Abbeydale
Building Environment Consultants

SITE INVESTIGATION REPORT

A628 DODWORTH ROAD CROSSROADS, BARNSLEY

SOUTH YORKSHIRE

Report 151069SI December 2018

Client:
Design and Transportation
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DOCUMENT VERIFICATION

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SUMMARY

Site Grid Ref:	432713E 406242N	**Site Level (m AOD)**	144	**Site Area (Ha)**	7
Development proposed:	New Highway.				
Past site development:	Clay pits infilled and then use as recreational grounds				
Ground Conditions	**Made Ground:**	Mainly granular made ground encountered to a max depth of 11.40m bgl.			
	Superficials:	Not encountered.			
	Bedrock:	Mudstone bedrock encountered from shallowest depth of 2.20m bgl.			
	Shallowest coal:	Thin Coal encountered at 3.00m bgl.			
	Groundwater:	Groundwater encountered at 7.50m and 9.00m bgl in deeper boreholes.			
	Ground Improvement:	Options for grouting, stone columns and geo-grid discussed.			
Drainage:	Off-site drainage required due to made ground.				
Gas protection:	Basic Radon and gas protection measures required in any confined spaces.				

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1. INTRODUCTION

On the instruction of Barnsley Metropolitan Borough Council (BMBC), a site investigation was carried out by Abbeydale Building Environment Consultants Ltd on a site adjacent to the crossroads between Dodworth Road and Pogmoor Road/Broadway, in Barnsley, South Yorkshire.

The site is located on the west side of Barnsley and is centred on National Grid Reference 432713E 406242N at approximately 144m AOD. See Fig 1. The site covers an area of approximately 7 Ha.

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The comments and recommendations presented in this site investigation report are based on the findings of a review of available information; ground conditions encountered during the intrusive investigation work and the laboratory testing results. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

When writing this report the proposed development was for a new highway scheme at, or close to, existing ground levels. If there are changes to these proposals, then some modification to the comments and recommendations given may be required.

A previous Desk Study was produced by Abbeydale BEC, Ref 151069DS dated October 2017. Where relevant, information from this Desk Study has been used in the production of this report.

2. OBJECTIVES

This report has been undertaken to evaluate current or former uses of the site and surrounding areas to determine the presence of any potential contaminative sources. As part of this evaluation the potential impact upon the identified receptors has been made, thus determining if there are any potential significant pollutant linkages present. If a potential significant pollutant linkage is identified, the report gives recommendations for further investigations and / or remediation.

The report also evaluates the current site proposals (where known) with regard to geotechnical and engineering considerations to determine what impact the existing ground conditions will have on the integrity of the proposed highway. As part of this evaluation the report gives foundation, highway and drainage recommendations.

3. THE SITE

As part of the previous Phase 1 Desk Study assessment, a site walkover was undertaken on the 30th of October 2017, to determine the presence of any visually identifiable features that may pose a risk to future site users. The proposed highway is to be constructed on a rectangular shaped parcel of land located on the north side of the crossroads between Pogmoor Road and Dodworth Road/Broadway and covering approximately 7 Ha. See Fig 2.

The site is currently occupied by Penny Pie Park, with a children's play area and artificial sports pitch located toward the northwest corner of the site. An electricity substation is located within the park, just to the north of the crossroads. The sites surface is covered by grass and is undulating, especially in the eastern part of the site where the ground is hummocky.

There was no visual or olfactory evidence at the surface of any contamination, distressed vegetation or any potentially contaminating sources noted on site, externally to any buildings.

The site is bound to the west by Pogmoor Road/Broadway, and to the south by Dodworth Road. Beyond these roads, and to the east of the site, are residential houses. To the north of the site is a railway line. The park is outlined by mature trees along most of its perimeter.

Ground levels across the site, while hummocky, are essentially level with a slight slope towards the east.

4. HISTORY

The historic Ordnance Survey maps of the site and surrounding area, appended, have been obtained from a GroundSure EnviroInsight report, dated September 2017.

The Site
The earliest OS map of 1855 shows the site to be largely unoccupied, consisting of open fields. Dodworth Road is situated in its present day location, intersected by a footpath in the position of the present day Pogmoor Road/Broadway. A sandstone quarry is shown in the south eastern corner of the site, just to the south of Dodworth Road. Adjacent to the northern site boundary is a railway line.

It is understood anecdotally that between 1861-1872 White Hill or Penny Pie Colliery was located within the site boundary, assumed to be centred around the two shafts

seen on the 1893 map. Due to the dates of the maps available, this colliery does not appear on any of the OS maps, so it is not known where the colliery buildings were located.

The next map, dated 1893, shows the site to be occupied by a brick works. This is located against the northern site boundary, with a branch line from the railway line leading to the brick works. To the south and east of the brick works two clay pits are labeled, which occupy most of the site between the brickworks and Dodworth Road to the south. A tramway is shown which connects the clay pits to the brick works. Two old shafts are also shown in the centre of the site.

The map of 1906 shows the clay pits and tramway have extended, with the tramway now shown to pass underneath Dodworth Road to a new pit in the southeast corner of the road. The map of 1931 shows the clay pits to have extended further east and south, beyond the site boundary, and the tramway has been repositioned and now passes beneath Dodworth Road further west than it did previously. Several houses are shown along the south side of Dodworth Road, adjacent to the crossroads.

The map of 1956 shows the beginning of the closure of the brickworks, with the tramway and western clay pits no longer shown on the maps. By the 1960 map, the buildings associated with the brick works have been removed, and the portion of the site to the northeast of the crossroads appears to have been infilled, with no clay pits shown. It is understood anecdotally that the clay pits on site were backfilled with domestic waste. The two old shafts in the centre of the site are still shown, and are now labeled as disused. The branch line from the main line to the south has also been removed. In the south east corner of the site, south of Dodworth road, disused clay pits are still shown. The entrance road into the brick works from Dodworth Road is still shown. At this time, Pogmoor Road and Broadway have been constructed.

The next map, dated 1969 shows a filling station on the south side of Dodworth Road, in the southeast corner of the site. To the south of this filling station, the former clay pits are labeled as a refuse tip. An electricity substation is also shown just north of the crossroads, on the east side of Pogmoor Road. The 1978 map shows that factories have been built on the refuse south of the filling station. A model railway is shown towards the north of the site with a few new buildings adjacent. The two shafts in the centre of the site are no longer shown. On the 1991 map, the area to the northeast of the cross roads is labeled as recreation grounds, with trees located along Pogmoor Road and Dodworth Road. The crossroads have also been modified and enlarged slightly, with a left turn lane from Broadway west onto Dodworth Road.

The map of 2000 no longer shows the model railway. The most recent map dated 2017 shows the filling station to have been removed and replaced with a car park which serves a school to the south.

Surrounding Area

The earliest map of 1855 shows the area surrounding the site to be largely unoccupied, consisting of open fields. Several footpaths are shown along the boundaries of fields, including footpaths which later will become Pogmoor Road and

Broadway. A well is shown around 50m west of the site. A railway line is shown immediately north of the site.

The map of 1893 shows several old shafts beyond the site, in addition to the two labeled within the site. Two shafts are shown around 150m west of the site, with another shown 100m east of the site. Further clay pits associated with Summer Lane brick works are shown 200m east of the site, at the other side of the railway line.

On the map of 1931, additional shafts are shown 125m east of the site. Summer Lane brick works is now labeled as a refuse site. Residential houses have begun to appear along Dodworth road to the southwest of the site. The map of 1932 shows Farmhouse Colliery 500m north of the site, with a drift mine entry labeled. On the 1938 map, residential housing can be seen spreading east from Barnsley centre, towards the site. Several of the footpaths around the site have become roads, including Broadway and Pogmoor Road (initially named West End Road). Farmhouse Colliery to the north of the site is now labeled as disused.

The map of 1960 shows housing to have been built on three of the four sides of the cross roads, with the exception of the northeast side. Additional housing has also been built to the east of the site along Dodworth Road, in the area of the former shafts. The map of 1977 shows that factories have been built to the south east of the site, in the area of the former clay pits. The 1983 map shows housing to have been built in the area of Farmhouse Colliery. The continued spread of housing from the centre of Barnsley has now reached the site, with the majority of the area surrounding the site now consisting of residential housing.

The most recent map, dated 2017, shows the removal of the warehouses to the southeast of the site, and the construction of the school and car park.

5. GEOLOGY

The Geological Survey maps of the area, BGS Sheet 87, Sheet SE30NW and Yorkshire County Series Sheet 274NE have been examined along with the memoir of the area. No drift deposits are shown within the site area indicating bedrock to be present under a residual soil.

The solid geology is recorded as the Middle Coal Measures of the Carboniferous period, dipping gently to the northeast at ~5°. The site is found at a stratigraphic level between the Dunsil Coal and the Barnsley Coal.

A geological fault is shown running through the centre of the site, trending northeast-southwest. Strata are downthrown to the southeast.

6. HYDROGEOLOGY

The Environment Agency (EA) indicate the bedrock is indicated to form a secondary A aquifer (formerly minor aquifer). The site is located within a high Groundwater vulnerability zone.

The site is not located within a groundwater source protection zone and there are no recorded licensed drinking water abstractions within 250m of the site.

The nearest surface water feature is an unnamed watercourse approximately 500m to the south of the site. The exact hydraulic gradient is unknown, however it is believed to have a gentle gradient towards the unnamed watercourse.

The site is located within EA Flood Risk Zone 1.

Relevant EA maps can be found appended to the desk study.

7. MINING AND QUARRYING

The presence of rock and mineral seams, including coal, which may have been mined or quarried in the area has been determined from the published geological maps, the memoir of the area and a South Yorkshire Mining Advisory Service (SYMAS) report, dated August 2017.

The geological maps show two coal seams outcropping within the site boundary. To the west of the site, trending roughly north-south, the Dunsil Coal is shown to outcrop. The Dunsil Coal is shown to outcrop to the south of the fault running through the site.

The Dunsil seam is indicated to range in thickness from 0.45 to 0.80m in thickness, and the SYMAS report states the seam to typically be 0.60m thick. Using a dip of 5°, the seam is anticipated to underlie the site from outcrop in the west to around 21m bgl to the east of the site.

A thin coal is also shown to outcrop towards the centre of the site, trending roughly north-south. Unlike the Dunsil Coal, this outcrop is shown on both sides of the geological fault. A further thin coal is shown to outcrop around 50m west of the site.

The SYMAS report states that Shallow Coal workings are considered a negligible risk to the proposed scheme as the seams mentioned above are of inferior quality. The Coal Authority interactive viewer agrees with the above, showing the Dunsil seam not to be associated with probable shallow coal mine workings.

Two shafts are located within the site boundary. These are associated with the former Penny Pie Colliery. The shafts are located 35-40m from the proposed highway. The SYMAS report states that abandonment plans show the shafts were sunk to 39m bgl to the Swallow Wood Coal seam. The SYMAS report understands the shafts to be in

ownership of BMBC, and that the shafts are known to have been treated, although details about the shaft caps are unknown.

The majority of the site is shown in the past to have been occupied by clay pits. The SYMAS report suggests that these pits were likely less than ~7.3m in depth.

8. ENVIRONMENTAL ENQUIRY

A GroundSure EnviroInsight report, dated September 2017, indicates that there are three historic landfill sites present on site, with an additional three recorded licensed landfill sites within 250m of the site.

The EnviroInsight report also highlights the presence of a former petrol station within the site boundary, which was located in the area of the present day school carpark, to the south of Dodworth Road. This petrol station closed in 1999.

The relevant GroundSure pages and maps are appended to the previous desk study.

9. FIELDWORK

Fieldwork was undertaken on the 5th, 6th, 8th and 29th of November, and also as the 11th of December, in general accordance with Eurocode 7, CLR 11, BS 5930:2015 and BS 10175. The conceptual site model formulated as part of the Phase 1 desk study has guided the type of investigative method chosen, to ensure that potential pollutant linkages and / or previously highlighted gaps in information are covered.

The relative ground levels and positions of the exploratory holes were assessed relative to existing features on site using a tape measure. See Fig 2 and 3. The investigation was restricted slightly by trees located around the perimeter of the park.

Four trial pits (TP1 to TP4) were excavated by a CAT 432 mechanical backhoe excavator with a 0.60m wide toothed bucket to depths of between 3.30m and 4.00m bgl. The trial pits were logged by our Geotechnical Engineer from the arisings and from examination of the sides and base of the pits from the surface. An assessment of the excavatability of the ground encountered and the stability of the pits was also recorded. Small disturbed samples were taken at regular intervals. The details of strata encountered are given within the individual logs attached to this report. On completion of site work, disturbed samples were returned to ABEC Ltd office for subsequent testing.

Thirteen window sample holes (WS1 to WS13) were carried out, to depths of between 3.00m and 5.45m bgl, using a tracked window sample rig. Small disturbed samples were taken at regular intervals. In addition, where required, SPTs were carried out at metre intervals using a 50mm split spoon sampler with a 70° taper driven using a 63.5kg hammer dropping through 750mm. The blow counts are recorded for every 75mm driven. The details of strata encountered are given within the individual logs

attached to this report. On completion of site work, disturbed samples were returned to ABEC office for subsequent testing.

Fifteen dynamic probe holes (DP1 to DP15) were carried out in accordance with the SRS15 test given in the German Standard DIN 4904. The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 36mm diameter rods driving a superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100) to refusal at depths of between 4.90m and 10.60m bgl.

Three 150mm diameter light cable tool percussion boreholes (BH1 to BH3) were advanced to depths of between 6.20m and 11.90m bgl. Standard Penetration Tests (SPTs) were carried out in accordance with the method outlined in BS 5930:1999 to provide an indication of the in-situ relative density and consistency of strength for the stratum present and also to obtain samples. During the course of boring, disturbed samples of each stratum were recovered at intervals for identification and classification purposes.

Gas monitoring standpipes (32mm diameter) were installed in WS1, WS6, WS7, WS8, BH1, BH2 and BH3 with the remainder of the holes backfilled with arisings. Gas monitoring using a Gas Data LMSxi gas monitor has been carried out, with the results recorded in Table 3.

10. LABORATORY TESTING

Laboratory testing was carried out by PSL in accordance with current BS 1377 and the results are summarised in Table 1, Fig 7 and Fig 8. Samples were also sent to ChemTech for chemical testing. See Table 2A to 2D. Testing methods are recorded on the results sheets provided. Test results are appended.

11. GROUND CONDITIONS

The ground conditions encountered are recorded in detail within the trial pit and window sample logs, and are summarised on a section, Fig 3. Any diagram of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed critical.

Across the site, grass covered topsoil was encountered from the surface. This generally consisted of loose light brown clay slightly gravelly sand, containing fragments of sandstone. The topsoil had a maximum thickness of 0.50m in BH1.

Beneath the topsoil, the majority of exploratory holes encountered granular made ground generally comprising loose to very loose slightly clayey sandy gravel, containing fine to coarse gravel of coal, red shale, mudstone, sandstone, glass, wood, plastic, brick, pottery, metal and fabric. Over the site, this made ground was generally very similar, although local variations were observed. This made ground was found to

a maximum depth of 11.40m in BH3 located towards the centre of the indicated position of the eastern clay pit.

SPT tests within this granular made ground generally gave N values ranging from 1-10, with the majority of values below 4, equating to very loose. Occasional high N values, such as an N value of 42 at 1.00m bgl in WS8. These have been interpreted to represent cobbles or possible boulders within the made ground.

To highlight the local variations in composition, constituent tests were undertaken on selected samples of the granular made ground. See Fig 9. The sample from BH2 at 2.50-3.00m bgl contained 0.71% of cloth/leather/fabric and 1.99% metal/glass/ceramics with the remaining 97.29% consisting of fine material (<10mm). The sample from BH3 at 8.00-9.00m contained 3.67% metal/glass/ceramics, 0.04% wood/roots and 1.61% coarse inert particles, with the remaining 94.68% consisting of fine material (<10mm). The sample from BH2 at 5.50-6.00m bgl contained 0.52% of cloth/leather/fabric and 0.61% metal/glass/ceramics and 46.13% coarse inert particles with the remaining 52.74% consisting of fine material (<10mm).

CBR testing on the granular made ground shows that a CBR value of 3% can be achieved provided the moisture content is kept below 27%. See Fig 7a/c.

DP11, DP13 and DP3 were carried out on the southern and western edges of the park, adjacent to the highway. These encountered the granular made ground to depths of 3.80m, 4.90m and 5.30m bgl respectively.

In WS8, TP3 and TP2 located towards the northern edge of the site, made ground was encountered beneath the granular made ground described above. This made ground comprised extremely weak mudstone to stiff clay containing gravel of mudstone, ironstone, brick and coal. This made ground has been interpreted as colliery discard, associated with the former colliery located on-site. The colliery discard was located from a minimum depth of between 1.20m bgl in TP3 to 3.30m bgl, and to a maximum depth ranging from 3.00m in TP3 to 5.00m in DP5 and DP7. Plasticity testing in this colliery discard in TP2 at 3.20m gave a moisture content of 28%, a liquid limit of 60%, a plastic limit of 27% and a modified plastic limit of 31.02%.

CBR testing on the colliery discard shows that a CBR value of 3% can be achieved provided the moisture content is kept below 25%. See Fig 7b.

TP1, located in the northwestern corner of the site adjacent to the playground, encountered natural cohesive ground beneath the granular made ground from 2.20m bgl. This consisted of very stiff orange and grey mottled clay containing lithorelics of mudstone. TP1 was then extended eastwards to locate the edge of the infilled clay pit, which was located at the location of TP1b. The natural clay was seen to dip towards the east with an approximate slope angle of 1:1 (v:h), indicating the edge of the infilled clay pit. This clay had a moisture content of 27%, a liquid limit of 84%, a plastic limit of 34% and a modified plastic limit of 48.50%.

Coal seams were encountered in TP1 between 3.00m and 3.20m bgl, and in TP3 between 3.00m and 3.30m bgl. The coal was recovered as gravel and cobbles sized

cuboids with slight orange staining on some faces. Due to the location of the fault and the mapped seam outcrops, the coal encountered in TP1 and TP3 is likely a thin unnamed coal shown to outcrop in the centre and to the west of the site.

Beneath the made ground, mudstone bedrock was encountered. The mudstone comprised extremely weak brown mudstone, recovered as slightly clayey gravel. The shallowest mudstone was encountered at 2.70m bgl in WS9, while the deepest bedrock was encountered at 11.40m bgl in BH3. Fig 6 shows the depth at which the base of the made ground was encountered, and shows how the clay pits appear to a cover a greater extent of the site than shown on historic maps.

Groundwater was only encountered in two of the exploratory holes, at 7.50m in BH2 and at 9.00m in BH3.

In accordance with NHBC Ch 4.2, the natural clay on the site can be classified as high shrinkable, while the colliery discard can be classified as medium shrinkable.

12. ENVIRONMENTAL ASSESSMENT

12.1 General

Contaminated land is defined under law through Part IIA of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995. This supports a 'suitable for use' based approach to the risk assessment of contaminated land. The evaluation is based upon an assessment of plausible pollutant linkages, referred to as the **contaminant - pathway - receptor** model, based upon the current or proposed use of the site.

A **pollutant linkage** is the relationship between a contaminant, a pathway and a receptor, unless all three elements are present a potential pollutant linkage does not exist.

Part IIA states for land to be considered contaminated by the local authority in whose area it is situated it needs to be in such a condition, by reason of substance in on or under the land that :

1. Significant harm is being caused or there is significant possibility of such harm being caused.
2. Pollution of controlled waters is being or is likely to be caused.

12.2. Proposed Site Use

The current development proposal for the site is for a new highway. This end-use is classified as low sensitivity. Future site users will have no direct contact with garden soil materials and will not be exposed indirectly to contaminants through uptake by any vegetables grown in the gardens.

12.3 Contamination Assessment

12.3.1 Exploratory Hole Locations and Sampling Strategy

As no specific source of contamination had been identified from the Phase 1 Conceptual Site Model, generally non-targeted exploratory hole locations and sampling were employed.

The sample depths taken were based on professional judgment, the materials encountered or at regular depths, or a combination of all three. The sampling depths took into account the final site levels (where known), the likely source of contamination (if previously identified) and the likely receptor(s).

12.3.2 On-Site Contamination

The potential risk of contamination on the site has been assessed by reference to the tables in Appendix A.

The site is shown in historic records to have been occupied by infilled clay pits with a high risk of contamination. There was no visual or olfactory evidence of contamination observed during the intrusive investigations. Although no evidence of contamination was observed on site, the made ground has been highlighted as the most likely potential source of contamination, therefore a significant percentage of our laboratory testing focused on these materials.

Soil chemical testing (see Tables 2a and 2b) indicate that several values are above the Suitable for Use Levels (S4ULs) for an end use of public open space. Arsenic and Beryllium elevations were found in BH1, TP1, WS1 and WS3. Elevations in Dibenzo(a,h)Anthracene, Benzo(a)Pyrene and Benzo(b&k)Fluoranthene were found in TP1, TP3, WS1, WS11, and WS7. The elevated sulphate found will not be of concern to human health, but will require protection as discussed in Section 11.7.

Soil leachate results (see Tables 2c and 2d) indicate that several metal values are above the Environmental Quality Standards (EQS) but below the Water Supply Regulations (WRS). These are Arsenic, Chromium (Total), Copper and Vanadium in TP1, WS2, WS4 and WS11. In addition, several leachable PAH species were found to be above guideline values. These were Fluorene, Phenanthrene, Pyrene, Acenapthene, Anthracene, Naphthalene and Fluoranthene in TP1, WS1, WS2, WS4 and WS11. The limit of detection for Benzo(a)Pyrene, Benzo(b&k)Fluoranthene, Indeno(1,2,3-cd)Pyrene, Benzo(g,h,i)Perylene are above the guideline values, however all results were below the limit of detection. There is no published guideline value for sulphide, and the laboratory detection limits for phenols are above the EQS level. However, both recorded values below the detection limits.

Test results show several contaminant species in both the topsoil (WS2/0.10m, WS4/0.10m, WS1/0.10m, TP3/0.20m) and the underlying made ground (TP1/0.80m, WS11/0.60m, WS1/1.20m, WS3/1.20m, WS7/0.70m).

12.3.3 Off-Site Contamination

In addition to the infilled clay pits found on-site, a further three landfill sites are located with 250m of the site.

A summary of potential sources of off-site contamination is given in Fig 5.

12.3.4 Potential Receptors

- Future site users.
- Vegetation.
- Ecological Systems.
- Construction workers.
- Livestock.
- Surface water.
- Groundwater.
- Buildings/substructures.
- Adjacent site users.

12.3.5 Potential Pathways

- Dermal contact (indoor & outdoor).
- Ingestion of soil and indoor dust.
- Indirect ingestion (indoor & outdoor).
- Inhalation of dust (indoor & outdoor).
- Inhalation of vapours (indoor & outdoor).
- Leaching to groundwater.
- Surface water run-off.
- Direct contact with substructures.
- Migration through the ground (vertical and horizontal).

12.4 Ground Gas

BGS Maps confirm the lower Coal Measures recorded as a having a low to moderate potential for radon and gas emissions. Therefore, **basic** protective measures are required in enclosed spaces, but in open highway areas no precautions are anticipated to be required.

The post investigation gas monitoring (see Table 3) gives rise to a Gas Screening Value (GSV) of 0.312l/h, based on the highest recorded carbon dioxide level (12%) and the highest recorded flow rate (2.6l/h), in accordance with CIRIA 665. Although the GSV is within the range for CS1, as the CO_2 is above 5%, the site must be categorized as CS2 in accordance with CIRIA 665 and NHBC guidance. This equates to a **low** risk.

12.5 Flood Risk

A previous Flood Risk Assessment report was carried out by ABEC in July 2018, Report Ref: 151069FR. This report sumarised that the site had a low risk of being flooded or causing flooding.

12.6 Invasive Species

The existing vegetation in and around the site has been examined. No obvious signs of Japanese Knotweed or other invasive plants were visible. However, because Japanese Knotweed could have been surface stripped or weedkiller applied to the stems prior to a site visit, not seeing the weed during our time on site cannot be a guarantee that it is not present on or around the site.

12.7 Risk Assessment

Risk has been assessed with regard to the tables in Appendix A, and is based on the previous Phase 1 Desk Study data and Site Investigation findings presented above.

Leachate testing has revealed several leachable contaminants in the topsoil and underlying madeground across the site. Chemical testing has revealed several contaminants in the topsoil and underlying madeground across the site, including arsenic, beryllium and several PAH species. However, due to the on-site proposals, the risk posed by soil on the site is considered **low**.

Post investigation gas monitoring results categorized the site as CS2 in accordance with CIRIA 665 and NHBC guidance. This equates to a **low** risk. Basic Radon protective measures are required in enclosed spaces, but in open highway areas no precautions are anticipated to be required.

12.8 Conceptual Model

The conceptual model is based on the **source-pathway-receptor** model and uses the information presented above, to determine if a possible significant pollutant linkage exists and what risks are posed to human health and environmental receptors.

The conceptual model is shown graphically on Fig. 4 and tabulated on Fig. 5. See Appendix A for conceptual model risk matrix.

12.9 Remediation Requirements

The chemical test results and conceptual model indicate that remediation of the site is not required. However, when excavating the topsoil, care should be taken to ensure that it is not mixed with the underlying granular made ground. The stockpiled topsoil should be tested at the rate of one test per 250m³ to confirm its suitability for re-use on-site. Also where quarry infill is excavated

it will need to be either re-capped with suitable topsoil or road construction, or removed from site.

13 ENGINEERING CONSIDERATIONS

13.1 General

An outline plan was available when completing this report. It has been assumed that a new highway is to be constructed at, or close to, existing ground levels. The proposed ground loadings were not known, but for the purpose of this report are assumed to be less than 50 kN/m. If there are any changes to these proposals, then some modification to the comments and recommendations given may be required.

13.2 Mining and Ground Stability

A thin coal is also shown to outcrop towards the centre of the site, trending roughly north-south. The thin coal seam was encountered at 3.00m bgl in TP1 and TP3. This coal was not encountered in the other exploratory holes, due to the extent of the previous clay pits.

The SYMAS report states that Shallow Coal workings are considered a negligible risk to the proposed scheme as the seams mentioned above are of inferior quality. The Coal Authority interactive viewer agrees with the above, showing the Dunsil seam not to be associated with probable shallow coal mine workings.

Two shafts are located within the site boundary. These are associated with the former Penny Pie Colliery. The shafts are located 35-40m from the proposed highway. The SYMAS report states that abandonment plans show the shafts were sunk to 39m bgl to the Swallow Wood Coal seam. The SYMAS report understands the shafts to be in ownership of BMBC, and that the shafts are known to have been treated, although details about the shaft caps are unknown.

Therefore the risk to site from shallow historical mining is considered **low**.

13.3 Earthworks

The majority of the proposed highway is to be constructed on the infilled clay pits, which occupy most of the site infilled with loose to very loose clayey granular domestic waste and is described in more detail in Section 11. A number of options to ground improve the infill are presented below. There may be other options or a combination of the options that might be considered.

Option 1 - Geo-Grid reinforced Formation
Geo-Grid reinforced formation to spread differential movement.

Geo-Grid placed too shallow in the construction will be prone to utility excavation and subsequent loss in long term effectiveness. Two layers of TriAx GeoGrid would therefore need to be place 1m to 1.5m below finished ground level in engineered fill 250mm to 300mm apart. The existing infill should be excavated down to at least 1.5m below finished level and the resulting surface compacted with a large vibratory roller. The use of a non-circular impact roller may provide greater compaction within the infill material. Suitable excavated fill should then be used in compacted layers to form a capping layer under the full width of the highway, plus 2m. A select granular fill and GeoGrid should then be used to form a stable platform on which the highway can be built.

The concern with only compacting the upper layers without improving the infill below is that secondary and degradation settlement will continue. The concern is not necessarily the total settlement that might be anticipated, but the differential settlement and with possibly of different areas settling at different periods of time. Therefore for this option to be considered on its own an enhanced maintenance schedule at 5 and then 10 year intervals would need to be considered as part of the construction package. Alternatively methods of improving the infill need to be considered as part of the construction process.

Option 2 - Stone column displacement.
Using a GeoGrid platform (Option 1) to spread loads, a series of stone columns could be installed through the infill to densify the existing material and transfer loads onto the stone columns. The spacing of columns would be dependent on the type of columns used. Also the thickness of the GeoGrid platform used might be reduced depending on the column spacing.

Option 3 - Grouting of infill.
Grouting techniques are commonly used in the Yorkshire Coalfield area to infill old shallow coal workings. The objective would be to substantially fill any voids within the infill. This would in turn reduce the potential for future settlement. As every site has different grouting characteristics, grout tests should be undertaken if this method is to be considered, to determine its potential effectiveness. If any void spaces within the infill can be shown to be reduced, the engineering characteristics of the infill will be significantly improved. As with Option 2 a GeoGrid platform should also be considered to spread loads.

13.5 Highways & Hardstanding

Highways and hardstanding will need to be constructed on re-engineered material. For design purposes a CBR of 2.5% may be assumed provided the formation is proof rolled and any soft spots are removed.

CBR tests on the granular made ground show that a CBR of 2.5% can be achieved provided that the moisture content is kept below 27%. A CBR of

2.5% can be achieved in the colliery discard provided that the moisture is kept below 25%. See Fig 7.

13.6 Drainage & Excavatability

Some difficulties in excavation of trenches for sewers and foundations in the made ground should be anticipated. Consideration should be given to providing safe temporary support of excavations within made ground or where greater than 1.2m deep.

Due to the made ground encountered soakaways are not suitable for this site, therefore off site drainage and retention in accordance with SUDs requirements will be required.

13.7 Chemical Precautions

The sulphate and pH test results indicate Class DS-2 (ACEC Class AC-1s) concrete can be used on this site in accordance with BRE Special Digest 1:2005. Where in made ground, water supply pipes should be leachate resistant.

14. DISPOSAL OF SOILS

Any wastes arising from remediation and/or development of the site, such as excess spoil or material deemed unsuitable for retention on site, should be disposed of in accordance with the Duty of Care Regulations. Waste Acceptance Criteria (WAC) analysis may be required to determine the most appropriate disposal facility for the waste, in accordance with the requirements of the current Landfill Directive.

Report **151069SI** **December 2018**.

TABLES

Exploratory Hole	Depth (m bgl)	Water Content (%)	Liquid Limit - LL (%)	Plastic Limit - PL (%)	Plasticity Index - IP (%)	Passing 0.425mm (%)	Modified Plasticity - IP' (%)	PSD D_{60}	PSD D_{15}	Dry Density (Mg/m^3)	Soil Ref.
BH1	0.00										B11
BH1	0.50										B1
BH1	1.00										S2
BH1	1.50										B3
BH1	2.00										S4
BH1	2.50										B5
BH1	3.00	24									S6
BH1	3.50										B7
BH1	4.00	25									S8
BH1	4.50										B9
BH1	5.00	19									S10
BH1	5.50	7									S12
BH1	6.20	4									S13
BH2	0.20										B1
BH2	1.00	16									S2
BH2	1.50										D3
BH2	2.00	37									S4
BH2	2.50										B5
BH2	3.00	40									S6
BH2	3.50										B7
BH2	4.00										S8
BH2	4.50										B9
BH2	5.00	20									S10
BH2	5.50										B11
BH2	6.00	33									S12
BH2	7.00										B13
BH2	8.50										B14
BH2	9.00	13									S15
BH3	0.00										B1
BH3	1.50	22									B2
BH3	2.00										S3
BH3	2.50	23									D4
BH3	3.00	33									S5
BH3	3.50										B6
BH3	4.00	24									S7
BH3	4.50										B8
BH3	5.00	27									S9
BH3	5.50										B10
BH3	6.00										S11
BH3	7.00										B12
BH3	7.50	43									S13
BH3	8.00										B14
BH3	9.00	32									S15
BH3	10.00										B16

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GEOTECHNICAL RESULTS SUMMARY

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 1

2018 ENGINEERING TESTING 151069.GPJ ABEC TEMPLATE.GDT 20/12/18

Exploratory Hole	Depth (m bgl)	Water Content (%)	Liquid Limit - LL (%)	Plastic Limit - PL (%)	Plasticity Index - IP (%)	Passing 0.425mm (%)	Modified Plasticity - IP' (%)	PSD D_{60}	PSD D_{15}	Dry Density (Mg/m^3)	Soil Ref.
BH3	10.50	15									S17
BH3	11.00	15									B18
BH3	7.00	7									S19
BH3	11.50	7									S19
BH3	12.08	6									S20
TP1	0.20	16									
TP1	1.50							10.905	0.168		
TP1	2.50	27	84	34	50	97	48.5				
TP1	2.90	19									
TP1	3.30	10									
TP2	0.10	13									
TP2	0.50	18									
TP2	3.20	28	60	27	33	94	31.02				
TP3	0.20	14									
TP3	0.50	3									
TP3	0.70	9									
TP3	1.30	8									
TP3	1.60							6.3			
TP3	3.10	4									
TP3	3.40	5									
TP4	0.20	29									
TP4	0.40	13									
TP4	2.00	26									
TP4	3.00	31									
WS1	0.30	16									
WS1	0.60	14									
WS1	1.80	16									
WS1	2.20	27									
WS1	2.80	15									
WS1	3.20	19									
WS1	3.80	17									
WS1	4.20	17									
WS1	4.80	24									
WS1	5.30	36									
WS10	0.10	14									
WS10	0.80	14									
WS10	1.20	17									
WS10	1.80	18									
WS10	2.20	21									
WS10	2.80	24									
WS10	3.20	22									
WS10	3.80	22									
WS10	4.20	33									
WS10	4.80	30									

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TABLE 1

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Exploratory Hole	Depth (m bgl)	Water Content (%)	Liquid Limit - LL (%)	Plastic Limit - PL (%)	Plasticity Index - IP (%)	Passing 0.425mm (%)	Modified Plasticity - IP' (%)	PSD D_{60}	PSD D_{15}	Dry Density (Mg/m^3)	Soil Ref.
WS10	5.30	20									
WS11	0.10	14									
WS11	1.20	12									
WS11	1.80	7									
WS11	2.20	8									
WS11	2.80	12									
WS11	3.20	10									
WS11	3.80	13									
WS11	4.30	13									
WS12	0.10	11									
WS12	0.60	9									
WS12	1.20	7									
WS12	1.80	7									
WS12	2.20	7									
WS12	2.80	15									
WS12	3.20	6									
WS13	0.10	13									
WS13	0.70	6									
WS13	1.20	12									
WS13	1.80	20									
WS13	2.20	18									
WS13	2.80	19									
WS13	3.20	13									
WS13	3.80	14									
WS13	4.20	14									
WS13	4.80	18									
WS13	5.30	18									
WS2	0.50	34		NP							
WS2	1.20	23									
WS2	1.80	19									
WS2	2.20	23									
WS2	2.80	40									
WS2	3.20	24									
WS2	3.80	18									
WS2	4.20	28									
WS2	4.80	29									
WS3	0.10	8									
WS3	0.50	21									
WS3	1.80	23									
WS3	2.20	20									
WS3	3.20	23									
WS4	0.50	18									
WS4	1.20	27									
WS4	1.80	27									

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TABLE 1

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Exploratory Hole	Depth (m bgl)	Water Content (%)	Liquid Limit - LL (%)	Plastic Limit - PL (%)	Plasticity Index - IP (%)	Passing 0.425mm (%)	Modified Plasticity - IP' (%)	PSD D_{60}	PSD D_{15}	Dry Density (Mg/m^3)	Soil Ref.
WS4	2.20	21									
WS4	2.80	16									
WS4	3.20	21									
WS4	3.80	19									
WS4	4.20	18									
WS4	4.80	19									
WS4	5.30	17									
WS5	0.10	12									
WS5	0.50	17									
WS5	1.20	18									
WS5	1.80	20									
WS5	2.20	16									
WS5	2.80	17									
WS5	3.20	18									
WS5	3.80	13									
WS5	4.20	19									
WS5	4.80	25									
WS5	5.30	24									
WS6	0.20	12									
WS6	1.20	19									
WS6	1.80	11									
WS6	2.20	14									
WS6	2.80	10									
WS6	3.20	15									
WS6	3.80	19									
WS6	4.20	15									
WS6	4.80	10									
WS7	0.50	6									
WS7	1.20	6									
WS7	1.80	8									
WS7	2.20	9									
WS7	2.60	12									
WS7	3.45	9									
WS8	0.10	11									
WS8	0.30	12									
WS8	1.20	18									
WS8	1.60	13									
WS9	0.10	11									
WS9	0.30	18									
WS9	1.20	18									
WS9	1.60	14									
WS9	1.90	22									
WS9	2.20	9									
WS9	2.50	18									

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GEOTECHNICAL RESULTS SUMMARY

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Project: A628 Dodworth Road Crossroads, Barnsley

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TABLE 1

2018 ENGINEERING TESTING 151069.GPJ ABEC TEMPLATE.GDT 20/12/18

Exploratory Hole	Depth (m bgl)	Water Content (%)	Liquid Limit - LL (%)	Plastic Limit - PL (%)	Plasticity Index - IP (%)	Passing 0.425mm (%)	Modified Plasticity - IP' (%)	PSD D_{60}	PSD D_{15}	Dry Density (Mg/m^3)	Soil Ref.
WS9	2.80	12									
WS9	3.30	11									

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GEOTECHNICAL RESULTS SUMMARY

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 1

2018 ENGINEERING TESTING 151069.GPJ ABEC TEMPLATE.GDT 20/12/18

Public Open Space near Residential Housing

			Toxic										Phytotoxic			Organics		Other			
Exploratory Hole	Depth (m)	Date	Arsenic As	Beryllium Be	Cadmium Cd	Chromium (III) Cr	Chromium (VI) Cr	Lead Pb	Mercury Hg	Selenium Se	Nickel Ni	Vanadium V	Copper Cu	Boron B	Zinc Zn	SOM	Phenols	Cyanide (total) Cn	Asbestos	Sulphate g/l	pH (units)
BH1	1.50		-	2.5	-	-	-	-	-	-	-	-	-	-	-	33.83	-	-	N.D	246.00	8.0
TP1	0.80		94	4.2	-	-	-	-	-	-	-	-	-	-	-	35.4	-	-	N.D	814.00	7.8
TP3	0.20		-	-	-	-	-	-	-	-	-	-	-	-	-	10.9	-	-	N.D	36.00	8.0
WS1	0.10		-	-	-	-	-	-	-	-	-	-	-	-	-	12.34	-	-	N.D	41.00	8.0
WS1	1.20		97	3.9	-	-	-	-	-	-	-	-	-	-	-	37.79	-	-	N.D	293.00	7.8
WS11	0.60		-	-	-	-	-	-	-	-	-	-	-	-	-	1.98	-	-	N.D	72.00	7.4
WS2	0.10		-	-	-	-	-	-	-	-	-	-	-	-	-	8.71	-	-	N.D	25.00	6.8
WS3	1.20		120	5.9	-	-	-	-	-	-	-	-	-	-	-	29.83	-	-	N.D	369.00	6.6
WS4	0.10		-	-	-	-	-	-	-	-	-	-	-	-	-	17.26	-	-	N.D	48.00	6.2
WS7	0.10		-	-	-	-	-	-	-	-	-	-	-	-	-	10.67	-	-	N.D	42.00	6.9
WS9	0.10		-	-	-	-	-	-	-	-	-	-	-	-	-	11.34	-	-	N.D	35.00	6.1
Number			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11		11	11
Average			50.09	2.53	0.56	97.55	1.00	208.73	0.65	2.33	50.45	73.55	314.55	1.87	220.18	19.10	0.50	1.15		183.73	7.24
Minimum			18	1.3	0.4	50	1	83	0.5	1.5	26	35	48	0.9	129	1.98	0.5	1		25	6.1
Maximum			120	5.9	1	246	1	475	2.2	4.1	118	208	2344	5.6	396	37.79	0.5	1.9		814	8
Standard Dev			37.47	1.49	0.20	60.68	0.00	146.89	0.51	0.81	30.54	50.49	678.69	1.53	91.81	12.63	0.00	0.33		242.46	0.74
US95			70.6		0.7			289.0	0.9	2.8	67.1		685.3	2.7	270.3		0.5	1.3		316.2	7.6
Source: LQM S4UL 2015			79 CS4L	2.2	120 CS4L	1500	7.7 CS4L	630 CS4L	120	1100	230	2000	12000	21000	81000	%	11000	50 DUTCH		0.5 BRE	5 to 9
			79		220		23	760													

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Notes:

1. Levels expressed as mg/kg (ppm) unless stated.
2. Soil guideline values are for POS(res).
3. Tested levels below S4UL are shown as - For actual result see certificate sheet.
4. Levels presented for SOM 6%.

CHEMICAL RESULTS ASSESSMENT

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 2A

2017 - SOIL METALS - POS(RES) 151069.GPJ ABEC TEMPLATE.GDT 20/12/18

Public Open Space near Residential Housing

			Probable carcinogens (2)			Possible carcinogens (2)													
Exploratory Hole	Depth (m)	Soil Organic Matter (%)	Benzo (a) Anthracene	Dibenzo (a,h) Anthracene	Benzo (a) Pyrene	Chrysene	Benzo (b&k) Fluoranthene	Indeno (1,2,3-cd) Pyrene	Fluorene	Phen-anthrene	Pyrene	Acenaph-thylene	Benzo (g,h,i) Perylene	Acenaphthene	Anthracene	Naphthalene	Fluoranthene	Carcinogenic PAH Total	PAH 16 Total
BH1	1.50	33.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.69	3.86
TP1	0.80	35.4	-	0.6	-	-	7.2	-	-	-	-	-	-	-	-	-	-	22.95	53.4
TP3	0.20	10.9	-	1.0	6.4	-	11.2	-	-	-	-	-	-	-	-	-	-	34.20	69.1
WS1	0.10	12.34	-	3.0	18.2	-	29.8	-	-	-	-	-	-	-	-	-	-	95.48	207
WS1	1.20	37.79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.94	30.9
WS11	0.60	1.98	-	2.0	13.4	-	22.2	-	-	-	-	-	-	-	-	-	-	73.38	146
WS2	0.10	8.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.31	13.3
WS3	1.20	29.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.27
WS4	0.10	17.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.85	10.4
WS7		10.67																	
WS7	0.70		-	1.1	7.3	-	12.9	-	-	-	-	-	-	-	-	-	-	40.88	91.8
WS9	0.10	11.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.29	4.47
Number			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11		11
Average				0.79	4.97	4.96	8.44	3.07	0.41	5.60	8.81	0.11	2.87	0.43	1.36	0.22	10.54		57.32
Minimum			0.02	0.02	0.02	0.01	0.04	0.02	0.01	0.02	0.03	0.01	0.02	0.01	0.02	0.01	0.09		0.27
Maximum			7.43	2.98	7.27	7.83	7.16	7.95	1.57	6.53	7.85	0.41	7.31	2.2	3.68	0.49	5.45		91.8
Standard Dev			5.64	0.95	5.97	5.72	9.84	3.76	0.49	6.87	10.48	0.12	3.46	0.64	1.46	0.15	12.49		67.35
US95				1.3	8.2	8.1	13.8	5.1	0.7	9.4	14.5	0.2	4.8	0.8	2.2	0.3	17.4		94.1
Source: LQM S4UL 2015			29	0.57	5.7 10	57	7.1	82	9900	3100	7400	15000	640	15000	74000	4900	3100		

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Notes:

1. Levels expressed as mg/kg (ppm) unless stated.
2. International Agency for Research on Cancer (IARC) classifications
3. Soil guideline values are for POS(res).
4. Tested levels below S4UL are shown as -
   For actual result see certificate sheet.
5. Levels presented for SOM 1% -
   Higher concentrations may be permissible

PAH RESULTS ASSESSMENT

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 2B

2016 - SOIL PAH - POS(RES) 151069.GPJ ABEC TEMPLATE.GDT 20/12/18

Exploratory Hole	Depth (m)	Date	Class	Arsenic As	Beryllium Be	Boron B	Cadmium Cd	Chromium (total) Cr	Copper Cu	Lead Pb	Mercury Hg	Nickel Ni	Selenium Se	Vanadium V	Zinc Zn	Cyanide (tot) Cn **(mg/l)**	Phenols **(mg/l)**	Sulphate **(mg/l)**	pH **(units)**	PAH (Total)
BH1			B11																	
BH1			B1																	
BH1			S2																	
BH1			B3																	
BH1			S4																	
BH1			B5																	
BH1			S6																	
BH1			B7																	
BH1			S8																	
BH1			B9																	
BH1			S10																	
BH1			S12																	
BH1			S13																	
BH2			B1																	
BH2			S2																	
BH2			D3																	
BH2			S4																	
BH2			B5																	
BH2			S6																	
BH2			B7																	
BH2			S8																	
			Number	5	5	5	5	5	5	5	5	5	5		5	5	5	5	5	0
			Average	3.3	0.1	25.60	0.070	2.300	3.84	0.3	0.0	1.58	0.4		6.2	20.00	10.00	25	7.6	
			Minimum	0.3	0.06	14	0.07	0.3	0.4	0.2	0.008	0.5	0.2		1.8	20	10	10	7.5	
			Maximum	13	0.06	42	0.07	5.5	11.1	0.6	0.008	2.8	0.7		14	20	10	70	7.8	
			Standard Dev	5.4	0.0	12.52	0.000	2.742	4.94	0.2	0.0	1.05	0.2		5.2	0.00	0.00	26	0.1	
			US95	8.5		37.54	0.070	4.915	8.55	0.5	0.0	2.59	0.6		11.2	20.00	10.00	50	7.8	
			[4]Water Supply Regulations (2000)	10		1000	5	50	2000	25	1	20	10	50	250	50		250		0.1
			[4]Environmental Quality Standard	50	12	2000	0.09	4.7	6	7.2	0.05	20	250	20*	50	1000	0.1**	400	6-9	

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Notes:

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2. * Assuming <100mg CaCO3/1
3. ** 0.1 = LOD, EQS limits = 0.03 mg/l
4. Elevations assessed against WSR and EQS whichever is lowest limit value. Concentrations below limit values given as -.

LEACHATE RESULTS ASSESSMENT

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 2C

2016 - LEACHATE METALS 151069.GPJ ABEC 2014 GINT TEMPLATE.GDT 20/12/18

Exploratory Hole	Depth (m)	Date	Class	Arsenic As	Beryllium Be	Boron B	Cadmium Cd	Chromium (total) Cr	Copper Cu	Lead Pb	Mercury Hg	Nickel Ni	Selenium Se	Vanadium V	Zinc Zn	Cyanide (tot) Cn **(mg/l)**	Phenols **(mg/l)**	Sulphate **(mg/l)**	pH **(units)**	PAH (Total)
BH2			B9																	
BH2			S10																	
BH2			B11																	
BH2			S12																	
BH2			B13																	
BH2			B14																	
BH2			S15																	
BH3			B1																	
BH3			B2																	
BH3			S3																	
BH3			D4																	
BH3			S5																	
BH3			B6																	
BH3			S7																	
BH3			B8																	
BH3			S9																	
BH3			B10																	
BH3			S11																	
BH3			B12																	
BH3			S13																	
BH3			B14																	
			Number	5	5	5	5	5	5	5	5	5	5		5	5	5	5	5	0
			Average	3.3	0.1	25.60	0.070	2.300	3.84	0.3	0.0	1.58	0.4		6.2	20.00	10.00	25	7.6	
			Minimum	0.3	0.06	14	0.07	0.3	0.4	0.2	0.008	0.5	0.2		1.8	20	10	10	7.5	
			Maximum	13	0.06	42	0.07	5.5	11.1	0.6	0.008	2.8	0.7		14	20	10	70	7.8	
			Standard Dev	5.4	0.0	12.52	0.000	2.742	4.94	0.2	0.0	1.05	0.2		5.2	0.00	0.00	26	0.1	
			US95	8.5		37.54	0.070	4.915	8.55	0.5	0.0	2.59	0.6		11.2	20.00	10.00	50	7.8	
			[4]Water Supply Regulations (2000)	10		1000	5	50	2000	25	1	20	10	50	250	50		250		0.1
			[4]Environmental Quality Standard	50	12	2000	0.09	4.7	6	7.2	0.05	20	250	20*	50	1000	0.1**	400	6-9	

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4. Elevations assessed against WSR and EQS whichever is lowest limit value. Concentrations below limit values given as -.

LEACHATE RESULTS ASSESSMENT

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 2C

2016 - LEACHATE METALS 151069.GPJ ABEC 2014 GINT TEMPLATE.GDT 20/12/18

Exploratory Hole	Depth (m)	Date	Class	Arsenic As	Beryllium Be	Boron B	Cadmium Cd	Chromium (total) Cr	Copper Cu	Lead Pb	Mercury Hg	Nickel Ni	Selenium Se	Vanadium V	Zinc Zn	Cyanide (tot) Cn **(mg/l)**	Phenols **(mg/l)**	Sulphate **(mg/l)**	pH **(units)**	PAH (Total)
BH3			S15																	
BH3			B16																	
BH3			S17																	
BH3			B18																	
BH3			S19																	
BH3			S20																	
TP1	0.80			-	-	-	-	5.5	-	-	-	-	-	-	-	20.00	10.00	-	7.70	
WS1	1.20			-	-	-	-	-	-	-	-	-	-	-	-	20.00	10.00	-	7.70	
WS11	0.60			13	-	-	-	5.1	-	-	-	-	-	21.2	-	20.00	10.00	-	7.50	
WS2	0.10			-	-	-	-	-	11.1	-	-	-	-	-	-	20.00	10.00	-	7.80	
WS4	0.10			-	-	-	-	-	6.9	-	-	-	-	-	-	20.00	10.00	-	7.50	

Number	5	5	5	5	5	5	5	5	5	5		5	5	5	5	5	0
Average	3.3	0.1	25.60	0.070	2.300	3.84	0.3	0.0	1.58	0.4		6.2	20.00	10.00	25	7.6	
Minimum	0.3	0.06	14	0.07	0.3	0.4	0.2	0.008	0.5	0.2		1.8	20	10	10	7.5	
Maximum	13	0.06	42	0.07	5.5	11.1	0.6	0.008	2.8	0.7		14	20	10	70	7.8	
Standard Dev	5.4	0.0	12.52	0.000	2.742	4.94	0.2	0.0	1.05	0.2		5.2	0.00	0.00	26	0.1	
US95	8.5		37.54	0.070	4.915	8.55	0.5	0.0	2.59	0.6		11.2	20.00	10.00	50	7.8	
[4]Water Supply Regulations (2000)	10		1000	5	50	2000	25	1	20	10	50	250	50		250		0.1
[4]Environmental Quality Standard	50	12	2000	0.09	4.7	6	7.2	0.05	20	250	20*	50	1000	0.1**	400	6-9	

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Notes:

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3. ** 0.1 = LOD, EQS limits = 0.03 mg/l
4. Elevations assessed against WSR and EQS whichever is lowest limit value. Concentrations below limit values given as -.

LEACHATE RESULTS ASSESSMENT

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 2C

2016 - LEACHATE METALS 151069.GPJ ABEC 2014 GINT TEMPLATE.GDT 20/12/18

			Probable carcinogens (2)			Possible carcinogens (2)													
Exploratory Hole	Depth (m)	Stratum	Benzo (a) Anthracene	Dibenzo (a,h) Anthracene	Benzo (a) Pyrene	Chrysene	Benzo (b&k) Fluoranthene	Indeno (1,2,3-cd) Pyrene	Fluorene	Phen-anthrene	Pyrene	Acenaph-thylene	Benzo (g,h,i) Perylene	Acenaphthene	Anthracene	Naphthalene	Fluoranthene	Carcinogenic PAH Total	PAH 16 Total
BH1	1.50																		
TP1	0.80		-	-	0.1	-	0.2	0.1	0.8	2.7	-	-	0.1	0.5	-	0.7	-	0.70	4.6
TP3	0.20																		
WS1	0.10																		
WS1	1.20		-	-	0.1	-	0.2	0.1	0.4	1.5	0.6	-	0.1	0.3	-	-	-	0.70	2.6
WS11	0.60		-	-	0.1	-	0.2	0.1	0.4	1	0.5	-	0.1	0.3	0.4	-	0.7	0.70	3.1
WS2	0.10		-	-	0.1	-	0.2	0.1	0.6	1.7	-	-	0.1	0.4	-	0.5	0.7	0.70	3.9
WS3	1.20																		
WS4	0.10		-	-	0.1	-	0.2	0.1	0.4	1.3	-	-	0.1	0.3	0.3	-	0.7	0.70	3
WS7	0.70																		
WS9	0.10																		
Number			5	5	5	5	5	5	5	5	5	5	5	11	5	5	5		5
Average			0.10	0.10	0.10	0.10	0.20	0.10	0.52	1.64	0.28	0.10	0.10	0.43	0.20	0.30	0.46		3.44
Minimum			0.1	0.1	0.1	0.1	0.2	0.1	0.4	1	0.1	0.1	0.1	0.01	0.1	0.1	0.1		2.6
Maximum			0.1	0.1	0.1	0.1	0.2	0.1	0.8	2.7	0.6	0.1	0.1	2.2	0.4	0.7	0.7		4.6
Standard Dev			0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.65	0.25	0.00	0.00	0.64	0.14	0.28	0.33		0.80
US95			0.1	0.1	0.1	0.1	0.2	0.1	0.7	2.3	0.5	0.1	0.1	0.8	0.3	0.6	0.8		4.2
Limit Value			0.1	0.1	0.05*	0.1	0.03	0.002	0.1	0.1	0.1	0.1	0.002	0.1	0.1*	0.1	0.1*		

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Notes:
1. Levels expressed as µg/l.
2. International Agency for Research on Cancer (IARC) classifications

*Acceptable annual average concentration. Maximum may be higher

** I(123-cd)P and B(ghi)P share limit value - added together must not exceed 0.002 µg/l)

LEACHABLE SPECIATED PAH RESULTS

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 2D

2016 - LEACHATE PAH 151069.GPJ ABEC TEMPLATE.GDT 20/12/18

Exploratory Hole	Date/Time	Flow Rate l/h	Methane Peak CH_4 %	Carbon Monoxide CO (ppm)	Hydrogen Sulphide H_2S (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)	VOCs ppm	Water Level / mBGL	Pressure (mbars)	Pressure Rise/Fall /Steady	Remarks
BH1	13/11/2018 13:00:00											Gas Tap burried under cement
BH1	29/11/2018 16:00:00								6.10			
BH1	11/12/2018 14:00:00	0.0	0.0			6.2	14.9	0.0	4.75	1000	S	Sunny + Dry + Cold (~6°C)
BH1	17/12/2018 09:00:00	-0.1	0.0			6.1	14.4		4.81	990	S	Sunny + Dry + Cold (~2°C). VOC reading ~80ppm-100ppm outside
BH2	13/11/2018 13:00:00	0.4	0.0			0.0	20.9	0.0	6.08	999	S	Mild, Sunny and Windy
BH2	04/12/2018 09:00:00	0.0	0.0			0.1	20.8	0.0	6.05	1004	S	Sunny but Cold (~3°)
BH2	11/12/2018 14:00:00	0.0	0.0			12.0	8.9	2.5	5.96	1000	S	Sunny + Dry + Cold (~6°C)
BH2	17/12/2018 09:00:00	0.0	0.0			1.3	21.5		5.90	990	S	Sunny + Dry + Cold (~2°C). VOC reading ~80ppm-100ppm outside
BH3	13/11/2018 13:00:00	2.4	0.0			0.0	21.0	0.2	N/A	999	S	Mild, Sunny and Windy. Tap stuck in place.
BH3	04/12/2018 09:00:00	0.0	0.0			0.0	21.0	0.0	N/A	1004	S	Sunny but Cold (~3°)
WS1	06/11/2018 15:00:00								Dry			
WS1	13/11/2018 13:00:00	2.6	0.0			0.2	20.9	0.0	Dry	999	S	Mild, Sunny and Windy
WS1	04/12/2018 09:00:00	-0.3	0.0			2.4	18.2	0.0	Dry	1004	S	Sunny but Cold (~3°)
WS1	11/12/2018 14:00:00	0.0	0.0			2.9	18.3	2.3	Dry	999	S	
WS1	17/12/2018 09:00:00	0.2	0.0			2.5	18.3	0.0	Dry	990	S	Sunny + Dry + Cold (~2°C). VOC reading ~80ppm-100ppm outside
WS6	06/11/2018 15:00:00								Dry			Gas Tap Seized Closed
WS6	13/11/2018 13:00:00								Dry			Gas Tap Seized Closed
WS6	29/11/2018 16:00:00								4.95			
WS6	11/12/2018 14:00:00	0.0	0.0			11.0	11.6	4.0	Dry	999	R	Sunny + Dry + Cold (~6°C)
WS6	17/12/2018 09:00:00	0.1	0.0			6.6	13.6		Dry	991	R	Sunny + Dry + Cold (~2°C). VOC reading ~80ppm-100ppm outside
WS7	06/11/2018 15:00:00								Dry			
WS7	29/11/2018 16:00:00								1.5			

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NR = Not recorded
-If required, on completion of any remaining monitoring visits, a full ground gas risk assessment including a complete Table 3 will be issued under separate cover.
-On receipt this assessment should be included within Appendix B of this site investigation report.

GAS MONITORING RESULTS

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 3

2016 - LANDSCAPE GAS MONITORING 151069.GPJ ABEC TEMPLATE.GDT 18/12/18

Exploratory Hole	Date/Time	Flow Rate l/h	Methane Peak CH_4 %	Carbon Monoxide CO (ppm)	Hydrogen Sulphide H_2S (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)	VOCs ppm	Water Level / mBGL	Pressure (mbars)	Pressure Rise/Fall /Steady	Remarks
WS7	17/12/2018 09:00:00	0.0	0.0			0.1	21.4		Dry	990	S	Sunny + Dry + Cold (~2°C). VOC reading ~80ppm-100ppm outside
WS8	06/11/2018 15:00:00								Dry			
WS8	13/11/2018 13:00:00	-1.7	0.0			0.2	20.6	6.2	N/A	999	S	Mild, Sunny and Windy
WS8	04/12/2018 09:00:00	0.0	0.0			0.0	21.0	16.5	Dry	1004	S	Sunny but Cold (~3°)
WS8	11/12/2018 14:00:00	0.0	0.0			2.5	18.1	4.7	1.88	998	F	Sunny + Dry + Cold (~6°C)
WS8	17/12/2018 09:00:00	0.0	0.0			2.9	17.6		Dry	990	S	Sunny + Dry + Cold (~2°C). VOC reading ~80ppm-100ppm outside

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GAS MONITORING RESULTS

Client: BMBC

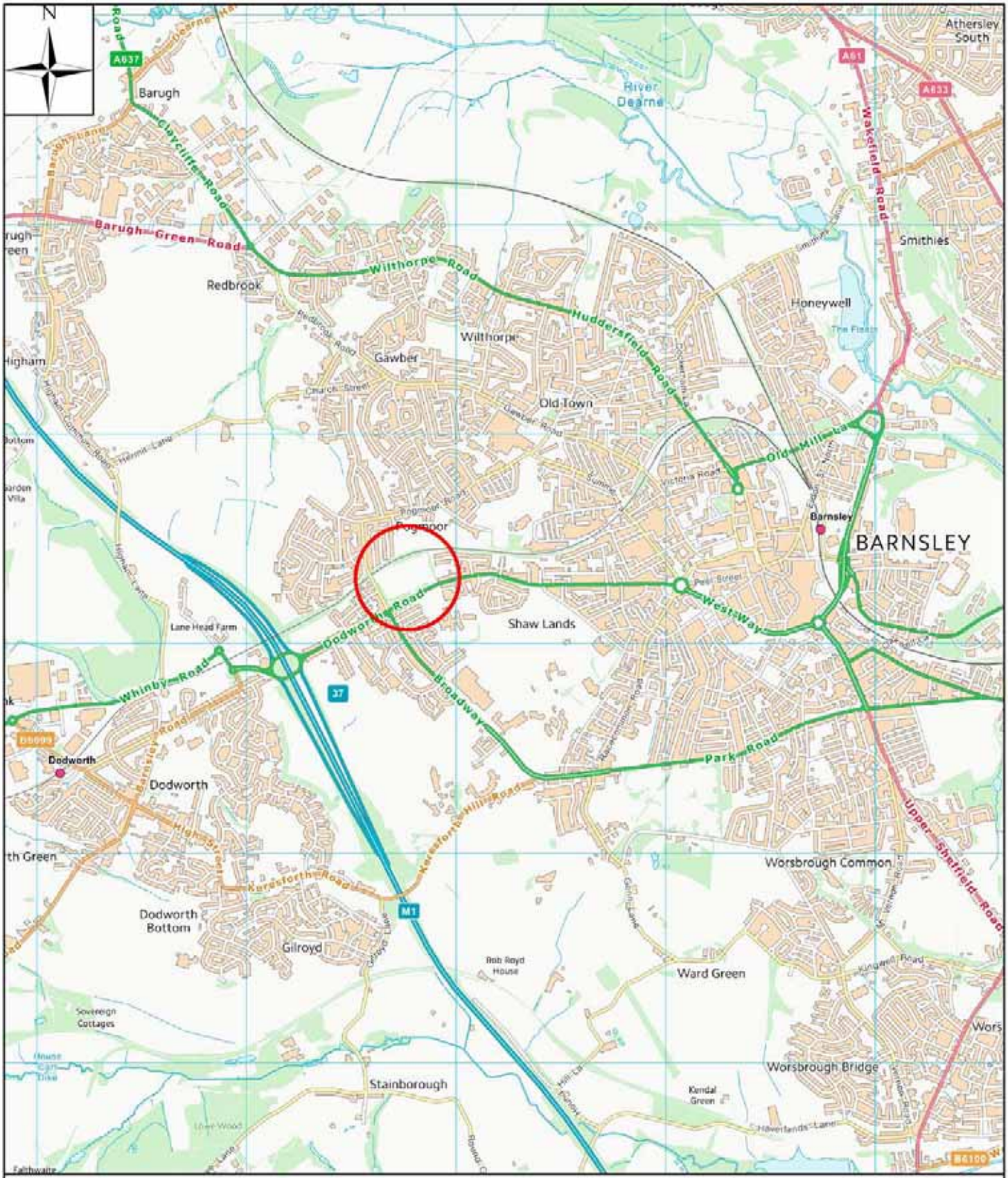
Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

TABLE 3

2016 - LANDSCAPE GAS MONITORING 151069.GPJ ABEC TEMPLATE.GDT 18/12/18

FIGURES



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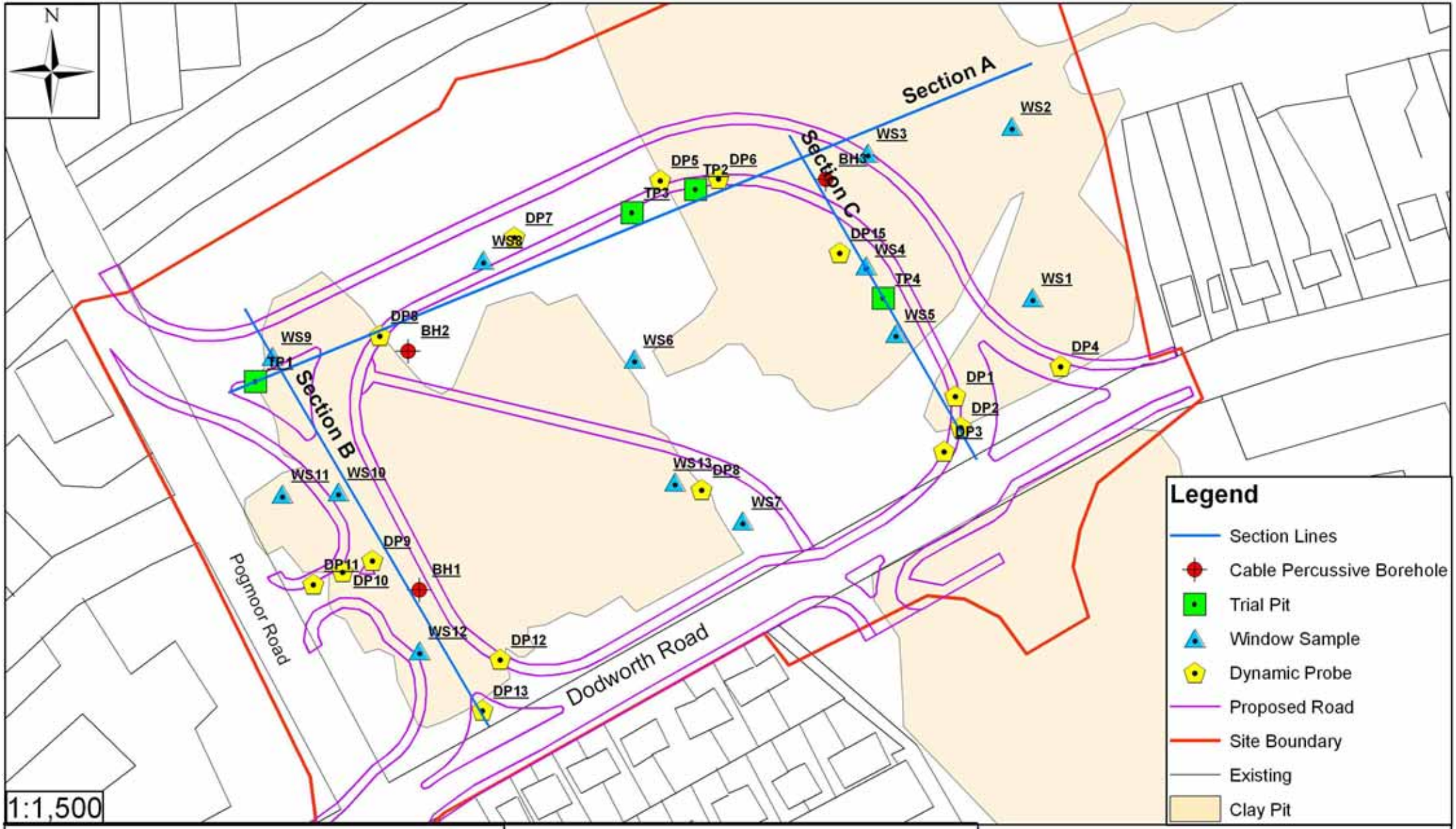
KEY PLAN

Site: A628 Dodworth Road Crossroads, Barnsley

Job No: 151069

Client: BMBC

Fig 1

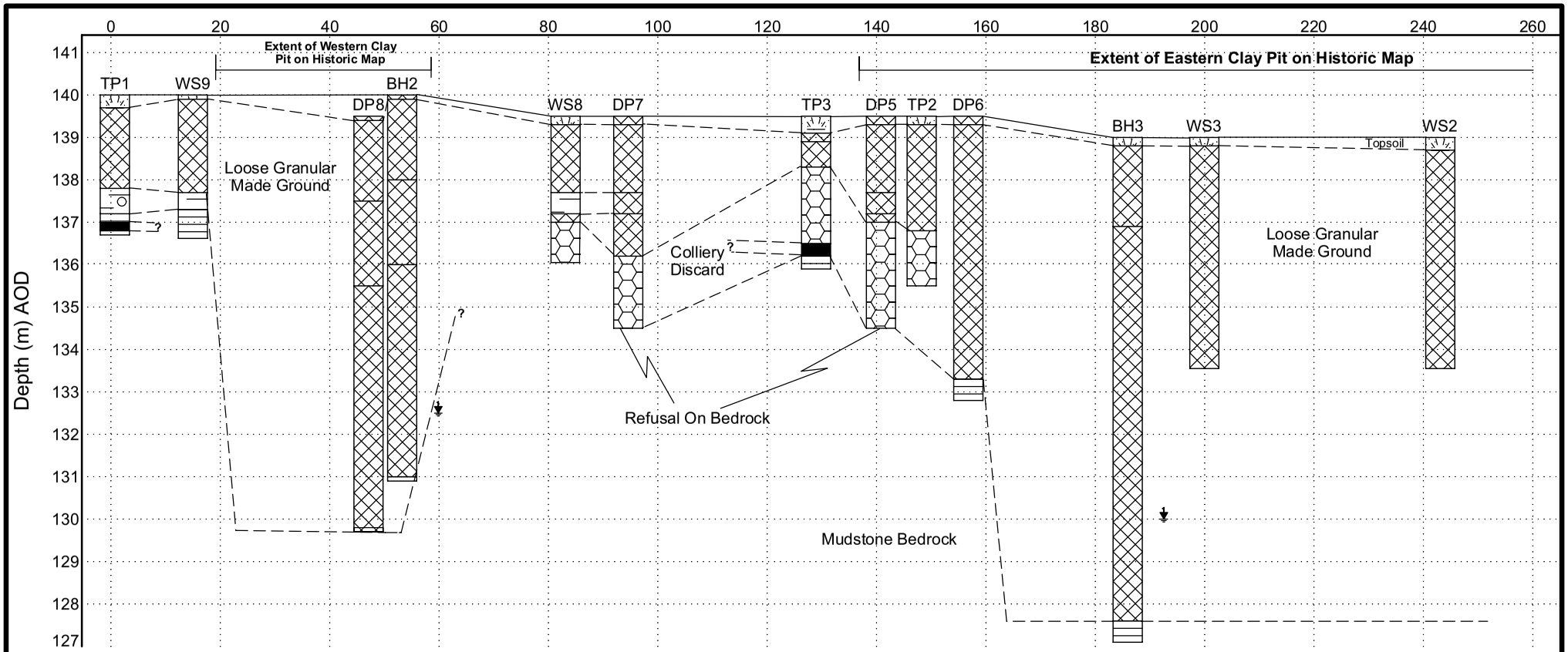


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SITE PLAN

Site: A628 Dodworth Road Crossroads, Barnsley
Job No: 151069
Client: BMBC

Fig 2



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SUBSURFACE DIAGRAM

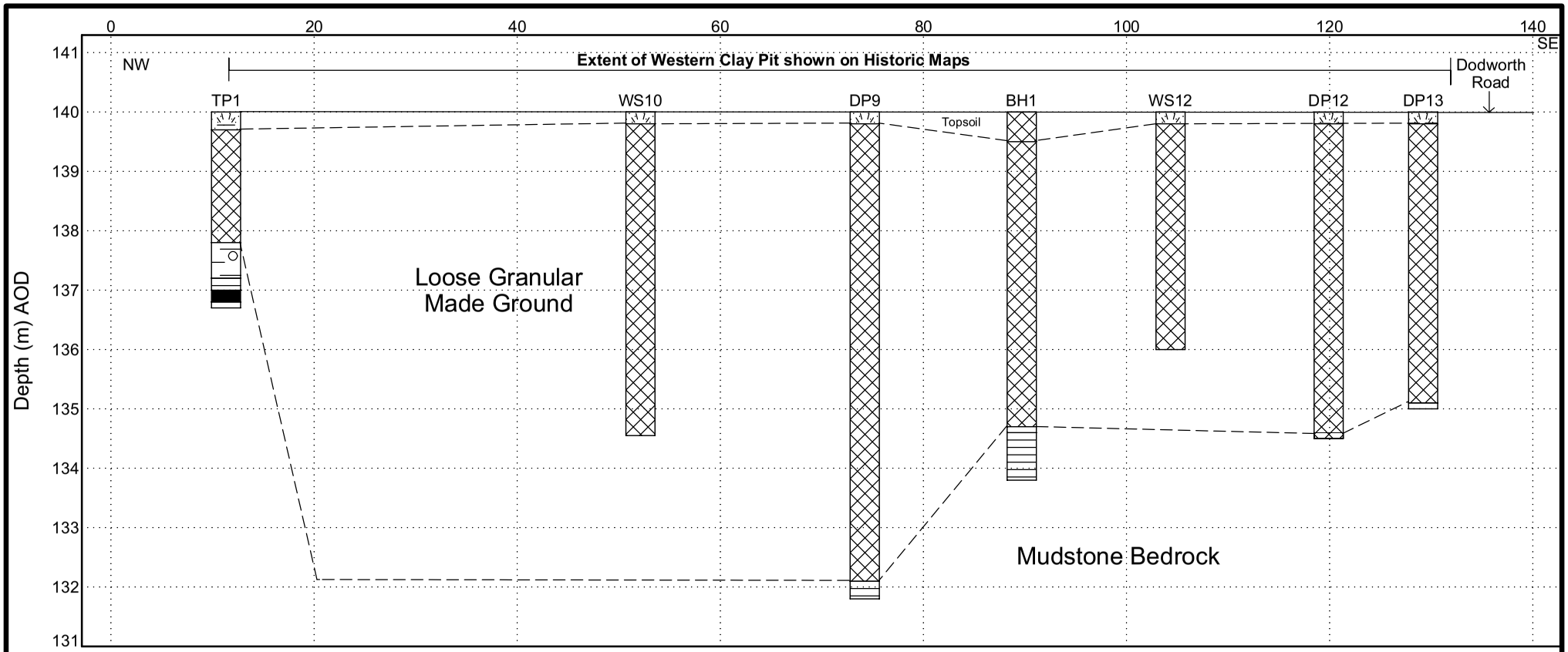
Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

FIG 3A

DEPTH SECTION 151069.GPJ ABEC TEMPLATE.GDT 17/12/18



DEPTH SECTION 151069.GPJ ABEC TEMPLATE.GDT 17/12/18

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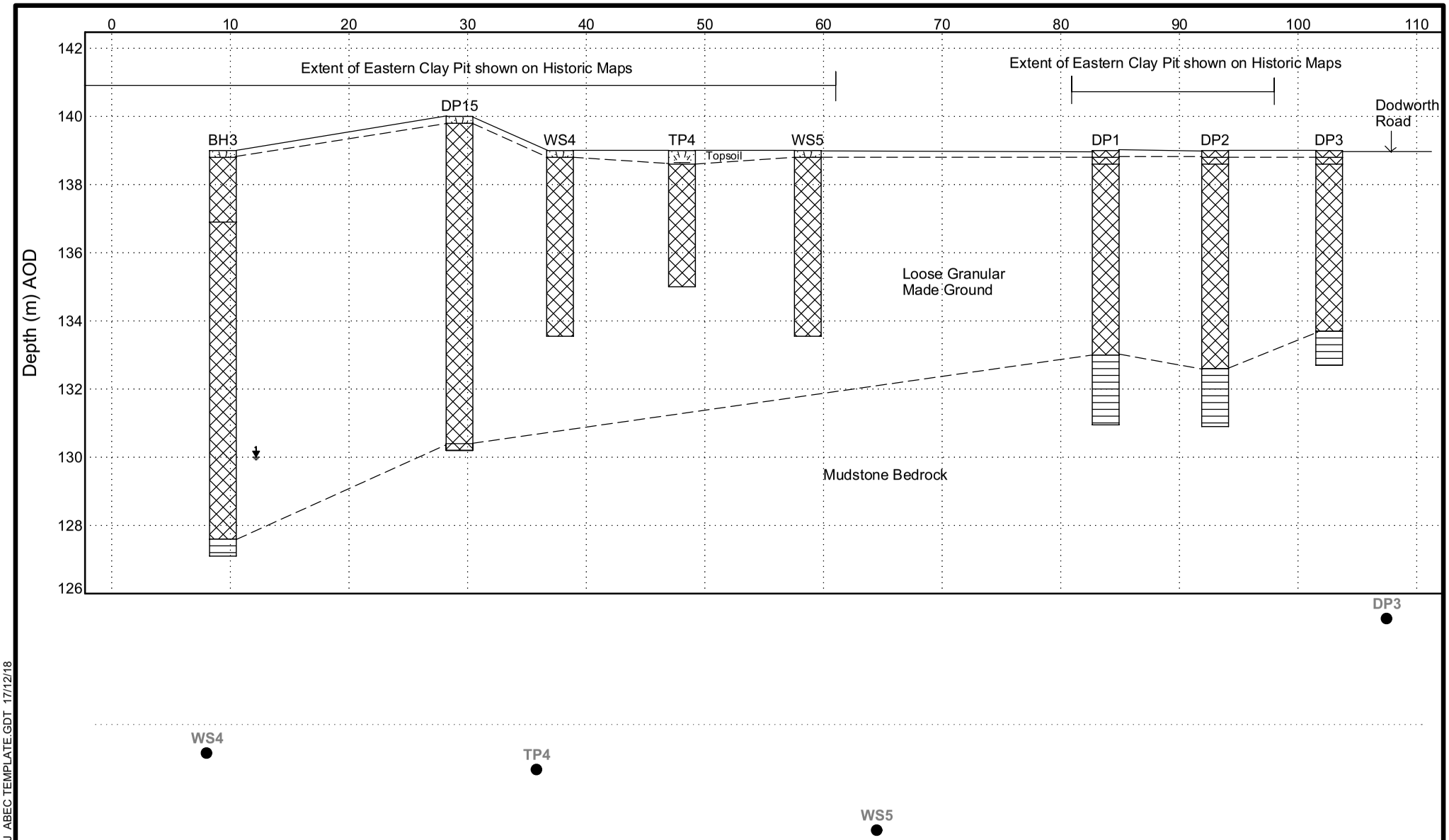
SUBSURFACE DIAGRAM

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

FIG 3B



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SUBSURFACE DIAGRAM

Client: BMBC

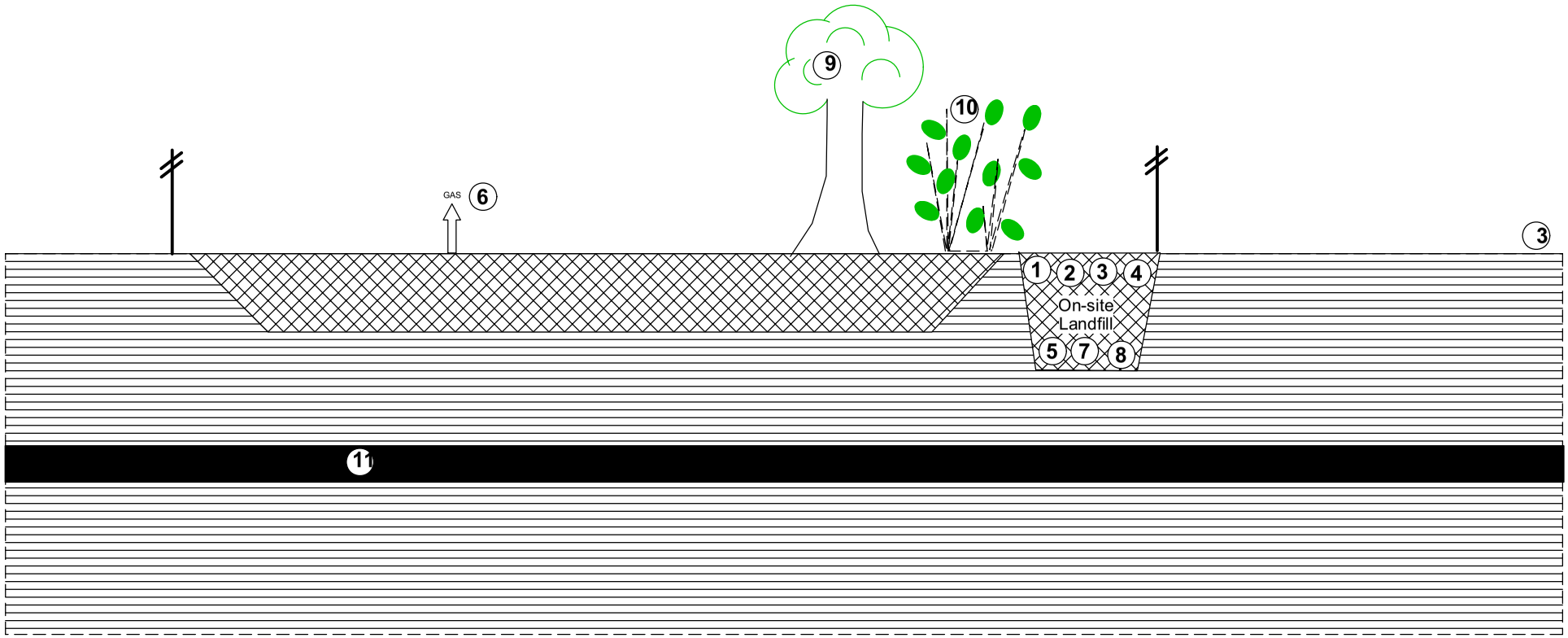
Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

FIG 3C

DEPTH SECTION 151069.GPJ ABEC TEMPLATE.GDT 17/12/18

Commercial



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Notes:
1. Diagram not to scale. This model is schematic only and does not reflect the specific ground conditions identified on or off the site.
2. See Fig 5 for Conceptual Model Table.
3. Sloping ground not depicted. Topography is considered in the report text.

CONCEPTUAL SITE MODEL

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

FIG 4

2016 - CONCEPT MODEL 151069.GPJ ABEC TEMPLATE.GDT 31/10/17

Number	Hazard	Source	Pathway	Receptor	Significant Pollutant Linkage	Current anticipated risk (1) *	Comment	Action	Anticipated risk after action *
1	Metals	On site landfill site	Direct contact	Site users	**Yes**	Moderate / Low 100%	No risk at levels present	No further action required	Low
2	PAH	On site landfill site	Direct contact	Site users	**Yes**	Moderate / Low 100%	No risk at levels present	No further action required	Low
3	Flooding	Unnamed water course	Over land flow	Buildings / structures	**Yes**	Very Low / 100%	Not within EA flood risk zone	No further action required	Low
4	Landfill Gas	On site landfill site	Vertical migration through the ground	Site users	**Yes**	Low / 100%	No precautions necessary	No further action required	Low
5	Mine / Ground Gas	Made Ground	Vertical migration through the ground	Site users	**Yes**	Low / 100%	No precautions necessary	No further action required	Low
6	Radon	Bedrock	Vertical migration through the ground	Site users	**Yes**	Low / 100%	No risk at levels present	No further action required	Low
7	Leachable metals	On site landfill site	Leaching to groundwater	Unnamed water course	**Yes**	Low / 100%	No risk at levels present	No further action required	Low
8	Leachable PAH	On site landfill site	Leaching to groundwater	Unnamed water course	**Yes**	Low / 100%	No risk at levels present	No further action required	Low
9	Trees	On site trees	Direct contact	Buildings / structures	**Yes**	Low / 25%	Further action not necessary	Vigilance during construction	Low
10	Japanese Knotweed	On site trees	Direct contact	Buildings / structures	**Yes**	Low / 100%	None identified during walkover	Vigilance during construction	Low
11	Mine working collapse	Mine Workings	Vertical migration through the ground	Buildings / structures	**Yes**	Low / 100%	Further action not necessary	Vigilance during construction	Low

(1) Anticipated risk over percentage site area

* See Appendix A

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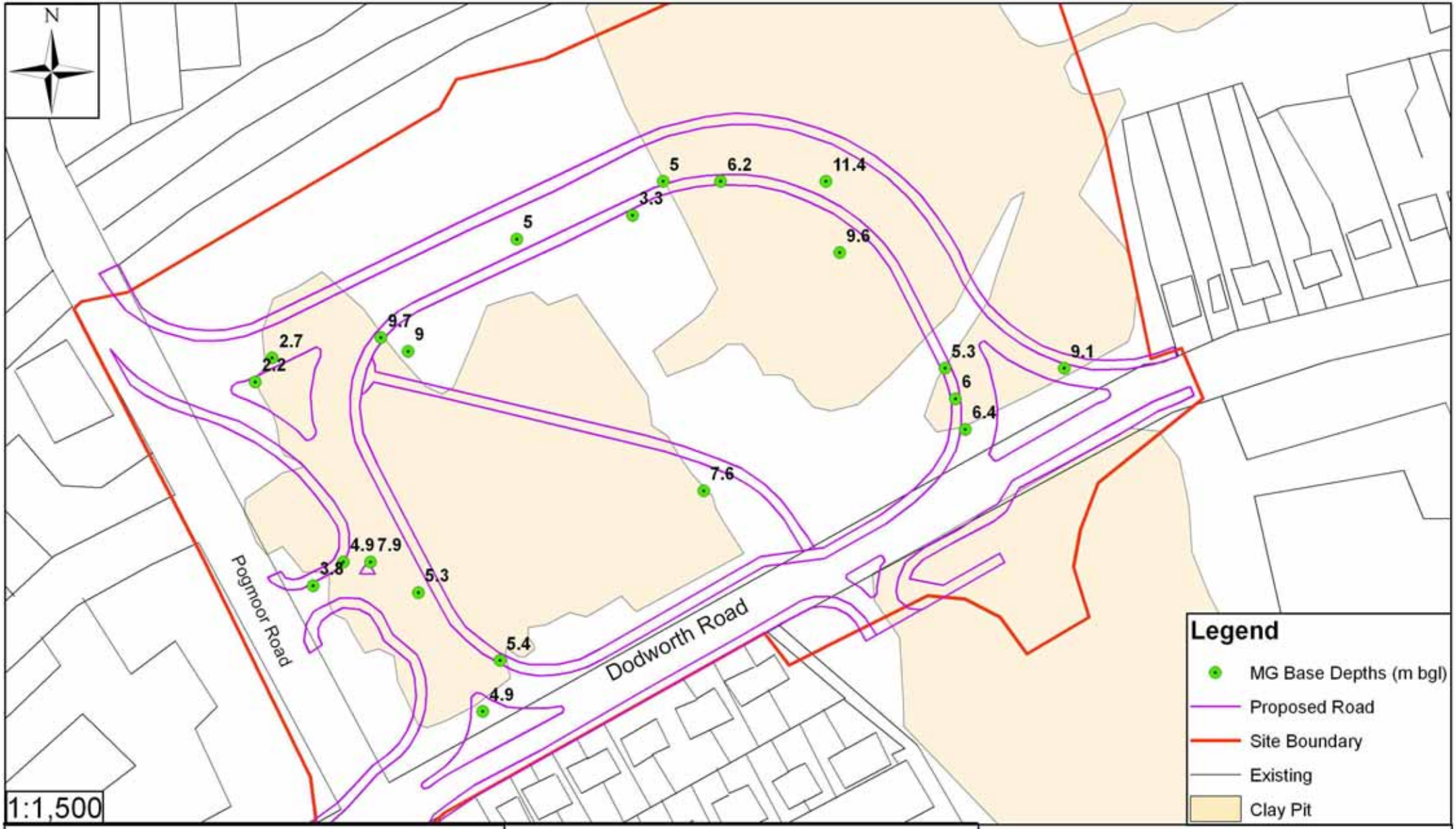
CONCEPTUAL MODEL TABLE

Client : BMBC

Project : A628 Dodworth Road Cross Roads

Job No : 151069

Fig 5:

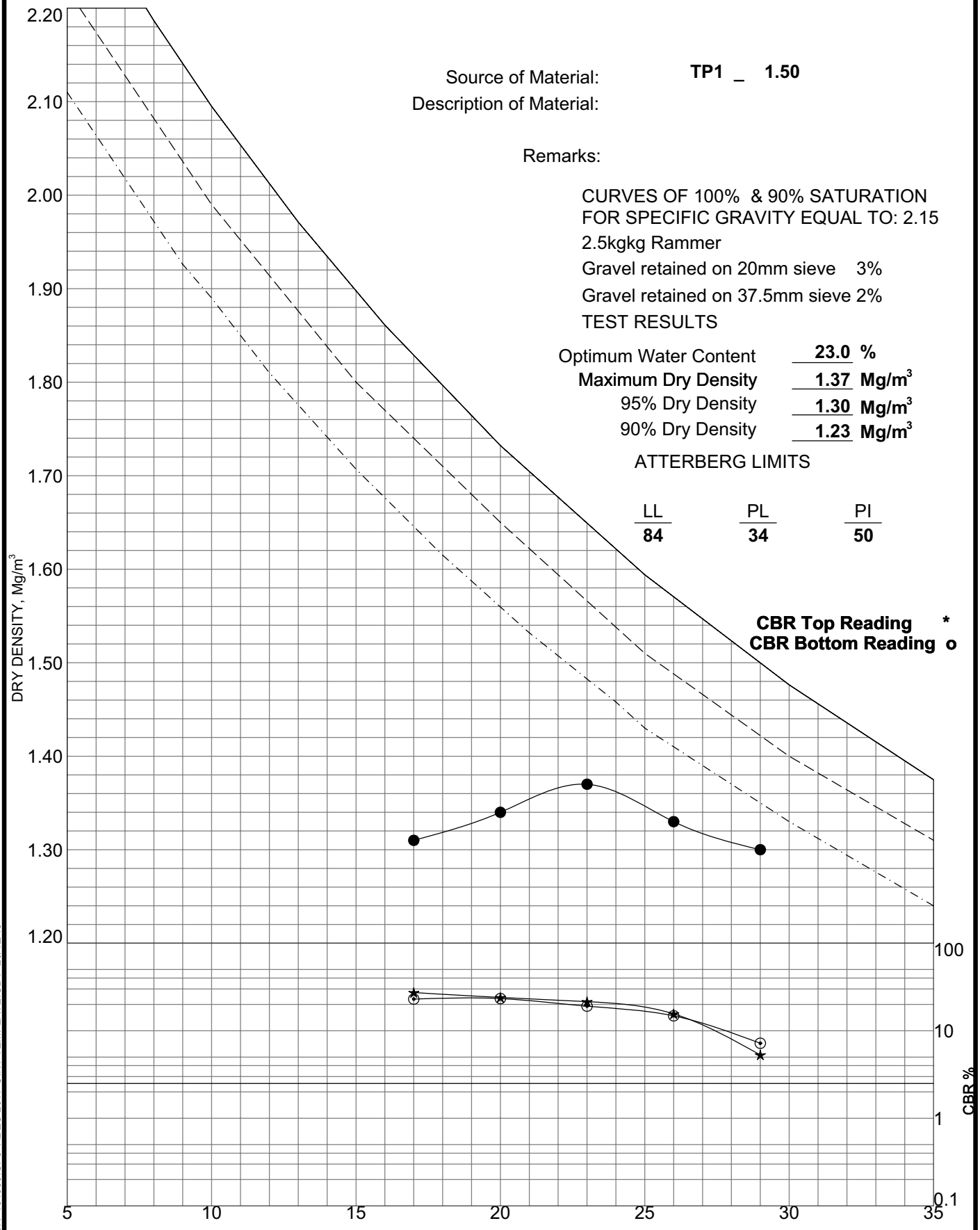


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Depths To Base Of Made Ground

Site: A628 Dodworth Road Crossroads, Barnsley
Job No: 151069
Client: BMBC

Fig 6



Source of Material: **TP1 _ 1.50**

Description of Material:

Remarks:

CURVES OF 100% & 90% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO: 2.15
2.5kgkg Rammer
Gravel retained on 20mm sieve 3%
Gravel retained on 37.5mm sieve 2%
TEST RESULTS

Optimum Water Content	**23.0**	**%**
Maximum Dry Density	**1.37**	**Mg/m^3**
95% Dry Density	**1.30**	**Mg/m^3**
90% Dry Density	**1.23**	**Mg/m^3**

ATTERBERG LIMITS

LL	PL	PI
84	**34**	**50**

CBR Top Reading *
CBR Bottom Reading o

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MOISTURE-DENSITY RELATIONSHIP

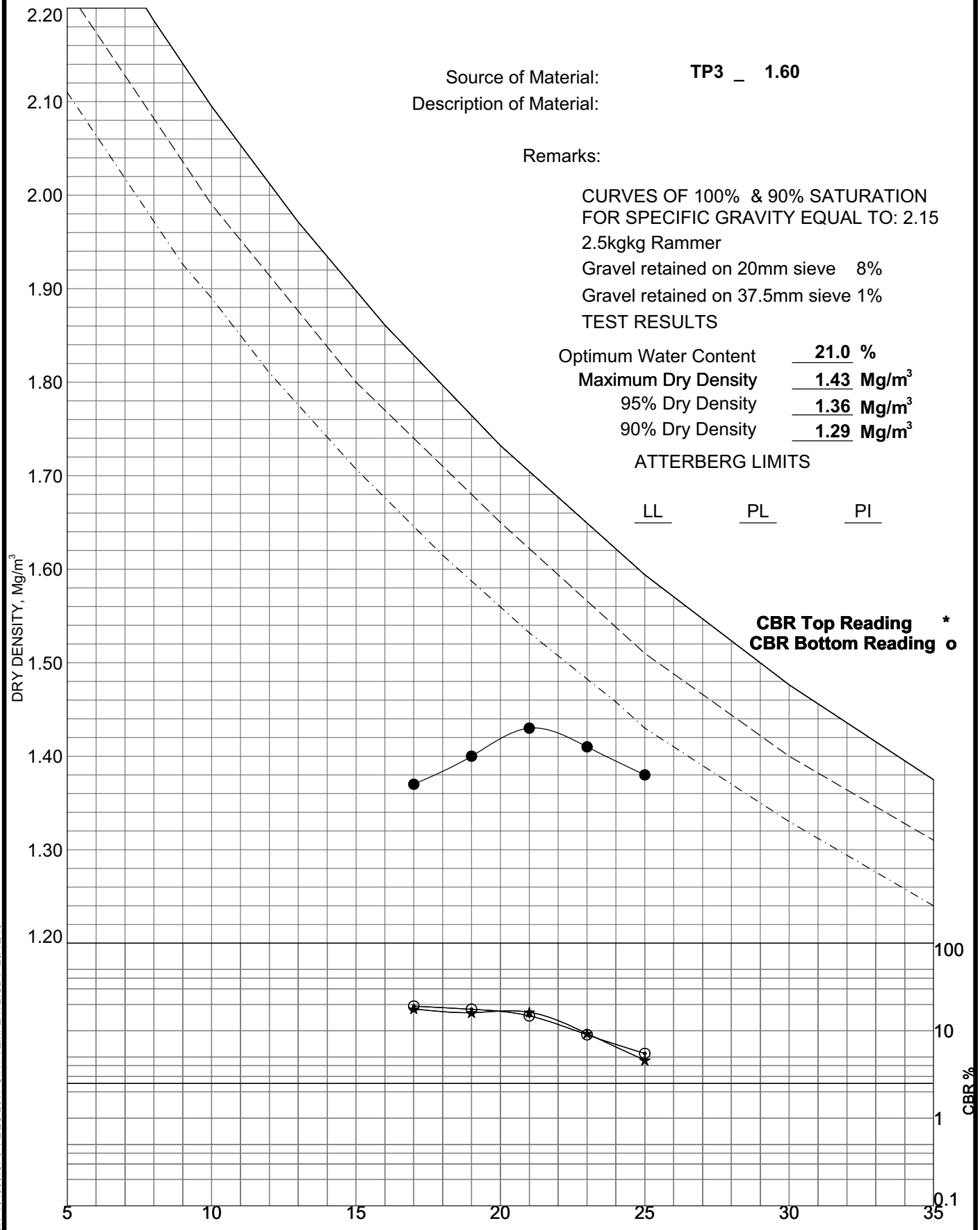
Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

Fig 7a

2016 ABEC COMPACTION V CBR 151069.GPJ ABEC 2017 GINT TEMPLATE.GDT 20/12/18



Source of Material: **TP3 _ 1.60**

Description of Material:

Remarks:

CURVES OF 100% & 90% SATURATION FOR SPECIFIC GRAVITY EQUAL TO: 2.15

2.5kgkg Rammer

Gravel retained on 20mm sieve 8%

Gravel retained on 37.5mm sieve 1%

TEST RESULTS

Optimum Water Content	**21.0**	**%**
Maximum Dry Density	**1.43**	**Mg/m^3**
95% Dry Density	**1.36**	**Mg/m^3**
90% Dry Density	**1.29**	**Mg/m^3**

ATTERBERG LIMITS

LL	PL	PI

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MOISTURE-DENSITY RELATIONSHIP

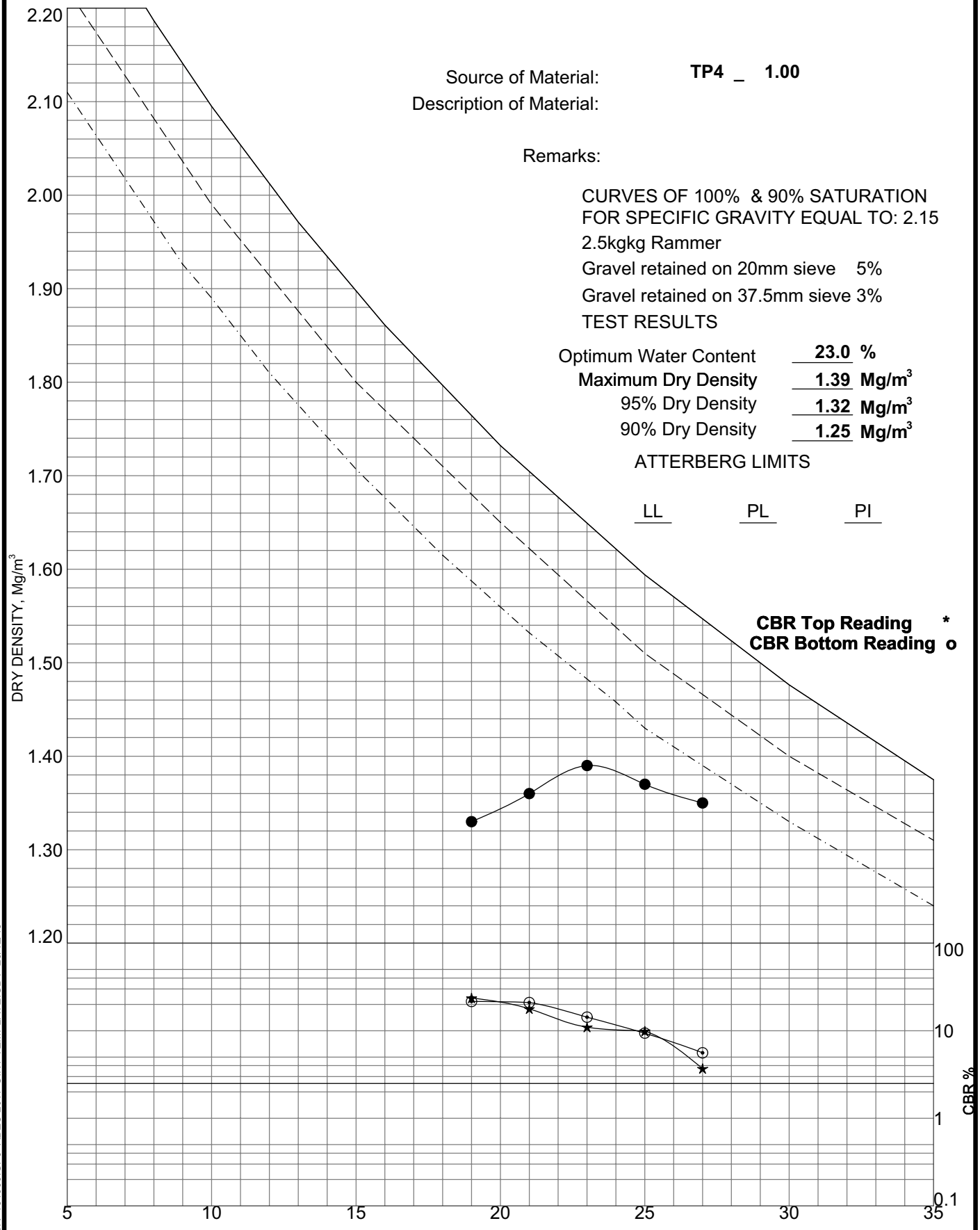
Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

Fig 7b

2016 ABEC COMPACTION V CBR 151069.GPJ ABEC 2017 GINT TEMPLATE.GDT 20/12/18



Source of Material: **TP4 _ 1.00**

Description of Material:

Remarks:

CURVES OF 100% & 90% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO: 2.15
2.5kgkg Rammer
Gravel retained on 20mm sieve 5%
Gravel retained on 37.5mm sieve 3%
TEST RESULTS

Optimum Water Content	**23.0**	**%**
Maximum Dry Density	**1.39**	**Mg/m^3**
95% Dry Density	**1.32**	**Mg/m^3**
90% Dry Density	**1.25**	**Mg/m^3**

ATTERBERG LIMITS

LL	PL	PI

CBR Top Reading *
CBR Bottom Reading o

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MOISTURE-DENSITY RELATIONSHIP

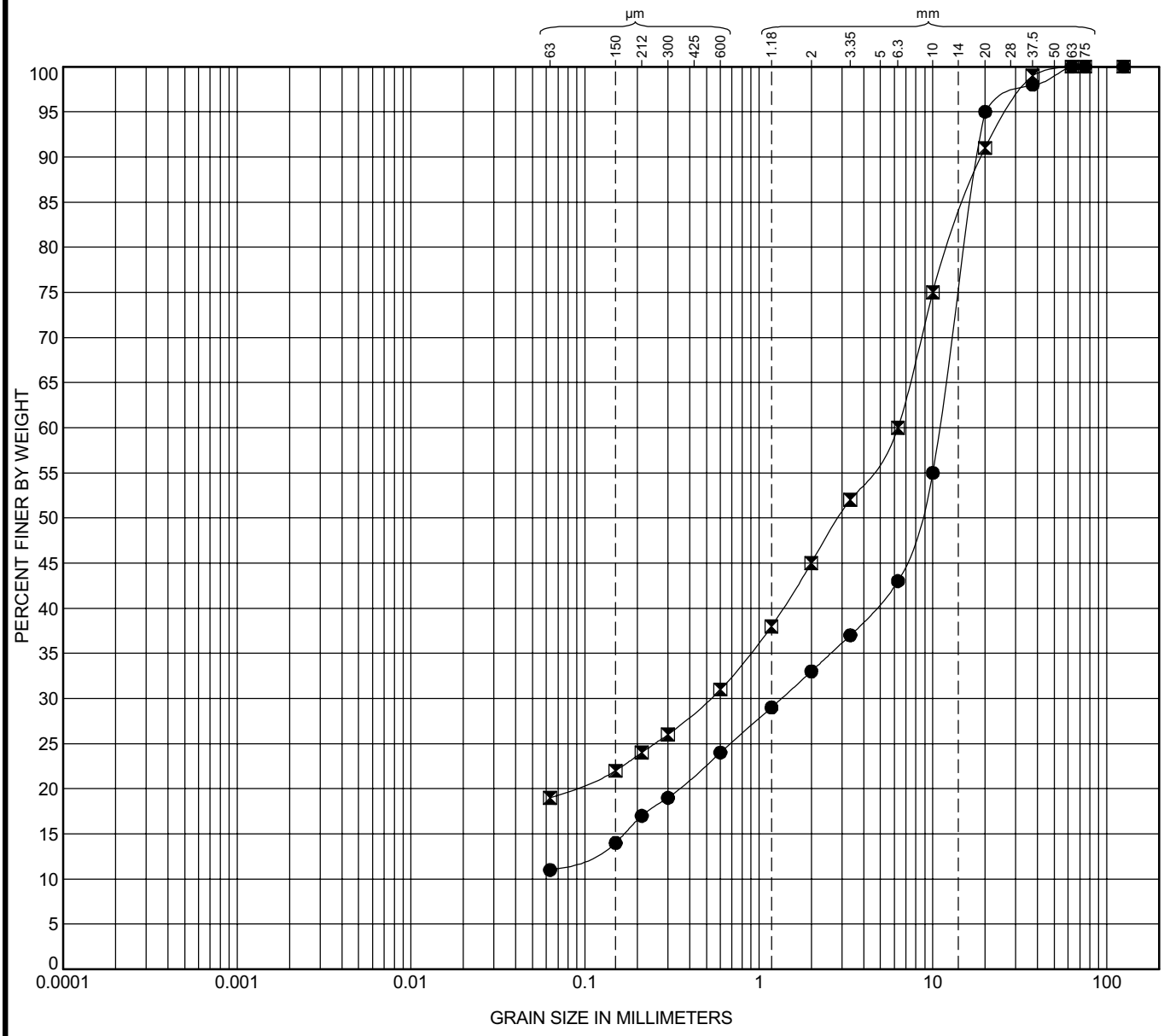
Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

Fig 7c

2016 ABEC COMPACTION V CBR 151069.GPJ ABEC 2017 GINT TEMPLATE.GDT 20/12/18



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

	Hole ID	Depth	Classification	C_u	C_c	LL	PL	PI
●	**TP1**	**1.50**		-	-			
⊠	**TP3**	**1.60**		-	-			
				-	-			
				-	-			
				-	-			

	Hole ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP1**	**1.50**	**63**	**10.905**	**1.346**		**66.8**	**22.2**	**10.8**	
⊠	**TP3**	**1.60**	**63**	**6.3**	**0.522**		**54.9**	**26.2**	**18.8**	

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GRAIN SIZE DISTRIBUTION

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

FIG 8

2018 GRADINGS 151069.GPJ ABEC TEMPLATE.GDT 20/12/18

Fig 9

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Forensic Soil Description Test Sheet

In general accordance with CIRIA RB1

Site:	Dodworth Cross Roads	**Test Date:**	
Site Ref:	151069	**Sample Ref:**	BH2 2.5m-3.0m
Sample Date:	5/11/18	**Sample Mass (kg):**	3.51
Comments:			
	Very loose brown clayey slightly gravelly sand. Gravel is fine to coarse sub angular coal and muds		

N.B. Clinker can contain high total organic carbon but low or no degradable carbon.

Fraction Mass (kg):		
Fine (including gravel <10mm)	3.42	
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick		
Wood, Trees, Branches, Roots etc	0.00	
Vegetable matter	0.00	
Cloth, Leather, Fabrics,	0.03	
Metal, glass, ceramic and other inert	0.07	
Paper and card	0.00	
Other degradable material	0.00	
Total	3.51	OK

SOM% of fine soil fraction		TOC % (SOM*0.58)	

Fraction % by Weight:		
Fine (including gravel <10mm)	97.29	N.B. % b/w is calculated from ((fraction mass/total mass) *100) - make sure total =100%
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick	0.00	
Wood, Trees, Branches, Roots etc	0.00	
Vegetable matter	0.00	
Cloth, Leather, Fabrics,	0.71	
Metal, glass, ceramic and other inert	1.99	
Paper and card	0.00	
Other degradable material	0.00	
Total	100.00	OK

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Forensic Soil Description Test Sheet

In general accordance with CIRIA RB1

Site:	Dodworth Cross Roads	**Test Date:**	
Site Ref:	151069	**Sample Ref:**	BH3 8.0m-9.0m
Sample Date:	5/11/18	**Sample Mass (kg):**	4.91
Comments:			
	Very loose dark brown sandy gravel. Gravel is fine to coarse sub-angular mudstone coal glass and		

N.B. Clinker can contain high total organic carbon but low or no degradable carbon.

Fraction Mass (kg):			
Fine (including gravel <10mm)	4.65		
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick	0.08		
Wood, Trees, Branches, Roots etc	0.00		
Vegetable matter	0.00		
Cloth, Leather, Fabrics,	0.00		
Metal, glass, ceramic and other inert	0.18		
Paper and card	0.00		
Other degradable material	0.00		
Total	4.91	OK	
SOM% of fine soil fraction		TOC % (SOM*0.58)	

Fraction % by Weight:		
Fine (including gravel <10mm)	94.68	N.B. % b/w is calculated from ((fraction mass/total mass) *100) - make sure total =100%
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick	1.61	
Wood, Trees, Branches, Roots etc	0.04	
Vegetable matter	0.00	
Cloth, Leather, Fabrics,	0.00	
Metal, glass, ceramic and other inert	3.67	
Paper and card	0.00	
Other degradable material	0.00	
Total	100.00	OK

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Forensic Soil Description Test Sheet

In general accordance with CIRIA RB1

Site:	Dodworth Cross Roads	**Test Date:**	
Site Ref:	151069	**Sample Ref:**	BH1 5.5m
Sample Date:	5/11/18	**Sample Mass (kg):**	3.17
Comments:			
	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.		

N.B. Clinker can contain high total organic carbon but low or no degradable carbon.

Fraction Mass (kg):			
Fine (including gravel <10mm)	3.17		
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick	0.00		
Wood, Trees, Branches, Roots etc	0.00		
Vegetable matter	0.00		
Cloth, Leather, Fabrics,	0.00		
Metal, glass, ceramic and other inert	0.00		
Paper and card	0.00		
Other degradable material	0.00		
Total	3.17	OK	
SOM% of fine soil fraction		TOC % (SOM*0.58)	

Fraction % by Weight:		
Fine (including gravel <10mm)	100.00	N.B. % b/w is calculated from ((fraction mass/total mass) *100) - make sure total =100%
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick	0.00	
Wood, Trees, Branches, Roots etc	0.00	
Vegetable matter	0.00	
Cloth, Leather, Fabrics,	0.00	
Metal, glass, ceramic and other inert	0.00	
Paper and card	0.00	
Other degradable material	0.00	
Total	100.00	OK

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Forensic Soil Description Test Sheet

In general accordance with CIRIA RB1

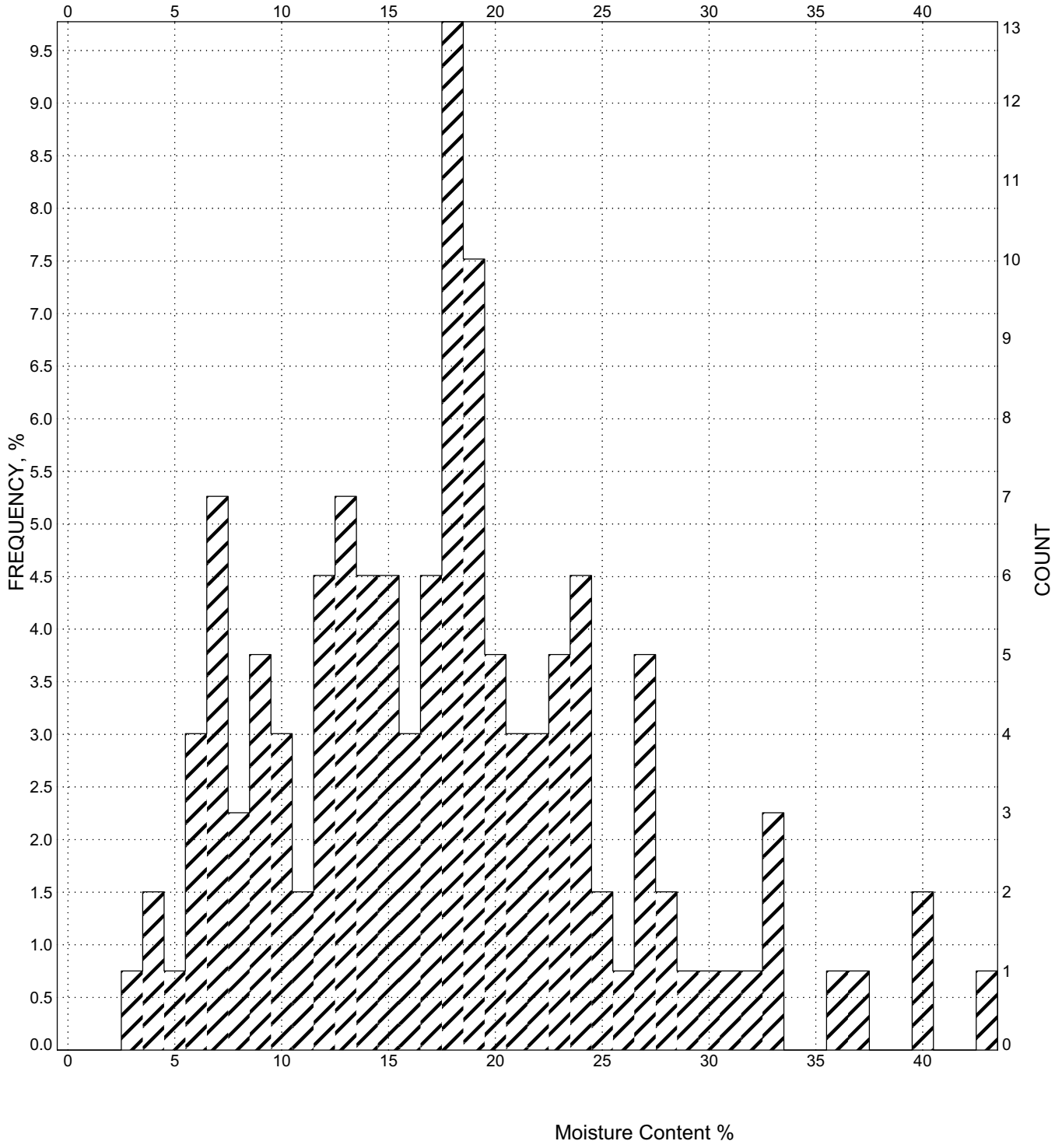
Site:	Dodworth Cross Roads	**Test Date:**	
Site Ref:	151069	**Sample Ref:**	BH2 5.5m-6.0m
Sample Date:	5/11/18	**Sample Mass (kg):**	4.78
Comments:	Very loose black sandy gravel. Gravel is fine to coarse sub angular red shale coal and sandstone.		

N.B. Clinker can contain high total organic carbon but low or no degradable carbon.

Fraction Mass (kg):		
Fine (including gravel <10mm)	2.52	
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick	2.21	
Wood, Trees, Branches, Roots etc	0.00	
Vegetable matter	0.00	
Cloth, Leather, Fabrics,	0.03	
Metal, glass, ceramic and other inert	0.03	
Paper and card	0.00	
Other degradable material	0.00	
Total	4.78	OK

SOM% of fine soil fraction		TOC % (SOM*0.58)	

Fraction % by Weight:		
Fine (including gravel <10mm)	52.74	N.B. % b/w is calculated from ((fraction mass/total mass) *100) - make sure total =100%
Coarse inert particles (>10mm) inc clinker, gravel, concrete, brick	46.13	
Wood, Trees, Branches, Roots etc	0.00	
Vegetable matter	0.00	
Cloth, Leather, Fabrics,	0.52	
Metal, glass, ceramic and other inert	0.61	
Paper and card	0.00	
Other degradable material	0.00	
Total	100.00	OK



Number of Tests:	133
Average:	17.8
Minimum:	3.0
Maximum:	43.0
Standard Dev:	8.1
US_{95}:	18.9

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Moisture Content Distribution

Client: BMBC

Project: A628 Dodworth Road Crossroads, Barnsley

Number: 151069

Fig 10

EXPLORATION LOGS

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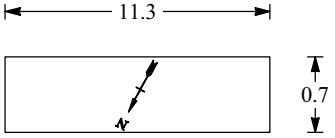
TRIAL PIT LOG

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Building Environment Consultants

Project				TRIAL PIT No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**TP1**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	08-11-18 08-11-18	140.00	E 432,641.0 N 406,285.0	
Method/Plant Used CAT 432E with 0.60m toothed bucket				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	D			139.70		(0.30) 0.30	MADE GROUND. Appears loose dark brown slightly clayey slightly gravelly sand. Gravel is fine to coarse, subangular sandstone. Grass topped. (Topsoil).		
0.80	D						MADE GROUND. Appears loose brown gravelly sand. Gravel is fine to coarse, subangular glass, plastic, ceramic, coal, bone. Cobbles of glass bottles.		
1.50	B					(1.90)			
2.50 2.50	D P	3.0+ kg/cm²		137.80		2.20			
				137.20		(0.60) 2.80	Very stiff orange and grey mottled slightly gravelly CLAY. Gravel is fine to medium, subangular lithorelics of mudstone. Root tracks present with some root material present. (Completely weathered Mudstone).		
2.90	D			137.00		(0.20) 3.00	Extremely weak dark brown partially weathered (class B) MUDSTONE. Thinly laminated with orange staining on laminations. Partially Recovered as clayey fine to coarse subangular gravel.		
3.10	D			136.80		(0.20) 3.20	Black COAL. Recovered as gravel and cobble sized cuboids with slight orange staining on some faces.		
				136.70		3.30	Extremely weak grey unweathered (class A) MUDSTONE.		
3.30	D						Trial Pit terminated at 3.30m bgl on hard strata.		

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

CAT used to check for services before digging.
No groundwater encountered. Backfilled with arisings. Easy dig.
Stable

All dimensions in metres Scale 1:25	Client BMBC	Contractor Hather Plant	Logged By GH

ABEC TRIAL PIT 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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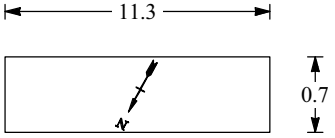
TRIAL PIT LOG

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Building Environment Consultants

Project				TRIAL PIT No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**TP1B**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	08-11-18 08-11-18	140.00	E 432,648.0 N 406,286.0	
Method/Plant Used: CAT 432E with 0.60m toothed bucket				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				139.70		(0.30) 0.30	MADE GROUND. Appears loose dark brown slightly clayey slightly gravelly sand. Gravel is fine to coarse, subangular sandstone. Grass topped. (Topsoil).		
						(3.00)	MADE GROUND. Appears loose brown gravelly sand. Gravel is fine to coarse, subangular glass, plastic, ceramic, coal, bone. Cobbles of glass bottles.		
				136.70		3.30			

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

CAT used to check for services before digging.
No groundwater encountered. Backfilled with arisings. Easy dig.
Stable

All dimensions in metres Scale 1:25	Client BMBC	Contractor Hather Plant	Logged By GH

ABEC TRIAL PIT 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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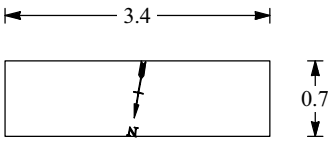
TRIAL PIT LOG

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Project				TRIAL PIT No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**TP2**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	08-11-18 08-11-18	139.50	E 432,770.0 N 406,341.0	
Method/Plant Used: CAT 432E with 0.60m toothed bucket				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			139.30		(0.20) 0.20	MADE GROUND. Appears loose dark brown slightly clayey slightly gravelly sand. Gravel is fine to coarse, subangular sandstone. Grass topped. (Topsoil).		
0.50	D						MADE GROUND. Appears loose dark brown and black very gravelly sand. Gravel is fine to coarse, subangular brick, glass, coal, plastic, wood, ceramic, sandstone. Cobbles of glass bottles and bricks.		
1.20	B					(2.50)			
				136.80		2.70			
2.80	P	1.3 kg/cm²					MADE GROUND. Firm to stiff grey, blue-grey and black slightly sandy very gravelly clay. Gravel is fine to coarse, subangular mudstone with ironstone nodules, brick and coal. Low cobble content of mudstone and ironstone nodules.		
3.00	B								
3.20	D					(1.30)			
				135.50		4.00			

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

CAT used to check for services before digging.
No groundwater encountered. Backfilled with arisings.
Stable

All dimensions in metres Scale 1:25	Client BMBC	Contractor Hather Plant	Logged By GH

ABEC TRIAL PIT 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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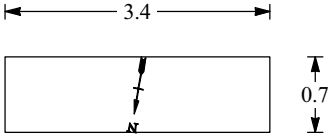
TRIAL PIT LOG

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Project				TRIAL PIT No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**TP2**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	08-11-18 08-11-18	139.50	E 432,770.0 N 406,341.0	
Method/Plant Used CAT 432E with 0.60m toothed bucket				Sheet 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
							Trial Pit terminated at 4.00m bgl at maximum reach of excavator.		

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

CAT used to check for services before digging.
No groundwater encountered. Backfilled with arisings.
Stable

All dimensions in metres Scale 1:25	Client BMBC	Contractor Hather Plant	Logged By GH

ABEC TRIAL PIT 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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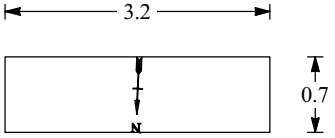
TRIAL PIT LOG

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Project				TRIAL PIT No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**TP3**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	08-11-18 08-11-18	139.50	E 432,752.0 N 406,334.0	
Method/Plant Used CAT 432E with 0.60m toothed bucket				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	D			139.10		(0.40) 0.40	MADE GROUND. Appears loose dark brown slightly clayey slightly gravelly sand. Gravel is fine to coarse, subangular sandstone. Grass topped. (Topsoil).		
0.50	D			138.90		(0.20) 0.60	MADE GROUND. Appears medium dense brown gravel. Gravel is fine to medium, subrounded quartzite pebbles.		
0.70	D			138.30		(0.60) 1.20	MADE GROUND. Appears medium dense dark brown sandy gravel. Gravel is fine to coarse, angular mudstone and red shale.		
1.30	D			136.50		(1.80) 3.00	PROBABLE MADE GROUND. Appears loose brown gravel. Gravel is fine to coarse mudstone with orange stained fractures and ~5cm conchoidal ironstone nodules. Frequent cobbles.		
1.60	B								
3.10	D			136.20		(0.30) 3.30	Black COAL. Recovered as gravel and cobble sized cuboids with slight orange staining on some faces.		
3.40	D			135.90		(0.30) 3.60	Extremely to very weak light grey with black streaks MUDSTONE. Recovered as angular fine to coarse gravel. Black streaks appear to be fossils.		
							Trial Pit terminated at 3.60m bgl on hard strata (Mudstone).		

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

CAT used to check for services before digging.
No groundwater encountered. Backfilled with arisings.
Stable

All dimensions in metres Scale 1:25	Client BMBC	Contractor Hather Plant	Logged By GH

ABEC TRIAL PIT 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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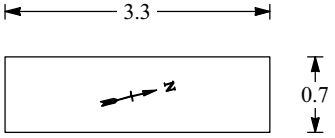
TRIAL PIT LOG

Abbeydale
Building Environment Consultants

Project				TRIAL PIT No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**TP4**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	08-11-18 08-11-18	139.00	E 432,826.0 N 406,309.0	
Method/Plant Used: CAT 432E with 0.60m toothed bucket				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	D			138.60		(0.40) 0.40	MADE GROUND. Appears loose dark brown slightly clayey slightly gravelly sand. Gravel is fine to coarse, subangular sandstone. Grass topped. (Topsoil).		
0.40	D						MADE GROUND. Appears loose brown and black slightly clayey very sandy gravel. Gravel is fine to coarse, subangular glass, brick, coal, sandstone, plastic, wood and metal. High cobble content of brick and glass bottles.		
1.00	B								
2.00	D					(3.60)			
3.00	D								
				135.00		4.00			

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

CAT used to check for services before digging.
No groundwater encountered. Backfilled with arisings.
Stable

All dimensions in metres Scale 1:25	Client BMBC	Contractor Hather Plant	Logged By GH

ABEC TRIAL PIT 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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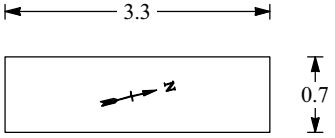
TRIAL PIT LOG

Abbeydale
Building Environment Consultants

Project				TRIAL PIT No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**TP4**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	08-11-18 08-11-18	139.00	E 432,826.0 N 406,309.0	
Method/Plant Used CAT 432E with 0.60m toothed bucket				Sheet 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
							Trial Pit terminated at 4.00m bgl at maximum reach of excavator.		

Shoring/Support: None
Stability: Stable



GENERAL REMARKS

CAT used to check for services before digging.
No groundwater encountered. Backfilled with arisings.
Stable

All dimensions in metres Scale 1:25	Client BMBC	Contractor Hather Plant	Logged By GH

ABEC TRIAL PIT 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				WS1
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,870.0 N 406,309.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			138.80		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.30	D			138.60		(0.20) 0.40	MADE GROUND: Loose slightly clayey dark brown sand. Frequent flakes of plastic. Occasional bits of metal.	a1	
0.60	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N1							
1.20	D	1,0,0 1,0,0							
1.80	D								
2.00	SPT	N3							
2.20	D	1,1,1 0,1,1						a1	
2.80	D					(5.05)			
3.00	SPT	N4							
3.20	D	1,1,1 1,1,1							
3.80	D								

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

ABEC WINDOW SAMPLE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS1**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,870.0 N 406,309.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N0					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
4.20	D	0,0,0 0,0,0							
4.80	D								
5.00	SPT	N3							
5.30	D	1,0,1 0,1,1		133.55		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS10**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	140.00	E 432,665.0 N 406,252.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			139.80		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
							MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
0.80	D								
1.00	SPT	N1							
1.20	D	1,0,0 0,1,0							
1.80	D								
2.00	SPT	N2						a1	
2.20	D	0,1,1 0,1,0							
2.80	D					(5.25)			
3.00	SPT	N3							
3.20	D	1,0,1 0,1,1							
3.80	D								

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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WINDOW SAMPLE LOG

Abbeydale
Building Environment Consultants

Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS10**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	140.00	E 432,665.0 N 406,252.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N3					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
4.20	D	1,0,0 1,1,1							
4.80	D								
5.00	SPT	N4							
5.30	D	1,0,1 1,1,1		134.55		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS11**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	140.00	E 432,649.0 N 406,251.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			139.70		(0.30) 0.30	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.60	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N6							
1.20	D	1,0,1 1,2,2							
1.80	D								
2.00	SPT	N0						a1	
2.20	D	1,0,0 0,0,0				(4.15)			
2.80	D								
3.00	SPT	N12					Ground becoming unstable from~3.00m bgl		
3.20	D	1,2,3 2,3,4							
3.80	D						Becoming clayey at 3.7m		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.
Unstable from ~3m bgl.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS11**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	140.00	E 432,649.0 N 406,251.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N7 1,1,2 2,2,1						a1	
4.30	D			135.55		4.45			
							Borehole terminated at 4.45m bgl due to unstable ground.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.
Unstable from ~3m bgl.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS12**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	140.00	E 432,689.0 N 406,205.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			139.80		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.60	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N1							
1.20	D	1,0,0 1,0,0							
1.80	D								
2.00	SPT	N1				(3.80)		a1	
2.20	D	1,0,0 1,0,0							
2.80	D								
3.00	SPT	N4					Ground becoming unstable from ~3.00m bgl.		
3.20	D	1,0,1 1,1,1							
							Becoming very clayey from 3.80m bgl.		
				136.00		4.00			

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.
Unstable from ~3m bgl.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS12**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	140.00	E 432,689.0 N 406,205.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
							Borehole terminated at 4.00m bgl due to unstable ground.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.
Unstable from ~3m bgl.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS13**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	139.50	E 432,764.0 N 406,255.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			139.30		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.70	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N8							
1.20	D	3,3,2 2,2,2							
1.80	D								
2.00	SPT	N0						a1	
2.20	D	1,0,0 0,0,0							
2.80	D					(5.25)			
3.00	SPT	N1							
3.20	D	1,0,0 1,0,0							
3.80	D								

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

ABEC WINDOW SAMPLE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS13**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	139.50	E 432,764.0 N 406,255.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N4					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
4.20	D	1,1,1 1,1,1							
4.80	D								
5.00	SPT	N5							
5.30	D	1,1,1 1,2,1		134.05		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				WS2
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,864.0 N 406,360.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			138.70		(0.30) 0.30	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.50	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N6							
1.20	D	1,2,3 2,1,0							
1.80	D								
2.00	SPT	N4						a1	
2.20	D	1,0,0 3,1,0							
2.80	D					(5.15)	Becoming purplish mottled dark grey from 2.80m.		
3.00	SPT	N2							
3.20	D	1,0,0 1,0,1							
3.80	D								

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

ABEC WINDOW SAMPLE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS2**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,864.0 N 406,360.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N0					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
4.20	D	0,0,0 0,0,0							
4.80	D								
5.00	SPT	N2							
		1,0,0 1,0,1							
5.30	D			133.55		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

Abbeydale
Building Environment Consultants

Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				WS3
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,821.0 N 406,352.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			138.80		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.50	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N0							
1.20	D	1,0,0 0,0,0							
1.80	D								
2.00	SPT	N3						a1	
2.20	D	1,0,1 1,0,1							
2.80	D					(5.25)			
3.00	SPT	N2							
3.20	D	1,0,1 0,1,0					Becoming dark grey from 3.20m.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

ABEC WINDOW SAMPLE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS3**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,821.0 N 406,352.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N5 1,0,2 1,1,1					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
5.00	SPT	N3 1,1,1 0,1,1							
5.30	D			133.55		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

ABEC WINDOW SAMPLE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS4**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,821.0 N 406,318.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			138.80		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.50	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N0							
1.20	D	1,0,0 0,0,0							
1.80	D								
2.00	SPT	N2						a1	
2.20	D	1,0,1 1,0,0							
2.80	D					(5.25)			
3.00	SPT	N9							
3.20	D	2,3,2 3,2,2							
3.80	D								

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS4**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,821.0 N 406,318.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N2					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
4.20	D	1,0,0 1,0,1							
4.80	D								
5.00	SPT	N6							
5.30	D	2,2,1 1,2,2		133.55		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				WS5
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,830.0 N 406,299.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			138.80		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.50	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N2							
1.20	D	1,1,1 0,0,1							
1.80	D								
2.00	SPT	N1						a1	
2.20	D	1,0,0 1,0,0							
2.80	D					(5.25)			
3.00	SPT	N1							
3.20	D	1,0,0 0,1,0							
3.80	D								

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS5**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,830.0 N 406,299.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N2					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
4.20	D	0,0,0 1,0,1							
4.80	D								
5.00	SPT	N2							
5.30	D	1,0,0 1,0,1		133.55		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

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Building Environment Consultants

Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS6**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.50	E 432,752.0 N 406,291.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	D			139.20		(0.30) 0.30	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.50	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N4							
1.20	D	1,0,0 1,1,2							
1.80	D								
2.00	SPT	N2						a1	
2.20	D	1,0,0 1,0,1							
2.80	D					(5.15)			
3.00	SPT	N2							
3.20	D	1,1,1 0,1,0							
3.80	D								

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS6**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.50	E 432,752.0 N 406,291.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00	SPT	N1					MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
4.20	D	1,0,0 0,0,1							
4.80	D								
5.00	SPT	N5							
		2,1,1 1,2,1							
				134.05		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS
CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				WS7
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.50	E 432,784.0 N 406,243.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			139.30		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.50	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N4 1,1,1 1,1,1							
1.20	D					(2.30)		a1	
1.80	D								
2.00	SPT	N9 1,1,1 2,2,4							
2.20	D			137.00		2.50			
2.60	D					(0.50)	MADE GROUND: Light Brown light grey mottled very clayey sand. Occasional Gravel of mudstone. SPT deflected below 2m.	a1	
3.00	SPT	N40 6,7,9 10,10,11		136.50		3.00	Borehole terminated at 3.00m bgl.		
3.45	D								

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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WINDOW SAMPLE LOG

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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**WS8**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	139.50	E 432,708.0 N 406,321.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	D			139.30		(0.20) 0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
0.30	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
1.00	SPT	N42				(1.60)		a1	
1.20	D	2,3,3 3,11,25 for 50mm							
1.60	D			137.70		1.80			
1.90	D						MADE GROUND: Very stiff light brown grey mottled slightly sandy slightly gravelly clay. Gravel is light grey mudstone.		
1.90	P	2Kg/cm2				(0.50)		a2	
2.00	SPT	N25		137.20		2.30			
		3,3,4 6,7,8		137.00		(0.20) 2.50	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
2.50	D								
2.80	D						MADE GROUND: Extremely weak thinly laminated light grey shaley mudstone. Discontinuities <1mm spaced subhorizontal fractures closed. Occasional infilling of coal.		
3.00	SPT	N61				(0.95)		a2	
		7,10,13 14,17,17							
3.30	D			136.05		3.45			
							Borehole terminated at 3.45m bgl.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client BMBC	Contractor Infosoil	Logged By WW

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WINDOW SAMPLE LOG

Abbeydale
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Project				HOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				WS9
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	06-11-18 06-11-18	140.00	E 432,646.0 N 406,292.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				139.90		0.10	Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone.	a1	
0.10	D						MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
0.30	D								
1.00	SPT	N0							
1.20	D	0,1,0 0,0,0				(2.20)		a1	
1.60	D								
1.90	D								
2.00	SPT	N7							
2.20	D	0,1,1 2,2,2		137.70		2.30			
2.50	D					(0.40)	MADE GROUND: Very stiff light brown grey mottled slightly sandy slightly gravelly clay. Gravel is light grey mudstone.	a2	
2.60	P	3Kg/cm2		137.30		2.70			
2.80	D						Extremely weak thinly laminated light grey shaley mudstone. Discontinuities <1mm spaced subhorizontal fractures closed. Occasional infilling of coal.		
3.00	SPT	N47				(0.68)		a2	
		7,12,12 14,21							
3.30	D			136.62		3.38			
							Borehole terminated at 3.38m bgl.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings and gravel on completion.

All dimensions in metres Scale 1:25	Client: BMBC	Contractor: Infosoil	Logged By: WW

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BOREHOLE LOG

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Project				BOREHOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**BH1**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	140.00	E 432,689.0 N 406,223.0	
Method/Plant Used: Dando 2000 Cable Percussive Rig				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00	B			139.50		(0.50) 0.50	MADE GROUND. Slightly clayey gravelly sand. Gravel is fine to coarse, subangular coal and sandstone. Low cobble content of sandstone.		
0.50-1.00	B						MADE GROUND. Generally loose black and dark brown slightly clayey sandy gravel. Gravel is fine to coarse, subangular coal, red shale, sandstone and mudstone.		
1.00-1.45	SPT	N5 1,0,1,1,2,1							
1.50-2.00	B								
2.00-2.45	SPT	N8 5,4,4,2,1,1							
2.50-3.00	B						Gravel contains porcelain from 2.50m bgl.		
3.00-3.45	SPT	N2 1,0,1,0,1,0				(4.80)	Becoming very loose from 3.00m bgl.		
3.50-4.00	B								
4.00-4.45	SPT	N3 1,0,0,1,1,1							
4.50-5.00	B								
5.00-5.45	SPT	N17 3,2,3,4,5,5		134.70		5.30	Becoming medium dense from 5.00m bgl. Very stiff thinly laminated CLAY.		
5.50-5.57	SPT	N50+ 10,15,25 for 70mm		134.60 133.80		5.40 (0.80) 6.20	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.		
6.20-6.23	SPT	N50+ 16,25 for 20mm 25 for 10mm					Borehole terminated at 6.20m bgl on Mudstone Bedrock.		

Boring Progress and Water Observations

Date	Depth	Water Depth	Casing Depth	Casing Dia. mm	Chiselling Depth	Chiselling Time (hr)
					5.4 6.2	1

GENERAL REMARKS

CAT used prior to drilling to check for services.
Monitoring standpipe installed to base of hole.
Groundwater not encountered.

All dimensions in metres Scale 1:50	Client BMBC	Contractor Infosoil	Logged By GH

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BOREHOLE LOG

Abbeydale
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Project				BOREHOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**BH2**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	140.00	E 432,686.0 N 406,294.0	
Method/Plant Used: Dando 2000 Cable Percussive Rig				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				139.90		0.10	MADE GROUND. Dark brown clayey slightly gravelly sand. Gravel is fine to coarse sandstone. Cobble of tarmac at base.		
0.20-1.00	B						MADE GROUND. Very loose black and dark brown gravelly sand. Gravel is fine to coarse, subangular coal and sandstone.		
1.00-1.45	SPT	N1				(1.90)			
		1,0,0,1,0,0							
1.50-2.00	D								
				138.00		2.00			
2.00-2.45	SPT	N0					MADE GROUND. Very loose brown clayey slightly gravelly sand. Gravel is fine to coarse, subangular sandstone and coal.		
		1,0,0,0,0,0							
2.50-3.00	B								
3.00-3.45	SPT	N1				(2.00)	Gravel contains porcelain from 3.00m bgl.		
		1,0,0,1,0,0							
3.50-4.00	B								
				136.00		4.00			
4.00-4.45	SPT	N2					MADE GROUND. Very loose black sandy gravel. Gravel is fine to coarse, subangular red shale, coal and sandstone.		
		1,0,1,0,1,0							
4.50-5.00	B								
5.00-5.45	SPT	N3							
		2,4,1,0,1,1							
5.50-6.00	B								
6.00-6.45	SPT	N6							
		2,2,1,2,1,2				(5.00)			
7.00-7.50	B								
			▼						
7.50-7.45	SPT	N1							
		1,0,0,0,1,0							

Boring Progress and Water Observations

Date	Depth	Water Depth	Casing Depth	Casing Dia. mm	Chiselling Depth	Chiselling Time (hr)

GENERAL REMARKS

CAT used prior to drilling to check for services.
Monitoring standpipe installed to base of hole.
Groundwater encountered at 7.50m bgl.

All dimensions in metres Scale 1:50	Client BMBC	Contractor Infosoil	Logged By GH

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BOREHOLE LOG

Abbeydale
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Project				BOREHOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**BH2**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	140.00	E 432,686.0 N 406,294.0	
Method/Plant Used: Dando 2000 Cable Percussive Rig				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				131.00		9.00	MADE GROUND. Very loose black sandy gravel. Gravel is fine to coarse, subangular red shale, coal and sandstone. *(continued)*		
8.50-9.00	B								
9.00-9.15	SPT	N50+		130.90		9.10	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.		
	13,12 for 70mm	50 for 40mm							

Boring Progress and Water Observations

Date	Depth	Water Depth	Casing Depth	Casing Dia. mm	Chiselling Depth	Chiselling Time (hr)
					9 9.40	1

GENERAL REMARKS

CAT used prior to drilling to check for services.
Monitoring standpipe installed to base of hole.
Groundwater encountered at 7.50m bgl.

All dimensions in metres Scale 1:50	Client BMBC	Contractor Infosoil	Logged By GH

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BOREHOLE LOG

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Project				BOREHOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**BH3**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,809.0 N 406,344.0	
Method/Plant Used: Dando 2000 Cable Percussive Rig				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-1.00	B			138.80		0.20	MADE GROUND. Brown slightly clayey gravelly sand. Gravel is fine to coarse, subangular sandstone and coal. Rootlets present.		
							MADE GROUND. Very loose dark brown slightly clayey gravelly sand. Gravel is fine to coarse, subangular glass, wood, plastic.		
1.00-1.45	SPT	N0 1,0,0,0,0,0				(1.90)			
1.50-2.00	B								
2.00-2.45	SPT	N0 1,0,0,0,0,0		136.90		2.10	MADE GROUND. Very loose dark brown sandy gravel. Gravel is fine to coarse, subangular mudstone, coal, glass and brick.		
2.50-3.00	D								
3.00-3.45	SPT	N2 2,1,2,0,0,0							
3.50-4.00	B								
4.00-4.45	SPT	N3 1,0,0,2,0,1							
4.50-5.00	B								
5.00-5.45	SPT	N1 2,1,0,1,0,0							
5.50-6.00	B								
6.00-6.45	SPT	N7 2,2,2,1,2,2				(9.30)			
7.00-7.50	B								
7.50-7.95	SPT	N1 1,0,0,1,0,0							

Boring Progress and Water Observations

Date	Depth	Water Depth	Casing Depth	Casing Dia. mm	Chiselling Depth	Chiselling Time (hr)

GENERAL REMARKS

CAT used prior to drilling to check for services.
Monitoring standpipe installed to base of hole.
Groundwater encountered at 9.00m bgl.

All dimensions in metres Scale 1:50	Client BMBC	Contractor Infosoil	Logged By GH

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BOREHOLE LOG

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Building Environment Consultants

Project				BOREHOLE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**BH3**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	05-11-18 05-11-18	139.00	E 432,809.0 N 406,344.0	
Method/Plant Used: Dando 2000 Cable Percussive Rig				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
8.00-8.50	B						MADE GROUND. Very loose dark brown sandy gravel. Gravel is fine to coarse, subangular mudstone, coal, glass and brick. *(continued)*		
9.00-9.45	SPT	N8 2,2,2,2,2,2	▼1				Becoming loose from 9.00m bgl.		
10.00-10.50	B								
10.50-10.95	SPT	N10 2,3,2,3,2,3							
11.00-11.50	B			127.60		11.40			
11.50-11.77	SPT	N50+ 14,11 for 60mm 50 for 60mm		127.10		(0.50) 11.90	Extremely weak to very weak dark grey MUDSTONE.		
11.90-12.08	SPT	N50+ 17,20 25 for 30mm					Borehole terminated at 11.90m bgl on Mudstone Bedrock.		

Boring Progress and Water Observations

Date	Depth	Water Depth	Casing Depth	Casing Dia. mm	Chiselling Depth	Chiselling Time (hr)
					11.55 11.90	1

GENERAL REMARKS

CAT used prior to drilling to check for services.
Monitoring standpipe installed to base of hole.
Groundwater encountered at 9.00m bgl.

All dimensions in metres Scale 1:50	Client BMBC	Contractor Infosoil	Logged By GH

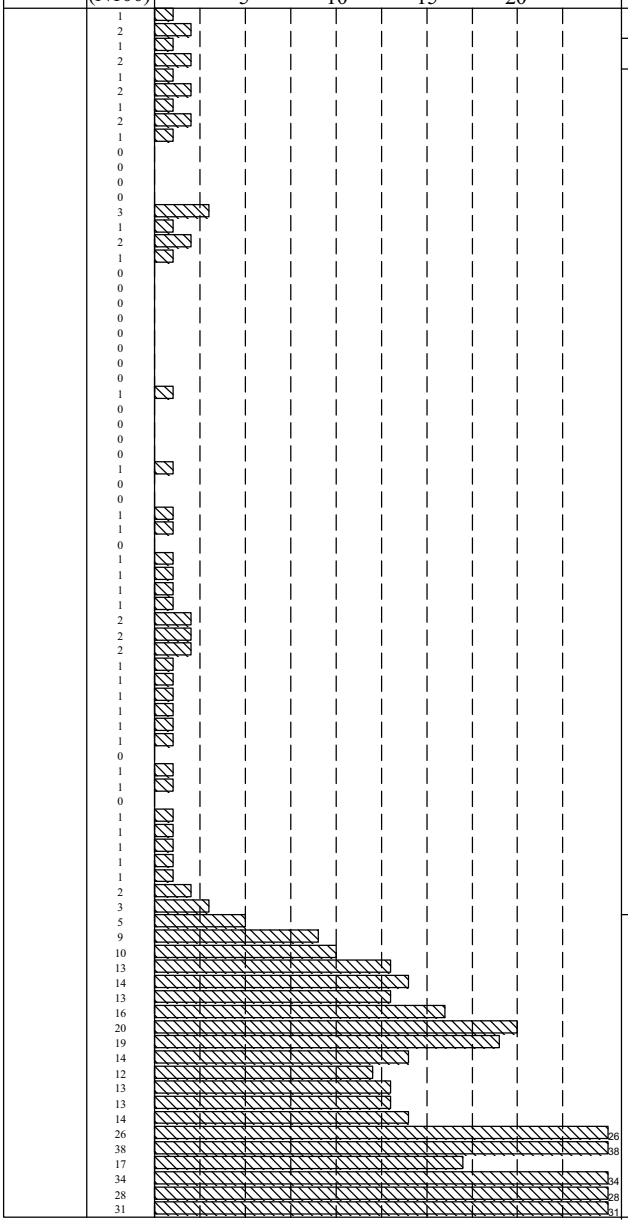
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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP1
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,847.0 N 406,280.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2



STRATA					
Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
138.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
138.60		0.40	MADE GROUND: Loose slightly clayey dark brown sand. Frequent flakes of plastic. Occasional bits of metal.	a1	
		(5.60)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
133.00		6.00			
		(2.05)	Extremely weak brown MUDSTONE.	c1	

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS1 and BH3

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP1
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,847.0 N 406,280.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

PROBE RESULTS			STRATA					
Torque kN	Blow counts (N100)	Blow counts (N100) 5 10 15 20	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
	50	50	130.95		8.05	Dynamic sampler refused at 8.05m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS1 and BH3

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

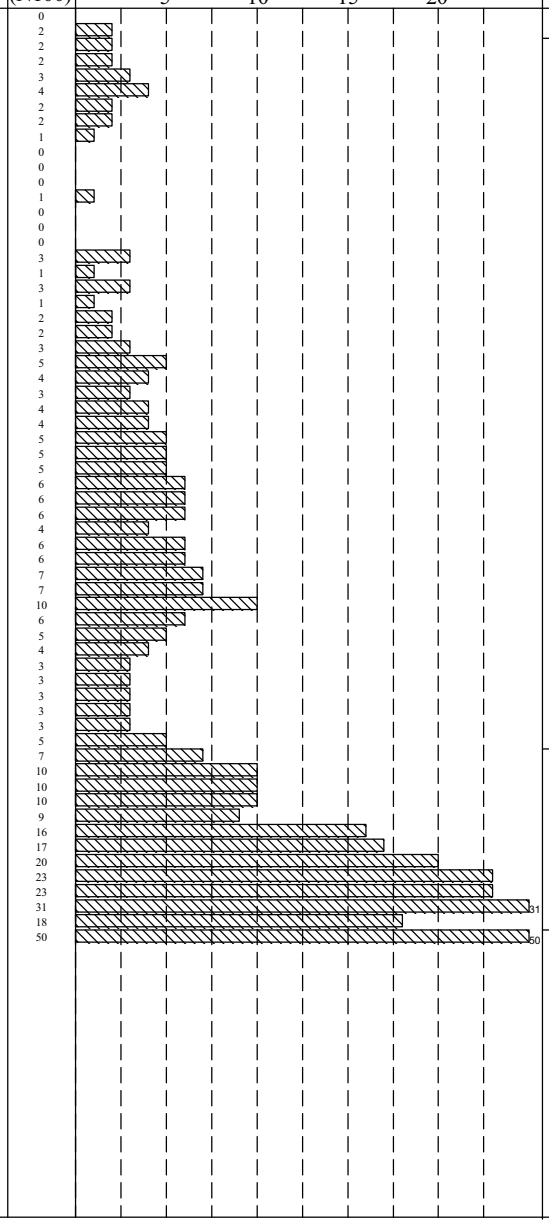
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DYNAMIC PROBE HOLE

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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP10
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,667.0 N 406,232.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1

PROBE RESULTS



STRATA

Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
		(4.70)		a1	
135.10		4.90			
		(0.70)	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.	c1	
133.90		6.10			
			Dynamic sampler refused at 6.1m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS10 and BH1.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

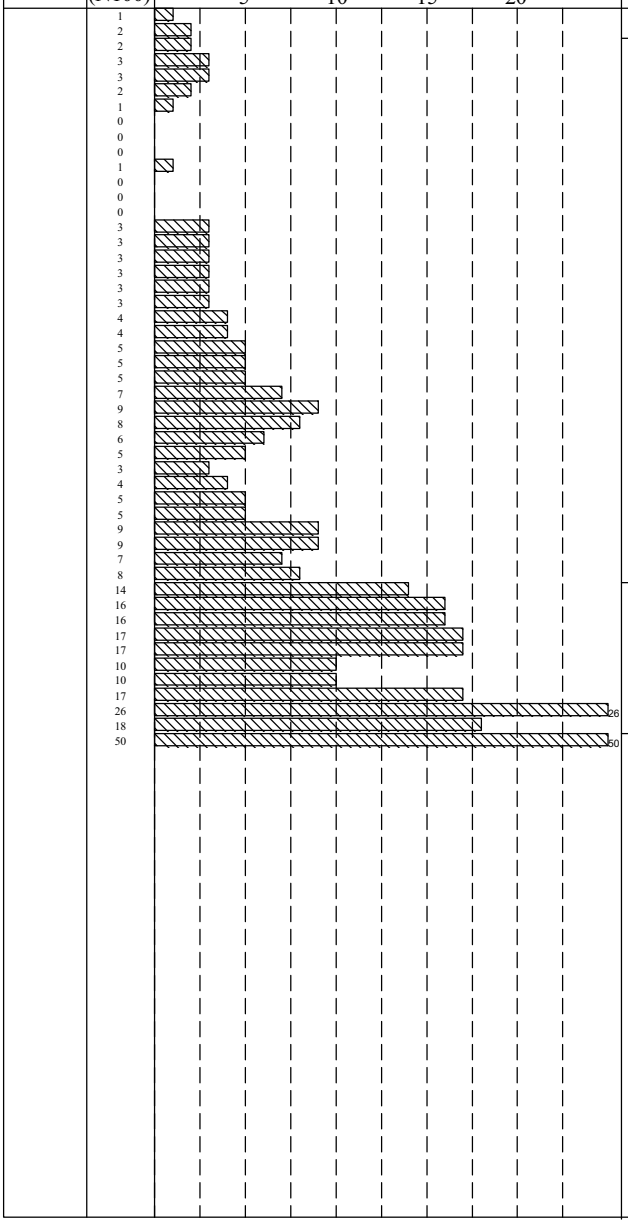
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DYNAMIC PROBE HOLE

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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP11
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,658.0 N 406,225.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1



STRATA					
Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
		(3.60)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
136.20		3.80			
		(1.00)	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.	c1	
135.20		4.80			
			Dynamic sampler refused at 4.8m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS11 and BH1.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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DYNAMIC PROBE HOLE

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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP12
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,713.0 N 406,203.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1

PROBE RESULTS

Torque kN	Blow counts (N100)	Blow counts (N100) 5 10 15 20
	1 1 2 4 3 2 1 1 1 3 4 2 2 1 1 0 0 0 1 1 0 0 0 0 1 0 0 0 1 0 0 0 1 0 0 2 3 2 1 1 1 1 2 1 1 1 1 1 3 4 2 2	50

STRATA

Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
		(5.30)		a1	
			Ground becoming unstable from ~3.00m bgl.		
			Becoming very clayey from 3.80m bgl.		
134.50		5.50	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.	c1	
			Dynamic sampler refused at 5.5m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS12 and BH1.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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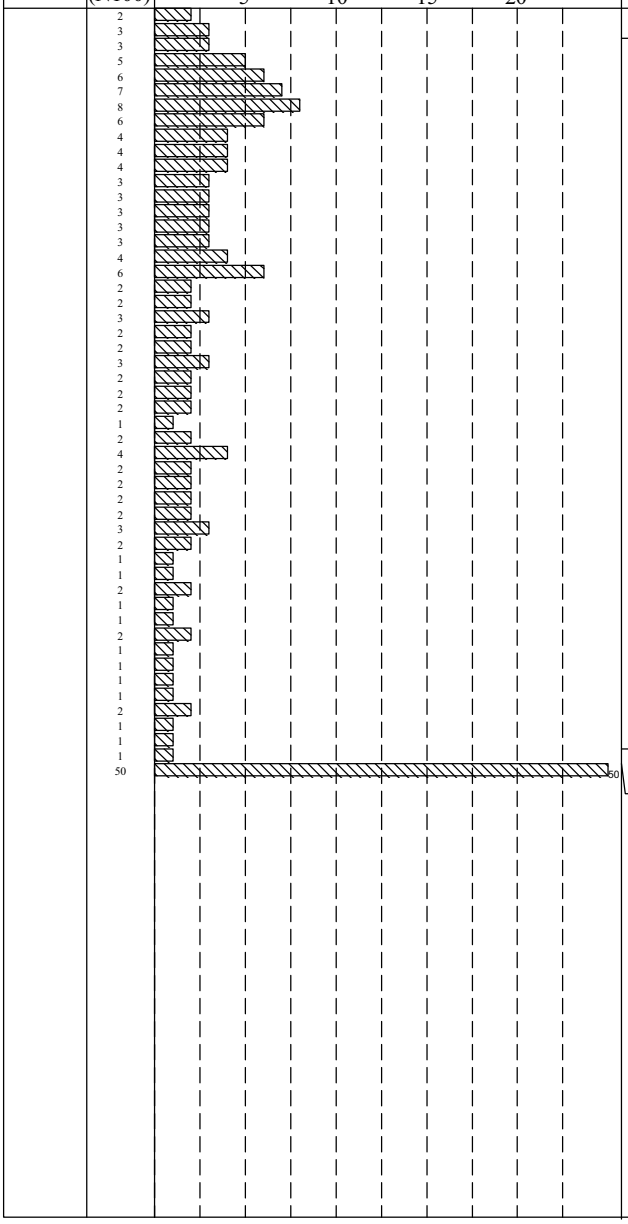
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DYNAMIC PROBE HOLE

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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP13
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,708.0 N 406,188.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1

PROBE RESULTS



STRATA

Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
		(4.70)		a1	
			Ground becoming unstable from ~3.00m bgl.		
			Becoming very clayey from 3.80m bgl.		
135.10		4.90			
135.00		5.00	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.	c1	
			Dynamic sampler refused at 5.0m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS12 and BH1.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

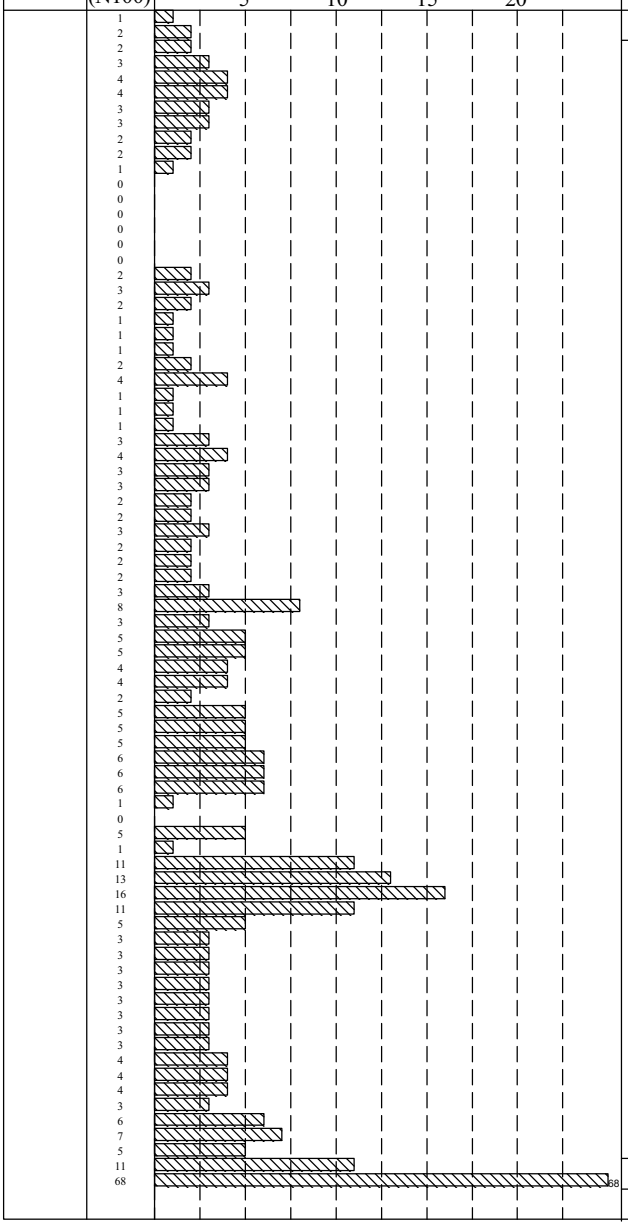
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DYNAMIC PROBE HOLE

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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP14
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,773.0 N 406,253.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1



STRATA						
Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
138.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
		(7.40)		a1	
131.40		7.60			
131.20		7.80	Extremely weak brown MUDSTONE.	c1	
			Dynamic sampler refused at 7.8m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS13 and BH1.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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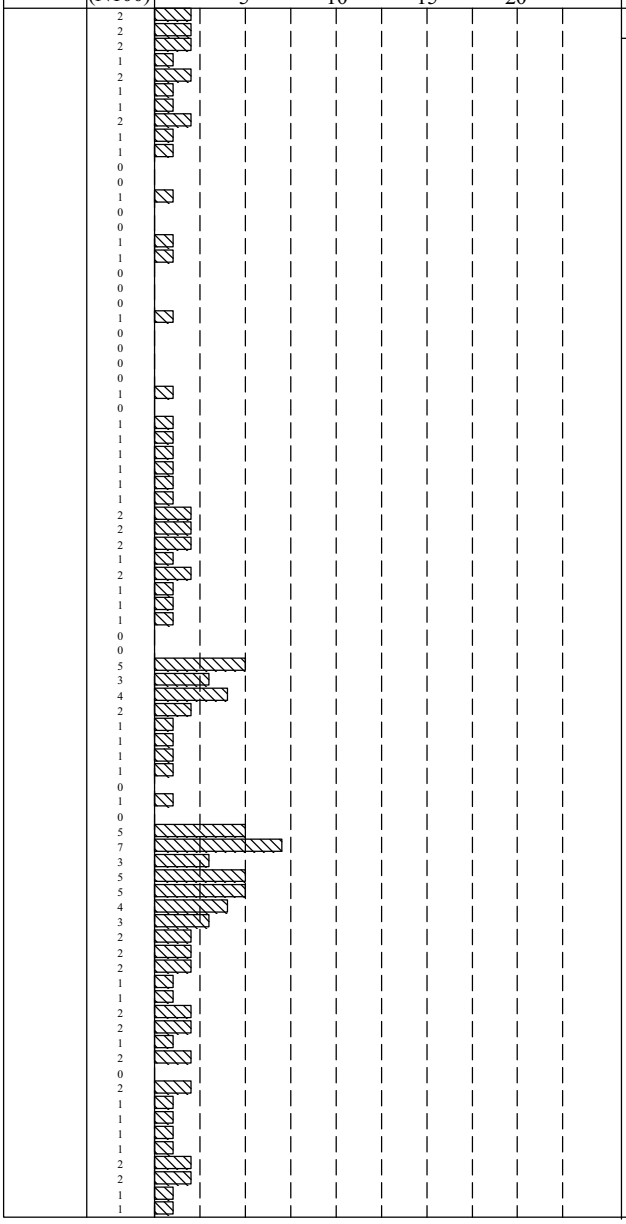
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DYNAMIC PROBE HOLE

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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP15
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,813.0 N 406,323.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

PROBE RESULTS



STRATA

Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
		(9.60)			

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS4 and BH3.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP15
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,813.0 N 406,323.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

PROBE RESULTS

Torque kN	Blow counts (N100)	Blow counts (N100) 5 10 15 20
	1 0 1 1 0 0 1 1 1 2 2 2 3 3 2 2 18 23 50	50

STRATA

Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. *(continued)*	a1	
130.20		9.80	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.	c1	
			Dynamic sampler refused at 9.8m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS4 and BH3.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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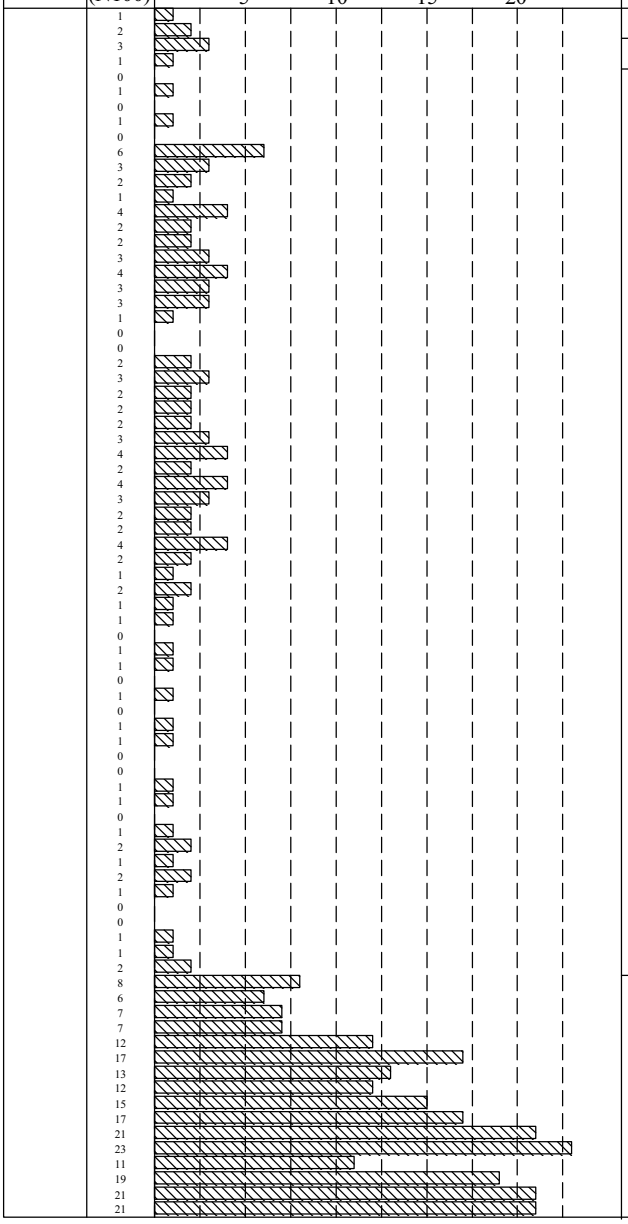
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DYNAMIC PROBE HOLE

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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP2
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,850.0 N 406,271.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

PROBE RESULTS



Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
138.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
138.60		0.40	MADE GROUND: Loose slightly clayey dark brown sand. Frequent flakes of plastic. Occasional bits of metal.	a1	
		(6.00)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
132.60		6.40	Extremely weak brown MUDSTONE.		
		(1.70)		c1	

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS1 and BH3

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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DYNAMIC PROBE HOLE

Abbeydale
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Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP2
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,850.0 N 406,271.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

PROBE RESULTS			STRATA					
Torque kN	Blow counts (N100)	Blow counts (N100) 5 10 15 20	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
	52	52	130.90		8.10	Dynamic sampler refused at 8.1m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS1 and BH3

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

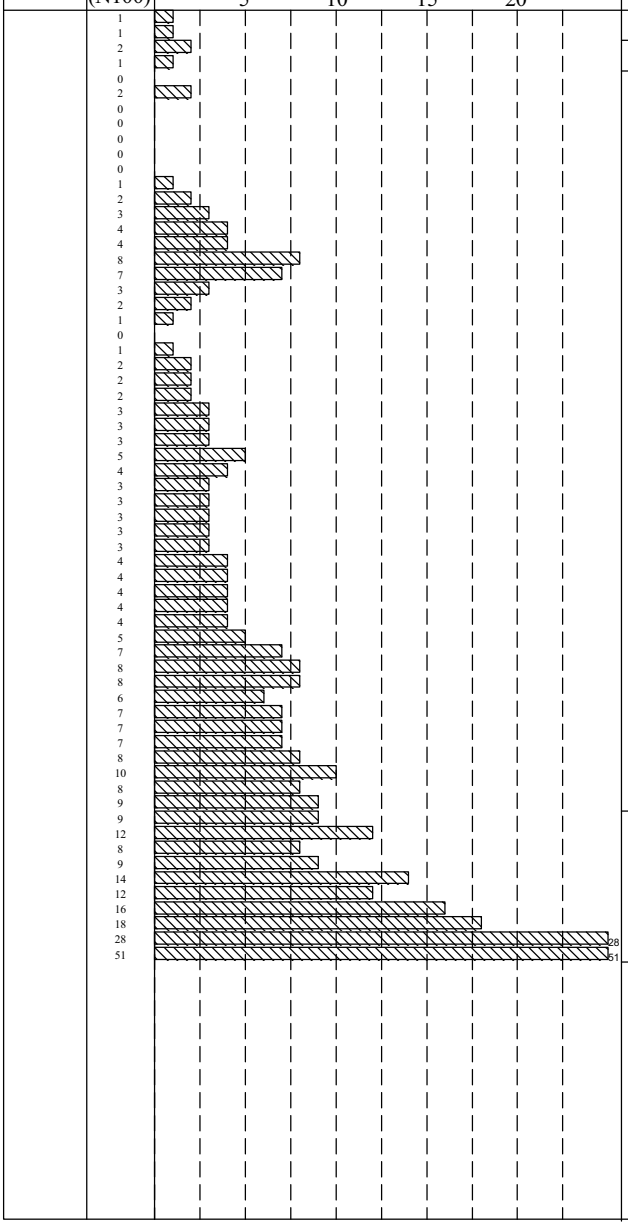
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Tel: 01924 376622
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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP3
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,844.0 N 406,289.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1



Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
138.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
138.60		0.40	MADE GROUND: Loose slightly clayey dark brown sand. Frequent flakes of plastic. Occasional bits of metal.	a1	
		(4.90)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood. Becoming stiff from 4.2m	a1	
133.70		5.30			
		(1.00)	Extremely weak brown MUDSTONE.	c1	
132.70		6.30	Dynamic sampler refused at 6.3m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS1 and BH3

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

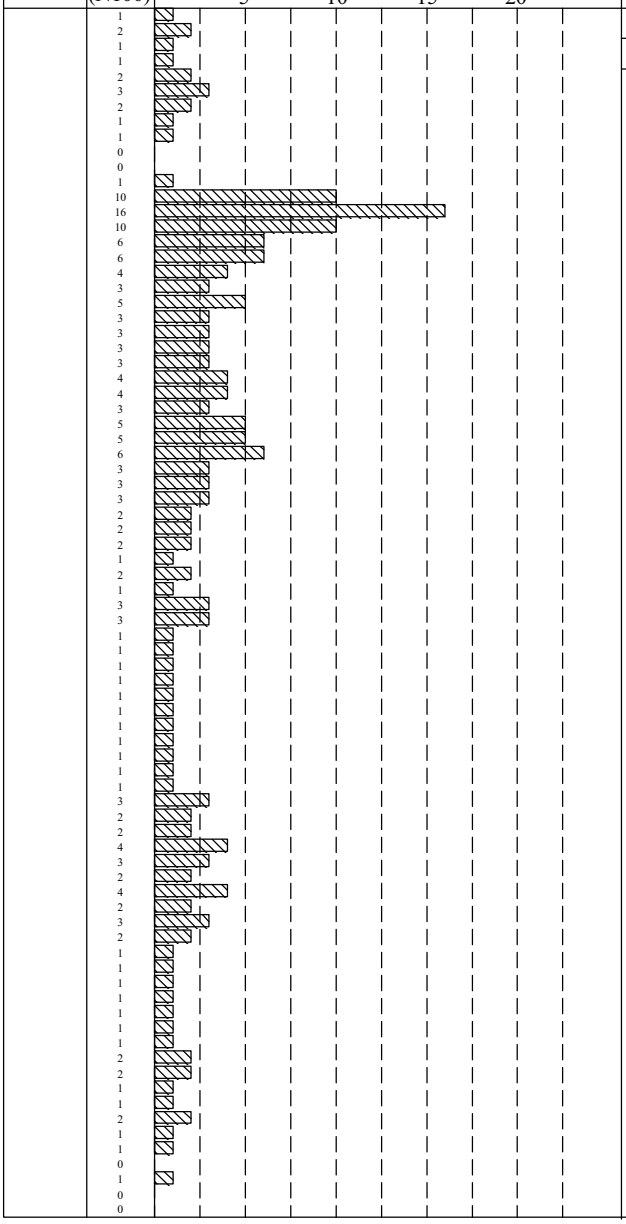
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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP4
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,879.0 N 406,289.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

PROBE RESULTS



STRATA

Red'cd Level	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
138.80	0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
138.60	0.40	MADE GROUND: Loose slightly clayey dark brown sand. Frequent flakes of plastic. Occasional bits of metal.	a1	
	(8.70)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS1 and BH3

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

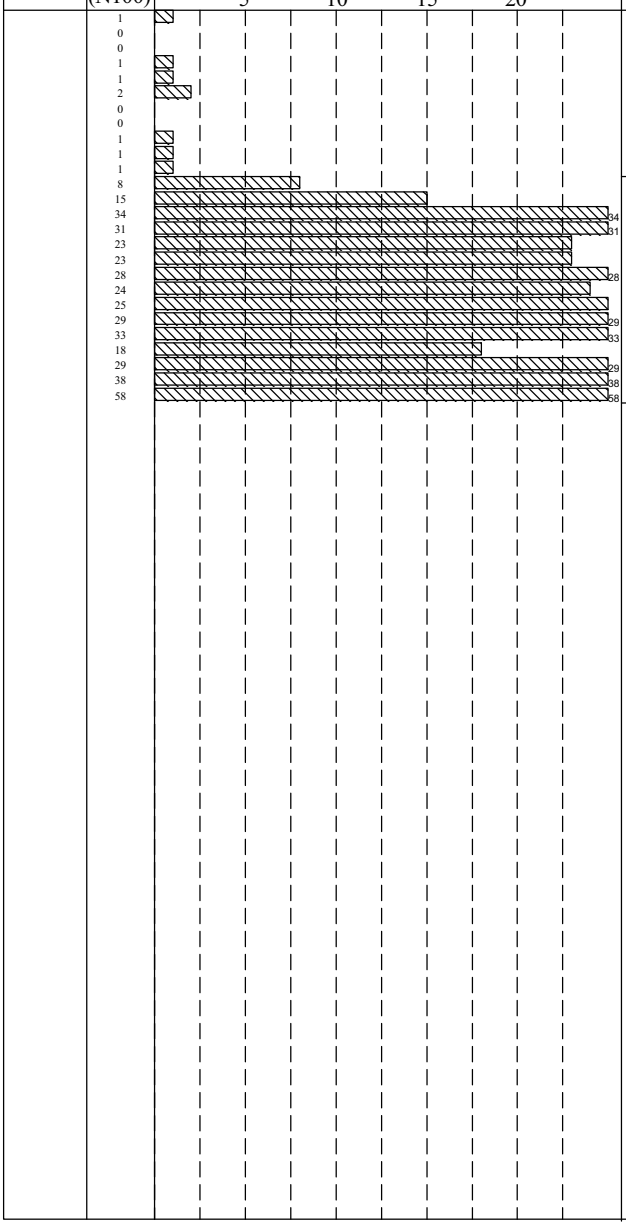
ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP4
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.00	E 432,879.0 N 406,289.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2



Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
129.90		9.10		a1	
		(1.50)	Extremely weak brown MUDSTONE.	c1	
128.40		10.60	Dynamic sampler refused at 10.6m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS1 and BH3

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

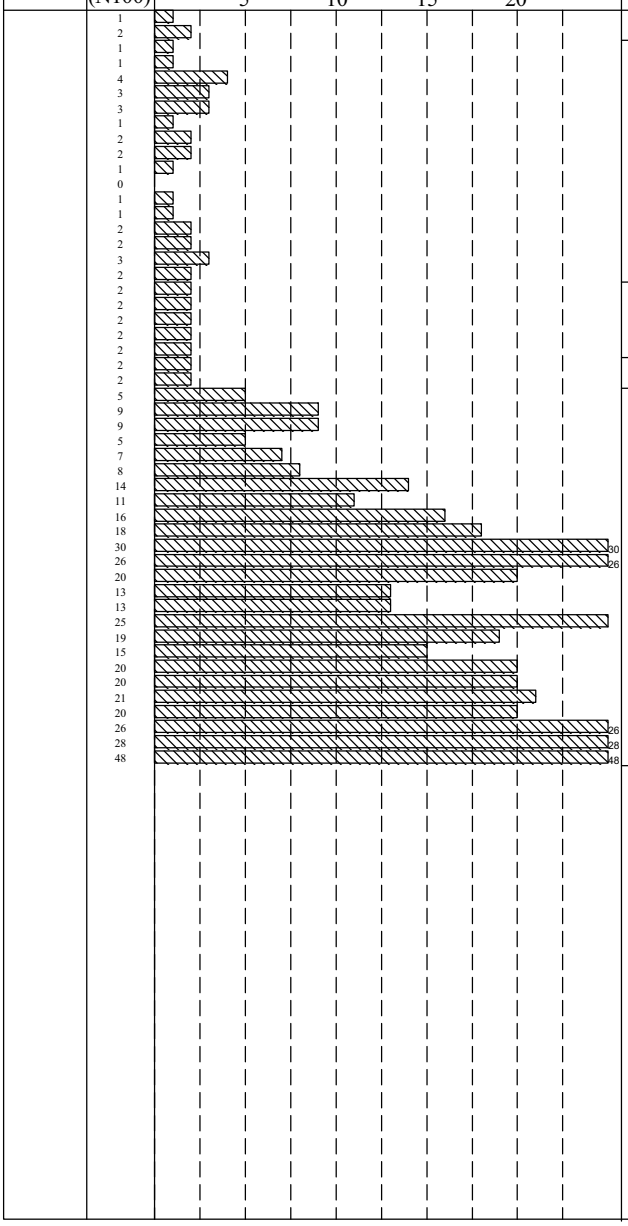
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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP5
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.50	E 432,761.0 N 406,344.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1



Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.30		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
		(1.60)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
137.70		1.80			
		(0.50)	MADE GROUND: Very stiff light brown grey mottled slightly sandy slightly gravelly clay. Gravel is light grey mudstone.	a2	
137.20		2.30			
137.00		2.50	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
		(2.50)		a2	
			MADE GROUND: Extremely weak thinly laminated light grey shaley mudstone. Discontinuities <1mm spaced subhorizontal fractures closed. Occasional infilling of coal.		
134.50		5.00			
			Dynamic sampler refused at 5.0m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS8.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

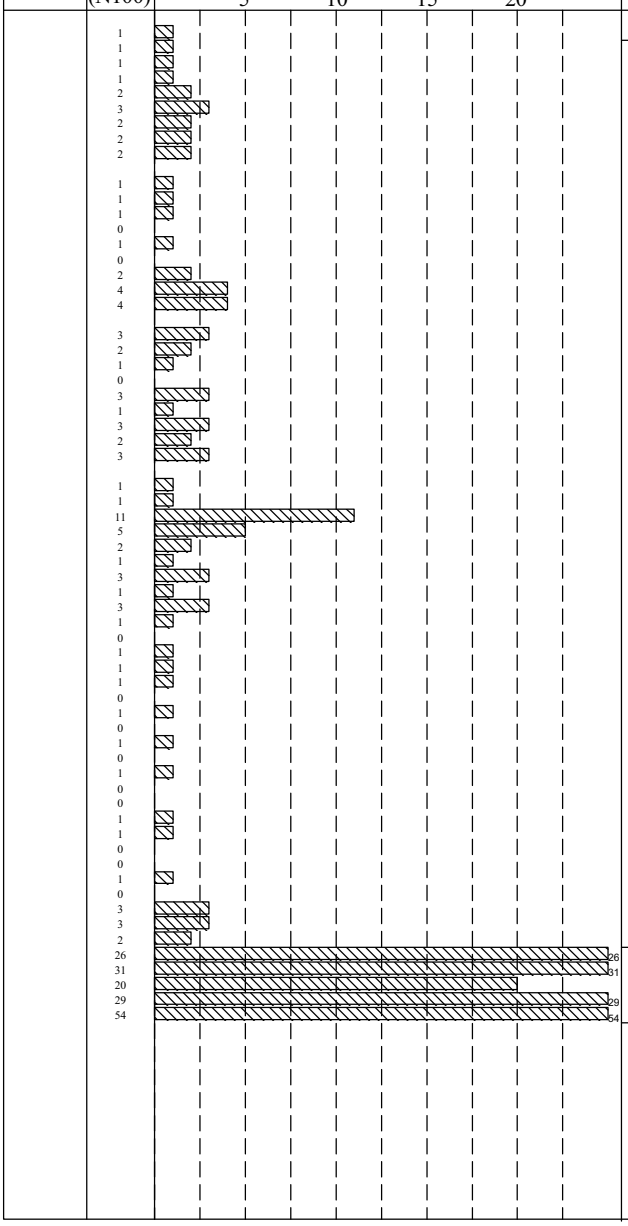
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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP6
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.50	E 432,778.0 N 406,344.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1



Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.30		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
		(6.00)		a1	
133.30		6.20			
		(0.50)	Extremely weak brown MUDSTONE.	c1	
132.80		6.70			
			Dynamic sampler refused at 6.7m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. initial Refusal at 0.5m bgl moved 2m west. Backfilled with arisings. Descriptions taken from WS3 and BH3.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

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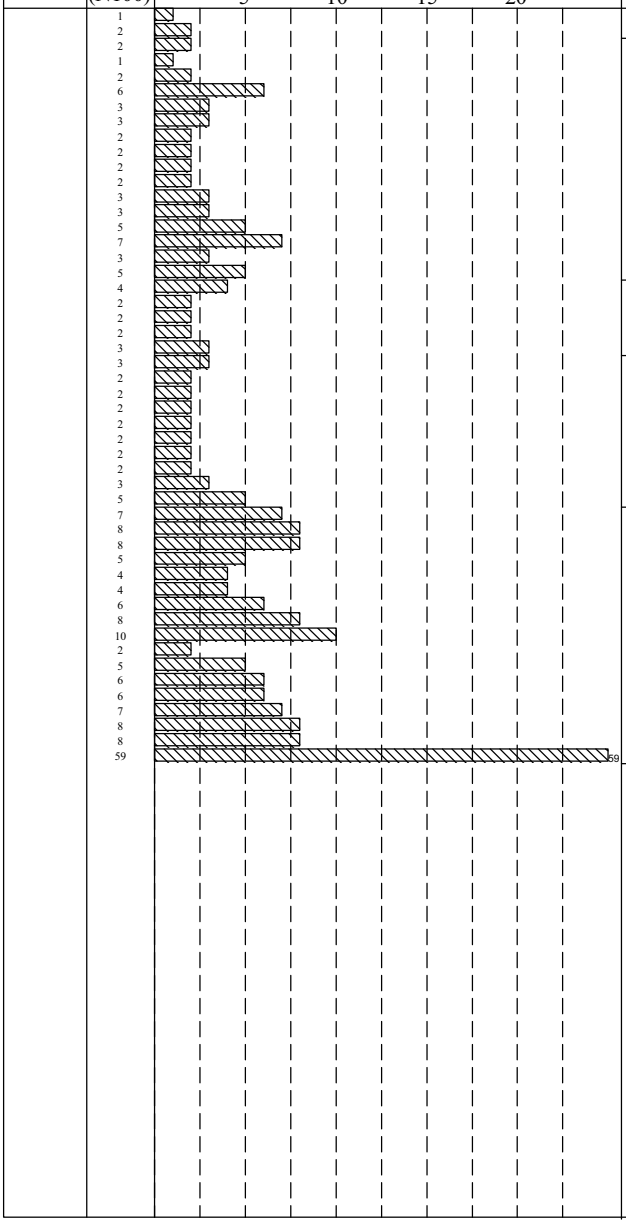
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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP7
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	29-11-18 29-11-18	139.50	E 432,718.0 N 406,327.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 1

PROBE RESULTS



STRATA

Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.30		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
		(1.60)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
137.70		1.80			
		(0.50)	MADE GROUND: Very stiff light brown grey mottled slightly sandy slightly gravelly clay. Gravel is light grey mudstone.	a2	
137.20		2.30			
		(1.00)	MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.	a1	
136.20		3.30			
		(1.70)	MADE GROUND: Extremely weak thinly laminated light grey shaley mudstone. Discontinuities <1mm spaced subhorizontal fractures closed. Occasional infilling of coal.	a2	
134.50		5.00			
			Dynamic sampler refused at 5.0m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS8

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

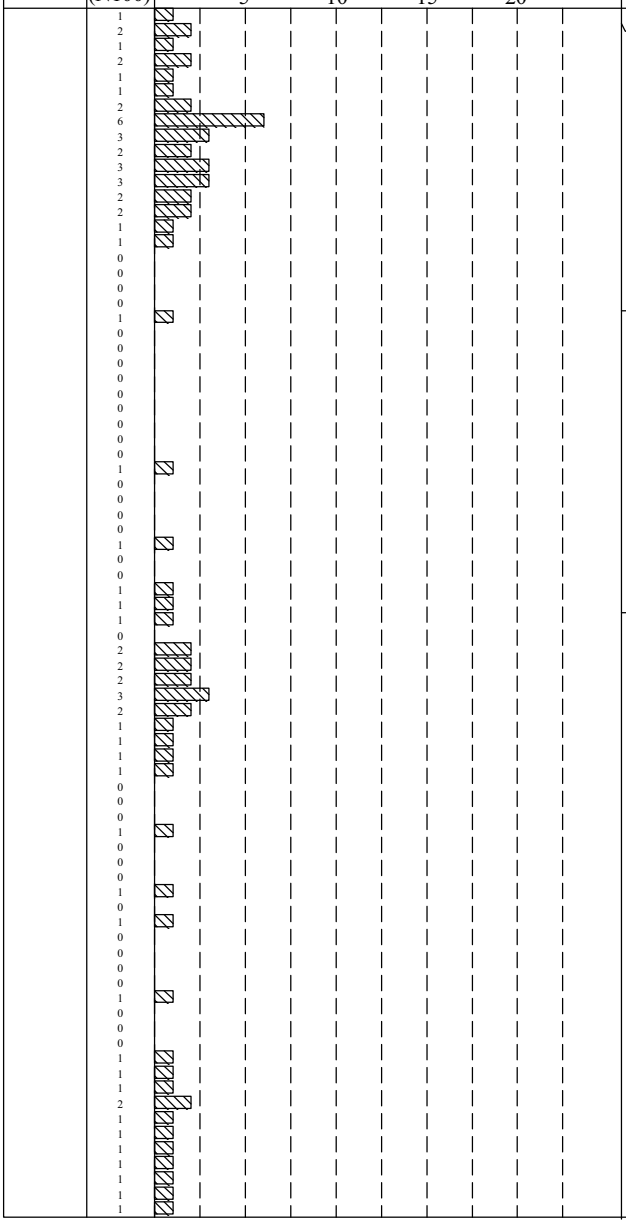
ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP8
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	139.50	E 432,678.0 N 406,298.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2



STRATA						
Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.40		0.10	MADE GROUND. Dark brown clayey slightly gravelly sand. Gravel is fine to coarse sandstone. Cobble of tarmac at base.	a1	
		(1.90)	MADE GROUND. Black and dark brown gravelly sand. Gravel is fine to coarse, subangular coal and sandstone.	a1	
137.50		2.00			
		(2.00)	MADE GROUND. Brown clayey slightly gravelly sand. Gravel is fine to coarse, subangular sandstone and coal. Gravel contains porcelain from 3.00m bgl.	a1	
135.50		4.00			
		(5.80)	MADE GROUND. Black sandy gravel. Gravel is fine to coarse, subangular red shale, coal and sandstone.	a1	

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from BH2.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

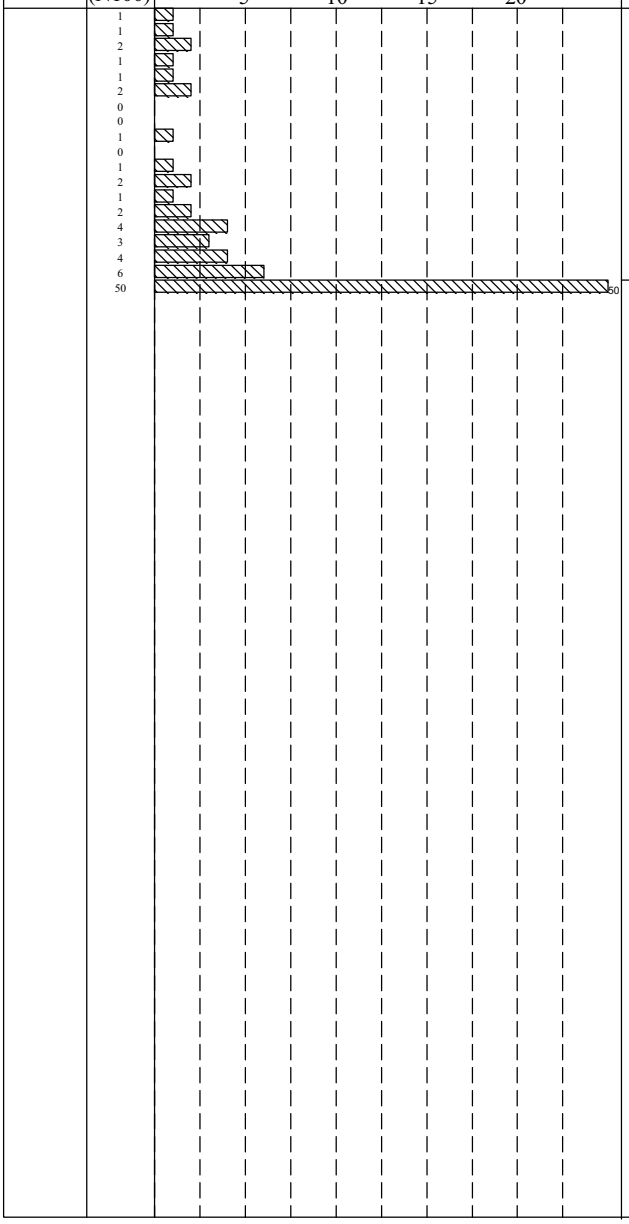
ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**DP8**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	139.50	E 432,678.0 N 406,298.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2



STRATA						
Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
			MADE GROUND. Black sandy gravel. Gravel is fine to coarse, subangular red shale, coal and sandstone. *(continued)*	a1	
129.70		9.80	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel.	c1	
			Dynamic sampler refused at 9.8m bgl.		

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from BH2.

All dimensions in metres Scale 1:50	Client BMBC	Contractor Infosoil	Logged By WW

ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

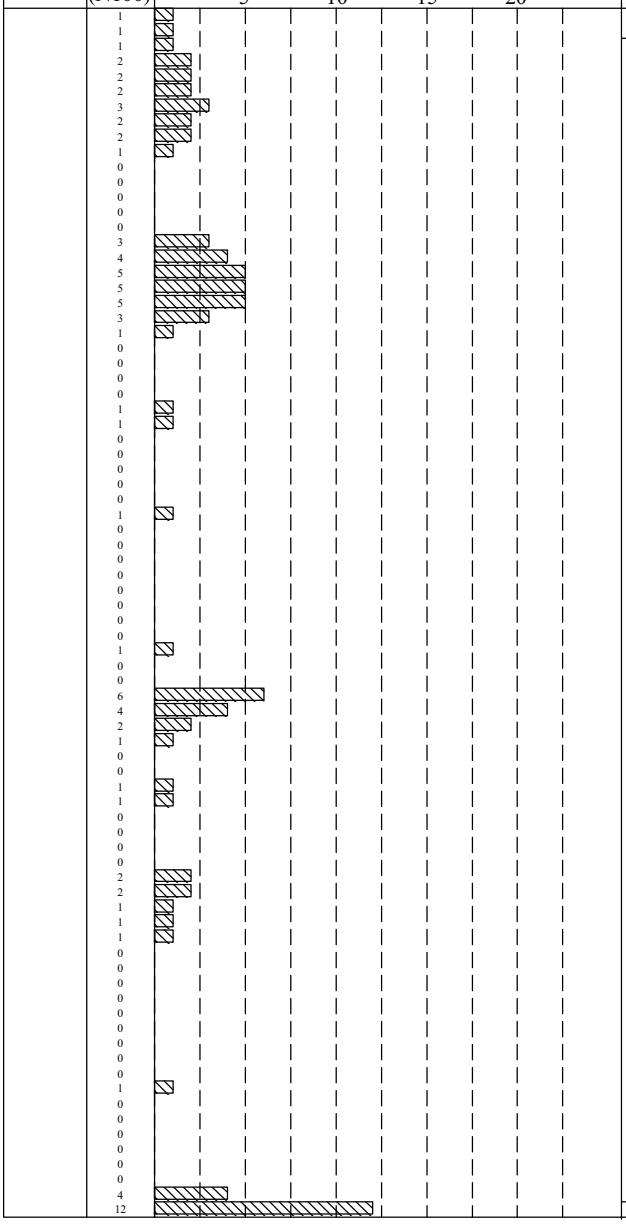
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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				DP9
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,675.0 N 406,232.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 1 of 2

PROBE RESULTS



STRATA

Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
139.80		0.20	MADE GROUND: Loose light brown slightly clayey fine SAND. Frequent rootlets. Rare fine gravel of subangular sandstone. (Topsoil).	a1	
			MADE GROUND: Loose light reddish brown black mottled slightly clayey slightly gravelly sand. Gravel is subangular fine to medium sandstone. Frequent shards of glass, Frequent strips of plastic, Frequent strips of fabric, Frequent fragments of pottery. Occasional fragments of coal. Occasional fragments of burnt wood.		
		(7.70)		a1	
132.10		7.90			

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS10 and BH1.

All dimensions in metres Scale 1:50	Client: BMBC	Contractor: Infosoil	Logged By: WW

ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

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DYNAMIC PROBE HOLE

Abbeydale
Building Environment Consultants

Project				PROBE No
A628 Dodworth Road Crossroads, Barnsley, South Yorkshire				**DP9**
Job No	Date	Ground level (m)	Co-Ordinates ()	
151069	11-12-18 11-12-18	140.00	E 432,675.0 N 406,232.0	
Method/Plant Used: Archway Competitor Dart Window Sample Rig.				Sheet: 2 of 2

PROBE RESULTS			STRATA					
Torque kN	Blow counts (N100)	Blow counts (N100) 5 10 15 20	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Main	Geology	Instrument/ Backfill
	24 31 50	31 50	131.80		8.20	Extremely weak brown MUDSTONE. Recovered as angular slightly clayey gravel. *(continued)* Dynamic sampler refused at 8.2m bgl.	c1 c1	

DYNAMIC PROBING METHOD

The dynamic probe was driven using a 63.5kg hammer dropping through 750mm, onto 32mm diameter rods driving a 90 degree superheavy SPT cone. The blow counts are recorded for every 100mm driven (N100).

GENERAL REMARKS

CAT employed to check for services. No ground water encountered. Backfilled with arisings. Descriptions taken from WS10 and BH1.

All dimensions in metres Scale 1:50	Client BMBC	Contractor Infosoil	Logged By WW

ABEC DYNAMIC PROBE 151069.GPJ ABEC TEMPLATE.GDT 19/12/18

TEST RESULTS

2531

ANALYTICAL TEST REPORT

Contract no: 75130

Contract name: P. P. P. (Penny Pie Park)

Client reference: 151069

Clients name: Abbeydale BEC

Clients address: 4 Neville Street
Wakefield
WF1 5EF

Samples received: 14 November 2018

Analysis started: 14 November 2018

Analysis completed: 21 November 2018

Report issued: 21 November 2018

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
NAD No Asbestos Detected

Approved by:

Dave Bowerbank
Customer Services Co-ordinator

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
75130-1	BH1	1.50	Sand with Gravel	-	-	18.8
75130-2	TP1	0.80	Sand with Gravel	-	-	15.0
75130-3	TP3	0.20	Sandy Clay with Gravel	-	-	14.3
75130-4	WS1	0.10	Sandy Clay with Gravel & Roots	-	-	19.0
75130-5	WS1	1.20	Sandy Clay with Gravel	-	-	23.7
75130-6	WS2	0.10	Sandy Clay with Gravel & Roots	-	-	15.8
75130-7	WS3	1.20	Sandy Clay with Gravel	-	-	34.3
75130-8	WS4	0.10	Sandy Clay with Gravel & Roots	-	-	17.6
75130-9	WS7	0.10	Sandy Clay with Gravel & Roots	-	-	16.1
75130-10	WS9	0.10	Sandy Clay with Gravel & Roots	-	-	22.8
75130-11	WS11	0.60	Sand with Gravel	-	-	13.1

Chemtech Environmental Limited

SOILS

Lab number			75130-1	75130-2	75130-3	75130-4	75130-5	75130-6
Sample id			BH1	TP1	TP3	WS1	WS1	WS2
Depth (m)			1.50	0.80	0.20	0.10	1.20	0.10
Date sampled			05/11/2018	08/11/2018	08/11/2018	05/11/2018	05/11/2018	05/11/2018
Test	**Method**	**Units**						
Arsenic (total)	CE127 M	mg/kg As	57	94	18	18	97	20
Beryllium (total)	CE127 U	mg/kg Be	2.5	4.2	1.6	1.7	3.9	1.3
Boron (water soluble)	CE063 M	mg/kg B	1.3	3.6	0.9	0.9	2.9	1.0
Cadmium (total)	CE127 M	mg/kg Cd	0.4	0.5	0.8	0.7	1.0	0.4
Chromium (III)	-	mg/kg CrIII	246	70	75	77	67	50
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE127 M	mg/kg Cu	156	2344	56	51	320	53
Lead (total)	CE127 M	mg/kg Pb	184	364	153	147	475	96
Mercury (total)	CE127 M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	2.2	<0.5
Nickel (total)	CE127 M	mg/kg Ni	66	74	30	31	83	28
Selenium (total)	CE127 M	mg/kg Se	2.4	3.3	1.9	2.1	3.0	1.5
Vanadium (total)	CE127 M	mg/kg V	71	73	51	48	81	35
Zinc (total)	CE127 M	mg/kg Zn	332	313	176	154	396	152
pH	CE004 M	units	8.0	7.8	8.0	8.0	7.8	6.8
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	246	814	36	41	293	25
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1	<1	<1	<1
Cyanide (total)	CE077	mg/kg CN	<1	1.9	<1	<1	<1	<1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE072 M	% w/w C	19.62	20.53	6.32	7.16	21.92	5.05
Estimate of OMC (calculated from TOC)	CE072 M	% w/w	33.83	35.40	10.90	12.34	37.79	8.71
Moisture Content	CE001	% w/w	18.8	15.0	14.3	19.0	23.7	15.8
PAH								
Naphthalene	CE087 M	mg/kg	0.11	0.49	0.31	0.26	0.17	0.13
Acenaphthylene	CE087 M	mg/kg	<0.01	0.41	0.11	0.15	0.08	0.07
Acenaphthene	CE087 M	mg/kg	<0.01	0.20	0.46	2.20	0.23	0.08
Fluorene	CE087 U	mg/kg	0.04	0.60	0.42	1.57	0.20	0.11
Phenanthrene	CE087 M	mg/kg	0.43	6.53	5.72	22.57	2.72	1.25
Anthracene	CE087 U	mg/kg	0.11	1.91	1.34	3.68	0.65	0.35
Fluoranthene	CE087 M	mg/kg	0.72	10.43	12.22	38.73	5.45	2.34
Pyrene	CE087 M	mg/kg	0.56	7.85	10.53	31.85	4.70	2.02
Benzo(a)anthracene	CE087 U	mg/kg	0.28	4.35	5.47	15.94	2.55	1.10
Chrysene	CE087 M	mg/kg	0.32	4.59	6.24	16.76	2.64	1.19
Benzo(b)fluoranthene	CE087 M	mg/kg	0.35	4.87	7.71	20.65	3.13	1.41
Benzo(k)fluoranthene	CE087 M	mg/kg	0.20	2.29	3.47	9.16	1.55	0.60
Benzo(a)pyrene	CE087 U	mg/kg	0.32	3.97	6.36	18.19	2.77	1.13
Indeno(123cd)pyrene	CE087 M	mg/kg	0.18	2.25	3.91	11.80	1.81	0.72
Dibenz(ah)anthracene	CE087 M	mg/kg	0.04	0.63	1.04	2.98	0.49	0.16
Benzo(ghi)perylene	CE087 M	mg/kg	0.18	2.06	3.83	10.84	1.72	0.69
PAH (total of USEPA 16)	CE087	mg/kg	3.86	53.4	69.1	207	30.9	13.3
Subcontracted analysis								
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			75130-7	75130-8	75130-9	75130-10	75130-11
Sample id			WS3	WS4	WS7	WS9	WS11
Depth (m)			1.20	0.10	0.10	0.10	0.60
Date sampled			05/11/2018	05/11/2018	05/11/2018	05/11/2018	06/11/2018
Test	**Method**	**Units**					
Arsenic (total)	CE127 M	mg/kg As	120	25	23	25	54
Beryllium (total)	CE127 U	mg/kg Be	5.9	1.6	1.3	1.7	2.1
Boron (water soluble)	CE063 M	mg/kg B	5.6	1.4	1.2	0.9	0.9
Cadmium (total)	CE127 M	mg/kg Cd	0.5	0.4	0.6	0.5	0.4
Chromium (III)	-	mg/kg CrIII	104	51	78	75	180
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1
Copper (total)	CE127 M	mg/kg Cu	212	65	51	48	104
Lead (total)	CE127 M	mg/kg Pb	449	97	132	83	116
Mercury (total)	CE127 M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 M	mg/kg Ni	118	28	26	30	41
Selenium (total)	CE127 M	mg/kg Se	4.1	1.9	1.7	1.6	2.1
Vanadium (total)	CE127 M	mg/kg V	208	42	37	48	115
Zinc (total)	CE127 M	mg/kg Zn	278	157	174	129	161
pH	CE004 M	units	6.6	6.2	6.9	6.1	7.4
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	369	48	42	35	72
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1	<1	<1
Cyanide (total)	CE077	mg/kg CN	1.7	<1	<1	<1	<1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE072 M	% w/w C	17.30	10.01	6.19	6.58	1.15
Estimate of OMC (calculated from TOC)	CE072 M	% w/w	29.83	17.26	10.67	11.34	1.98
Moisture Content	CE001	% w/w	34.3	17.6	16.1	22.8	13.1
PAH							
Naphthalene	CE087 M	mg/kg	<0.01	0.14	0.40	0.10	0.32
Acenaphthylene	CE087 M	mg/kg	<0.01	<0.01	0.10	<0.01	0.20
Acenaphthene	CE087 M	mg/kg	<0.01	0.09	0.77	0.02	0.65
Fluorene	CE087 U	mg/kg	<0.01	0.07	0.93	0.02	0.59
Phenanthrene	CE087 M	mg/kg	<0.02	0.95	10.99	0.33	10.09
Anthracene	CE087 U	mg/kg	<0.02	0.19	3.07	0.07	3.53
Fluoranthene	CE087 M	mg/kg	0.09	1.92	16.83	0.73	26.44
Pyrene	CE087 M	mg/kg	0.03	1.65	13.75	0.62	23.38
Benzo(a)anthracene	CE087 U	mg/kg	<0.02	0.78	7.43	0.33	14.21
Chrysene	CE087 M	mg/kg	<0.01	0.94	7.83	0.39	13.66
Benzo(b)fluoranthene	CE087 M	mg/kg	<0.02	1.05	8.86	0.53	15.11
Benzo(k)fluoranthene	CE087 M	mg/kg	<0.02	0.50	4.08	0.24	7.06
Benzo(a)pyrene	CE087 U	mg/kg	<0.02	0.88	7.27	0.43	13.37
Indeno(123cd)pyrene	CE087 M	mg/kg	<0.02	0.57	4.29	0.29	7.95
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	0.13	1.12	0.08	2.02
Benzo(ghi)perylene	CE087 M	mg/kg	<0.02	0.55	4.08	0.30	7.31
PAH (total of USEPA 16)	CE087	mg/kg	<0.27	10.4	91.8	4.47	146
Subcontracted analysis							
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD	NAD

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PREPARED LEACHATES

Lab number			75130-2L	75130-5L	75130-6L	75130-8L	75130-11L
Sample id			TP1	WS1	WS2	WS4	WS11
Depth (m)			0.80	1.20	0.10	0.10	0.60
Test	**Method**	**Units**					
Arsenic (dissolved)	CE128 U	µg/l As	1.2	0.3	1.0	1.2	13
Beryllium (dissolved)	CE128 U	µg/l Be	<0.06	<0.06	0.06	<0.06	<0.06
Boron (dissolved)	CE128 U	µg/l B	42	36	18	18	14
Cadmium (dissolved)	CE128 U	µg/l Cd	<0.07	<0.07	<0.07	<0.07	<0.07
Chromium III (dissolved)	-	µg/l CrIII	5.5	0.3	0.3	0.3	5.1
Chromium VI (dissolved)	CE050 U	µg/l CrVI	<10	<10	<10	<10	<10
Copper (dissolved)	CE128 U	µg/l Cu	<0.4	<0.4	11.1	6.9	<0.4
Lead (dissolved)	CE128 U	µg/l Pb	<0.2	<0.2	0.6	0.3	<0.2
Mercury (dissolved)	CE128 U	µg/l Hg	<0.008	<0.008	<0.008	<0.008	<0.008
Nickel (dissolved)	CE128 U	µg/l Ni	0.8	<0.5	2.8	2.6	1.2
Selenium (dissolved)	CE128 U	µg/l Se	0.7	0.4	0.3	0.2	0.4
Vanadium (dissolved)	CE128 U	µg/l V	0.3	<0.3	0.7	1.0	21.2
Zinc (dissolved)	CE128 U	µg/l Zn	4.3	2.1	9.0	14	1.8
Hardness (by calculation)	CE121	mg/l $CaCO_3$	115	81	9.8	18	56
pH	CE004 U	units	7.7	7.7	7.8	7.5	7.5
Sulphate	CE049 U	mg/l SO_4	70	26	<10	<10	<10
Cyanide (total)	CE147	µg/l CN	<20	<20	<20	<20	<20
Phenols (total)	CE148	µg/l PhOH	<10	<10	<10	<10	<10
PAH							
Naphthalene	CE051	µg/l	0.7	<0.1	0.5	<0.1	<0.1
Acenaphthylene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	CE051	µg/l	0.5	0.3	0.4	0.3	0.3
Fluorene	CE051	µg/l	0.8	0.4	0.6	0.4	0.4
Phenanthrene	CE051	µg/l	2.7	1.5	1.7	1.3	1.0
Anthracene	CE051	µg/l	<0.1	<0.1	<0.1	0.3	0.4
Fluoranthene	CE051	µg/l	<0.1	<0.1	0.7	0.7	0.7
Pyrene	CE051	µg/l	<0.1	0.6	<0.1	<0.1	0.5
Benzo(a)anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123cd)pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
PAH (total of USEPA 16)	CE051	µg/l	4.6	2.6	3.9	3.0	3.1

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Beryllium (total)	Aqua regia digest, ICP-MS	Dry	U	1	mg/kg Be
CE063	Boron (water soluble)	Hot water extract, ICP-OES	Dry	M	0.5	mg/kg B
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
-	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Vanadium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg V
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
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
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	Wet		1	mg/kg CN
CE077	Cyanide (total)	Extraction, Continuous Flow Colorimetry	Wet		1	mg/kg CN
CE078	Phenols (total)	Extraction, Continuous Flow Colorimetry	Wet		0.5	mg/kg PhOH
CE072	Total Organic Carbon (TOC)	Removal of IC by acidification, Carbon Analyser	Dry	M	0.1	% w/w C
CE072	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry	M	0.1	% w/w
CE001	Moisture Content	Gravimetry	Wet		0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	Wet	U	0.01	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	Wet		0.27	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

METHOD DETAILS

METHOD	PREPARED LEACHATES	METHOD SUMMARY	STATUS	LOD	UNITS
CE001	Leachate preparation (EA)	L:S 10:1		-	-
CE128	Arsenic (dissolved)	ICP-MS	U	0.06	µg/l As
CE128	Beryllium (dissolved)	ICP-MS	U	0.06	µg/l Be
CE128	Boron (dissolved)	ICP-MS	U	6	µg/l B
CE128	Cadmium (dissolved)	ICP-MS	U	0.07	µg/l Cd
-	Chromium III (dissolved)	Calculation: Cr (total) - Cr (VI)		10	µg/l CrIII
CE050	Chromium VI (dissolved)	Colorimetry	U	10	µg/l CrVI
CE128	Copper (dissolved)	ICP-MS	U	0.4	µg/l Cu
CE128	Lead (dissolved)	ICP-MS	U	0.2	µg/l Pb
CE128	Mercury (dissolved)	ICP-MS	U	0.008	µg/l Hg
CE128	Nickel (dissolved)	ICP-MS	U	0.5	µg/l Ni
CE128	Selenium (dissolved)	ICP-MS	U	0.07	µg/l Se
CE128	Vanadium (dissolved)	ICP-MS	U	0.3	µg/l V
CE128	Zinc (dissolved)	ICP-MS	U	1	µg/l Zn
CE121	Hardness (by calculation)	ICP-MS		1	mg/l $CaCO_3$
CE004	pH	Based on BS 1377, pH Meter	U	-	units
CE049	Sulphate	Ion Chromatography	U	10	mg/l SO_4
CE147	Cyanide (total)	Continuous Flow Colorimetry		20	µg/l CN
CE148	Phenols (total)	Continuous Flow Colorimetry		10	µg/l PhOH
CE051	PAH (speciated)	Solvent extraction, GC-MS		0.1	µg/l
CE051	PAH (total of USEPA 16)	Solvent extraction, GC-MS		1.6	µg/l

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)
75130-1	BH1	1.50	Y	Phenols, PAHs (IC)
75130-2	TP1	0.80	N	
75130-3	TP3	0.20	Y	Phenols, PAHs (IC)
75130-4	WS1	0.10	Y	Phenols, PAHs (IC)
75130-5	WS1	1.20	N	
75130-6	WS2	0.10	N	
75130-7	WS3	1.20	Y	Phenols, PAHs (IC)
75130-8	WS4	0.10	N	
75130-9	WS7	0.10	Y	Phenols, PAHs (IC)
75130-10	WS9	0.10	Y	Phenols, PAHs (IC)
75130-11	WS11	0.60	N	

PSL
Professional Soils Laboratory

LABORATORY REPORT

REPORT

UKAS TESTING
4043

Contract Number: PSL18/6006

Report Date: 12 December 2018

Client's Reference: 151069/3358

Client Name: Abbeydale BEC
4 Neville Street
Wakefield
WF1 5EF

For the attention of: Glyn Hogg

Contract Title: Penny Pie Park

Date Received: 16/11/2018
Date Commenced: 16/11/2018
Date Completed: 12/12/2018

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)	A Watkins (Director)	R Berriman (Quality Manager)
L Knight (Senior Technician)	S Eyre (Senior Technician)	A Fry (Senior Technician)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP1		B	1.50		MADE GROUND dark brown very sandy clayey gravel.
TP3		B	1.60		MADE GROUND dark brown very sandy very clayey gravel.
TP4		B	1.00		MADE GROUND dark brown very sandy very clayey gravel.
TP1			2.50		Brown mottled grey slightly gravelly CLAY.
WS2			0.50		MADE GROUND brown very sandy slightly clayey very silty gravel.
TP2			3.20		Brown mottled grey slightly gravelly CLAY.

UKAS TESTING	PSL Professional Soils Laboratory	Penny Pie Park	Contract No:
			PSL18/6006
ws2			Client Ref:
			151069/3358

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP1			2.50		27			84	34	50	97	Very high plasticity CV.
WS2			0.50		34				NP			
TP2			3.20		28			60	27	33	94	High plasticity CH.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Penny Pie Park

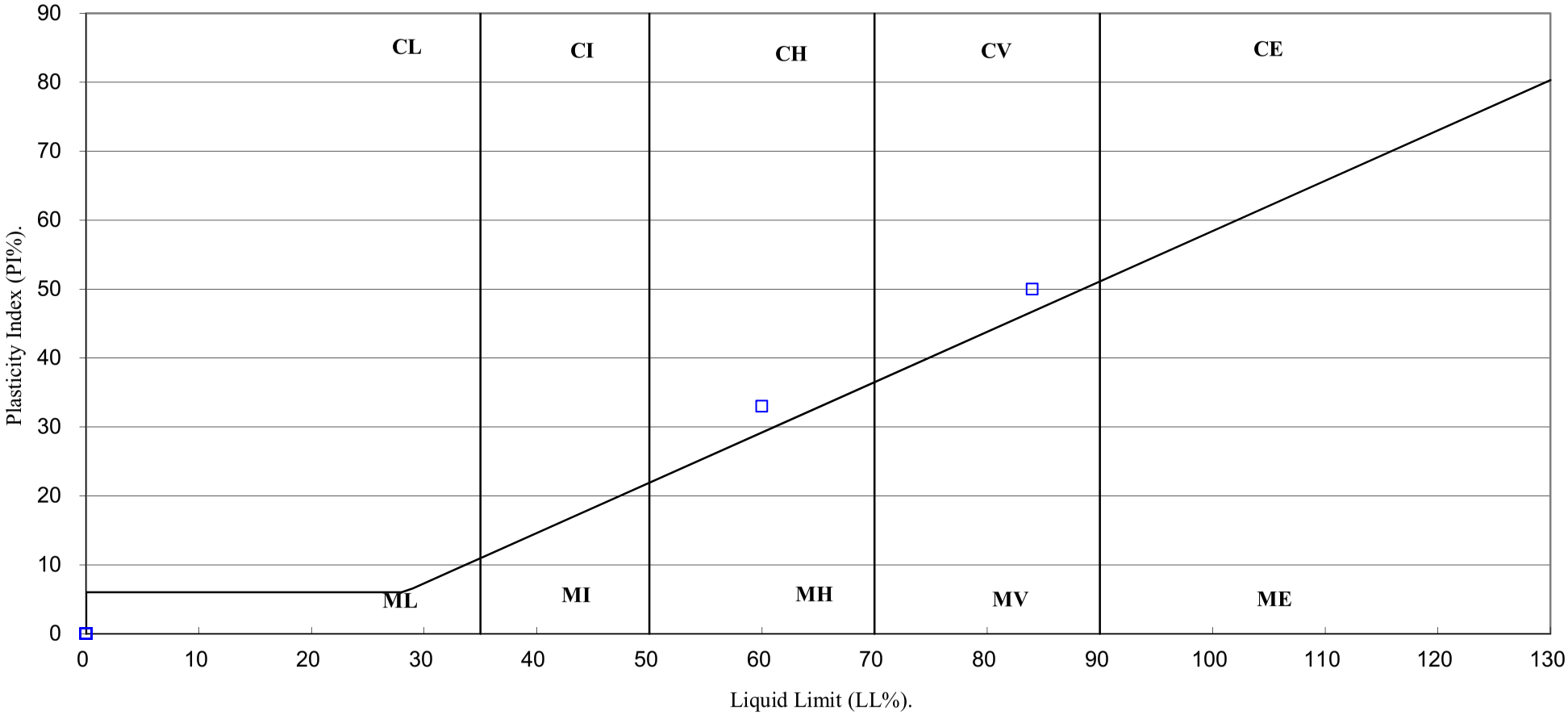
Contract No:

PSL18/6006

Client Ref:

151069/3358

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Penny Pie Park	Contract No: PSL18/6006 Client Ref: 151069/3358

PARTICLE SIZE DISTRIBUTION TEST

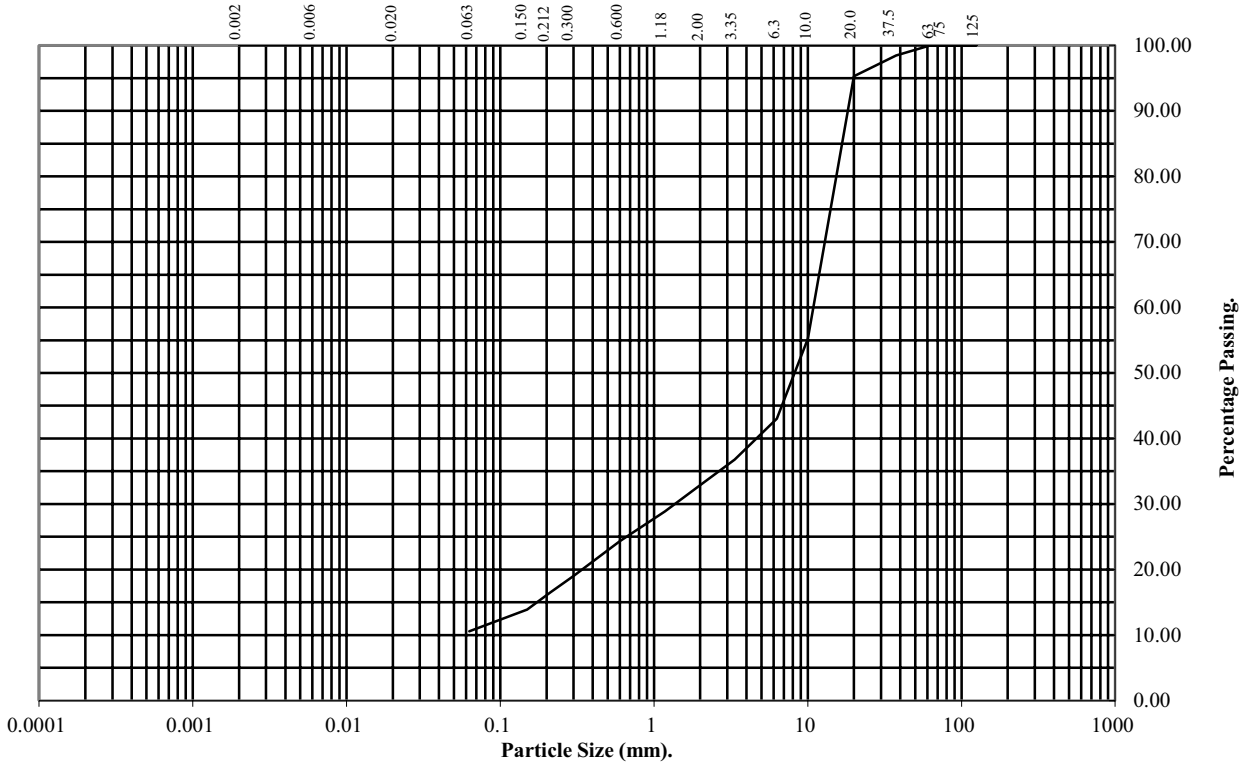
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1 **Top Depth (m):** 1.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	98
20	95
10	55
6.3	43
3.35	37
2	33
1.18	29
0.6	24
0.3	19
0.212	17
0.15	14
0.063	11

Soil Fraction	Total Percentage
Cobbles	0
Gravel	67
Sand	22
Silt/Clay	11

Remarks:

See Summary of Soil Descriptions

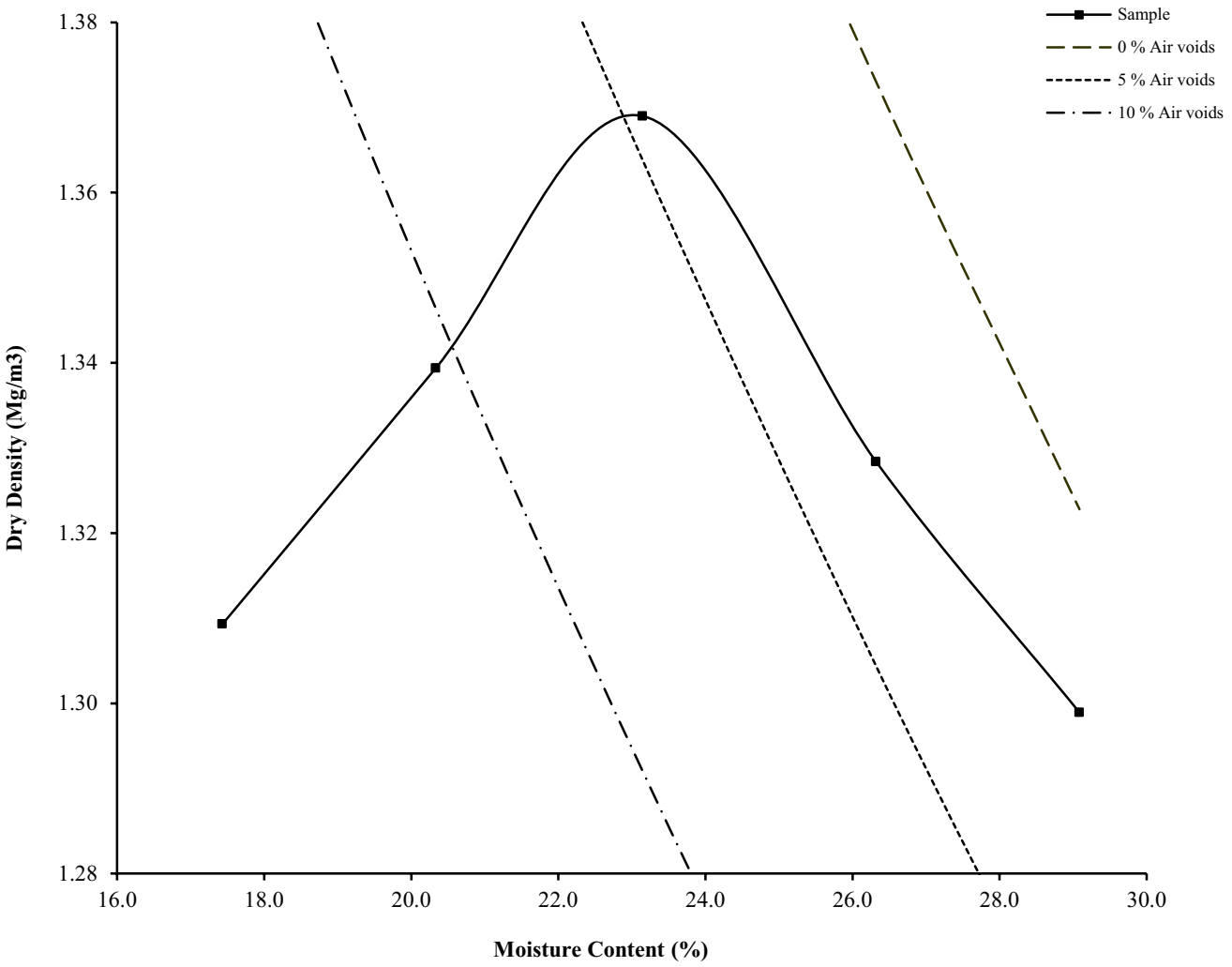
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP1 **Top Depth (m) :** 1.50

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		17	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.15	Assumed	Material Retained on 37.5 mm Test Sieve (%):		2
Maximum Dry Density (Mg/m3):		1.37	Material Retained on 20.0 mm Test Sieve (%):		3
Optimum Moisture Content (%):		23			
Remarks See summary of soil descriptions.					

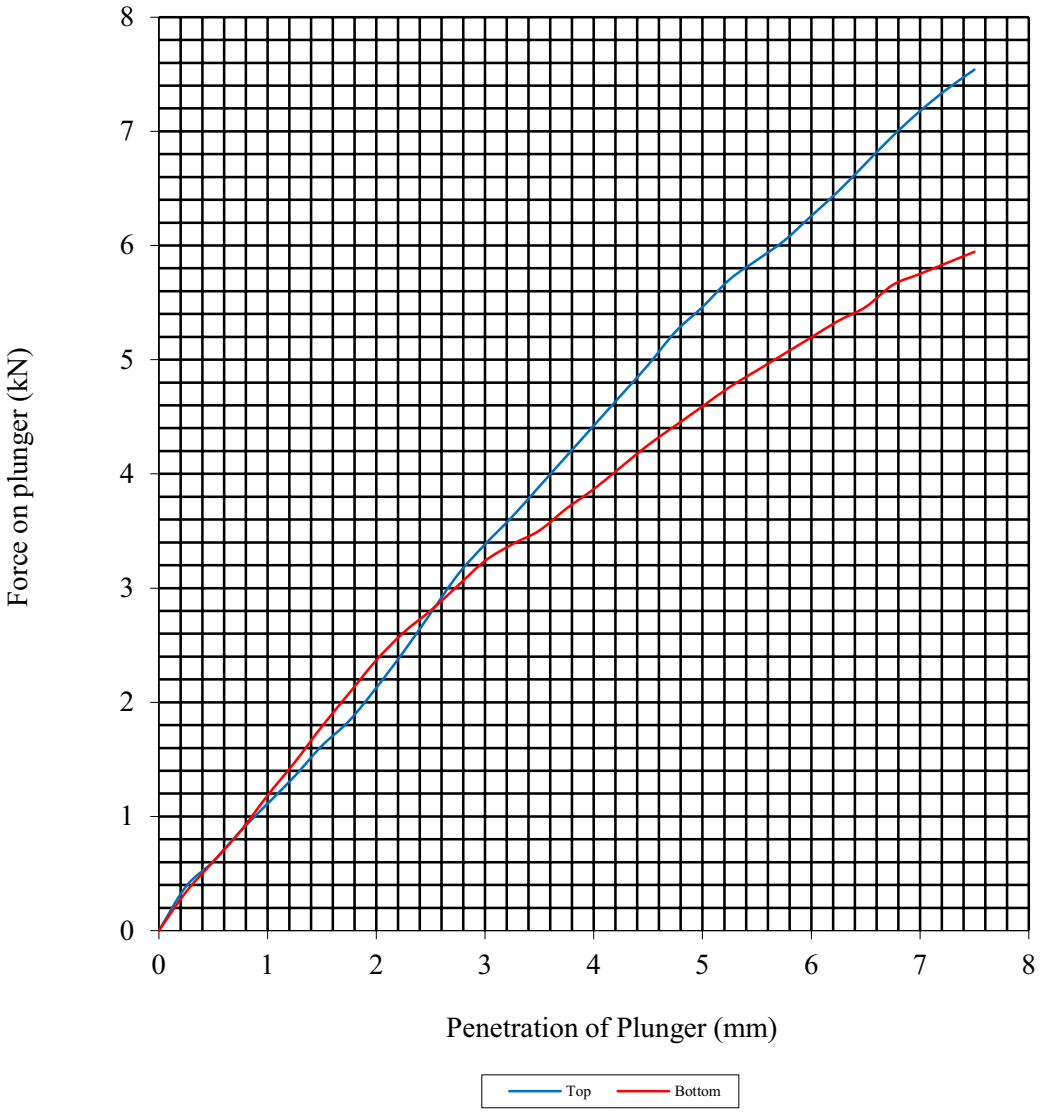
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP1 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	17	Surcharge Kg:	4.20	Sample Top	17	Sample Top	27.3
Bulk Density Mg/m3:	1.54	Soaking Time hrs	0	Sample Bottom	18	Sample Bottom	23.0
Dry Density Mg/m3:	1.31	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			5				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

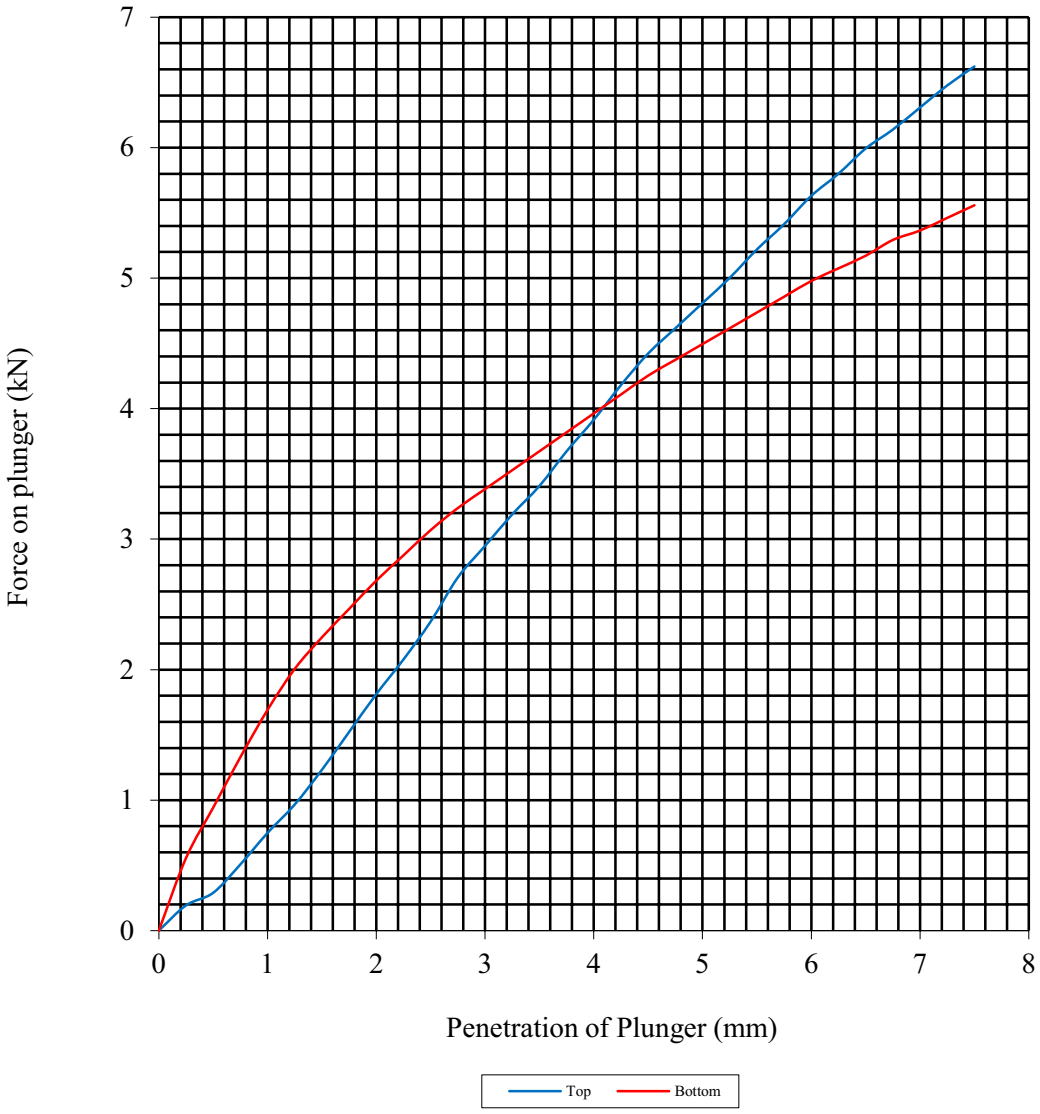
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP1 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	20	Surcharge Kg:	4.20	Sample Top	20	Sample Top	24.0
Bulk Density Mg/m3:	1.61	Soaking Time hrs	0	Sample Bottom	21	Sample Bottom	23.3
Dry Density Mg/m3:	1.34	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			5				
Compaction Conditions		2.5kg					

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Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

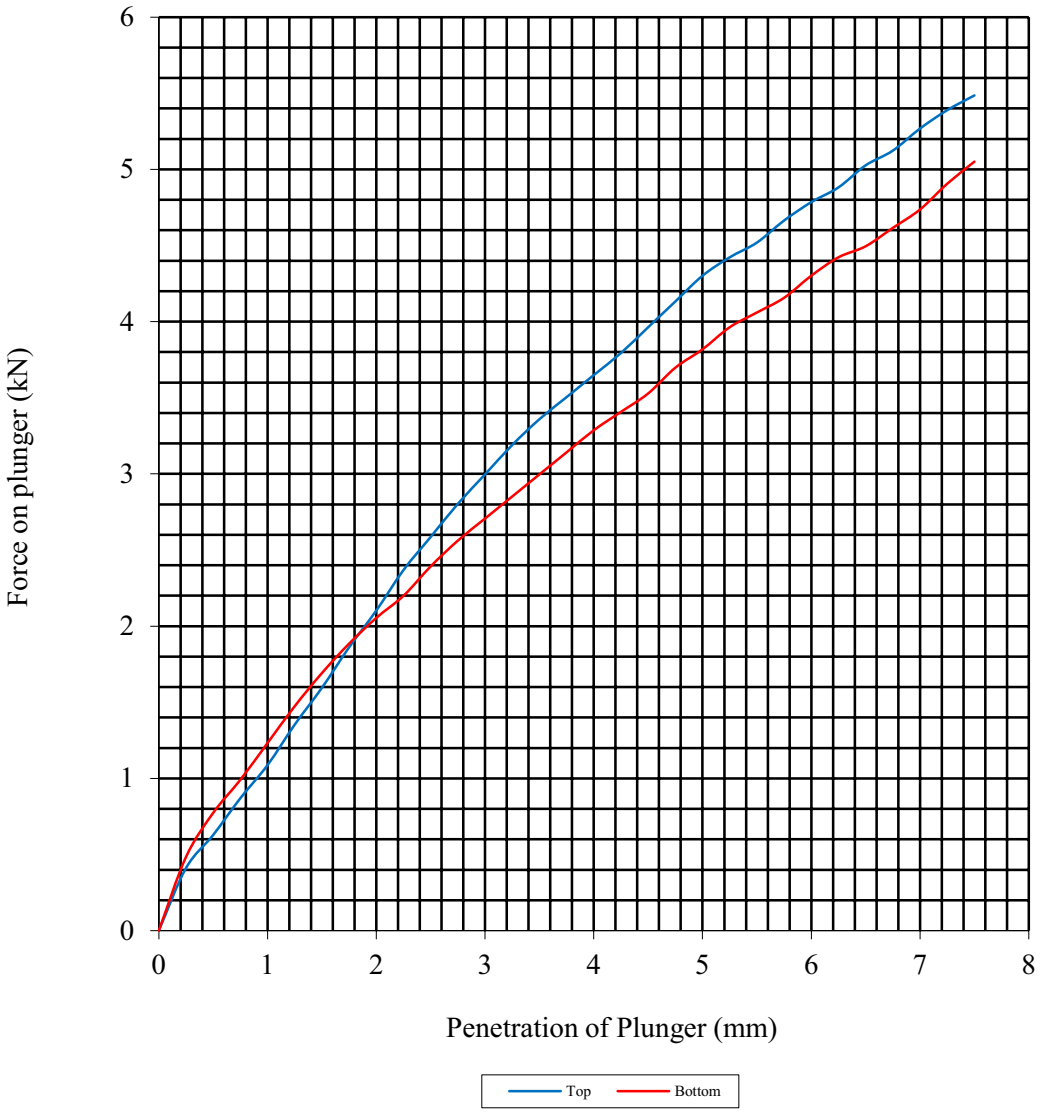
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP1 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	23	Surcharge Kg:	4.20	Sample Top	23	Sample Top	21.5
Bulk Density Mg/m3:	1.69	Soaking Time hrs	0	Sample Bottom	23	Sample Bottom	19.1
Dry Density Mg/m3:	1.37	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			5				
Compaction Conditions		2.5kg					

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Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

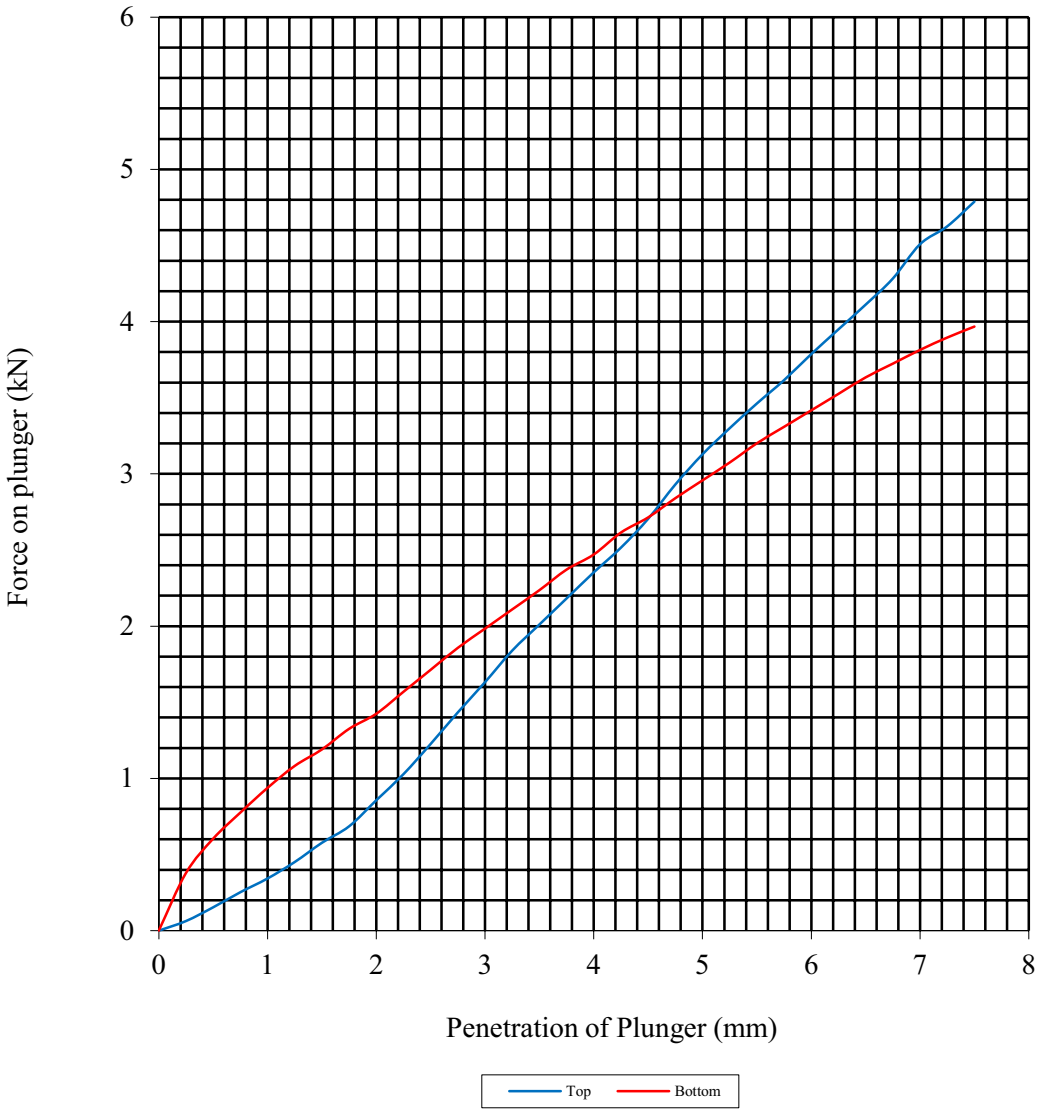
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP1 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	26	Surcharge Kg:	4.20	Sample Top	26	Sample Top	15.6
Bulk Density Mg/m3:	1.68	Soaking Time hrs	0	Sample Bottom	27	Sample Bottom	14.8
Dry Density Mg/m3:	1.33	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			5				
Compaction Conditions		2.5kg					

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Contract No: PSL18/6006

Client Ref: 151069/3358

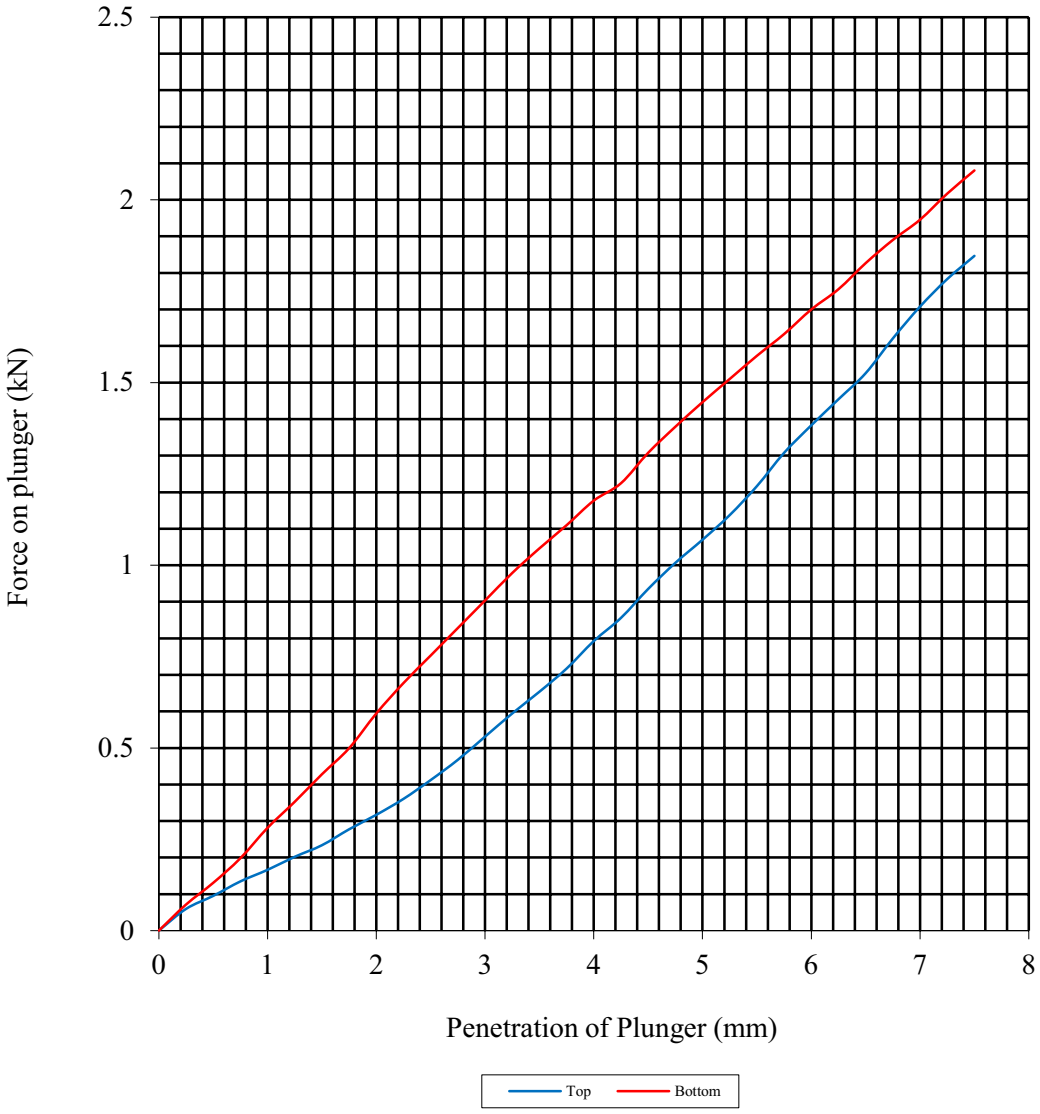
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP1 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	29	Surcharge Kg:	4.20	Sample Top	29	Sample Top	5.3
Bulk Density Mg/m3:	1.68	Soaking Time hrs	0	Sample Bottom	29	Sample Bottom	7.2
Dry Density Mg/m3:	1.30	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			5				
Compaction Conditions		2.5kg					

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Contract No: PSL18/6006

Client Ref: 151069/3358

PARTICLE SIZE DISTRIBUTION TEST

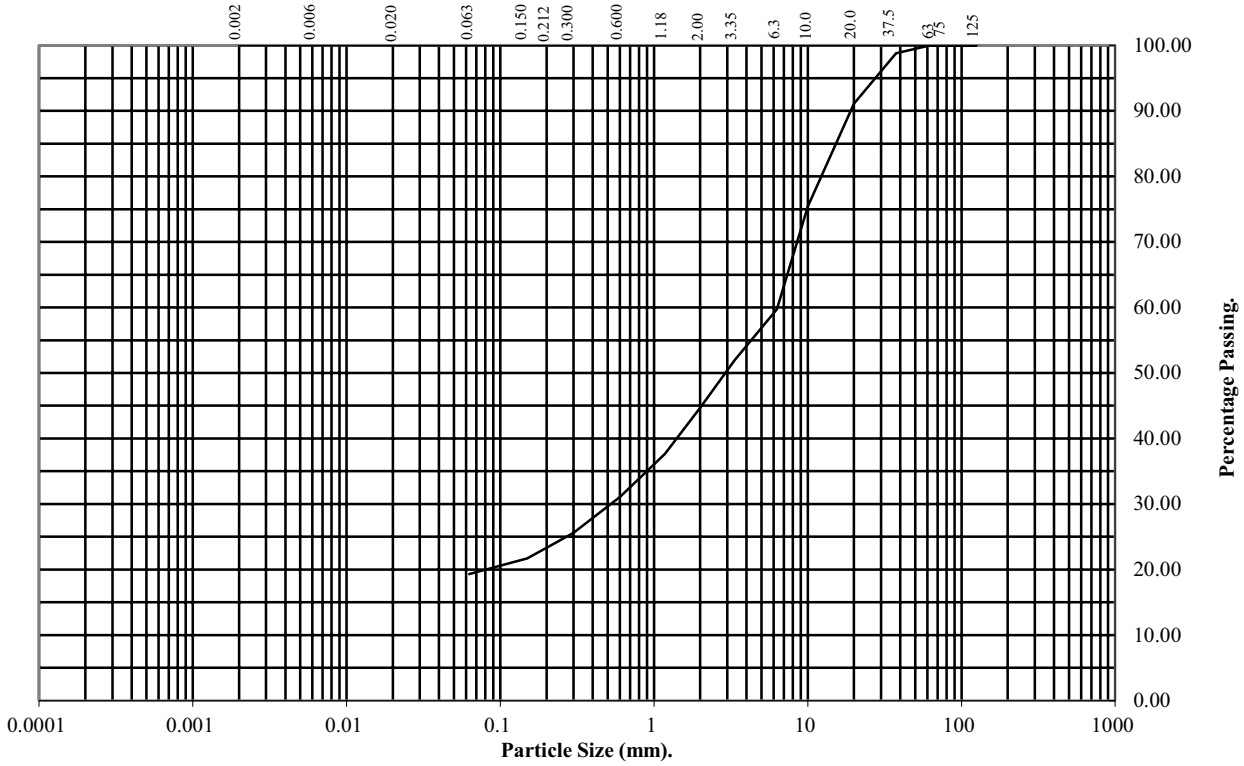
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP3 **Top Depth (m):** 1.60

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	99
20	91
10	75
6.3	60
3.35	52
2	45
1.18	38
0.6	31
0.3	26
0.212	24
0.15	22
0.063	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	55
Sand	26
Silt/Clay	19

Remarks:

See Summary of Soil Descriptions

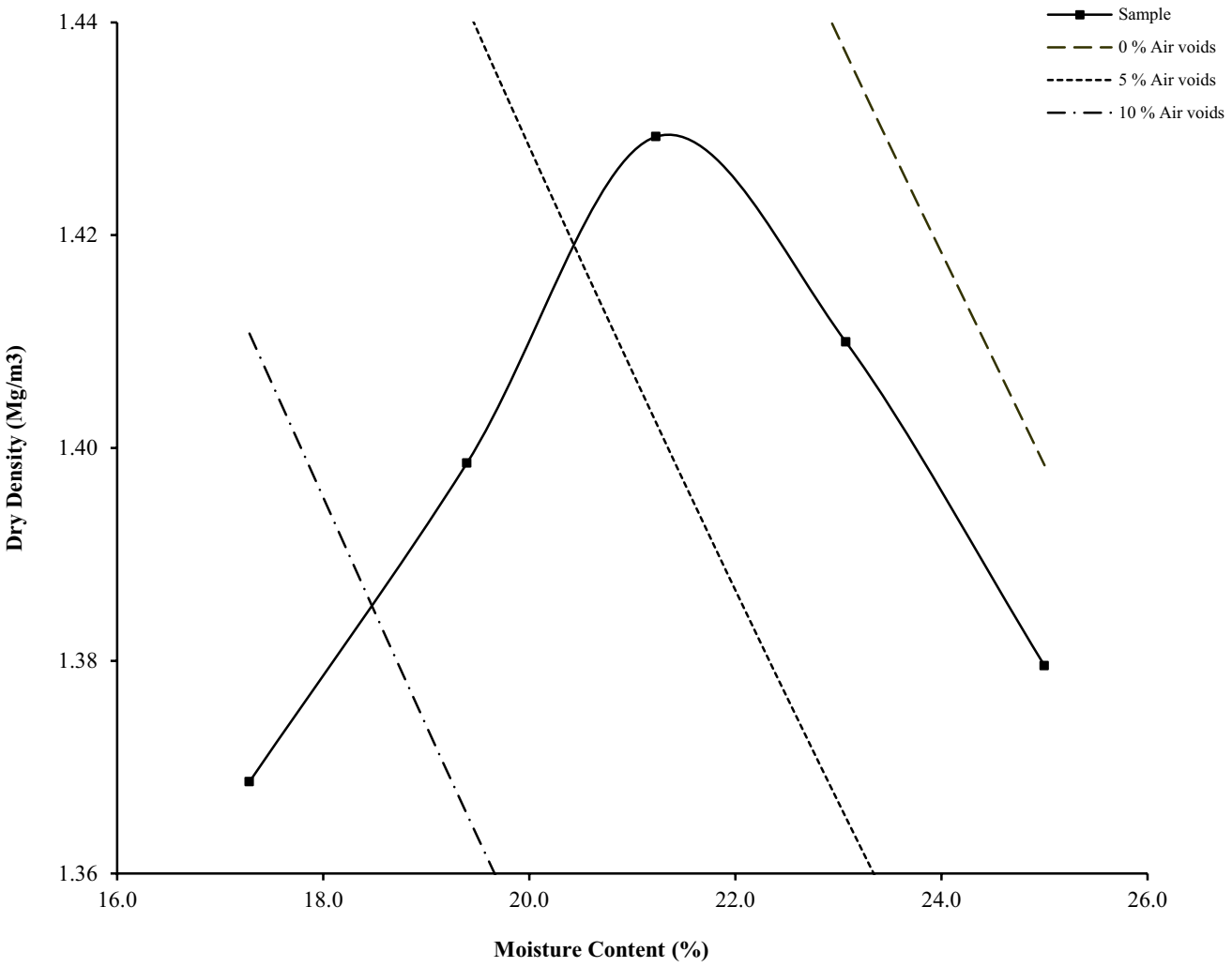
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m) :** 1.60

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		21	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.15	Assumed	Material Retained on 37.5 mm Test Sieve (%):		1
Maximum Dry Density (Mg/m3):		1.43	Material Retained on 20.0 mm Test Sieve (%):		8
Optimum Moisture Content (%):		21			
Remarks See summary of soil descriptions.					

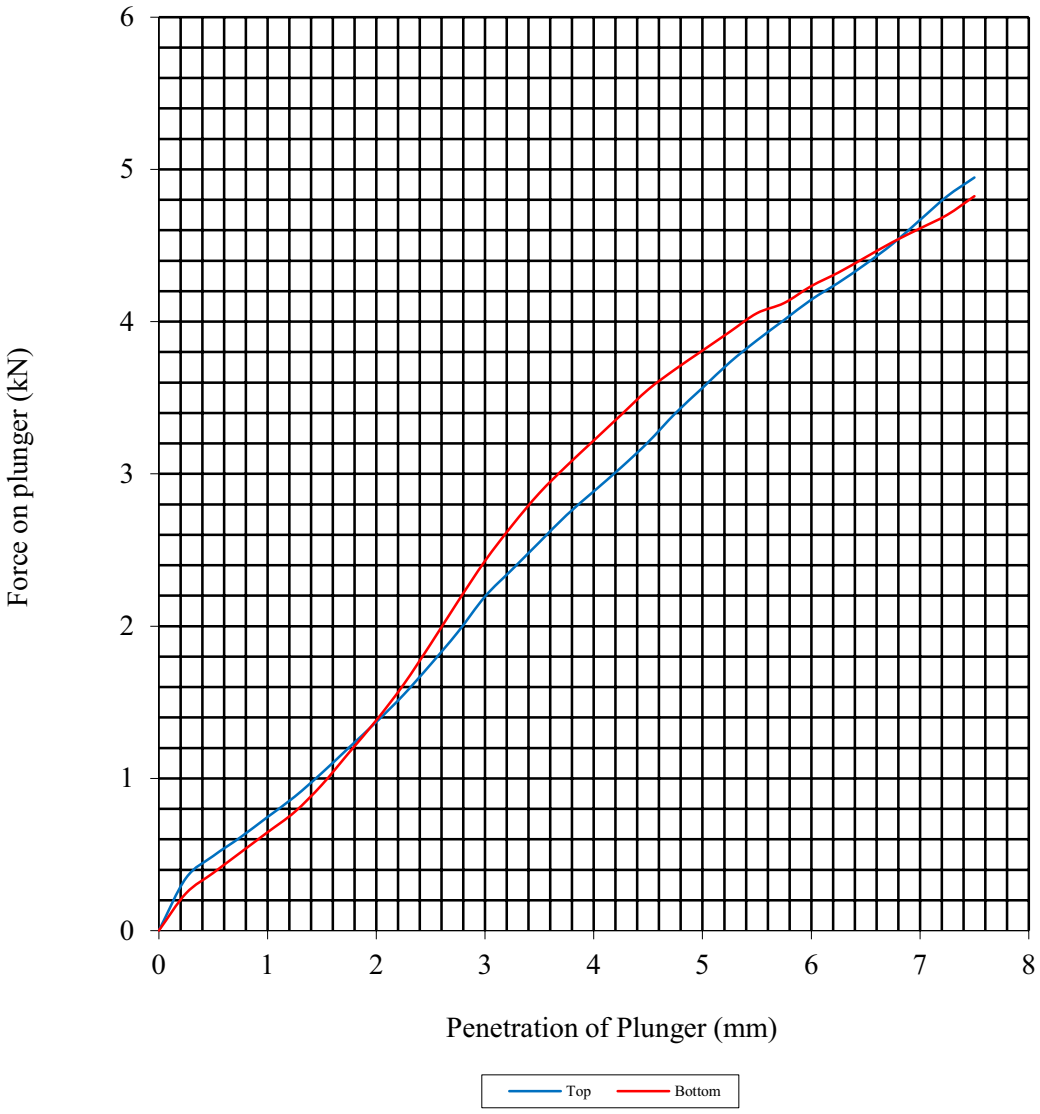
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m):** 1.60

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	17	Surcharge Kg:	4.20	Sample Top	17	Sample Top	17.8
Bulk Density Mg/m3:	1.61	Soaking Time hrs	0	Sample Bottom	17	Sample Bottom	19.1
Dry Density Mg/m3:	1.37	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			9				
Compaction Conditions		2.5kg					

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PSL Professional Soils Laboratory

Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

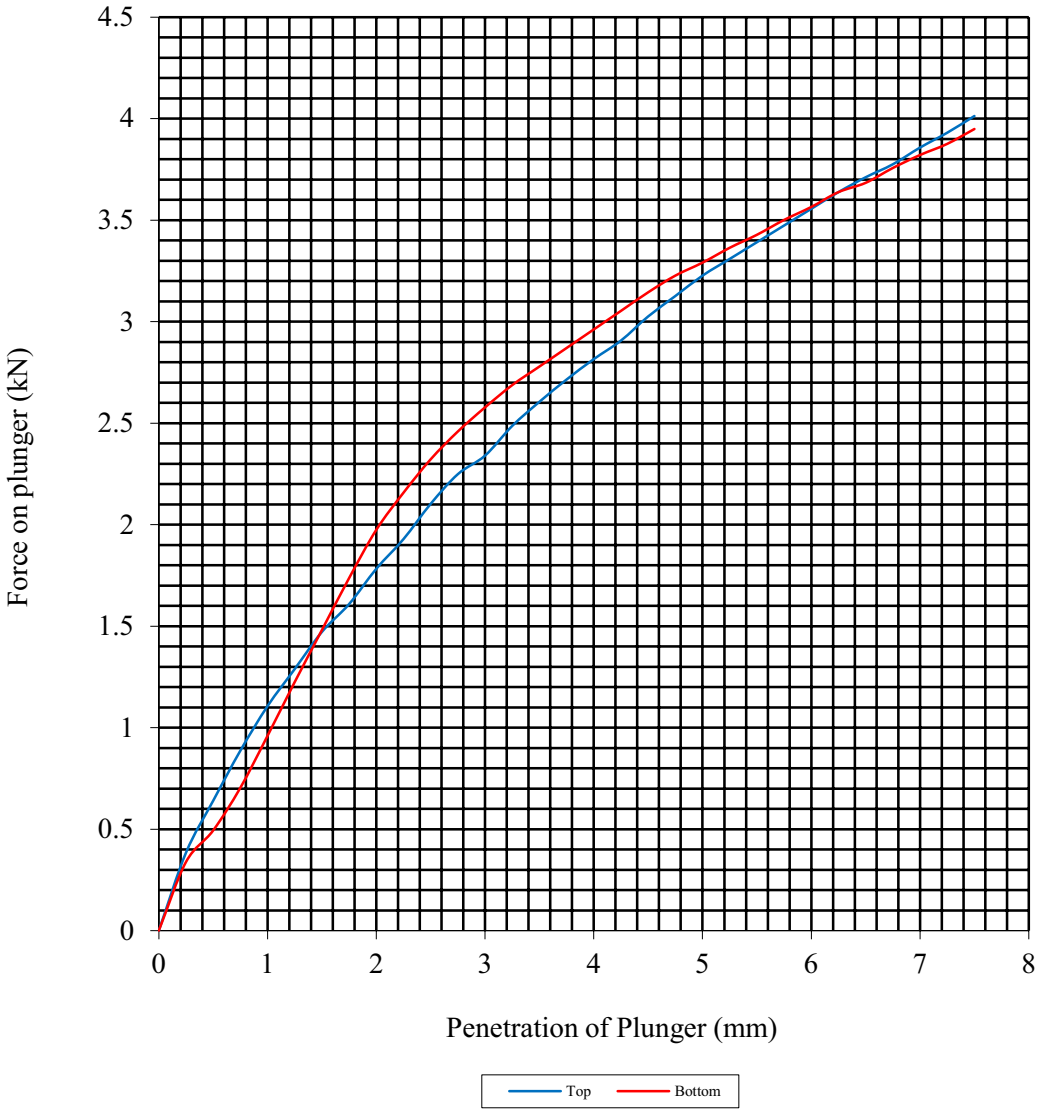
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m):** 1.60

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	19	Surcharge Kg:	4.20	Sample Top	19	Sample Top	16.1
Bulk Density Mg/m3:	1.67	Soaking Time hrs	0	Sample Bottom	10	Sample Bottom	17.6
Dry Density Mg/m3:	1.40	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			9				
Compaction Conditions		2.5kg					

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Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

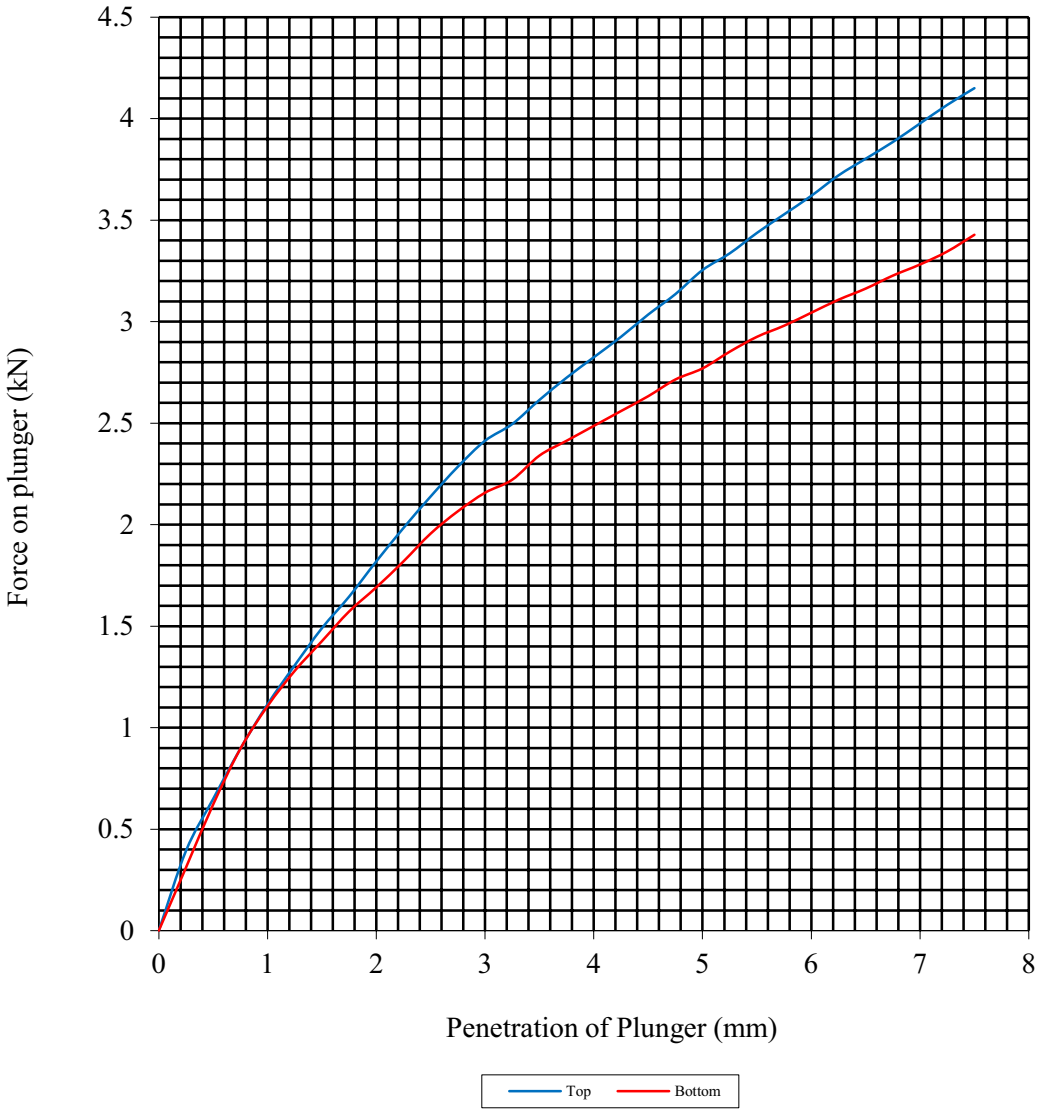
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m):** 1.60

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	21	Surcharge Kg:	4.20	Sample Top	21	Sample Top	16.3
Bulk Density Mg/m3:	1.73	Soaking Time hrs	0	Sample Bottom	21	Sample Bottom	14.8
Dry Density Mg/m3:	1.43	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			9				
Compaction Conditions		2.5kg					

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Penny Pie Park

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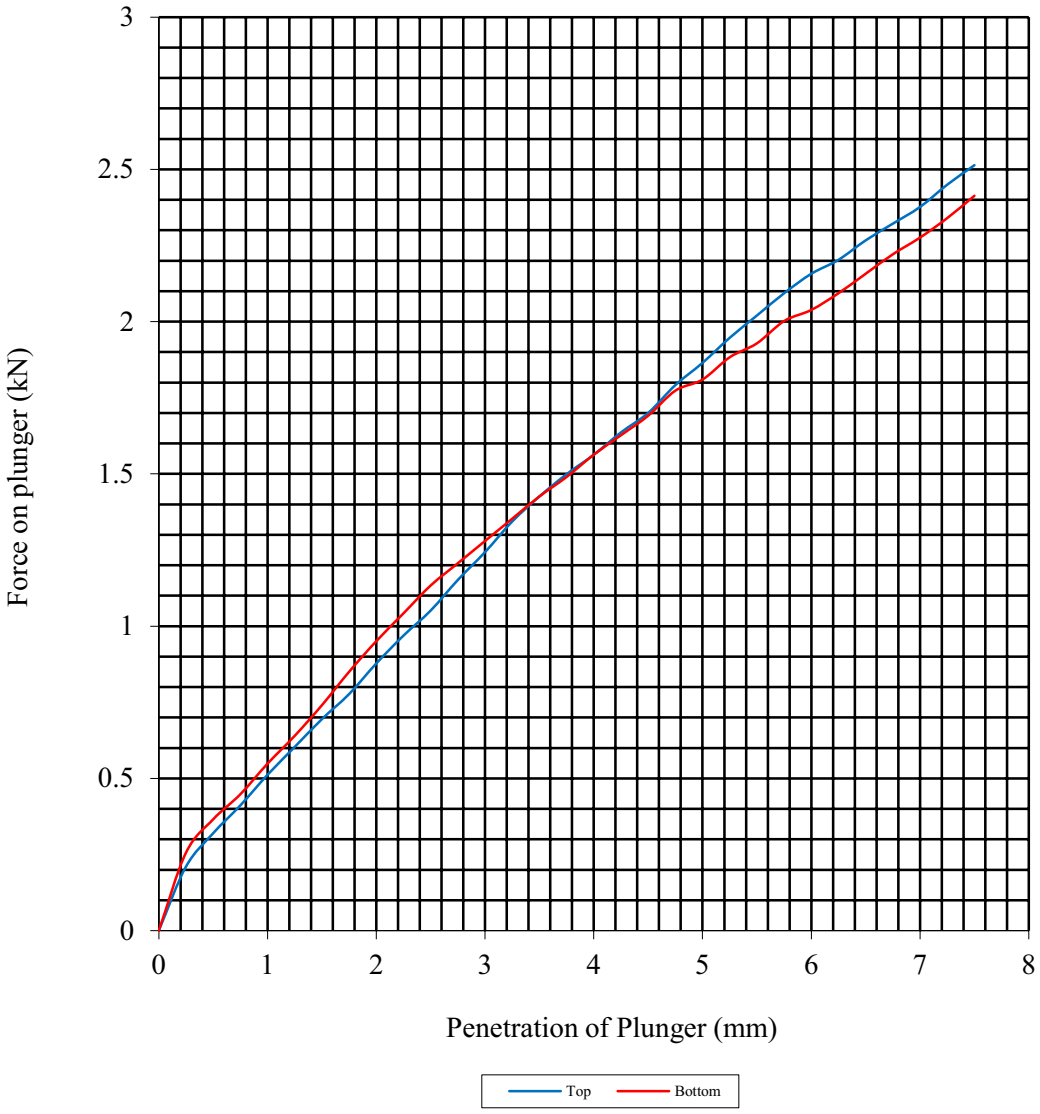
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m):** 1.60

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	23	Surcharge Kg:	4.20	Sample Top	23	Sample Top	9.3
Bulk Density Mg/m3:	1.74	Soaking Time hrs	0	Sample Bottom	23	Sample Bottom	9.0
Dry Density Mg/m3:	1.41	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			9				
Compaction Conditions		2.5kg					

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Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

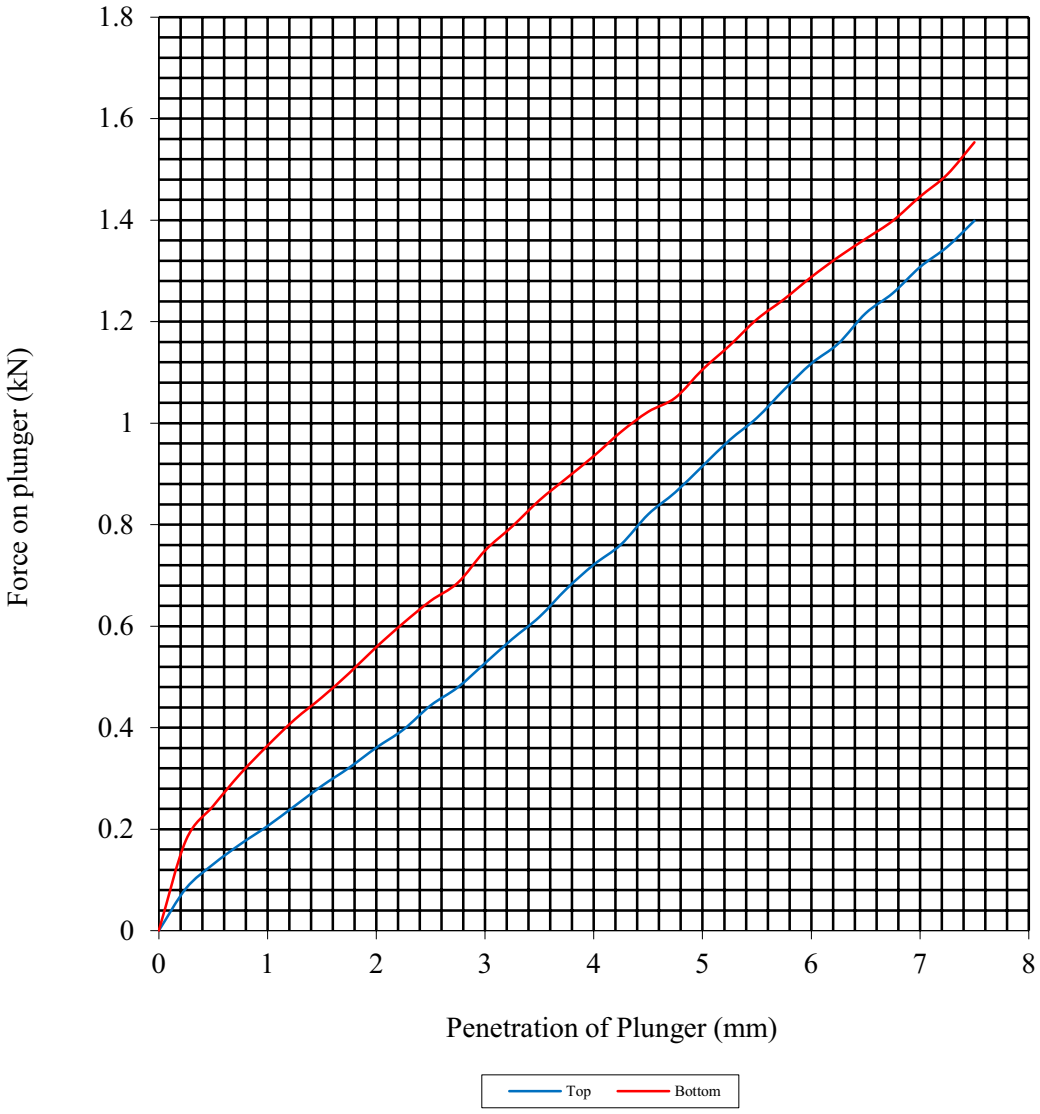
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m):** 1.60

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	25	Surcharge Kg:	4.20	Sample Top	25	Sample Top	4.6
Bulk Density Mg/m3:	1.72	Soaking Time hrs	0	Sample Bottom	25	Sample Bottom	5.5
Dry Density Mg/m3:	1.38	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			9				
Compaction Conditions		2.5kg					

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PSL Professional Soils Laboratory

Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

PARTICLE SIZE DISTRIBUTION TEST

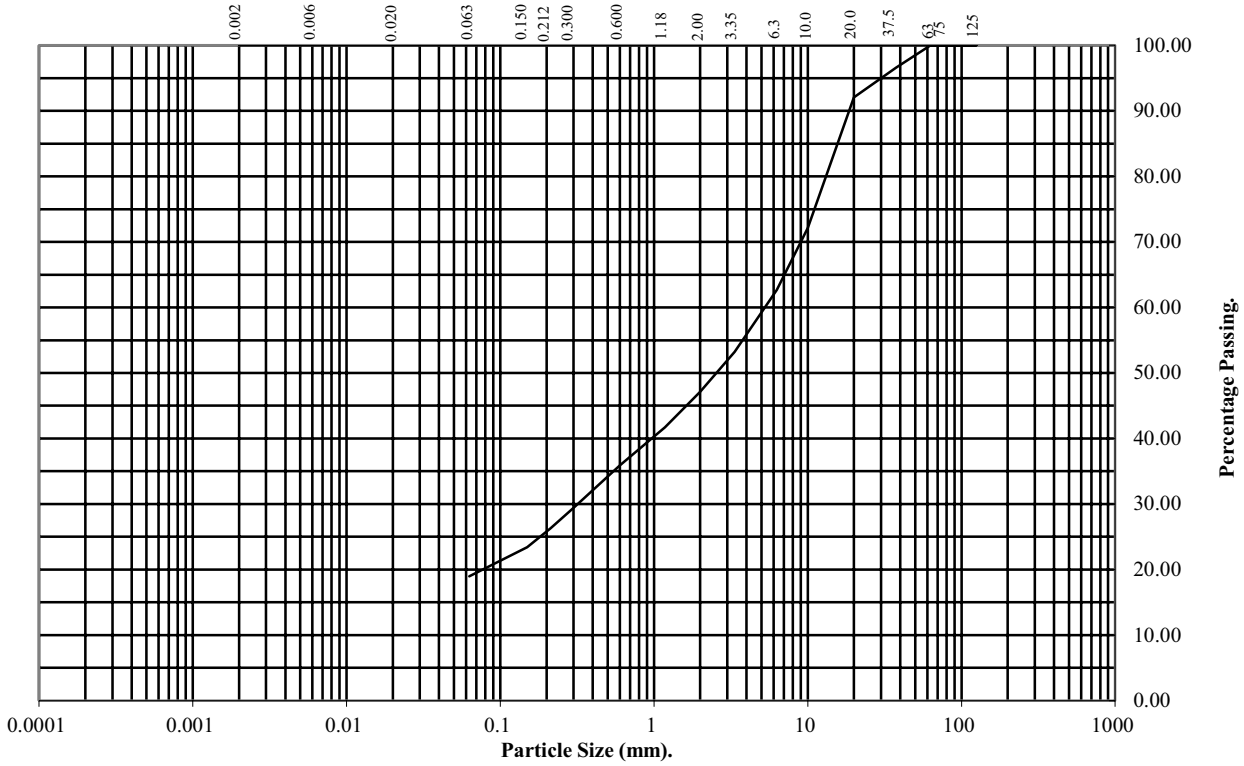
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP4 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	97
20	92
10	72
6.3	63
3.35	53
2	47
1.18	42
0.6	36
0.3	29
0.212	26
0.15	23
0.063	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	53
Sand	28
Silt/Clay	19

Remarks:

See Summary of Soil Descriptions

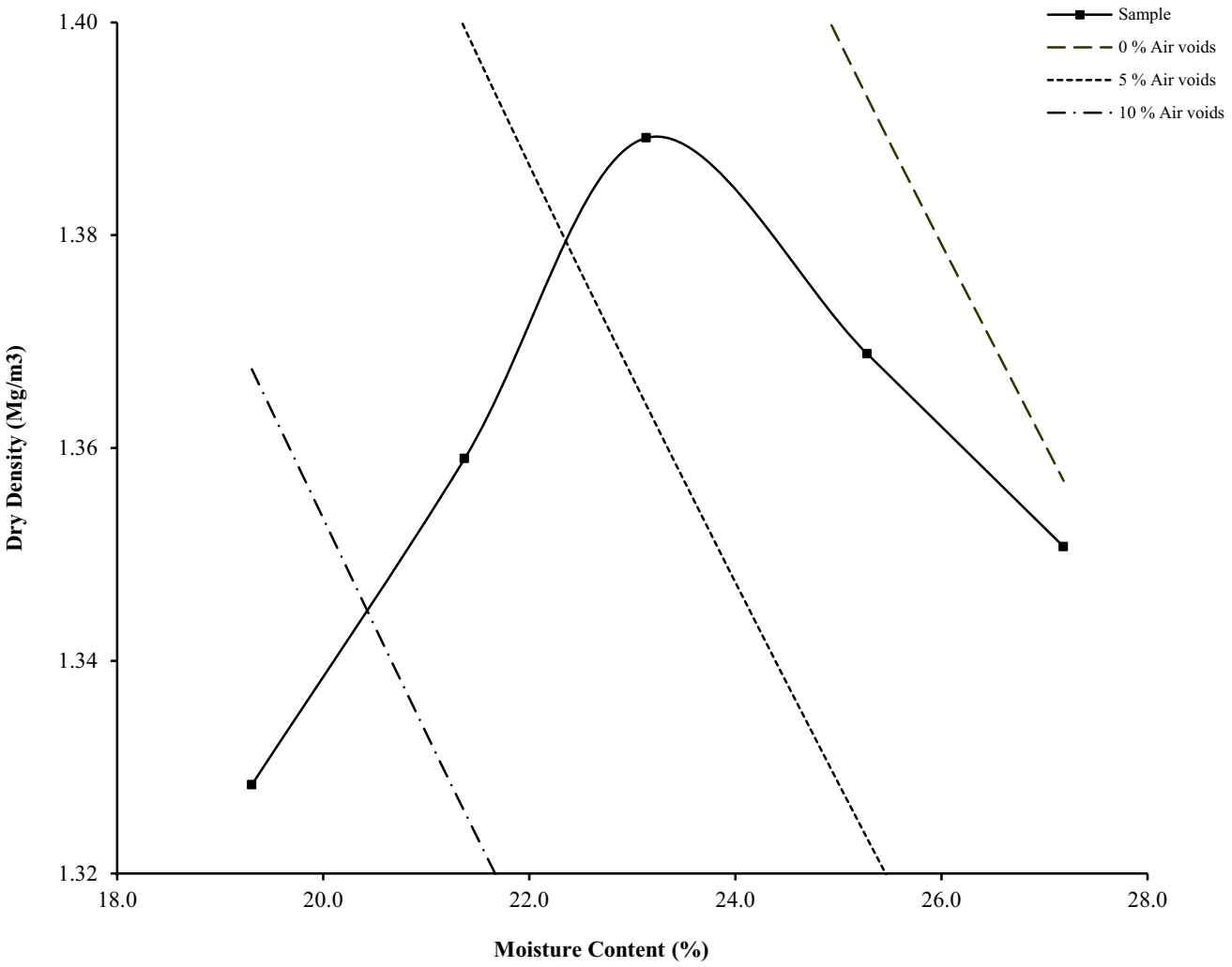
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP4 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		27	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.15	Assumed	Material Retained on 37.5 mm Test Sieve (%):		3
Maximum Dry Density (Mg/m3):		1.39	Material Retained on 20.0 mm Test Sieve (%):		5
Optimum Moisture Content (%):		23			
Remarks See summary of soil descriptions.					

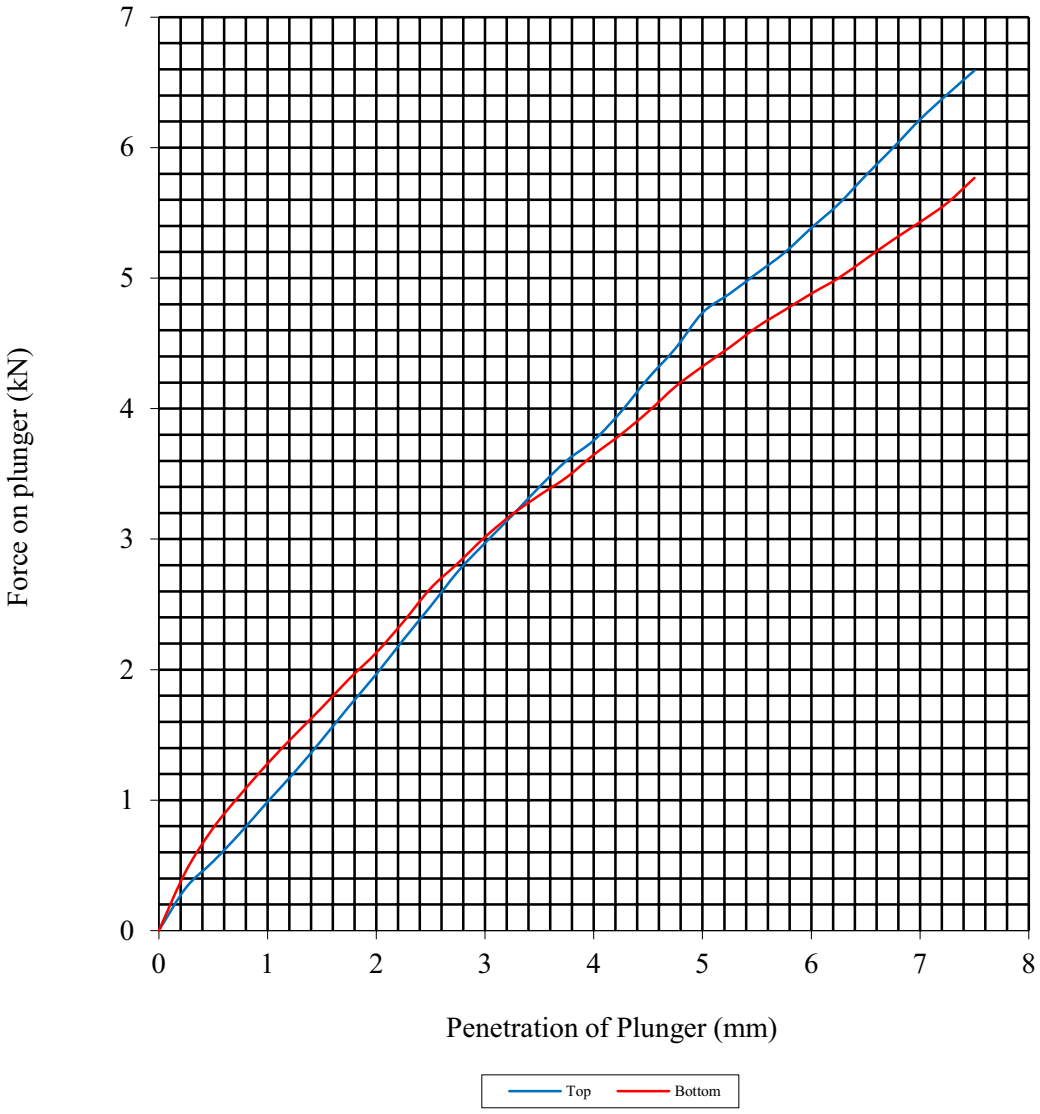
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP4 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	19	Surcharge Kg:	4.20	Sample Top	19	Sample Top	23.7
Bulk Density Mg/m3:	1.58	Soaking Time hrs	0	Sample Bottom	20	Sample Bottom	21.6
Dry Density Mg/m3:	1.33	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			8				
Compaction Conditions		2.5kg					

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Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

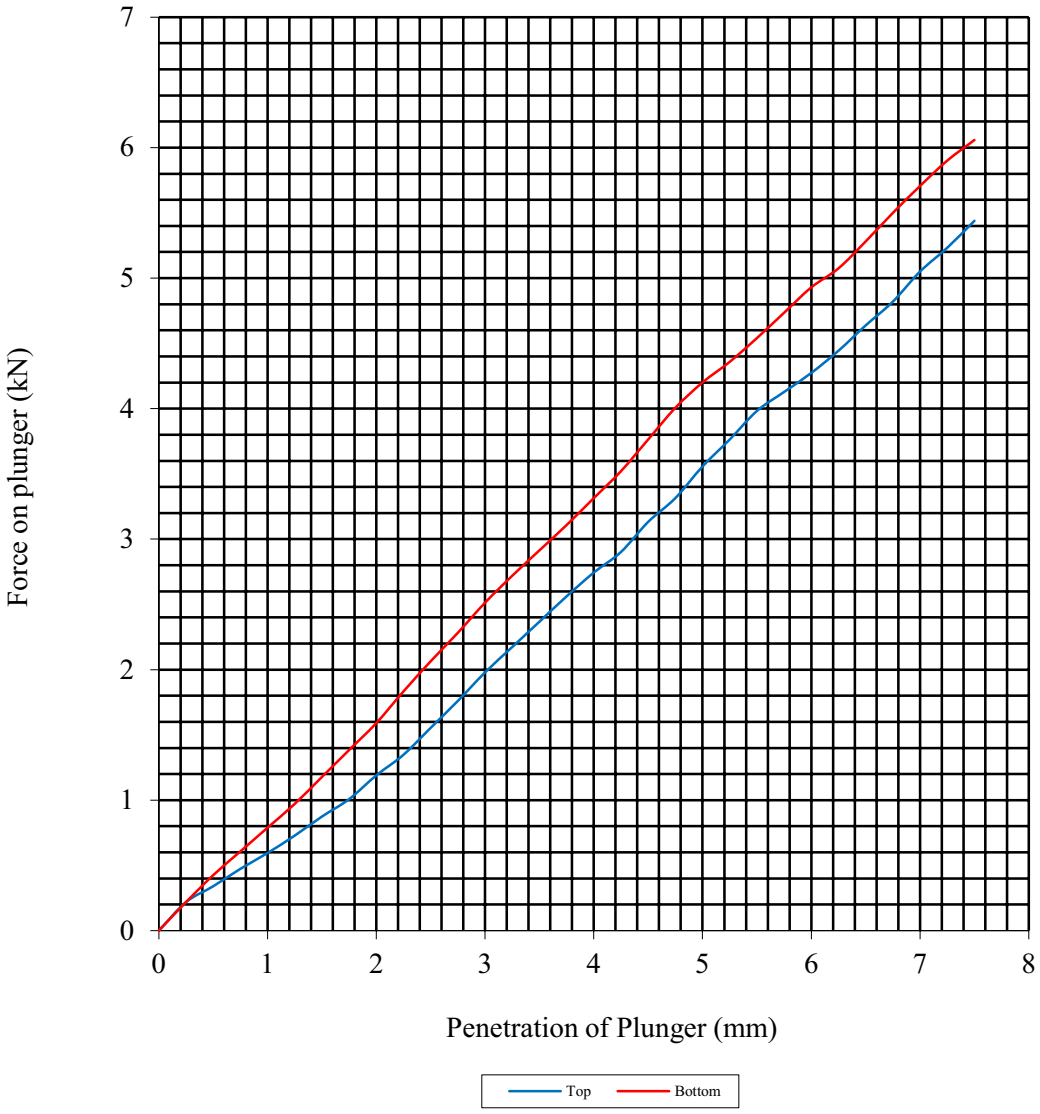
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP4 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	21	Surcharge Kg:	4.20	Sample Top	21	Sample Top	17.8
Bulk Density Mg/m3:	1.65	Soaking Time hrs	0	Sample Bottom	22	Sample Bottom	21.0
Dry Density Mg/m3:	1.36	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			8				
Compaction Conditions		2.5kg					

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Contract No: PSL18/6006

Client Ref: 151069/3358

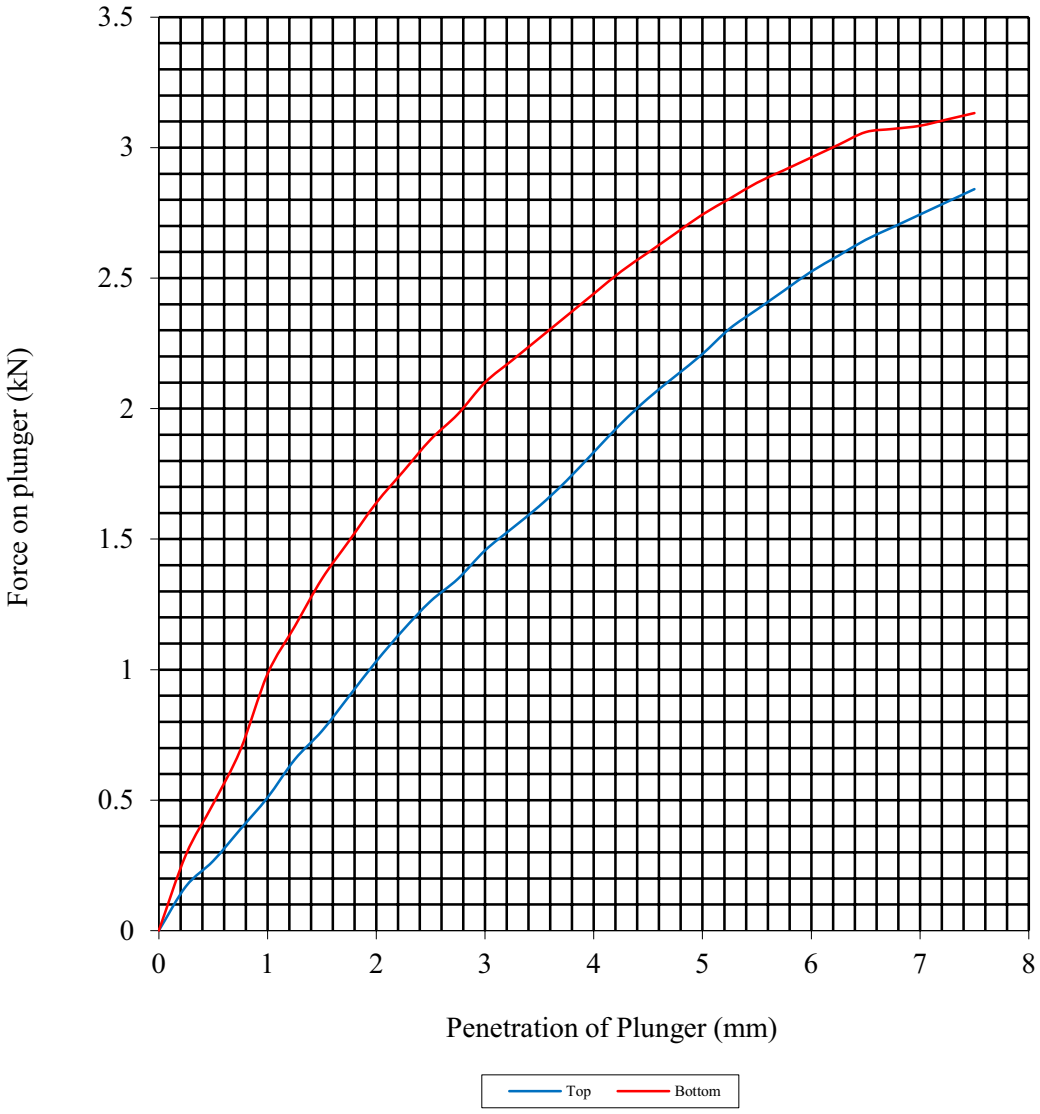
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP4 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	23	Surcharge Kg:	4.20	Sample Top	23	Sample Top	11.0
Bulk Density Mg/m3:	1.71	Soaking Time hrs	0	Sample Bottom	23	Sample Bottom	14.3
Dry Density Mg/m3:	1.39	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			8				
Compaction Conditions		2.5kg					

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Contract No: PSL18/6006

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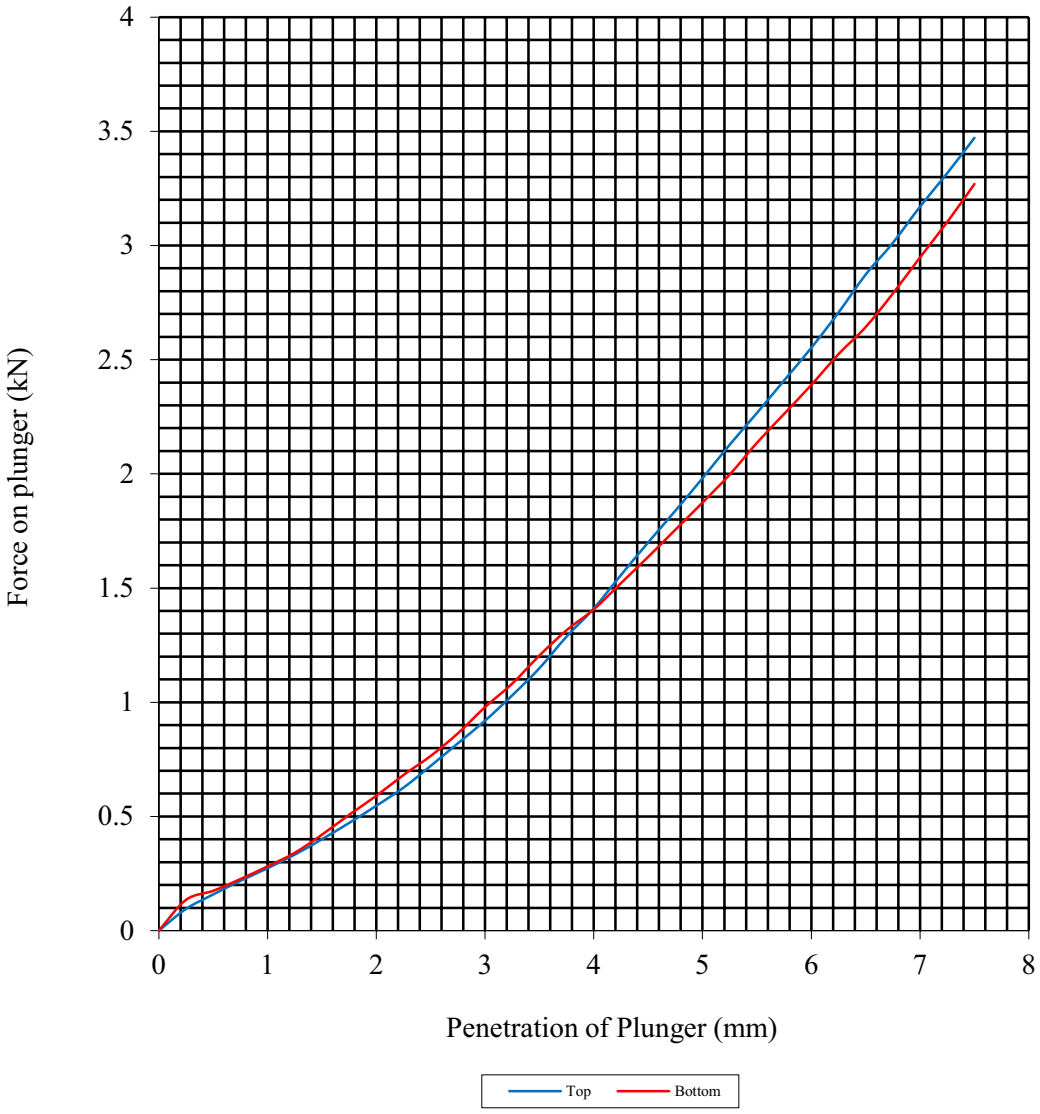
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP4 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	25	Surcharge Kg:	4.20	Sample Top	25	Sample Top	9.9
Bulk Density Mg/m3:	1.71	Soaking Time hrs	0	Sample Bottom	26	Sample Bottom	9.4
Dry Density Mg/m3:	1.37	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			8				
Compaction Conditions		2.5kg					

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Contract No: PSL18/6006

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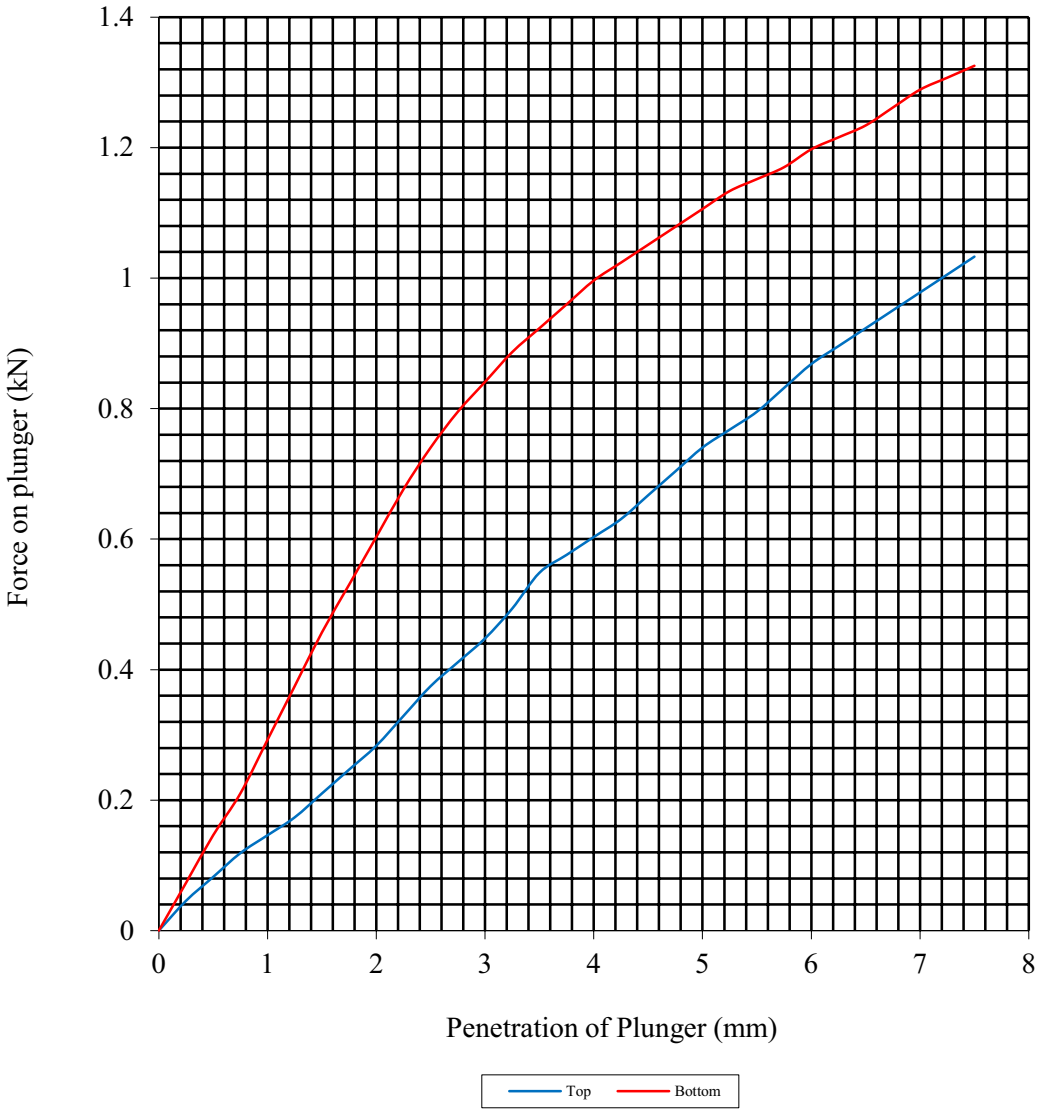
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP4 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	27	Surcharge Kg:	4.20	Sample Top	27	Sample Top	3.7
Bulk Density Mg/m3:	1.72	Soaking Time hrs	0	Sample Bottom	28	Sample Bottom	5.6
Dry Density Mg/m3:	1.35	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			8				
Compaction Conditions		2.5kg					

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PSL Professional Soils Laboratory

Penny Pie Park

Contract No: PSL18/6006

Client Ref: 151069/3358

APPENDIX A - CONTAMINATION RISK ASSESSMENT

Land Use Risk Assessment:

An assessment has been carried out for a number of common past land uses, indicating the severity risk rating that should be used. Where little is known about a site the higher land uses found and rating range figures should be used. Also given are the recommended chemical tests associated with a site investigation, however the exact tests will be determined on a site by site basis.

Potential Risk		Land Use	Risk Rating Range	Contamination testing					Comment
Description	SI Colour Rating			EA Screen	Leachate	TPH	PAH 16	BTEX PCBs	
Very High 5	Red	Radioactive site	5	Specialist assessment required					
		Petrol/Chemical Plant	5	x	x	x	x	x	
		Metal Works	5	x	x	x	x		Toxic metals
		Landfill Site	3 - 5	x	x				Dependent on infill
		Dye Works	3 - 5	x	x	x	x	x	
		Coke Works	4 - 5	x	x	x	x	x	
		Gas Works	4 - 5	x	x	x	x	x	
		Tannery	4 - 5	x	x				
		Petrol Station	3 - 5	x	x	x	x		
		Oil Depot	3 - 5	x	x	x	x		
High 4	Yellow	Infilled ground	3 - 5	x	x				Dependent on infill
		Heavy Industry	4	x	x		x	x	
		Soap Works	4	x	x			x	
		Power Station	4	x	x				
		Garage	4	x	x	x	x		
		Timber Yard	4	x	x				
		Highway	3 - 4	x	x	x	x		
		Abattoir	3 - 4	x	x				
		Colliery	3 - 4	x	x				
Moderate 3		Fabric Mill	3 - 5	x	x			x	5 if dye on site
		Foundry	3 - 4	x	x				
		Hospital	3 - 4	x	x				
		Food Factory	3	x	x				
		Sewage Works	3	x	x		x	x	
		Brewery	3	x	x				
		Coal Yard	3	x	x				
		Airfield	3	x	x				
		Light Industry	3	x	x				
		Colliery Spoil	2 - 3	x	x				
Low 2	Green	Offices/Commercial	2	x	x				
		Storage/Warehouse	2	x	x				
		Residential	2	x	x				
		Quarry	2	x	x				Unfilled
		Gardens/Parkland	1 - 2	x	x				
Negligible		Farm/Wood/Moors	1 - 2	x	x				

Site Contamination Risk Assessment

In assessing overall contamination risk, the following categorisation has been developed:

Term	Description
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action. Investigation required (if not already undertaken) and remediation very likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action. Investigation required (if not already undertaken) and remediation likely to be required.
Moderate Risk	It is possible that without appropriate remedial action harm could arise to a designated receptor. It is relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild. Investigation usually required (if not already undertaken) and remediation may be required.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard. It is likely that, at worst if any harm was realised any effects would be mild. Investigation may be required (if not already undertaken) but remediation is unlikely to be required.
Negligible Risk	The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor. Investigation may be required (if not already undertaken) to confirm.

Risk matrix to be used when assessing risk for conceptual site model

		Severe	Medium	Mild	Minor	>12 = Very High
	Risk	4	3	2	1	12 = High
High Likelihood	4	16	12	8	4	8 to 9 = Moderate
Likely	3	12	9	6	3	4 to 6 = Moderate / low
Low Likelihood	2	8	6	4	2	3 = Low
Unlikely	1	4	3	2	1	1 to 2 = Very Low

Risk	Risk Rating
Very High	5
High	4
Moderate	3
Moderate / Low	2 to 3
Low	2
Very Low	1

APPENDIX B - FURTHER REPORTING

None requested at present - December 2018