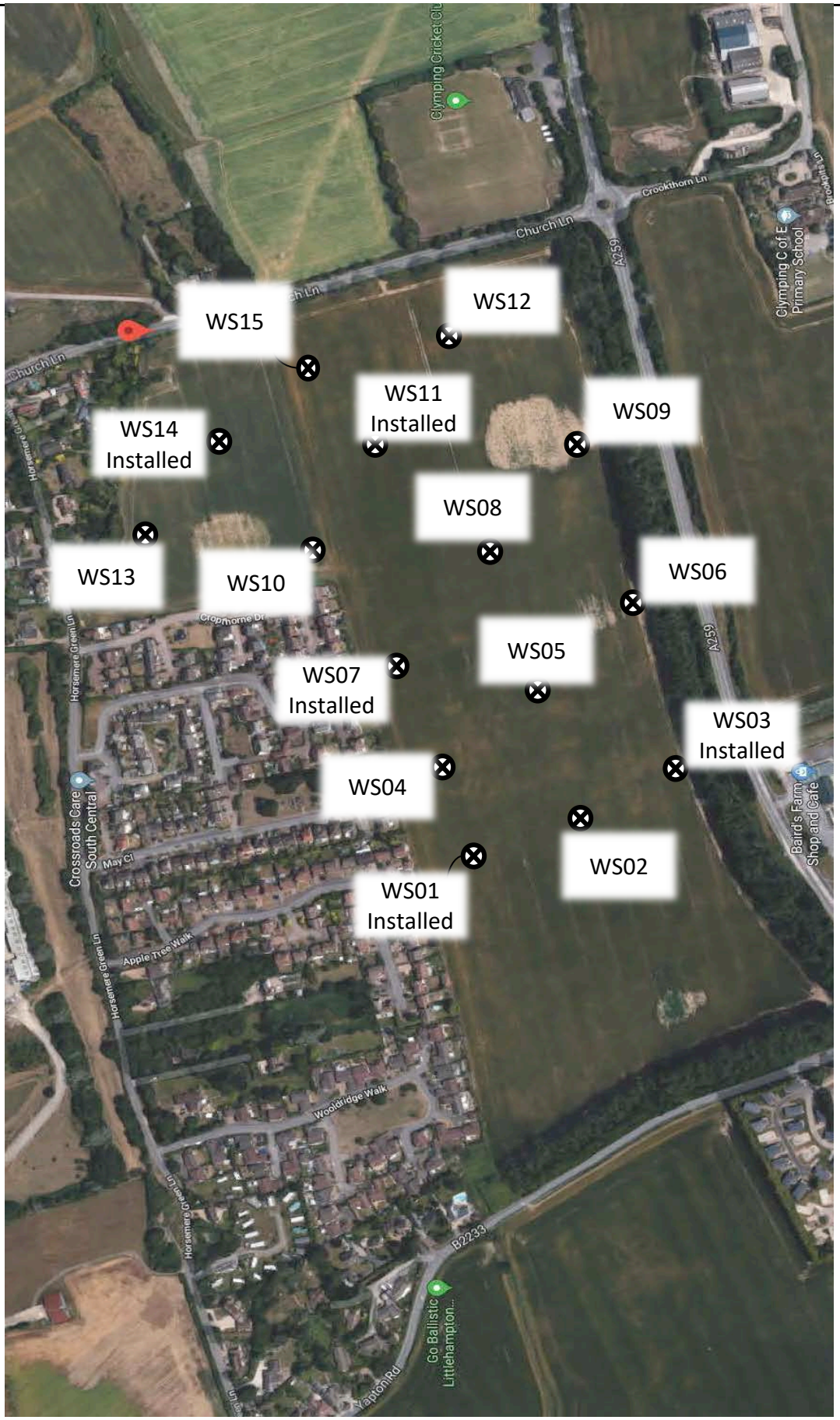
Project
LAND ADJ CHURCH LANE, CLYMPING
CONTRACT No. 2322 07.12.16

Drawing
SITE LAYOUT
OUTLINE DRAINAGE STRATEGY

| | | | |
|---|---|---|---|
| Drawn by: | MN | Date: | 07.12.16 |
| Checked by: | OH | Date: | 07.12.16 |
| Approved by: | DC | Date: | 07.12.16 |

Drawing No. 2322/01
Revision -
Drawing Scale: 1:1250 A1

# APPENDIX B: Site Investigation Plan




Title: **Investigation Location Plan**

| | | |
|---|---|---|
| Your Environment | Site Name: **Church Lane, Clymping** | Job No: **YE6619** |

# APPENDIX C: Borehole Logs

YourGeotechnical

# Borehole Log

Borehole No.
**WS01**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: 499901E - 102043N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying soft brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | 0.40 | | | Soft becoming firm brown becoming light brown silty CLAY. |
| | | 1.00 - 2.00 | C | | | | | |
| | | 1.20 | C | N=11 (2,1/2,3,2,4) | | | | |
| | | | | | 1.68 | | | Light brown slightly clayey SAND. Sand is fine to medium. |
| | | 2.00 - 3.00 | C | | | | | |
| | | 2.00 | C | N=10 (3,2/3,2,2,3) | | | | |
| | | | | | 2.35 | | | Soft light brown silty, slightly sandy CLAY becoming more sandy with depth. Sand is fine to medium. |
| | ▼ | 3.00 - 4.00 | C | | | | | |
| | | 3.00 | C | N=8 (2,3/2,2,2,2) | | | | |
| | | | | | 3.50 | | | CHALK comprised of brown mottled white clayey, gravelly SILT. Gravel is fine to medium, sub-rounded to sub-angular of flint. (LEWES NODULAR FORMATION). |
| | | 4.00 | C | N=46 (10,10/11,11,11,13) | | | | |
| | | | | | 4.45 | | | End of Borehole at 4.45m |

Remarks

Core recovery: 0-1m 90%, 1-2m 80%, 2-3m 100%, 3-4m 100%.
Installation noted to 3.00m.
Water strike at 3.00m.

AGS

YourGeotechnical

# Borehole Log

Borehole No.
**WS02**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: 499912E - 101958N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying soft brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | 0.50 | | | Soft brown becoming light brown silty CLAY. |
| | | 1.00 - 2.00 | C | | | | | |
| | | 1.20 | C | N=9 (2,2/2,2,2,3) | | | | |
| | | 2.00 - 3.00 | C | | | | | |
| | | 2.00 | C | N=9 (2,3/2,3,2,2) | | | | |
| | | | | | 2.70 | | | CHALK comprised of brown becoming white clayey, gravelly SILT. Gravel is fine to medium, angular to sub-angular of flint. (LEWES NODULAR FORMATION). |
| | ▼ | 3.00 - 4.00 | C | | | | | |
| | | 3.00 | C | N=7 (1,1/1,2,2,2) | | | | |
| | | 4.00 | C | N=40 (9,9/10,10,10,10) | | | | |
| | | | | | 4.45 | | | End of Borehole at 4.45m |

Remarks

Core recovery: 0-1m 80%, 1-2m 80%, 2-3m 90%, 3-4m 100%.
Water strike at 3.10m.

AGS

YourGeotechnical

# Borehole Log

Borehole No.
**WS03**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 499956E - 101865N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 1.00 | C | | 0.25 | | | TOPSOIL: Grass overlying soft brown silty, slightly sandy CLAY. Sand is fine. |
| | | 1.00 - 2.00 | C | | | | | Brown becoming light brown silty, slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel is occasional fine to coarse, sub-angular of flint. |
| | | 1.20 | C | N=9 (2,2/3,2,2,2) | | | | |
| | ▼ | 2.00 - 3.00 | C | | | | | |
| | ▼ | 2.00 | C | N=11 (2,3/3,2,3,3) | | | | |
| | | 3.00 | C | N=42 (10,10/10,11,10,11) | | | | |
| | | | | | 3.45 | | | End of Borehole at 3.45m |

Remarks

Core recovery: 0-1m 95%, 1-2m 750%, 2-3m 100%.
Installation noted to 3.00m.
Water stirke at 2.30m.

AGS

YourGeotechnical

# Borehole Log

Borehole No.
**WS04**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 499956E - 102067N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | 0.53 | | | Soft brown becoming light brown silty CLAY. |
| | | 1.00 - 2.00 | C | | | | | |
| | | 1.20 | C | N=10 (2,2/2,3,2,3) | 1.25 | | | Orangish brown slightly clayey, gravelly SAND. Sand is fine to medium. Gravel is fine to medium, angular to sub-angular of flint. |
| | | 2.00 | C | N=60 (4,4/7,8,15,30) | | | | |
| | | | | | 2.45 | | | End of Borehole at 2.45m |

1 2 3 4 5 6 7 8 9 10

Remarks
Core recovery: 0-1m 100%, 1-2m 85%.

AGS

YourGeotechnical

# Borehole Log

Borehole No. **WS05** Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500003E - 101979N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying brown silty, slightly sandy, slightly gravelly CLAY. Sand is fine. Gravel is occasional, coarse sub-rounded of flint. |
| | | | | | 0.70 | | | |
| | | 1.00 - 2.00 | C | | | | | Soft brown silty, slightly gravelly CLAY. Gravel is occasional, fine of mixed lithology. |
| | | 1.20 | C | N=9 (2,2/2,2,2,3) | | | | |
| | | | | | 1.75 | | | |
| | | 2.00 - 3.00 | C | | | | | Light brown slightly clayey, gravelly SAND. Sand is fine to medium. Gravel is fine, sub-angular of flint. |
| | | 2.00 | C | N=11 (3,3/3,2,3,3) | | | | |
| | | | | | 2.80 | | | |
| | | 3.00 - 4.00 | C | | | | | Soft becoming firm light brown silty, slightly sandy CLAY becoming more sandy with depth. Sand is fine to medium. |
| | ▼ | 3.00 | C | N=8 (2,2/2,2,2,2) | | | | |
| | | 4.00 | C | N=45 (10,11/11,11,11,12) | | | | |
| | | | | | 4.45 | | | End of Borehole at 4.45m |

1 2 3 4 5 6 7 8 9 10

Remarks

Core recovery: 0-1m 90%, 1-2m 70%, 2-3m 100%, 3-4m 80%.
Water strike at 3.40m.

AGS

YourGeotechnical

# Borehole Log

Borehole No.
**WS06**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: 500074E - 101898N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | 0.25 | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | 1.00 - 2.00 | C | | | | | Firm orangish brown becoming light brown silty, slightly gravelly CLAY. Gravel is occasional, fine of mixed lithology. |
| | | 1.20 | C | N=12 (2,2/3,3,3,3) | | | | |
| | | 2.00 - 3.00 | C | | 1.90 | | | CHALK comprised of light brown becoming light brown mottled white clayey, silty, sandy GRAVEL. Sand is fine to medium. Gravel is fine to medium, angular of chalk and flint. (LEWES NODULAR FORMATION). |
| | | 2.00 | C | N=14 (3,3/3,3,4,4) | | | | |
| | | 3.00 | C | N=42 (9,9/9,10,11,12) | | | | |
| | | | | | 3.45 | | | End of Borehole at 3.45m |

Remarks
Core recovery: 0-1m 100%, 1-2m 60%, 2-3m 100%.

AGS

YourGeotechnical

# Borehole Log

Borehole No.
**WS07**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500026E - 102095N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing Depth (m) | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 1.00 | C | | 0.30 | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | 1.00 - 2.00 | C | | | | | Soft becoming firm brown sandy, slightly gravelly CLAY. Sand is fine. Gravel is occasional, fine of mixed lithology. |
| | | 1.20 | C | N=8 (2,2/2,2,2,2) | | | | |
| | | 2.00 - 3.00 | C | | 2.00 | | | Light brown clayey, gravelly SAND. Sand is fine. Gravel is fine of chalk and flint. |
| | | 2.00 | C | N=14 (2,3/3,4,3,4) | | | | |
| | ▼ | 3.00 - 4.00 | C | | | | | |
| | ▼ | 3.00 | C | N=10 (2,2/2,2,2,4) | | | | |
| | | 4.00 | C | N=45 (9,11/10,13,10,12) | | | | |
| | | | | | 4.45 | | | End of Borehole at 4.45m |

Remarks

Core recovery: 0-1m 70%, 1-2m 100%, 2-3m 70%, 3-4m 100%.
Installation noted to 3.00m.
Water strike at 3.20m.

AGS

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# Borehole Log

Borehole No.
**WS08**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: 500134E - 102035N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | | | | 0.30 | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | 1.20 | C | N=11 (3,3/2,3,3,3) | | | | Soft becoming firm brown silty, sandy, slightly gravelly CLAY getting sandier with depth. Sand is fine. Gravel is occasional, fine of mixed lithology. |
| | | 2.00 | C | N=14 (3,3/3,3,4,4) | | | | |
| | | 3.00 | C | N=41 (8,9/11,10,10,10) | | | | |
| | | | | | 3.45 | | | End of Borehole at 3.45m |

1 2 3 4 5 6 7 8 9 10

Remarks
Core recovery: 0-1m 90%, 1-2m 80%, 2-3m 95%, 3-4m 100%.

AGS

YourGeotechnical

# Borehole Log

Borehole No.
**WS09**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500231E - 101956N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | 0.30 | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | 1.00 - 2.00 | C | | | | | Soft brown becoming light brown silty, slightly gravelly CLAY. Gravel is occasional, fine of flint and mixed lithology. |
| | | 1.20 | C | N=12 (3,3/3,3,3,3) | 1.80 | | | CHALK comprised of white clayey, silty GRAVEL. Gravel is fine to medium, angular to sub-angular of flint. (LEWES NODULAR FORMATION). |
| | | 2.00 - 3.00 | C | | | | | |
| | | 2.00 | C | N=9 (2,2/3,2,2,2) | | | | |
| | | 3.00 | C | N=40 (10,10/10,10,10,10) | | | | |
| | | | | | 3.45 | | | End of Borehole at 3.45m |

1 2 3 4 5 6 7 8 9 10

Remarks
Core recovery: 0-1m 100%, 1-2m 100%, 2-3m 90%, 3-4m 70%.

AGS

YourGeotechnical

# Borehole Log

Borehole No. **WS10**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500140E - 102164N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 23/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | 0.30 | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | 1.00 - 2.00 | C | | | | | Soft brown becoming light brown silty, slightly gravelly CLAY. Gravel is occasional, fine of flint and mixed lithology. |
| | | 1.20 | C | N=8 (2,2/2,2,2,2) | 1.80 | | | Light brown clayey, slightly gravelly SAND. Sand is fine to medium. Gravel is occasional, fine, angular to sub-angular of flint. |
| | | 2.00 - 3.00 | C | | | | | |
| | | 2.00 | C | N=16 (3,4/4,4,4,4) | 3.00 | | | Chalk comprised of white clayey, silty GRAVEL. Gravel is fine to medium, angular to sub-angular of flint. (LEWES NODULAR FORMATION). |
| | | 3.00 - 4.00 | C | | | | | |
| | | 3.00 | C | N=12 (3,3/2,3,3,4) | | | | |
| | | 4.00 | C | N=48 (7,9/10,10,13,15) | 4.45 | | | End of Borehole at 4.45m |

1 2 3 4 5 6 7 8 9 10

Remarks

Core recovery: 0-1m 90%, 1-2m 90%, 2-3m 80%, 3-4m 100%.

AGS

YourGeotechnical

# Borehole Log

Borehole No.
**WS11**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500229E - 102119N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 24/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | 0.40 | | | Soft brown slightly sandy CLAY. Sand is fine. |
| | | 1.00 - 2.00 | C | | 1.00 | | | Firm light brown sandy, slightly gravelly CLAY. Sand is fine. Gravel is occasional, fine of chalk, flint and mixed lithology. |
| | | 1.20 | C | N=11 (2,3/2,3,3,3) | | | | |
| | | 2.00 - 3.00 | C | | | | | |
| | | 2.00 | C | N=16 (4,4/4,4,4,4) | | | | |
| | | 3.00 | C | N=41 (9,10/10,10,11,10) | | | | |
| | | | | | 3.45 | | | End of Borehole at 3.45m |

Remarks

Core recovery: 0-1m 85%, 1-2m 90%, 2-3m 100%, 3-4m 100%.
Installation noted to 3.00m.

AGS

YourGeotechnical

# Borehole Log

Borehole No. **WS12**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500338E - 102060N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 24/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | 0.30 | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | | | | Soft brown slightly sandy CLAY. Sand is fine. |
| | | 1.00 - 2.00 | C | | 1.00 | | | |
| | | 1.20 | C | N=9 (2,2/2,2,3,2) | | | | Firm light brown sandy CLAY. Sand is fine. |
| | | | | | 1.75 | | | |
| | | 2.00 - 3.00 | C | | | | | Light brown clayey, slightly gravelly SAND. Sand is fine to medium. gravel is occasional, fine of flint. |
| | | 2.00 | C | N=12 (3,3/3,3,3,3) | | | | |
| | | 3.00 - 4.00 | C | | 3.00 | | | |
| | | 3.00 | C | N=16 (3,4/4,4,4,4) | | | | Firm light brown sandy, gravelly CLAY. Sand is fine. Gravel is fine to medium, angular to sub-angular of flint and chalk. |
| | | 4.00 | C | N=43 (9,9/10,11,11,11) | | | | |
| | | | | | 4.45 | | | End of Borehole at 4.45m |

Remarks

Core recovery: 0-1m 90%, 1-2m 100%, 2-3m 90%, 3-4m 80%.

AGS

YourGeotechnical

# Borehole Log

Borehole No. **WS13**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500156E - 102303N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 24/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | 0.75 | | | |
| | | 1.00 - 2.00 | C | | | | | Soft brown becoming light brown sandy CLAY becoming sandier with depth. Sand is fine. |
| | | 1.20 | C | N=11 (2,3/2,2,3,4) | | | | |
| | | 2.00 - 3.00 | C | | 2.00 | | | CHALK comprised of cream slightly clayey, very silty GRAVEL. Gravel is fine to medium, angular of chalk. (LEWES NODULAR FORMATION). |
| | | 2.00 | C | N=12 (3,3/3,3,3,3) | | | | |
| | | 3.00 - 4.00 | C | | | | | |
| | | 3.00 | C | N=11 (3,2/2,2,3,4) | | | | |
| | ▼ | | | | | | | |
| | | 4.00 | C | N=45 (11,12/12,11,11,11) | | | | |
| | | | | | 4.45 | | | End of Borehole at 4.45m |

Remarks

Core recovery: 0-1m 80%, 1-2m 85%, 2-3m 90%, 3-4m 100%.
Water strike at 3.60m.

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YourGeotechnical

# Borehole Log

Borehole No.
**WS14**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: 500230E - 102252N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: 24/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | 0.60 | | | |
| | | 1.00 - 2.00 | C | | | | | Firm brown becoming light brown sandy, slightly gravelly CLAY becoming sandier with depth. Sand is fine. Gravel is occasional, fine to medium of flint and chalk. |
| | | 1.20 | C | N=12 (3,3/3,3,3,3) | | | | |
| | | 2.00 - 3.00 | C | | 2.00 | | | CHALK comprised of white slightly clayey, very silty GRAVEL. Gravel is fine to medium, angular of chalk. (LEWES NODULAR FORMATION) |
| | | 2.00 | C | N=16 (3,4/4,4,4,4) | | | | |
| | | 3.00 | C | N=43 (7,9/9,11,11,12) | | | | |
| | | | | | 3.45 | | | End of Borehole at 3.45m |

Remarks

Core recovery: 0-1m 70%, 1-2m 80%, 2-3m 100%, 3-4m 100%.
Installation noted to 3.00m.

AGS

YourGeotechnical

# Borehole Log

Borehole No. **WS15**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Church Lane, Climping. | Project No. YE6619 | Co-ords: | 500307E - 102187N | Hole Type WLS |
| Location: | Littlehampton, BN17. | | Level: | | Scale 1:50 |
| Client: | Bailifscourt Estate. | | Dates: | 24/01/2019 | Logged By TJS |

| Well | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| | | 0.00 - 1.00 | C | | | | | TOPSOIL: Grass overlying brown silty, slightly sandy CLAY. Sand is fine. |
| | | | | | 0.60 | | | |
| | | 1.00 - 2.00 | C | | | | | Firm brown sandy, slightly gravelly CLAY becoming sandier with depth. Sand is fine. Gravel is occasional, fine of flint. |
| | | 1.20 | C | N=10 (2,2/2,3,2,3) | | | | |
| | | 2.00 - 3.00 | C | | | | | |
| | | 2.00 | C | N=23 (4,5/5,6,6,6) | | | | |
| | | 3.00 | C | N=45 (9,10/11,11,11,12) | | | | |
| | | | | | 3.45 | | | End of Borehole at 3.45m |

Remarks

Core recovery: 0-1m 80%, 1-2m 95%, 2-3m 100%, 3-4m 90%.

AGS

# APPENDIX D: Geotechnical Lab Results

YourGeotechnical
Chilgrove Business Centre
Chilgrove Park Road
Chichester
PO18 9HU

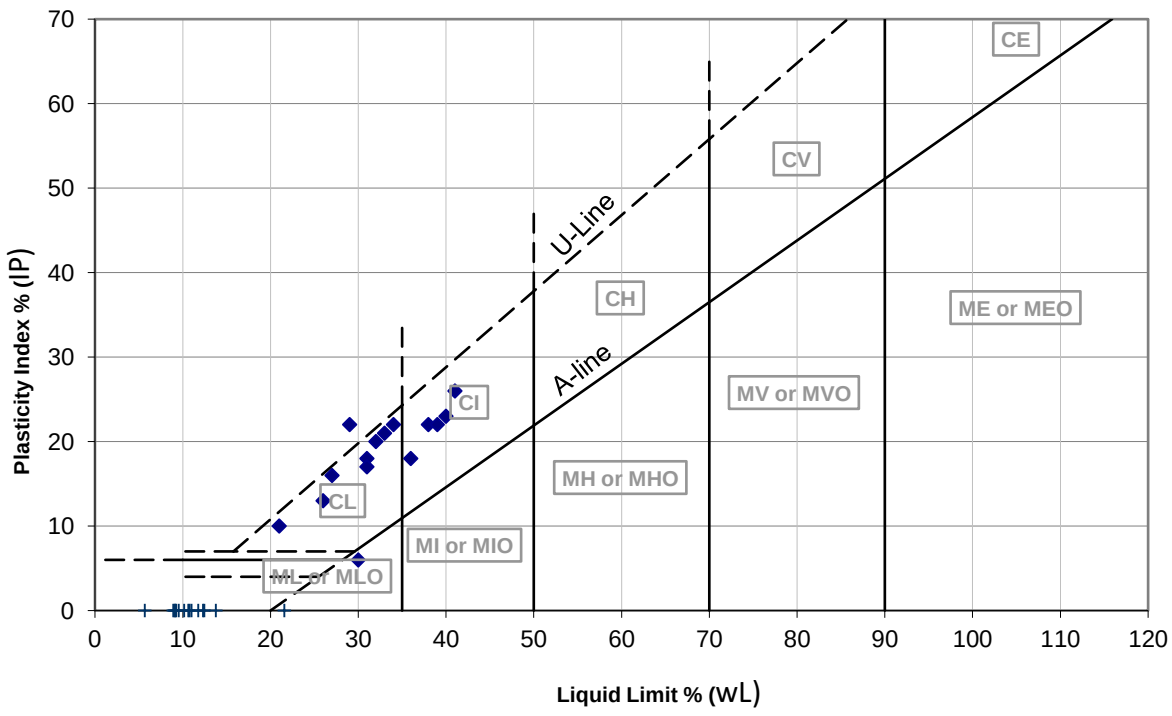
Client: Bailifscourt Estate.

| Job No: | Site: | Date: | Sheet: |
|---|---|---|---|
| YE 6619 | Church Lane, Climping. | 04/02/2019 | 1 |

## Interpretation of Moisture Content, Liquid and Plastic Limits

| Location | Depth | Moisture Content | Liquid Limit | Plastic Limit | Plasticity Index | Retained by 0.425mm | Modified ($w$) | Modified ($I_P$) | Liquidity/ Consistency | | Casagrande Class | N.H.B.C Class |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ($w$) | ($w_L$) | ($w_P$) | ($I_P$) | | ($w'$) | ($I_P'$) | ($I_L$) | ($I_C$) | | |
| | (m) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | | (%) |
| WS01 | 1.00 | 20 | 36 | 18 | 18 | 0 | 20 | 18 | 0.1 | 0.9 | C I | LOW |
| WS02 | 1.80 | 25 | 40 | 17 | 23 | 0 | 25 | 23 | 0.3 | 0.7 | C I | MEDIUM |
| WS03 | 2.75 | 21 | 31 | 13 | 18 | 0 | 21 | 18 | 0.4 | 0.6 | C L | LOW |
| WS04 | 0.50 | 17 | 27 | 11 | 16 | 11 | 19 | 14 | 0.4 | 0.6 | C L | LOW |
| WS05 | 1.50 | 16 | | | | | | | | | | |
| WS06 | 1.00 | 23 | 38 | 16 | 22 | 0 | 23 | 22 | 0.3 | 0.7 | C I | MEDIUM |
| WS07 | 1.50 | 18 | 32 | 12 | 20 | 0 | 18 | 20 | 0.3 | 0.7 | C L | MEDIUM |
| WS08 | 2.75 | 27 | 39 | 17 | 22 | 0 | 27 | 22 | 0.5 | 0.5 | C I | MEDIUM |
| WS09 | 2.80 | 27 | 29 | 7 | 22 | 0 | 27 | 22 | 0.9 | 0.1 | C? L | MEDIUM |
| WS10 | 3.75 | 28 | 30 | 24 | 6 | 0 | 28 | 6 | 0.7 | 0.3 | M L | * |
| WS11 | 0.80 | 18 | 34 | 12 | 22 | 0 | 18 | 22 | 0.3 | 0.7 | C L | MEDIUM |
| WS12 | 3.50 | 13 | 21 | 11 | 10 | 0 | 13 | 10 | 0.2 | 0.8 | C L | LOW |
| WS13 | 1.50 | 23 | 41 | 15 | 26 | 0 | 23 | 26 | 0.3 | 0.7 | C I | MEDIUM |
| WS14 | 1.80 | 16 | 31 | 14 | 17 | 0 | 16 | 17 | 0.1 | 0.9 | C L | LOW |
| WS14 | 0.80 | 17 | 26 | 13 | 13 | 0 | 17 | 13 | 0.3 | 0.7 | C L | LOW |
| WS15 | 1.50 | 18 | 33 | 12 | 21 | 0 | 18 | 21 | 0.3 | 0.7 | C L | MEDIUM |

*Clause 4.2 - D5 (b) of the NHBC Standards states that 'shrinkable soils are those...having a modified plasticity index of 10% or greater'



2531

# ANALYTICAL TEST REPORT

**Contract no:** 76457

**Contract name:** Church Lane

**Client reference:** YE6619

**Clients name:** YourGeotechnical

**Clients address:** Unit 8-10 Brockholes Business Park
Brockholes
Holmfirth
HD9 7BN

**Samples received:** 30 January 2019

**Analysis started:** 30 January 2019

**Analysis completed:** 05 February 2019

**Report issued:** 05 February 2019

**Notes:**
Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

**Key:**
U UKAS accredited test
M MCERTS & UKAS accredited test
$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing

**Approved by:** [redacted]

Karan Campbell
Director

# Chemtech Environmental Limited

# SAMPLE INFORMATION

**MCERTS (Soils):**

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones.

| Lab ref | Sample id | Depth (m) | Sample description | Material removed | % Removed | % Moisture |
|---|---|---|---|---|---|---|
| 76457-1 | WS01 | 1.50 | Sandy Clay | - | - | 14.7 |
| 76457-2 | WS03 | 2.50 | Silty Clay | - | - | 14.3 |
| 76457-3 | WS05 | 3.50 | Silty Clay | - | - | 14.3 |
| 76457-4 | WS07 | 1.00 | Silty Clay | - | - | 14.5 |
| 76457-5 | WS09 | 2.00 | Silty Clay with Gravel | - | - | 19.9 |
| 76457-6 | WS11 | 3.00 | Sandy Clay with Gravel | - | - | 10.6 |
| 76457-7 | WS13 | 0.75 | Sandy Clay | - | - | 15.9 |

# Chemtech Environmental Limited

# SOILS

| **Lab number** | | | 76457-1 | 76457-2 | 76457-3 | 76457-4 | 76457-5 | 76457-6 |
|---|---|---|---|---|---|---|---|---|
| **Sample id** | | | WS01 | WS03 | WS05 | WS07 | WS09 | WS11 |
| **Depth (m)** | | | 1.50 | 2.50 | 3.50 | 1.00 | 2.00 | 3.00 |
| **Date sampled** | | | 28/01/2019 | 28/01/2019 | 28/01/2019 | 28/01/2019 | 28/01/2019 | 28/01/2019 |
| **Test** | **Method** | **Units** | | | | | | |
| pH | CE004 M | units | 7.2 | 7.3 | 7.4 | 7.3 | 7.7 | 7.8 |
| Sulphate (2:1 water soluble) | CE061 M | mg/l $SO_4$ | <10 | <10 | <10 | 16 | <10 | <10 |
| Sulphate (2:1 water soluble) | CE061 M | g/l $SO_4$ | <0.01 | <0.01 | <0.01 | 0.02 | <0.01 | <0.01 |
| Sulphate (total) | CE062 M | mg/kg $SO_4$ | 120 | 134 | 109 | 156 | 290 | <100 |
| Sulphate (total) | CE062 M | % w/w $SO_4$ | 0.01 | 0.01 | 0.01 | 0.02 | 0.03 | <0.01 |
| Sulphur (total) | CE119 | % w/w S | <0.01 | 0.02 | <0.01 | <0.01 | 0.22 | 0.05 |

# Chemtech Environmental Limited

# SOILS

| | | | |
|---|---|---|---|
| **Lab number** | | | 76457-7 |
| **Sample id** | | | WS13 |
| **Depth (m)** | | | 0.75 |
| **Date sampled** | | | 28/01/2019 |
| **Test** | **Method** | **Units** | |
| pH | CE004 M | units | 7.5 |
| Sulphate (2:1 water soluble) | CE061 M | mg/l $SO_4$ | <10 |
| Sulphate (2:1 water soluble) | CE061 M | g/l $SO_4$ | <0.01 |
| Sulphate (total) | CE062 M | mg/kg $SO_4$ | 183 |
| Sulphate (total) | CE062 M | % w/w $SO_4$ | 0.02 |
| Sulphur (total) | CE119 | % w/w S | 0.02 |

# Chemtech Environmental Limited

# METHOD DETAILS

| METHOD | SOILS | METHOD SUMMARY | SAMPLE | STATUS | LOD | UNITS |
|---|---|---|---|---|---|---|
| CE004 | pH | Based on BS 1377, pH Meter | Wet | M | - | units |
| CE061 | Sulphate (2:1 water soluble) | Aqueous extraction, ICP-OES | Dry | M | 10 | mg/l $SO_4$ |
| CE061 | Sulphate (2:1 water soluble) | Aqueous extraction, ICP-OES | Dry | M | 0.01 | g/l $SO_4$ |
| CE062 | Sulphate (total) | Acid extraction, ICP-OES | Dry | M | 100 | mg/kg $SO_4$ |
| CE062 | Sulphate (total) | Acid extraction, ICP-OES | Dry | M | 0.01 | % w/w $SO_4$ |
| CE119 | Sulphur (total) | Acid extraction, ICP-MS | Dry | | 0.01 | % w/w S |

# Chemtech Environmental Limited

# DEVIATING SAMPLE INFORMATION

**Comments**
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

**Key**

| | |
|---|---|
| N | No (not deviating sample) |
| Y | Yes (deviating sample) |
| NSD | Sampling date not provided |
| NST | Sampling time not provided (waters only) |
| EHT | Sample exceeded holding time(s) |
| IC | Sample not received in appropriate containers |
| HP | Headspace present in sample container |
| NCF | Sample not chemically fixed (where appropriate) |
| OR | Other (specify) |

| Lab ref | Sample id | Depth (m) | Deviating | Tests (Reason for deviation) |
|---|---|---|---|---|
| 76457-1 | WS01 | 1.50 | N | |
| 76457-2 | WS03 | 2.50 | N | |
| 76457-3 | WS05 | 3.50 | N | |
| 76457-4 | WS07 | 1.00 | N | |
| 76457-5 | WS09 | 2.00 | N | |
| 76457-6 | WS11 | 3.00 | N | |
| 76457-7 | WS13 | 0.75 | N | |

# APPENDIX L:
# PileDesigns Geotechncial Expertise Technical Note

[redacted]

PILEDESIGNS
GEOTECHNICAL EXPERTISE

# Technical Note

**To:** Alex Stratford (Ground & Water)
**cc:**
**From:** Samuel Akinola (Piledesigns Limited)
**Date:** 22th July 2024
**Project:** 27481 – Climping - Land adjacent to Church Lane, West Sussex, BN17 5GG

## Pile Capacity Assessment

This Technical Note (TN) provides an assessment of the pile design resistances at the proposed development at the land adjacent to Church Lane, Climping, West Sussex. It is understood that the proposed development comprises of the of construction of multiple new residential dwellings.

Piledesigns Limited has been appointed by Ground & Water to undertake a review of pile capacities. At the time or writing no pile loads are currently available and we have provided approximate capacities for 300mm, 350mm and 450mm diameter auger bored piles.

The design has been carried out in accordance with BS EN 1997 and other relevant documents.

## Ground Conditions

Information in the ground conditions have been taken from the Ground & Water Borehole logs (Ref: GWPR6003) dated 21/05/2024. This site investigation comprised records of seven cable percussive boreholes which were shown to extend to a maximum depth of 20mBGL (metres below ground level.

The general sequence of strata found during the investigation comprised of made ground overlying River Terrace Deposits and in turn Undifferentiated Chalk - Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk and Portsdown Chalk Formation with depth.

The River Terrace Deposits were generally composed both cohesive and granular parts. The cohesive part was proven to a maximum depth of 5.2mBGL and generally described as brown, grey gravelly sandy Clay and were encountered in all exploratory hole. The granular part was proven to a maximum depth of 6.7mBGL and generally described as brown, grey, yellow, gravelly clayey Sand and encountered in only BH1-2 and BH6.

The Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk and Portsdown Chalk Formation was recorded as an off white, cream, brown gravelly sandy Silt. For preliminary assessment the Chalk has been assumed from a maximum depth of 7.0mBGL.

Groundwater strikes were encountered between 3.0m-6.0mBGL during the site investigation work. For design purpose we have modelled groundwater at 3.0mBGL.

Note that solution features can be typical of some chalk stratum it is understood that whilst they haven't specifically been identified during site works, they cannot be discounted. The design is based on a seven

borehole and the depth to Chalk could vary across the site. There is a residual risk that dissolution features could be encountered in the construction phase, identified by voiding or locally loose soil.

A summary of the soil profile and geotechnical test results are presented in the Appendices.

## Ground Model

It is assumed that works will be carried out from approximately borehole commencement level. A single ground model has been taken which is outlined in Table 1 below.

**Table 1: Ground Model**

| Depth (mBGL) | | | Soil |
|---|---|---|---|
| 0.0 | to | 2.5 | Made Ground and potentially desiccated Clay |
| 2.5 | to | 7.0 | River Terrace Deposits |
| 7.0 | to | -- | Undifferentiated Chalk Formation |

For design purpose we have modelled groundwater at 3.0mBGL

## Geotechnical Assessment

All piles have been designed to derive their bearing capacity from shaft and end bearing within the Chalk. Positive shaft friction within the made ground and upper cohesive deposits up to a maximum depth of 2.50mBGL which has been ignored to account for heave, deeper made ground deposits and or material above cut off level.

## Concrete Aggressivity

C28/35 concrete has been used in the structural analysis and is sufficient for the pile actions. In the absence of relevant testing sulphate conditions are unknown.

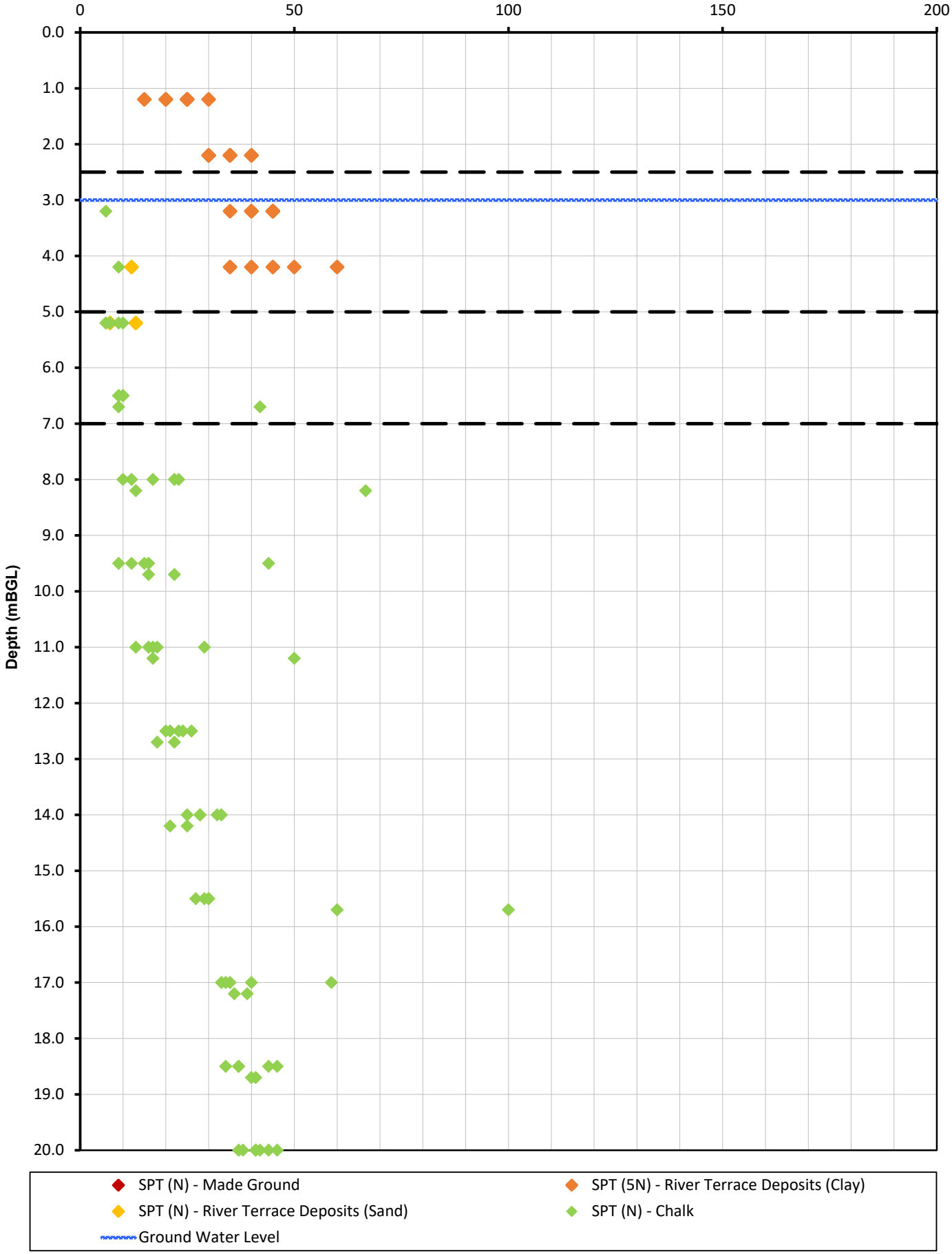
# Appendix A

# Soil Profile, Geotechnical Tests Results

PILEDESIGNS
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| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Climping- Land adjacent to Church Lane | | | **Date:** | 22/07/2024 |
| **Project No:** | 27481 | **Drawn by:** | SA | **Rev:** | TA1 |

**All against depth for all boreholes**

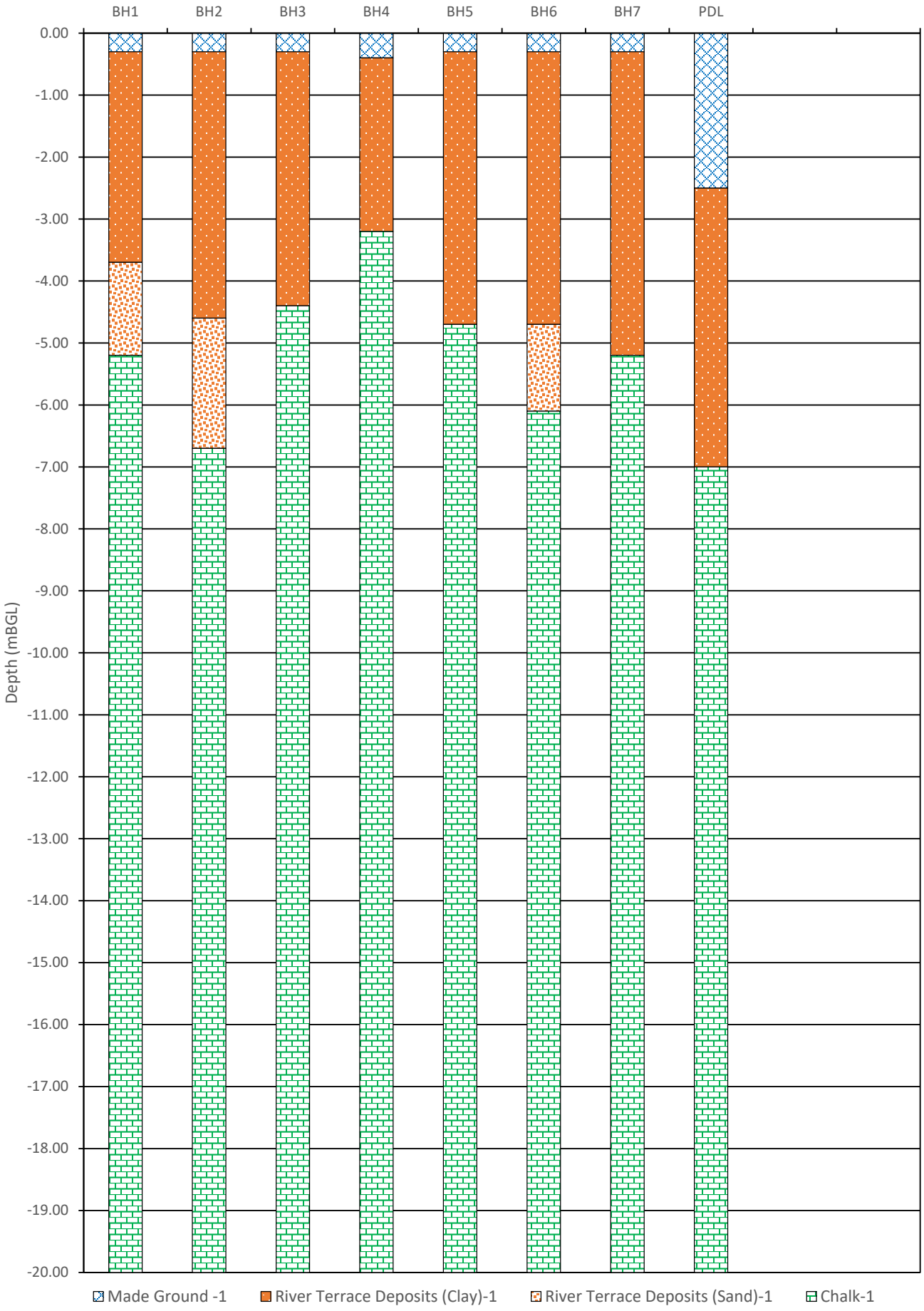


PILEDESIGNS
GEOTECHNICAL EXPERTISE

**Project Name:** Climping- Land adjacent to Church Lane **Date:** 22/07/2024

**Project No.** 27481 **Drawn by:** SA **Rev:** TA1

## Borehole Profile



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# Appendix B

# Summary of Allowable Pile Capacities

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| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Climping - Land adjacent to Church Lane | | | **Date:** | 16/07/2024 |
| **Project No:** | 27481 | **Drawn by:** | SA | **Rev:** | TA0 |

**F.rep Design Resistance [Based upon 80/20 dead live spilt and FoS of 1.5 on pile shaft]**

