

10. Practical Measures

10.1 Introduction

If it is anticipated that a drilling operation will encounter unworked coal or former coal mine workings, including shafts and adits, particular risks to site personnel and members of the public must be considered. Precautions to protect those working on the site and any others who may be affected by the works will need to be evaluated before work commences.

Dangers from inhalation of hazardous gases, collapsing ground, ignition of coal seams and migration of gases both within and beyond the site need particular consideration. Practical measures to alleviate or control risk should be taken by the Client, Designer and Contractor.

These measures are intended to focus attention on planning and management of the drilling or piling works from design concept onwards. The aim is to ensure the safety of operatives, the Public and property from hazardous gases.

10.2 Pre-Tender Stage

This is the stage prior to inviting drilling or piling contractors to bid for the work. The Client (see [section 4](#)) or their appointed agent has a duty, under CDM Regulations, to provide pre-construction information (PCI) to be supplied with any invitation to tender for drilling or piling works. The PCI should include, but not be limited to, “actual and potential health and safety hazards”. In particular details of anticipated ground conditions, underground structures or watercourses that may affect the safe use of drilling machines and site personnel should be listed. This also includes safety hazards which have the potential to affect adjacent land or occupants of adjacent properties. Other hazards such as buried services should also be identified.

It is recommended that a desk study is carried out to determine;

- Underlying geology of the site.
- Whether coal seams are present.
- Whether the coal seams are known to be susceptible to spontaneous combustion.
- Presence of shafts or workings.
- Dip and strike of the strata.
- Potential gas migration pathways.
- Potential gases that may be encountered or produced.
- Proximity of properties and occupancy potential beyond the site boundaries.
- Site classification (Green, Yellow or Red according to BDA/SISG guidelines).

From the desk study (see [Section 8](#)) the principal safety hazards will be identified and forwarded in the pre-construction information pack for potential contractors to consider. Please note that information on the coal seams underlying the site should be compared to the named seams on the Coal Authority's web site under spontaneous combustion http://coal.decc.gov.uk/en/coal/cms/services/permits/coal_seams/coal_seams.aspx.

It is the Client's responsibility to apply for the Coal Authority's permission and this is best done at either pre or post tender stage. Only those who have a long term interest in the drilling or piling works should apply for permission as the applicant must take responsibility for the works and indemnify the Coal Authority for a period of 12 years.

In the urban environment the risk assessment will usually dictate that water flush drilling techniques are required for exploratory or remedial drilling. However it is recommended that Clients obtain the Designer's advice on drilling methods before applying for permission.

The Coal Authority in considering any application for permission will only grant when it is satisfied that the applicant has applied suitable safeguards to mitigate the potential hazards from its unworked coal and coal workings and it is not uncommon for proposed methodologies to require alteration before permission can be given.

It is important that sufficient time is allocated for permission to be granted and for the agreed methodology to be incorporated into the pre-construction information to be provided to contractors at tender stage. If the bidding contractors are unaware of the agreed methodology then bids submitted may vary and may not be directly comparable. This could result in a bid being incorrectly awarded which could in turn carry financial and contractual issues.

Refer to [Section 7](#) for further details on procedures for applications to The Coal Authority.

The Contractor should ensure that permission has been obtained before commencing site works.

All drilling or piling works which require Coal Authority permission should be formally contracted between the Client, the Contractor and the Subcontractor. Such contracts should be in writing and clearly identify the responsibilities of each party with regard to hazardous gases either on-site or off-site. There should be clear agreement within the contract(s) as to the course of action and by whom in the event of hazardous gases posing a risk to site operatives, the Public or property.

10.3 Planning of Works Prior to Site Operations

This is the stage after contract award when the Contractor will plan for the works using the pre-construction information supplied at tender stage.

The successful Contractor will review the supplied information to determine the coal hazards that could be present, as part of their risk assessment and method statement preparation. The Contractor will provide the Client with its risk assessments and method statements.

The risk assessment shall include a review of both the on-site and off-site conditions and those who may be affected by the site works.

If acting as the Designer the Drilling or Piling Contractor will assess the coal mining circumstance and determine whether there is a potential for any hazardous gases to be either present or created, the potential for pathways to the surface (e.g. presence of adits or mine shafts within or adjacent to the site) and the distance to the nearest on and off site properties, including their type of occupancy. From this the Contractor shall determine whether there is a potential for hazardous gases to emanate at the surface, either on site or beyond the boundaries of the site, which may endanger the operatives or the public.

If there is a risk of gas entering properties, controls need to be put in place. Controls available include:

- The method of drilling – consider whether techniques other than using a flush medium are suitable.
- The flushing medium – water flush will displace smaller volumes of gas.
- Monitoring holes will not prevent gas migration, but monitoring might indicate whether dangerous gases are present.

Where the risk of mobilising and displacing mine gases cannot be eliminated, mitigation measures must be put in place. The principal mitigation method is to install gas alarms in properties which are potentially at risk. Monitoring of gas levels may also be considered to identify any gas ingress below alarm threshold levels. Where there is a significant risk of harm or where the occupants are vulnerable, evacuation should be considered as an alternative.

The Contractor should prepare a Construction Phase Health and Safety Plan, whether the project is notifiable or not under CDM Regulations, as there are elevated risks associated with drilling or piling into coal and former coal workings. The Construction Phase Plan sets out how health and safety is to

be managed. The Construction Phase Plan should list all known or significant hazards present on the site. The risks should have been identified from the desk study or other preliminary investigations. Measures to control the risks to health and safety of those working on the site and, where identified, off site, must be included in the Construction Phase Plan.

Measures to be planned for could include but not be limited to;

- Appropriate Personal Protective Equipment (PPE) for site workers.
- Appropriate Respiratory Protective Equipment (RPE) for site workers.
- Gas monitoring equipment and procedures (see Section 6.6).
- Gas alarms.
- Suitable and sufficient material on site to seal boreholes in an emergency.
- Evacuation procedures.
- Fire control measures e.g. no naked lights, smoking, flammable liquid storage.
- Shutdown procedures.
- Blow out preventer.
- First aid.
- Training.

The Contractor should use the drilling flush method stipulated in the application for the Coal Authority's permission. If the Contractor considers from the risk assessment that a different drilling flush could be used safely, an application for an amendment to the Coal Authority permission shall be made and agreed prior to changing the flush method.

If off site gas monitoring is identified by the risk assessment then monitoring and early warning systems should be implemented where practicable and permitted. In all circumstances where monitoring equipment or alarms have been installed the Contractor shall ensure that the occupant has been briefed on their operation and has understood the requirement for them.

If an occupier refuses to allow gas monitors then the Contractor must reassess the risks and if required adopt other suitable mitigation measures. If the risks cannot be effectively mitigated and significant danger to the public remains then work must not proceed.

It should be noted that monitoring of specific perimeter holes is unlikely to protect properties adjacent to the site. Whilst these holes may intersect mineworkings, other unconnected mineworkings and pathways may exist elsewhere.

It is recommended that where requests to install gas monitors have been refused then the reasons for permission not being granted are recorded.

The Contractor following all the above processes will have established site specific safe systems of work for the contract which will include a contingency emergency plan.

10.4 Management of On-Site Works.

This is the stage when the Contractor should ensure that the planned safe systems of work are strictly followed during site operations. The Contractor should not commence work until emergency contingency plans are in place both on and off site as required.

Where flammable gases are possible no naked lights, smoking, or storage of flammable liquids should be permitted within a minimum of 15m of the borehole. This zone can be extended should the risk assessment or prevailing conditions dictate. Consideration should be given to the direction of the wind. Suitable warning notices should be posted warning of the restrictions and dangers.

If the safe system of work includes gas monitoring equipment then the equipment should be available on site and used by trained personnel to monitor the works. Refer to Section 6.5 for details. Gas monitoring must be undertaken at the top of the borehole prior to starting the rig or other plant to ensure the absence of flammable gases.

Where the borehole position has to be fenced off then escape routes must be set up and kept clear while drilling or piling operations are continuing.

Emergency control measures should be ready to be implemented if required.

10.5 Monitoring

Refer also to [Section 5.6](#).

This is the stage when the Contractor should ensure that the planned gas monitoring is strictly followed during site operations and from the start of drilling operations into permeable strata.

Prior to any gas monitoring the Contractor should ensure that the monitor is calibrated with inspection certificates available for inspection and that the appropriate drill crew are trained to operate the gas monitoring equipment. It is recommended that a reading is taken in fresh air to check that the sensors are reading correctly. When drilling into any unworked coal or coal workings **this guide recommends that monitors / alarms should routinely sample for carbon dioxide, carbon monoxide, methane and oxygen**. Carbon dioxide readings can be inferred from low oxygen readings which usually have a direct correspondence, but this is not always the case and slight changes in displayed oxygen concentrations are not uncommon in monitors. The presence of hydrogen sulphide is very rare and is apparent by its smell even at very low levels. Hydrogen is also very rare within mineworkings and can be monitored indirectly by a combustible gas meter if this gas is suspected. Should a flammable gas be recorded by this means and there is little or no methane then hydrogen may be present. Laboratory tests would be required to confirm the identity of the combustible gas.

If hazardous gases are expected to be encountered and the boreholes are close to the site boundary or adjacent properties then monitoring boreholes around the perimeter may be beneficial, in addition to the monitoring of the properties, when using air or air/mist and these should be monitored when coals or workings (broken ground) are encountered in the “production” borehole.

If hazardous gases are detected at either the top of the borehole or at any of the monitoring points then awareness of a potential gas problem will be heightened. If gases are detected in the general working area, in concentrations above the trigger levels (see [Section 5.6.2](#)), or if any of the gas alarms are activated then the drilling supervisor should be informed and he should make an assessment of the situation and determine suitable actions to take. Where the concentrations detected in the general working area exceed suggested action levels, drilling should cease and all personnel be withdrawn from the affected area. If withdrawal takes place there should be no return to the affected area until a competent person has investigated and assessed that it is safe to do so.

Where gas monitors/alarms are fitted inside buildings, on or off site, these should, where practicable, be inspected by the Contractor's site management at the time of any hazardous gas levels being detected on or off site. Those inspecting the gas monitors/alarms should carry personal gas monitors and test the atmosphere before entering any building, basement or room. If gas monitors within buildings cannot be inspected at this time e.g. locked residential housing, then this should be noted and provision made to alert occupants, before they enter these properties, to immediately check for elevated gas readings.

Hazardous gases are sometimes encountered under pressure when drilling and piling and it may be necessary to allow a hole to vent for a while until the pressure in the mineworkings drops and the emanating gas reaches safe levels. In circumstances where high levels continue a decision may have to be made to seal the borehole.

Gas monitoring equipment installed inside buildings should have suitable alarms to warn the occupants to take action and this may include the provision of special alarms for occupants with

hearing difficulties. All such equipment must be calibrated, in good working order and if battery operated should be installed with new cells. The Contractor must provide additional batteries in a timely manner so that monitors/alarms are never non-operational.

Building occupants must be briefed on the dangers from hazardous gases and what actions to be taken if gases are detected entering the building. Where gas monitors/alarms are fitted inside buildings these could also be monitored by the Contractor at suitable intervals as required.

Spontaneous combustion sometimes only becomes apparent when smoke starts appearing out of the open hole. Monitoring of drilled holes should provide an early indication of a problem if high levels of carbon monoxide are detected.

10.6 Rig Operations

This is the stage when the Contractor should start work after implementing all identified safe systems. Before commencing work all site personnel should have a site induction. The induction should include, but not be limited to, the hazardous gas information and instructions contained in the Construction Phase Health & Safety Plan. If required by the Construction Phase Health & Safety Plan, persons off site who may be affected by the works should be informed of precautions prior to operations commencing. Where warning alarms and monitoring is required then it should be in position and operable prior to operations commencing. All drilling crew should have basic hazardous gas training and should be aware of the recommended trigger levels. All on site personnel should have appropriate PPE and RPE (as identified by the risk assessment).

When drilling into coal seams where the depth of coal is definitively known the Contractor may choose to employ a different flush prior to encountering the coal, former workings or overlying broken ground and permeable deposits (e.g. air flush through superficial deposits and water flush through rock). The switch to the agreed flushing medium, as specified during the obtaining of the Coal Authority permit, must be made in a timely manner to ensure a suitable standoff distance is maintained between any potentially hazardous areas and the drill bit.

10.7 Spontaneous Combustion

If a seam is likely to be contacted which could be prone to spontaneous combustion then a non air based flush should be the primary method used to drill the holes. In practice this will usually be water flush. Depending on the other drilling risks, there may be occasions when air flush drilling cannot be avoided, but in such circumstances there must be strict monitoring of the holes (along with any other precautions which the risk assessment determines) to determine if any signs of combustion are apparent. If any such signs are noted then the holes must be sealed and to this end grout and suitable equipment must be available on site to enable this to take place without delay.

Where conditions of a possible heating are detected management should be informed immediately. If still drilling, the drill flush should be switched off, and where it is safe to do so CO should be continuously monitored, the drill string should be removed and the rig moved off the borehole position. Open holes and any coal workings encountered should be grouted without delay to seal the fire from the air/oxygen. Consideration should be given to the inclusion of down hole temperature sensors to monitor the situation and ensure that the heating has been confined.

DO NOT INSTINCTIVELY INJECT WATER INTO A COAL SEAM WHICH IS ON FIRE. Water added to burning coals can dissociate, releasing oxygen and hydrogen leading to an uncontrolled and unpredictable explosion. No further drilling should be undertaken other than for controlling the fire/heating and this should only be undertaken following a specialist risk assessment.

The Site Manager/Engineer should arrange for a site meeting to inform all interested parties of the situation and co-ordinate an action plan to control the heating and assess the implications on properties adjacent the site, including hazardous gas migration, especially up dip from the incident. The Site Manager/Engineer should also ensure that the Fire Brigade has been notified and informed that water is unlikely to be an appropriate medium for extinguishing a coal seam fire.

Long term, monitoring will also be required to ascertain whether the heating has been controlled, which could involve the drilling of monitoring holes nearby.

The Site Manager/Engineer should inform the Coal Authority of any incident at the earliest practicable opportunity.

10.8 Borehole Backfilling

Open boreholes, which intersect unworked coal and former coal workings, are a pathway which can allow potentially hazardous mine gases to emanate at the surface, and furthermore can allow the ingress of air which could trigger a spontaneous combustion event.

On completion of each borehole it should be temporarily plugged or sealed pending permanent sealing at the earliest practicable opportunity, having regard to the proposals for operational needs and site stabilisation. Boreholes left open for monitoring purposes must be provided with a cap or seal pending permanent sealing upon abandonment. Where indications of a spontaneous event are detected the hole and any workings encountered should be grouted immediately, having regard to the fact that monitoring equipment may need to be installed down hole, to assess whether the incident has been contained.

All temporary plugs, caps and seals must be robust, effective in preventing the movement of gases in or out of the borehole and tamper proof if being left on an unsecured site.

For site investigation and other non treatment holes permanent sealing should be affected with a suitable cementitious based material and should have the following properties:

- Be throughout the full depth of the borehole.
- Be injected through a grout pipe / tremie from the bottom of the hole upwards.
- Contain suitable and sufficient swelling material, such as bentonite, to inhibit shrinkage and ensure a good seal with the sides of the borehole.
- Once set, should be chemically inert.

For boreholes drilled for the treatment of mine workings, permanent sealing should be affected with the specified infill grout. This should be injected until the grout overflows at the surface and then the casing should be pressurised to ensure the hole is completely full.

If any grouting materials contain blast furnace cement or fly ash they should meet the waste quality protocols as detailed on the Environment Agency's website <http://www.environment-agency.gov.uk/business/topics/waste/32154.aspx>.

10.9 Off Site Considerations

The Contractor must consider the risks from hazardous gases being present in and around coal seams and former mineworkings and also from the operation spontaneously combusting (heating) the coal. This will also produce hazardous gases, which, dependent upon the flush being used, can move gases over considerable distances and possibly off site.

Due to this potential for hazardous gases to be forced out beyond the site boundaries the Designer and Contractor must also consider the risks to those beyond the site boundaries before work commences.

Different types of occupiers will have different risks. Those in commercial properties may be less at risk than residential occupants. Commercial building occupiers may accept hazardous gas monitoring and be suitably trained to respond to any alarms. Doors and windows may be opened providing some ventilation. Residential property occupiers may not be willing to have hazardous gas monitoring installed in their homes and may have their doors and windows closed for long periods during the day. Alarms installed in residential properties may have to alert sleeping occupants or those with hearing

and mobility issues.

Given the unacceptably high risks to members of the Public, the prevention of the production of hazardous gases and the forcing of hazardous gases off site into adjacent occupied residential buildings should be prevented.

The distance gases can be forced along coal seams or workings is not able to be calculated with any reasonable degree of certainty. On very limited tests, at one site, indications were that under certain specific conditions the flow from the air flush drilling was not detected in test holes much beyond 50m. It has to be emphasised that the results were specific to the ground conditions at the particular site and cannot be considered representative of other sites.

Air flush drilling will create the furthest flow of gases through fractured coals than open worked seams due to size of voids. Considerable quantities of flush blows out of the top of the borehole with cuttings until a void is encountered at which point the “flush is lost”. The air flush down the borehole will take time to pressurise the voids before the flush flows back out of the top of the borehole. However the flush may not return depending on the size of void and the degree of rock/coal fracturing which can allow flow of flush through fractures and even out of other boreholes. There is also the potential for the flush to follow the fractures in seams which can outcrop beneath property, excavations, sewer systems, culverts or other sub-surface structures, presenting risks to personnel who may be working or living in the structures. Other structures that could be at risk from hazardous gases, particularly flammable gases, are lighting columns.

The examples given are not exhaustive and an assessment of the risks to any structures adjacent to the site needs to be considered.

10.10 Emergencies

An emergency plan must be in place which should take into account the risks of spontaneous combustion, and hazardous gases emanating off site where property exists.

The Emergency Plan must be suitable for dealing with the risks identified in the site risk assessment and be able to be implemented immediately.

The Site Manager/Engineer or Drilling/Piling Supervisor should have access to a list of emergency contact names and telephone numbers from where they can obtain advice and report abnormal situations.

Consideration must be given to the evacuation of properties at risk and the possible requirement to house residents in temporary accommodation.

If methane or coals ignite, the Drilling/Piling Supervisor should immediately notify their Manager.

Injured personnel should be treated by their First Aider. A BDA Audited Lead Driller is qualified in first aid; however, if they are injured or the injured person has suffered significant injuries the Ambulance Service should be called immediately.

In the event of an underground heating, the Site Manager/Engineer or Drilling/Piling Supervisor shall contact the Fire Brigade stipulating that water is unlikely to be an appropriate medium for extinguishing a coal seam fire.

If any flames at the surface are perceived to be moderate to low then attempts to extinguish the flame using carbon dioxide or powder fire extinguishers may be attempted, but it should be recognised that the source of the flames may be many metres down the hole and as such this may have little effect on the fire.

Where the borehole site needs to be evacuated other site personnel should be informed of the incident and the need to clear the borehole site. Where necessary, especially if boreholes are to be left to vent overnight, the borehole site should be fenced, with suitable warning signs posted, to

prevent unauthorised personnel accessing the area where they would be at risk.

The Site Manager/Engineer should inform the Coal Authority of any incident at the earliest practicable opportunity, using the Coal Authority's emergency call-out number **01623 646333**.

10.11 Reporting and Recording

The method and date of boring, water strikes, flush and prevailing strata found during boring operations will be recorded by the Drilling/Piling Supervisor in their company's record sheet. The subsequent method of backfilling should also be recorded in the borehole logs (see [Section 10.8](#))

The Drilling/Piling Supervisor or Site Engineer will monitor the gases from the hole and record the results. Additionally the atmospheric pressure and flow of gases at the borehole head should be noted.

The following gases are to be recorded; methane, carbon dioxide, oxygen and carbon monoxide. Where there is reason to suspect other gases these should also be determined e.g. hydrogen sulphide, ethane, propane and hydrogen. If a flammable gas monitor is used and detects gases and there is little or no methane found by the other method then hydrogen may be present. Minor gases generally require a sample to be submitted to an Analytical Laboratory for chromatographic analysis.

The person carrying out the monitoring should be suitably trained and familiar with the specific instrument being used and what procedures are to be carried out should gas concentrations increase to levels of concern. Modern instruments can have alarm values set to warn operatives of approaching concentrations of hazardous gas levels.

Significant incidents such as emissions of hazardous gases into property or spontaneous combustion should be reported to the Coal Authority at the earliest practicable opportunity, using the Coal Authority's emergency call-out number **01623 646333**. Furthermore such incidents along with gas monitoring results should be included within the validation/completion report which is required to be sent to the Coal Authority under the terms and conditions of a Permit. Site works are considered by the Coal Authority to be ongoing until a completion report is received.

Appendices

Appendix A - Case Studies

Case 1

Following reports of subsidence below a large pharmaceutical works in the north east of England the Coal Authority was called upon to investigate and subsequently carry out remedial stabilisation grouting under the occupied control building of the plant. As the building was clearly unstable it was decided that water flush drilling could not be used as this could worsen the underground conditions resulting in further damage to the structure. The works were undertaken as part of a CDM project and during the design stage and at pre start meetings the potential for mine gases within unrecorded workings had been considered along with possible unrecorded gas migration pathways. As well as monitoring for gases adjacent to the drill string the risk control measures called for the installation of a series of gas monitoring meters at strategic places within the control building along with emergency evacuation procedures should the alarms have sounded. Furthermore lone working procedures were established for certain areas of the building involving personal gas alarms and 2 way radios.

The work involved drilling down to 25 metres into unrecorded shallow coal mine workings which were thought to contain voids of up to 5m. A series of holes had been established around the perimeter of the building when carbon dioxide was recorded at 2% v/v blowing out of one of the last holes to be drilled. At this stage the drill string was pulled out and the gas was allowed to vent into the atmosphere discharging the pressurised void of gas (approximately 5 hours duration). None of the monitors in the buildings recorded any carbon dioxide and it decided that there was no reason to evacuate the buildings.

Carbon dioxide emissions at these levels could have had very serious consequences, especially within a confined space, however the risk assessment and control measures employed ensured that the works were undertaken safely and no one was injured.

Case 2

At 3 am a father of three was awakened by the noise of a carbon monoxide detector downstairs. He struggled for over half an hour to wake up his family who were in a very deep sleep like state. Although the detectors had been installed many years ago by a former owner of the property, this was the first time they had gone off.

Three days before this incident a drilling company had begun to work at a site which bordered the house. This was the preliminary phase of a house building project and they had been contracted by a developer to remediate the site, by drilling to locate the underground mine workings and then grout the voids.

The site was located over a coal seam which the Coal Authority had identified as a seam which had a high risk of spontaneous combustion. The drilling company had not consulted the Authority prior to the work commencing and thus did not have the appropriate amount of information on which to make an adequate assessment of the risks of drilling in this area. They were drilling using air flush and left several boreholes open in order to establish the gas levels rising from the holes. However, this only made the situation worse.

The following morning, HSE inspectors arrived on the site and suggested additional measures to be taken by the drilling contractor before the drilling could recommence. This included re-housing the family in a hotel, venting the house using fans and negative pressure units, creating a trench on the perimeter to trace the pathways and adopting a better testing regime for CO movement. This placed a huge additional cost upon the drilling company which could have been avoided by a desk study and

use of the Coal Authority's expertise of the location of high risk sites.

HSE hadn't encountered this problem before but has helped with this guidance which represents reasonably practicable precautions to address the issue. Whilst this guidance is not compulsory, assessing and controlling risk is, and those who fail to do so may expect formal enforcement action to be considered.

Case 3

A Drilling Contractor was commissioned to drill into coal measures strata to determine the engineering properties of the ground prior to the construction of a new building.

A desk study had been undertaken and being in coal mining area this included an assessment of the mining risk. The coal mining report had indicated that shallow coal was likely to be present below the site and further investigation had narrowed this down to a zone of between 10m to 20m below the surface. The properties closest to the site were about 50m from the nearest borehole and the seam which was anticipated was not known to be susceptible to spontaneous combustion. The risk of hazardous gases being present in the workings and the potential for pathways to be present was considered but was not able to be quantified and as such it was assumed that they could be present.

The Coal Authority's Permissions team had been contacted and the agreed methodology had been that the contractor would use air mist flush through the overburden into rock before changing to coring techniques employing air mist flush within the rock. After encountering rock the contractor would check for hazardous gases each time rods were added. The overburden was typically 0.9m of loose fill material over 6.8m of boulder clay, with a sandstone rockhead.

At 11.6m, within the sandstone a 0.3m deep void was encountered, the flush return was lost and drilling stopped. The borehole was checked for the presence of hazardous gases. Elevated concentrations of carbon dioxide, 9.9% v/v, and low levels of oxygen, 6.4% v/v were found.

The Lead Driller stopped drilling and informed the Site Engineer who contacted the organisations Contracts Manager for instruction. The Contracts Manager called a meeting with the Client, their Safety and Geotechnical Managers to discuss the situation.

It was considered that the likely source of the gas was from coal workings below through broken ground created by the collapsing of the workings.

As the gas encountered was at dangerous concentrations it was decided to carry out a gas spike survey adjacent to the residential premises nearby. No hazardous gases were detected. Coring was allowed to proceed but it was decided to utilise water flush, along with gas monitoring, to ensure that the gases could not be mobilised and displaced.

The first coal workings were encountered at 15.8m and the flush was stopped and gases within the borehole checked. Again elevated carbon dioxide, 3.3% v/v, was found with low levels of oxygen, 17.5% v/v. No other gases were detected.

Coring proceeded with gas monitoring each time a drill rod was added. A further set of coal workings were encountered at 20.6m and again a check for gases undertaken. No hazardous gases were detected.

Coring stopped at the required depth and a gas monitoring installation was inserted into the borehole with post site monitoring carried out by the Consultant Engineer for a period of 6 months, over differing barometric conditions.

Case 4

A series of drilling tests were carried out at the location of a planned opencast site where exploratory drilling operations had been ongoing. A line of six boreholes using air flush was drilled extending over a distance of 60m with the shortest separation of the holes 5m and the longest 20m. The seams in this location were prone to spontaneous combustion. The drilling encountered mining voids at different seam levels. The degree of voiding suggested that the mine workings were still substantially open rather than collapsed. Continuous monitoring on the second drilled hole during the drilling operations indicated peak levels of about 5% v/v carbon dioxide. However these peaks were also associated with peaks of carbon monoxide in excess of 30ppm and hydrogen in excess of 100ppm. Pressures at the drilled holes were monitored during drilling of the next hole when it contacted void or broken ground. Recorded pressures due to the air flush did not exceed 5Pa, which was of the same order as the pressures potentially induced by wind moving over the site. However, flows were detected at the drilled holes out to 60m where they reached a level indistinguishable from wind induced flow. Nevertheless, on drilling the final hole it was found that at the first three holes, at distances between 50m and 60m away, the carbon dioxide concentration rose from about 5% v/v to between 8.7% and 10%. This final result appears to indicate that another body of mine gas had been contacted and was being displaced into a location over 50m away.

Appendix B - Legislation, Standards and Industry Guidance

The following is some of the principal legislation applicable to drilling within coal and former mine workings at the time of publication. This list is by no means comprehensive and users of this guidance are advised to make themselves aware of all the current legislation which may be applicable to their particular work activity.

Acts

The Health & Safety at Work etc Act, 1974 (HSWA)

Applies to most work activities and places a variety of duties on employers, the self-employed, and employees. The Act lays down the general principles for managing health and safety for all work activities. It places a duty to ensure, so far as is reasonably practicable, the health, safety and welfare of those employed and others who may be affected by the work activity, including the general public. HSWA also places similar duties on those who own premises, to the extent of their control, to ensure that work taking place there is carried out safely.

Regulations

Construction, Design and Management Regulations 2007 (CDM)

CDM applies to all construction work. This is defined within the regulations and includes most of the work described in this guidance. It provides a description of persons involved in construction work and assigns specific duties to them. This includes client, principal contractor, designer and contractor. These duties are explored in greater detail in Section 4 of this document.

Management of Health and Safety at Work Regulations 1999 as amended (MHSWR)

Imposes a duty upon an employer to assess the entire health and safety operational arrangements of their organisation. The duty applies to most types of work activity and includes the following requirements:

- Assess the risk to health and safety of employees and other persons who could be affected by the work activity. Where there are more than five employees this should be written down.
- Implement measures shown by the risk assessment to be necessary to adequately manage these risks.
- Ensure that only trained persons carry out these activities.
- Set up emergency procedures for foreseeable risks.
- Supply employees with adequate information with regard to health and safety.

Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)

Dangerous substances can put people's safety at risk from fire and explosion. DSEAR puts duties on employers and the self-employed to protect people from risks to their safety from fires, explosions and similar events in the workplace. This includes members of the public who may be put at risk by work activity.

Dangerous substances are any substances used or present at work that could, if not properly controlled, cause harm to people as a result of a fire or explosion. They are especially relevant to the drilling industry as they include such things as flammable gases and explosible dusts.

What does DSEAR require?

Employers must:

- Find out what potentially explosible substances are in their workplace and what the level of risk is.
- Put control measures in place to either remove those risks or, where this is not possible, control them.
- Put controls in place to reduce the effects of any incidents involving dangerous substances.
- Prepare plans and procedures to deal with accidents, incidents and emergencies involving dangerous substances.
- Make sure employees are properly informed about and trained to control or deal with the risks from the dangerous substances.
- Identify and classify areas of the workplace where explosive atmospheres may occur and avoid ignition sources (from unprotected equipment, for example) in those areas.

The Building (Approved Inspectors etc.) Regulations 2010

The Building Regulations are made under powers provided in the Building Act 1984 and the majority of building projects are required to comply with them. They exist to ensure the health and safety of people in and around all types of buildings (i.e. domestic, commercial and industrial).

The Building Regulations contain various sections dealing with definitions, procedures, and what is expected in terms of the technical performance of building work and set out the 'requirements' with which the individual aspects of building design and construction must comply in the interests of health and safety.

Practical guidance on ways to comply with the functional requirements in the Building Regulations is contained in a series of Approved Documents. The document which will be of particular interest with regard to the drilling and piling industry is "Approved Document C - Site preparation and resistance to contaminants and moisture".

For the purposes of this document gases associated with coal mining are classed as contaminants.

From 31 December 2011 the power to make Building Regulations for Wales has been transferred to Welsh Ministers. The Building Regulations 2010 and related guidance, including Approved Documents as at that date will continue to apply in Wales until Welsh Ministers make changes to them.

More information is available on the following web site:

<http://www.communities.gov.uk/planningandbuilding/buildingregulations/brlegislation/>

The Building (Scotland) Amendment Regulations 2010

The Building Regulations are made under powers provided in the Building (Scotland) Act 2003 and came into force on October 1, 2010. This has resulted in changes to mandatory standards and associated guidance, and the publication of new documents.

More information is available on the following web site:

<http://www.legislation.gov.uk/ssi/2010/32/contents/made>

Confined Spaces Regulations 1997

A confined space is a place which is substantially enclosed (though not always entirely), and where serious injury can occur from hazardous substances or conditions within the space or nearby.

Employers must carry out a suitable and sufficient risk assessment for all work to be undertaken and put in place appropriate control measures to ensure safety.

It should be noted that whilst some risks may be a feature of the confined space itself, others, as could be the case for drilling, may be caused by particular work activities carried out there.

For example, if gases were to emanate from unworked coal or mine workings whilst drilling in or near a substantially enclosed space there would be a serious risk of asphyxiation or explosion and as such the area should be defined as a confined space.

The Control of Substances Hazardous to Health Regulations 2002 as amended (COSHH)

Provide a framework for the control of substances at work that may be hazardous to health, for example, substances that are toxic, cause irritation or are corrosive. Organisations must make an assessment of the risks from the hazardous substance and decide on control measures to prevent harmful exposure. A hierarchy of control is established: elimination; substitution; reduction; control.

Provision and use of Work Equipment Regulations 1998 as amended (PUWER)

These regulations place a duty on employers to ensure that they:

- Select the right equipment to perform the task.
- Ensure this equipment is inherently safe to use, in good working order and inspected and maintained in line with manufacturers recommendations.
- Ensure that equipment is operated by persons trained in its use and familiar with its specific control systems.
- Prevent access to dangerous moving parts of machinery.

The Lifting Operations and Lifting Equipment Regulations 1998 as amended (LOLER)

The Regulations require that lifting equipment provided for use at work is:

- Strong and stable enough for the particular use and marked to indicate safe working loads.
- Positioned and installed to minimise any risks.
- Used safely, i.e. the work is planned, organised and performed by competent people.
- Subject to ongoing thorough examination and, where appropriate, inspection by competent people.

What equipment is covered by the Regulations?

Lifting equipment includes any equipment used at work for lifting or lowering loads, including attachments used for anchoring, fixing or supporting it. The Regulations cover a wide range of equipment including cranes, fork-lift trucks, lifts, hoists, mobile elevating work platforms, and drill rigs. The definition also includes lifting accessories such as chains, slings, eyebolts etc.

If you allow employees to provide their own lifting equipment, then this too is covered by the Regulations.

British Standards

The following are some British Standards which may be useful for both background reading on related activities and for further information on some of the issues raised in this guidance. This list is by no means comprehensive and users of this guidance are encouraged to make themselves aware of all Standards which may be applicable to their particular work activity.

BS EN 791:1996 + AMD2: 2008 - Drill rigs. Safety (currently under review and will be superseded by

BS EN 16228: Drilling and foundation equipment - Safety)

BS 8485:2007 Code of practice for the characterisation and remediation from ground gas in affected developments. (currently under review)

BS EN 1127-1:2007 - Explosive atmospheres. Explosion prevention and protection. Basic concepts and methodology.

BS EN 1997-1:2007 - Eurocode 7 Geotechnical design. General Rules.

BS EN 1997-2:2007 - Eurocode 7. Geotechnical design. Ground investigation and testing.

BS 5930:1999+A2:2010 - Code of practice for site investigations. (currently under review)

BS EN 1127-2:2002+A1:2008 - Explosive atmospheres. Explosion prevention and protection. Basic concepts and methodology for mining.

BS EN 1536:2010 - Execution of special geotechnical work: Bored piles.

BS 10175:2011 - Investigation of potentially contaminated sites. Code of practice.

BS EN 12699:2001 - Execution of special geotechnical work: Displacement piles.

BS EN 14199:2005 - Execution of special geotechnical work: Micropiles.

BS EN ISO 22475-1:2006 - Geotechnical investigation and testing. Sampling methods and groundwater measurements. Technical principles for execution.

BS EN 50104:2002 - Electrical apparatus for the detection and measurement of oxygen. Performance requirements and test methods.

BS EN 60079-29-2:2007 - Explosive atmospheres. Gas detectors. Selection, installation, use and maintenance of detectors for flammable gases and oxygen.

BS EN 61779-1:2000 - Electrical apparatus for the detection and measurement of flammable gases. General requirements and test methods.

BS EN 61779-2:2000 - Electrical apparatus for the detection and measurement of flammable gases. Performance requirements for group I apparatus indicating a volume fraction up to 5% methane in the air.

BS EN 61779-3:2000 - Electrical apparatus for the detection and measurement of flammable gases. Performance requirements for group I apparatus indicating a volume fraction up to 100% methane in air.

BS EN 61779-4:2000 - Electrical apparatus for the detection and measurement of flammable gases. Performance requirements for group II apparatus indicating a volume fraction up to 100% lower explosive limit.

BS EN 61779-5:2000 - Electrical apparatus for the detection and measurement of flammable gases. Performance requirements for group II apparatus indicating a volume fraction up to 100% gas.

Industry Guidance

The following are published by various industry bodies and may be useful for both background reading on related activities and for further information on some of the issues raised in this guidance. This list is by no means comprehensive and users of this guidance are encouraged to make themselves aware of all industry guidance which may be applicable to their particular work activity.

AGS : 2006 : A Client's Guide to Desk Studies. Association of Geotechnical and Geoenvironmental Specialists.

BDA : 2000 : Guidance Notes for the Protection of Persons from Rotating Parts and Ejected or Falling Material Involved in the Drilling Process. British Drilling Association.

BDA: 2002 : Health and Safety Manual for Land Drilling – A Code of Safe Drilling Practice. British Drilling Association.

BDA : 2005 : Guidance for the Safe Operation of Cable Percussion Rigs and Equipment. British Drilling Association.

BDA : 2007 : Guidance for the Safe Operation of Dynamic Sampling Rigs and Equipment. British Drilling Association.

BDA : 2008 : Guidance for Safe Intrusive Activities on Contaminated or Potentially Contaminated Land. British Drilling Association.

BRE : 1990 : Site Investigation for Low Rise Building: Desk Studies. Digest 318. Building Research Establishment.

BRE : 2003 : Building on Brownfield Sites: Identifying Hazards. Digest GBG 59 Part 1. Building Research Establishment.

BRE : 2003 : Building on Brownfield Sites: Reducing the Risks. Digest GBG 59 Part 2. Building Research Establishment.

CIRIA : 1995 : Contaminated Land Risk Assessment – A Guide to Good Practice. Special Publication 103. Construction Industry Research and Information Association.

CIRIA : 1996 : A Guidance for Safe Working on Contaminated Sites. Report 132. Construction Industry Research and Information Association. ISBN 0 86017 451 4.

CIRIA : 1999 : Environmental Issues in Construction – A Desk Study. Project Report 73. Construction Industry Research and Information Association.

CIRIA : 2007 : C665 - Assessing risks posed by hazardous ground gases to buildings (revised) Construction Industry Research and Information Association.

CIRIA : 2010 : C692 - Environmental good practice on site (third edition). Construction Industry Research and Information Association.

EA : 2002 : Piling into Contaminated Sites. Environment Agency.

ESA : 2005 : ICoP 1, DSEAR for the Waste Management Industry. Industry Code of Practice. Environmental Services Association.

ESA : 2007 : ICoP 4, Drilling into Landfill Waste. Industry Code of Practice. Environmental Services Association.

FPS: 2010 : Notes for Guidance on POWER (Regulations 11 & 12) in Relation to Guarding and Cleaning of Augers on Piling Operations.

GSHPA: 2011 : Closed Loop Vertical Borehole Design, Installation & Materials Standards. Ground Source Heat Pump Association.

HSE : 1981 : The Health & Safety (First-Aid) Regulations. Approved Code of Practice and Guidance, L74. Health & Safety Executive. ISBN 0 7176 1050 0.

HSE : 1991 : HSG 66 Protection of Workers and the General Public During the Development of Contaminated Land. Health & Safety Executive. ISBN 0 11 885657 X.

HSE : 1993 : Health Surveillance under COSHH. Guidance for Employers. Health & Safety Executive. ISBN 0 7176 0491 8.

HSE: 1997 : Safe Work in Confined Spaces. Approved Code of Practice, Regulations and Guidance: Health & Safety Executive. ISBN 0 1106 4643 6.

HSE : 1998 : L22 Safe Use of Work Equipment. The Provision and Use of Work Equipment Regulations. Approved Code of Practice and Guidance. Health & Safety Executive. ISBN 0 7176 1626 6.

HSE : 1998 : L113 Safe Use of Lifting Equipment. The Lifting Operations and Lifting Equipment Regulations. Approved Code of practice and guidance. Health & Safety Executive. ISBN 0 7176 1628 2.

HSE : 1998 : HSG 53 The Selection, Use and Maintenance of Respiratory Protective Equipment. A

Practical Guide. Health & Safety Executive. ISBN 0 7176 1537 5.

HSE : 1999 : HSG 61 Health Surveillance at Work (revised). Health & Safety Executive. ISBN 0 7176 1705 X.

HSE : 2005 : EH 40 - Occupational Exposure Limits: Health & Safety Executive.

HSE : 2007 : Managing Health and Safety in Construction: Construction (Design and Management) Regulations. Approved code of practice and guidance. Health and Safety Executive.

NHBC: 2007 : Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present. National House Building Council.

NHBC/Environment Agency/CIEH: 2008 : R & D 66 : Guidance for the Safe Development of Housing on Land Affected by Contamination.

SISG : 1993 : Guidelines for the Safe Drilling of Landfills and Contaminated Land. Institution of Civil Engineers, Site Investigation Steering Group – Thomas Telford.

SISG: 2011 : UK Specification for Ground Investigation. Second Edition. Institution of Civil Engineers, Site Investigation Steering Group – ICE Publishing.

Appendix C - Regulatory Agencies and Trade Bodies

Health & Safety Executive (HSE)

The Health and Safety at Work etc Act 1974 established the enduring principle that those who create risk are best placed to manage it. The Act led to the formation of the Executive (HSE). HSE is responsible for regulation of health and safety within specific industries, these include factories, construction sites, agriculture, mining, nuclear sites and chemical industries. HSE provides strategic direction for health and safety. It does this by inspection, investigation and enforcement, and other key activities including research, creating regulations and codes of practice, alerting duty holders to new and emerging risks and providing information and advice.

The Coal Authority (CA)

The Coal Authority is a Non-Departmental Public Body sponsored by the Department of Energy and Climate Change and established by the Coal Industry Act 1994. Its duties include the holding and managing of the rights and interests in unworked coal and former mines of coal, licensing of coal mining operations, the provision of coal mining information and certain functions in respect to coal mining subsidence.

Environment Agency (EA)

The Environment Agency is an Executive Non-Departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs and an Assembly Sponsored Public Body responsible to the National Assembly for Wales.

Its principal aims are to protect and improve the environment, and to promote sustainable development. It plays a central role in delivering the environmental priorities of central government and the Welsh Assembly Government through its functions and roles.

Scottish Environmental Protection Agency (SEPA)

The Scottish Environmental Protection Agency is a Non-Departmental Public Body, accountable through Scottish Ministers to the Scottish Parliament. Its main role is to protect and improve the environment by regulating activities that can cause harmful pollution and by monitoring the quality of Scotland's air, land and water. The regulations it enforces also cover the keeping, use and the accumulation and disposal of radioactive substances.

Local Government

Local government is the collective term for local councils, sometimes referred to as local authorities. Local authorities work within the powers laid down under various acts of parliament. Their functions are far-reaching. Some functions are mandatory, others are discretionary.

Councils can either provide services directly to the public or arrange for others to do so e.g. approved inspectors in the case of Building Regulations. The local authority has a general duty to enforce the Building Regulations in its area and will seek to do so by informal means wherever possible. This duty extends to and forms a part of its function when it is carrying out the Building Control Service. Local authorities have enforcement powers to require you to alter work, which does not comply with Building Regulations, if they consider it necessary.

The British Drilling Association (BDA)

The British Drilling Association (BDA) was founded in 1976 and is the trade association for those associated with ground drilling activities. Comprising some 115 company members, it includes contractors, manufacturers and suppliers amongst others.

The range of member activity incorporates ground investigation, geotechnical processes & ground stabilisation (grouting, anchoring etc.), waterwell, mineral exploration, geothermal, landfill and other ground drilling. The BDA's mission statement is "Committed to Excellence in Health & Safety, Quality of Workmanship and Technical Standards for the Benefit of the Drilling Industry and its Clients".

The Association of Geotechnical & Geoenvironmental Specialists (AGS)

The Association of Geotechnical & Geoenvironmental Specialists (AGS) is a trade association established to improve the profile and quality of geotechnical and geoenvironmental engineering. The membership comprises organisations and individuals having a common interest in site investigation, geotechnics, geoenvironmental engineering, engineering geology, geochemistry, hydrogeology and other related disciplines.

The Federation of Piling Specialists (FPS)

The Federation of Piling Specialists (FPS) represents piling and foundation contractors. FPS's principal objectives are to maintain and improve standards and seek technical excellence in all of members' activities in carrying out piling, embedded walling and other specialist foundation techniques. All Members are audited by an independent auditor on a regular basis to ensure that high standards are maintained in technical ability, quality management, safety, training and environmental practice.

Ground Source Heat Pump Association (GSHPA)

The Ground Source Heat Pump Association (GSHPA) is a trade association which encourages the growth and development of the ground source heat pump industry by promoting the efficient and sustainable use of ground source heat pumps; raising awareness of the benefits of ground source heat pumps; developing ground source installation standards, and encouraging high standards of training for the industry.

Appendix D - Useful Contacts & Addresses

The Coal Authority

- **web:** <http://coal.decc.gov.uk/>
- **e-mail:** thecoalauthority@coal.gov.uk
- **mail:** 200, Lichfield Lane, Mansfield, Notts. NG18 4RG
- **tel:** Permissions: 01623 637 339
Mining Reports: 0845 762 6848
Mining Records: 01623 637 235
Surface Hazards Emergency: 01623 646 333
- **fax:** 01623 620 363

Health and Safety Executive (HSE)

- **web:** www.hse.gov.uk

British Drilling Association (BDA)

- **web:** www.britishdrillingassociation.co.uk
- **e-mail:** Office@britishdrillingassociation.co.uk
- **mail:** Wayside, London End, Upper Boddington, Daventry, Northamptonshire, NN11 6DP
- **tel:** 01327 264622
- **fax:** 01327 264623

Association of Geotechnical & Geoenvironmental Specialists (AGS)

- **web:** www.ags.org.uk
- **e-mail:** ags@ags.org.uk
- **mail:** Forum Court, 83 Copers Cope Road, Beckenham, Kent. BR3 1NR
- **tel:** 020 8658 8212
- **fax:** 020 8663 0949

Federation of Piling Specialists (FPS)

- **web:** www.fps.org.uk
- **e-mail:** fps@fps.org.uk
- **mail:** Forum Court, 83 Copers Cope Road, Beckenham, Kent. BR3 1NR
- **tel:** 020 8663 0947
- **fax:** 020 8663 0949

COAL SEAMS WITH A HISTORY OF SPONTANEOUS COMBUSTION.

The following tables presents a list of coal seams which have been known to suffer from occurrences of spontaneous combustion and are consequently regarded as at 'high risk' of succumbing to spontaneous combustion when being entered, worked or disturbed.

Coal seams which are excluded from the table should not be regarded as free from risk of spontaneous combustion as the majority of coal seams could suffer from spontaneous combustion depending upon the method of them being entered, worked or disturbed.

Please be aware that some areas may have localised names for these seams.

Coal Seams in England with a History of Spontaneous Combustion

Seam Location:	Coal Seam:
Cannock	Bass Eight Foot Shallow
Cumberland	Where roof coal is left
>Durham (South)	Maudlin Seam
Lancashire	Where roof coal is left Higher Florida Lower Florida Trencherbone
Leicestershire	Lount Seam Excelsior New Main
Derbyshire (North)	Deep Soft Top Hard
Derbyshire (South)	Main Coal
Northumberland	High Main Main
Nottinghamshire	Blackshale Top Hard Top Soft Parkgate Low Main
Staffordshire (North)	Great Row Spencroft Cannel Row Moss Cockshead Ten Feet
Staffordshire (South)	Staffordshire thick coal
Warwickshire	Warwickshire thick coal

**Coal Seams in England with a History
of Spontaneous Combustion**

Seam Location: Coal Seam:

Yorkshire

Barnsley
Top Soft
Day Bed
Dunsil
Beeston
Stanley Main
Shafton
High Hazel
Thorncliffe
Parkgate
Silkstone

Coal Seams in Scotland with a History of Spontaneous Combustion

Seam Location: Coal Seam:

Ayrshire

Big Drum Seam
Coral Seam
Gas Water
Main Coal
Major seam
Patna
Seven Foot Coal
Thick
Wee Drum

Scotland (North)

Dysart Main

Scotland (South)

Stairhead
Corbie
The Kelty Main (Kinrod)
Free Craighead (Quarrelton Thick Coal)

Coal Seams in Wales with a History of Spontaneous Combustion

Seam Location: Coal Seam:

North Wales

Where roof coal is left

COAL SEAMS WITH HIGH RISK SPONTANEOUS COMBUSTION BASED ON CROSS OVER TEMPERATURE VALUES

The following table presents a list of coal seams which laboratory tests indicated were at high or medium risk of spontaneous combustion. The designation of high or moderate risk is based wholly on cross-over temperature (COT) tests*.

It must be emphasised that, unlike the list of seams prone to spontaneous combustion based on mining history (above), this list is largely based on small samples from seams. Where there are multiple samples the number is shown in brackets following the risk level. This second list should therefore be treated as having less weight than the first list, although still having a significant value.

Coal seams which are excluded from the table should not be regarded as free from risk of spontaneous combustion as the majority of coal seams could suffer from spontaneous combustion depending upon the method of them being entered, worked or disturbed.

Coal Seams in England with a High Risk of Spontaneous Combustion Based on Cross Over Temperature Values

Seam Location:	Coal Seam:	Spontaneous Combustion Risk:
South Yorkshire	Two Foot	High
	Best	High
	Clod	High (3)
	Little Flint	High/Medium (3)
	Lower Clunch	High (2)
	Lower New Mine	High/Medium (2)
	Randle	High (2)
	Two Foot (Residual Coal)	High (2)
	Upper Clunch	High (3)

* COT tests gradually heat coal in the presence of air until the temperature becomes self sustaining and the lower temperature that this occurs, the greater the risk of spontaneous combustion. Coal samples with COT's of below 170°C are designated high risk and those up to 200°C medium risk.



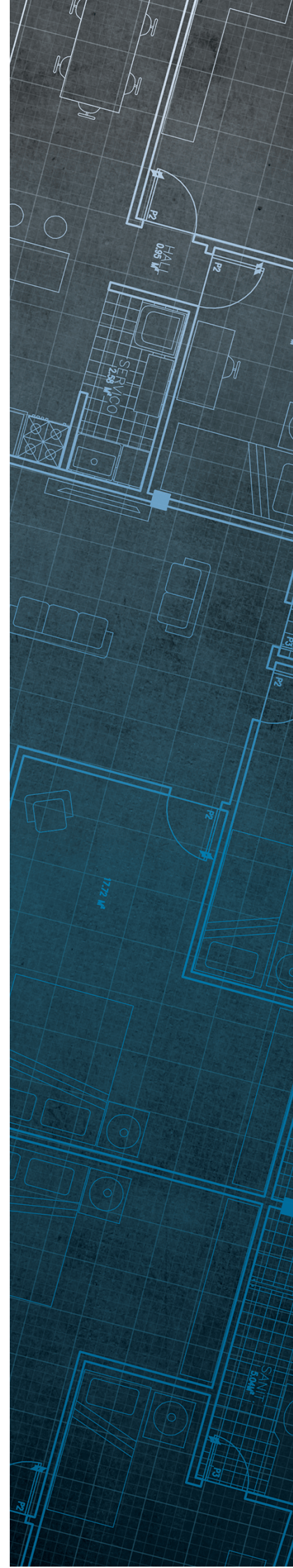
The Coal
Authority

Consultants Coal Mining Report

Dyson Refractories
Occupation Lane
Woodville
Swadlincote
Derbyshire
DE11 8EX

Date of enquiry:	20 March 2018
Date enquiry received:	20 March 2018
Issue date:	20 March 2018

Our reference:	51001809784001
Your reference:	B067895.100



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Curtins

Enquiry address

Dyson Refractories
Occupation Lane
Woodville
Swadlincote
Derbyshire
DE11 8EX

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

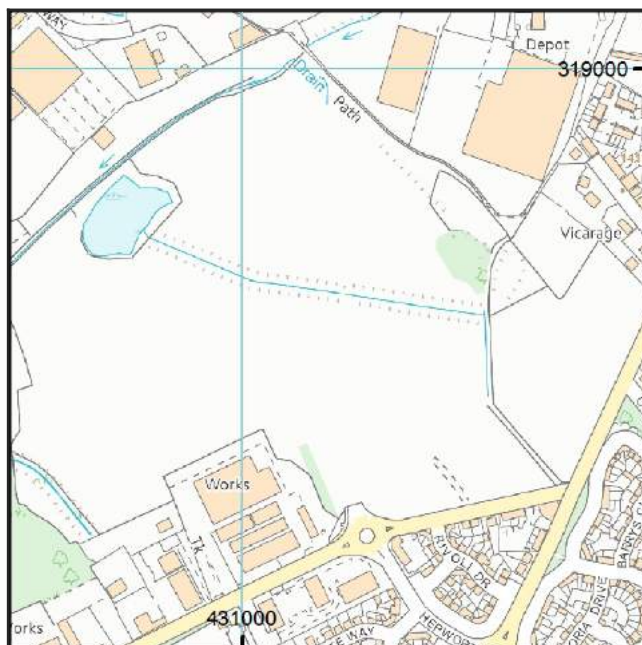
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
POOLWORKS	FIRECLAY	Fireclay	4RVH	11	Beneath Property	3.8	West	167	1872
NEWFIELD / LITTLEWORTH	FIRECLAY	Fireclay	4RVM	16	South-East	4.6	South-East	160	1860
GRANVILLE	UPPER KILBURN	Coal	4NF4	60	Beneath Property	6.6	South-West	113	1930
GRANVILLE	UPPER KILBURN	Coal	4NXE	71	North	5.0	South-West	113	1930
GRANVILLE	BLOCK	Coal	4NF9	73	Beneath Property	7.2	West	122	1950
GRANVILLE	YARD	Coal	4NFB	91	Beneath Property	6.5	West	80	1935
GRANVILLE	YARD	Coal	4NXL	97	Beneath Property	5.3	West	80	1934
GRANVILLE	BLOCK	Coal	4NXF	98	Beneath Property	8.0	West	122	1947
GRANVILLE	UPPER KILBURN	Coal	4NF3	108	Beneath Property	8.5	West	113	1945
GRANVILLE	YARD	Coal	4NFC	116	Beneath Property	6.9	South-West	80	1932
GRANVILLE	BLOCK	Coal	4NF8	134	Beneath Property	4.8	South-West	122	1947
GRANVILLE	LITTLE KILBURN	Coal	4NFM	161	Beneath Property	9.2	West	91	1951
GRANVILLE	LITTLE	Coal	4NFI	165	Beneath Property	11.3	South-West	137	1844
GRANVILLE	LITTLE	Coal	4NFH	179	Beneath Property	10.7	West	137	1847
GRANVILLE	LITTLE	Coal	4NXP	181	North-West	2.4	West	137	1859
GRANVILLE	LITTLE KILBURN	Coal	4NXV	190	North	2.3	West	85	1920
GRANVILLE	MAIN COAL	Coal	4NFV	192	Beneath Property	10.8	West	183	1866
GRANVILLE	LITTLE KILBURN	Coal	4NFN	200	North	14.2	South	85	1918
GRANVILLE	LITTLE	Coal	4NFJ	201	Beneath Property	2.0	South-West	137	1914
GRANVILLE	MAIN COAL	Coal	4NFW	209	Beneath Property	7.8	South-West	183	1866
GRANVILLE	LITTLE KILBURN	Coal	4NFP	224	West	1.3	West	85	1953
GRANVILLE	MAIN COAL	Coal	4NY6	225	Beneath Property	3.4	West	183	1897

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
GRANVILLE	MAIN COAL	Coal	4NY5	230	North-West	3.4	West	183	1897
GRANVILLE	STOCKINGS	Coal	4NGH	241	Beneath Property	11.4	South-West	150	1946
GRANVILLE	WOODFIEL D	Coal	4NG4	249	Beneath Property	9.3	West	135	1909
GRANVILLE	MAIN COAL	Coal	4NFY	264	West	1.8	South-West	183	1860
GRANVILLE	EUREKA	Coal	4NGT	265	Beneath Property	11.3	West	120	1901
GRANVILLE	MAIN COAL	Coal	4NG1	266	West	1.9	South-West	183	1878
GRANVILLE	WOODFIEL D	Coal	4NYG	267	Beneath Property	7.1	South-West	135	1931
GRANVILLE	WOODFIEL D	Coal	4NG5	274	Beneath Property	8.4	South-West	135	1931
GRANVILLE	MAIN COAL	Coal	4NFU	276	Beneath Property	4.1	West	183	1874
GRANVILLE	STOCKINGS	Coal	4NYO	284	Beneath Property	4.8	South-West	150	1946
GRANVILLE	EUREKA	Coal	4NYT	296	Beneath Property	13.7	West	120	1901
GRANVILLE	STANHOPE	Coal	4NGZ	306	Beneath Property	6.3	South-West	90	1913
GRANVILLE	EUREKA	Coal	4NYU	312	North-West	4.3	South-West	120	1910
GRANVILLE	WOODFIEL D	Coal	4NG6	318	North-West	1.1	South-West	135	1931
GRANVILLE	EUREKA	Coal	4NGV	320	North-West	9.1	South-West	120	1910
GRANVILLE	WOODFIEL D	Coal	4NG9	323	South-East	4.0	West	135	1916
GRANVILLE	STOCKINGS	Coal	4NGJ	324	South-West	1.8	South-West	150	1919
GRANVILLE	STOCKINGS	Coal	4NGL	326	West	1.8	West	150	1920
GRANVILLE	EUREKA	Coal	4NYV	329	North-West	4.3	South-West	120	1910
GRANVILLE	STANHOPE	Coal	4NZ4	330	Beneath Property	8.3	South	90	1912
GRANVILLE	WOODFIEL D	Coal	4NG3	332	Beneath Property	3.9	West	135	1906
GRANVILLE	EUREKA	Coal	4NGW	346	West	1.7	West	120	1890
GRANVILLE	STOCKINGS	Coal	4NGG	354	Beneath Property	3.9	West	150	1946
GRANVILLE	EUREKA	Coal	4NGS	354	Beneath Property	4.0	West	120	1899
GRANVILLE	EUREKA	Coal	4NGU	358	Beneath Property	11.4	West	120	1901
GRANVILLE	STANHOPE	Coal	4NMO	359	North-West	6.3	South-West	90	1945

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
GRANVILLE	KILBURN	Coal	4NZF	396	North	6.3	South-West	137	1900
GRANVILLE	KILBURN	Coal	4NZD	401	North-West	7.0	South-West	137	1917
GRANVILLE	KILBURN	Coal	4NH5	402	North-West	6.3	South-West	137	1907
GRANVILLE	KILBURN	Coal	4NZG	414	North-West	6.3	South-West	137	1907
GRANVILLE	KILBURN	Coal	4NH3	440	South-West	2.0	North-West	137	1948
GRANVILLE	KILBURN	Coal	4NH4	441	West	1.3	West	137	1946

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	430318-001	430746 318594	this shaft may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-041	430733 318449	may have been partially or totally removed by previous opencast mining operations	Fireclay	
Adit	430318-048	430671 318635	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-049	430687 318636	may have been partially or totally removed by previous opencast mining operations	Fireclay	
Shaft	430318-050	430694 318649	may have been partially or totally removed by previous opencast mining operations	Fireclay	
Shaft	430318-051	430714 318650	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-052	430747 318731		Fireclay	
Shaft	430318-053	430759 318693		Fireclay	
Shaft	430318-054	430745 318556	may have been partially or totally removed by previous opencast mining operations	Fireclay	
Shaft	430318-055	430769 318509	may have been partially or totally removed by previous opencast mining operations	Fireclay	
Shaft	430318-056	430799 318488	may have been partially or totally removed by previous opencast mining operations	Fireclay	
Shaft	430318-057	430869 318699	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-058	430858 318447		Fireclay	
Shaft	430318-059	430908 318475		Fireclay	
Shaft	430318-060	430892 318441		Fireclay	
Shaft	430318-061	430894 318413		Fireclay	
Shaft	430318-062	430995 318432		Fireclay	
Shaft	430318-063	430681 318529	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-070	430794 318629	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-071	430829 318749	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-072	430851 318762	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-073	430868 318744	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-077	430911 318868	this shaft may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-079	430749 318651	may have been partially or totally removed by previous opencast mining operations	Coal	
Shaft	430318-089	430760 318579	may have been partially or totally removed by previous opencast mining operations	Fireclay	

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	431318-019	431530 318729		Coal	
Shaft	431318-030	431030 318367		Fireclay	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

11973	2788	EM60
14208	13663	14273
OM15190	OM1820	17772

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

Distance to site investigation (m)	Direction
0.4	North

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

There are 1 claim(s) within 50 metres of the property boundary that do not match the property address. These are shown on the enquiry boundary plot.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

If further subsidence damage claims information is required, please visit www.groundstability.com.

See Section 4 for further information.

Mine gas

Distance to gas incident/remediation (m)	Direction
227.8	North-West
338.7	North-West

See Section 4 for further information.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

Coal mining subsidence

The site is within an area of previous interest. It is close to where the Coal Authority or licensed mine operator has investigated and where necessary remediated issues relating to coal mining subsidence.

The site requires further investigation and may influence your risk assessment. We recommend that you order the appropriate **Coal Authority Subsidence Claims Report**, which will include more information about the hazard.

Mine gas remedial works

The site is within an area of previous interest. It is close to where the Coal Authority has investigated and subsequently remediated the effects of mine or ground gas emissions following specific reported hazards.

The site requires further investigation and may influence your risk assessment. We recommend that you order the **Coal Authority Mine Gas Emission Report**, which will include more information about the hazard.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

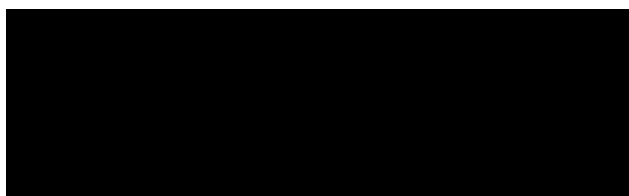
Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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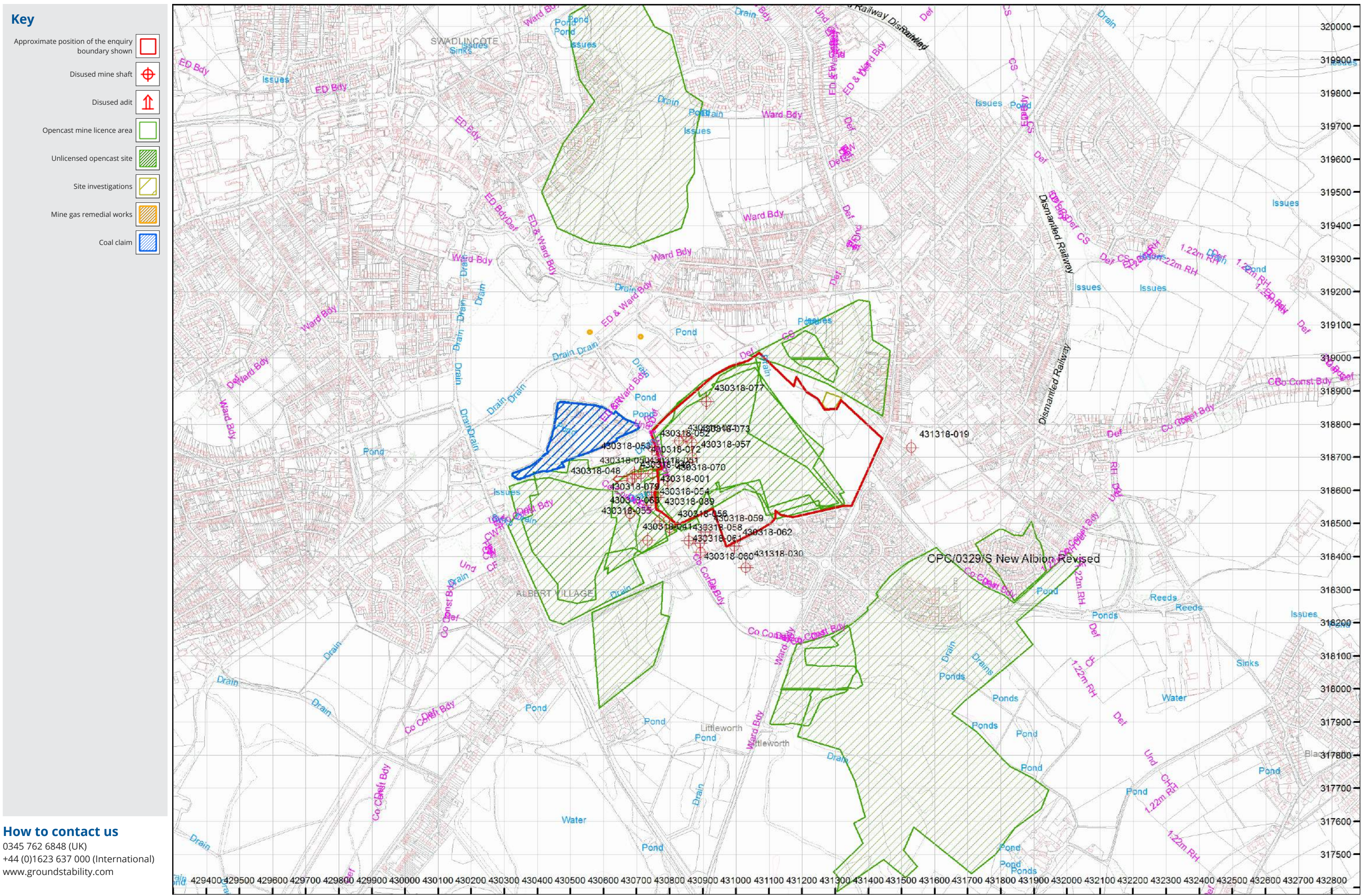
VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	20 March 2018
Issued to	CURTINS ADMIRAL HOUSE 78 EAST STREET LEEDS LS9 8EE
Property search for	DYSON REFRACTORIES OCCUPATION LANE WOODVILLE SWADLINCOTE DERBYSHIRE DE11 8EX
Reference number	51001809784001
Date of issue	20 March 2018



VAT registration	598 5850 68
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The map highlights any specific surface or subsurface features within or near to the boundary of the site.



**The Coal Authority
Mining Records Office
Search Results**

Search Criteria:

OS Easting: 431055 **OS Northing:** 318760

Radius: 500 metres

Colliery Selection:

All collieries were selected

Seam Selection:

All seams were selected

Working Types Selection:

Underground

Opencast

Dirt Tip

Other Minerals

Total number of entries found: 106

Search Results:

Cat_No	Colliery	Seam	Date Abandoned
10043	GRANVILLE NO1&2 GRANVILLE OLD	LITTLE OR FIVE FEET	5/3/1930
10043	GRANVILLE NOS. 1 & 2, GRANVILLE OLD	LITTLE OR FIVE FEET	5/3/1930
10787	GRANVILLE NO1&2	BLOCK OR JACK DENNIS	30/6/1932
10788	GRANVILLE NOS 1 & 2, GRANVILLE OLD	NETHER OR MAIN	5/1932
10788	GRANVILLE NOS 1 & 2, GRANVILLE OLD	OVER COAL IN MAIN	5/1932
10788	GRANVILLE NO1&2 GRANVILLE OLD	NETHER OR MAIN	5/1932
10788	GRANVILLE NO1&2 GRANVILLE OLD	OVER COAL IN MAIN	5/1932
11973	GRANVILLE, OLD GRANVILLE	YARD	16/6/1944
11973	GRANVILLE, OLD GRANVILLE	WOODFIELD	31/3/1933
11973	GRANVILLE, OLD GRANVILLE	EUREKA	31/12/1936
11973	GRANVILLE, OLD GRANVILLE	WOODFIELD	31/5/1933
11973	GRANVILLE, OLD GRANVILLE	CANNEL	31/12/1936
11977	CARTWRIGHT (ALLIANCE)	WOODFIELD	1890
13663	POOL NO1	POSSIBLY ELL	24/12/1943
13663	POOL NO.1	POSSIBLY ELL	24/12/1943
14101	RAWDON	MAIN	28/9/1920

14102	CHURCH GRESLEY	MAIN	3/1935
14208	GRANVILLE NO.3	FOUR FEET OR DICKIE GOBBLER	25/7/1965
14208	GRANVILLE NO3	FOUR FOOT OR DICKIE GOBBLER	25/7/1945
14208	GRANVILLE NO.3	FOUR FEET OR DICKIE GOBBLER	25/7/1945
14208	GRANVILLE NO 3	FOUR FOOT OR DICKIE GOBBLER	27/7/1945
14271	GRANVILLE	LITTLE WOODFIELD OR TOAD	3/1937
14272	GRANVILLE	STANHOPE	1/1945
14273	GRANVILLE	STOCKINGS OR TWO YARD	1/1946
1494	POOL WORKS	BOURNES PROBABLY IN ELL	1883
16175	HEPWORTH (OPENC.AST)	P25	4/1992
16175	HEPWORTH (OPENC.AST)	P21R	4/1992
16175	HEPWORTH (OPENCAST)	P27	4/1992
16175	HEPWORTH (OPENC.AST)	P22	4/1992
16175	HEPWORTH (OPENCAST)	P21	4/1992
16175	HEPWORTH (OPENCAST)	P18	4/1992
16175	HEPWORTH (OPENC.AST)	P19	4/1992
16175	HEPWORTH (OPENCAST)	P26	4/1992
16175	HEPWORTH (OPENCAST)	P17	4/1992
16175	HEPWORTH (OPENC.AST)	P23	4/1992
16175	HEPWORTH (OPENCAST)	P20	4/1992
16175	HEPWORTH (OPENCAST)	P24	4/1992
16175	HEPWORTH (OPENC.AST)	P28P	4/1992
16175	HEPWORTH (OPENCAST)	P19B	4/1992
16175	HEPWORTH (OPENCAST)	P28	4/1992
16175	HEPWORTH (OPENCAST)	P29	4/1992
16244	BLACKFORDBY	ELL	1873
16714	HILLSIDE QUARRY OPENCAST	POTTERY CLAY SERIES P.31? TO P41	
17337	ASHBY WOULD'S		
	FIRECLAY	1900	
17578	ALBION WORKS & EXTENSION OPENCAST	P.34	
17578	ALBION WORKS & EXTENSION OPENCAST	P27/28	
17594	SWADLINCOTE	FIVE FEET (LITTLE)	1861
17594	SWADLINCOTE	DEEP (MAIN)	1861
17594	SWADLINCOTE	UNNAMED	1861
17594	SWADLINCOTE	SHAFTS ONLY	1861
17721	POOL WORKS & EXTENSION OPENCAST	POTTERY COAL SERIES	1974
17770	MILK HILL & EXTENSION OPENCAST	POTTERY COAL SERIES (PROBABLY P32 - P39)	1978
17772	BOUNDARY OPENCAST	POTTERY COAL SERIES (PROBABLY P26 - P39)	1977
2319	GRANVILLE	WOODFIELD	3/5/1889
2788	GRANVILLE	STANHOPE	29/9/1892

3045	GRANVILLE	STOCKINGS	25/3/1891
3086	POTSHERDS	ELL	10/1877
3086	POTSHERDS	REFERREE	10/1877
3586A	CARTWRIGHT	EUREKA	28/3/1901
3586A	CARTWRIGHT	STANHOPE	11/1900
3640	GRANVILLE NO1	MAIN	2/1897
3640	GRANVILLE NO 1	MAIN	2/1897
3640	GRANVILLE NO.1	MAIN	2/1897
6393	GRANVILLE NO1	LITTLE	8/3/1915
6393	GRANVILLE NO.1	LITTLE	8/3/1915
6393	GRANVILLE NO 1	LITTLE	8/3/1915
9445	GRANVILLE NO1&2	MAIN OR OVER	30/4/1926
9457	CLAY PITS DRIFT NO 2 HILLSIDE	UNNAMED BELIEVED IN ELL SERIES	5/5/1928
9833	GRANVILLE	STANHOPE	21/7/1928
EM1249	RAWDON	WOODFIELD	15/7/1985
EM1251	RAWDON	UPPER KILBURN	2/4/1986
EM1285	RAWDON	STOCKING	19/3/1986
EM1285	RAWDON	STOCKINGS	19/3/1986
EM1354	GRANVILLE	MAIN	12/7/1968
EM1390OC	GRANVILLE	P38	19/7/1988
EM1390OC	GRANVILLE	P35	19/7/1988
EM1390OC	GRANVILLE	P32	19/7/1988
EM1390OC	GRANVILLE	SEAM A & B	19/7/1988
EM1390OC	GRANVILLE	P34	19/7/1988
EM1390OC	GRANVILLE	P39	19/7/1988
EM1390OC	GRANVILLE	P37	19/7/1988
EM1390OC	GRANVILLE	P40	19/7/1988
EM1390OC	GRANVILLE	P33	19/7/1988
EM1390OC	GRANVILLE	P36	19/7/1988
EM1390OC	GRANVILLE	POTTERY COAL P 31	19/7/1988
EM60	SWADLINCOTE DISTRICT	MAIN	1872
EM60	SWADLINCOTE DISTRICT	MAIN AND LITTLE	1872
EM60	SWADLINCOTE DISTRICT	LITTLE	1872
EM746	GRANVILLE	LITTLE	30/9/1959
EM753	GRANVILLE	KILBURN	3/4/1964
EM8	GRANVILLE	BLOCK	1/5/1950
EM899	GRANVILLE	LITTLE KILBURN	18/11/1966
OM10076	POOL NO.6 (ORIGINAL PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)	FIRECLAY AND MARL	7/3/1930
OM11098	POOL NO.8 (ORIGINAL PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)	MARL AND FIRECLAY, BOTTLE CLAY	17/8/1933
OM11360	BOOTHORPE (ORIGINAL PLAN HELD AT DERBYSHIRE RECORDS OFFICE, MATLOCK)	CLAY, RAFAREE	20/9/1934
OM14186	POOL NO.9 (ORIGINAL	FIRECLAY	1/1946

	PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)		
OM14264	POOL NO.5 (ORIGINAL PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)	FIRECLAY	16/10/1944
OM15190	NEW ENGLAND (ORIGINAL PLAN HELD AT DERBYSHIRE RECORDS OFFICE, MATLOCK)	FIRECLAY, DEEP FIRECLAY SEAM	12/9/1959
OM15243	NEWFIELD NOS.2 AND 5, JOHN KNOWLE (ORIGINAL PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)	FIRECLAY, DERBY	4/3/1966
OM1820	POOL (ORIGINAL PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)	FIRECLAY	17/10/1885
OM2136	BOOTHORPE (ORIGINAL PLAN HELD AT DERBYSHIRE RECORDS OFFICE, MATLOCK)	FIRECLAY	1/1888
OM2712	BOOTHORPE (ORIGINAL PLAN HELD AT DERBYSHIRE RECORDS OFFICE, MATLOCK)	FIRECLAY	7/11/1891
OM3109	WOODWARDS (ORIGINAL PLAN HELD AT DERBYSHIRE RECORDS OFFICE, MATLOCK)	FIRECLAY	2/1887
OM4280	ALBION (ORIGINAL PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)	CLAY, FIRECLAY, STONECLAY	30/9/1900
OM635	WOODVILLE (ORIGINAL PLAN HELD AT LEICESTERSHIRE RECORDS OFFICE, WIGSTON MAGNA)	FIRECLAY	1877
OM7158	WOODVILLE (ORIGINAL PLAN HELD AT DERBYSHIRE RECORDS OFFICE, MATLOCK)	FIRECLAY	12/1905

**The Coal Authority
Mining Records Office
Search Results**

Search Criteria:

OS Easting: 431055 **OS Northing:** 318760

Radius: 10 metres

Colliery Selection:

All collieries were selected

Seam Selection:

All seams were selected

Working Types Selection:

Underground

Opencast

Dirt Tip

Other Minerals

Total number of entries found: 24

Search Results:

Cat_No	Colliery	Seam	Date Abandoned
10043	GRANVILLE NO1&2 GRANVILLE OLD	LITTLE OR FIVE FEET	5/3/1930
10043	GRANVILLE NOS. 1 & 2, GRANVILLE OLD	LITTLE OR FIVE FEET	5/3/1930
10787	GRANVILLE NO1&2	BLOCK OR JACK DENNIS	30/6/1932
11973	GRANVILLE, OLD GRANVILLE	EUREKA	31/12/1936
11973	GRANVILLE, OLD GRANVILLE	WOODFIELD	31/3/1933
11973	GRANVILLE, OLD GRANVILLE	YARD	16/6/1944
14208	GRANVILLE NO.3	FOUR FEET OR DICKIE GOBBLER	25/7/1945
14208	GRANVILLE NO3	FOUR FOOT OR DICKIE GOBBLER	25/7/1945
14272	GRANVILLE	STANHOPE	1/1945
14273	GRANVILLE	STOCKINGS OR TWO YARD	1/1946
17337	ASHBY WOULD'S		
	FIRECLAY	1900	
17594	SWADLINCOTE	DEEP (MAIN)	1861
17594	SWADLINCOTE	FIVE FEET (LITTLE)	1861
17770	MILK HILL & EXTENSION OPENCAST	POTTERY COAL SERIES (PROBABLY P32 - P39)	1978
2788	GRANVILLE	STANHOPE	29/9/1892
3640	GRANVILLE NO.1	MAIN	2/1897
3640	GRANVILLE NO1	MAIN	2/1897
6393	GRANVILLE NO.1	LITTLE	8/3/1915
6393	GRANVILLE NO1	LITTLE	8/3/1915
9833	GRANVILLE	STANHOPE	21/7/1928
EM60	SWADLINCOTE DISTRICT	LITTLE	1872

EM60	SWADLINCOTE DISTRICT	MAIN	1872
EM8	GRANVILLE	BLOCK	1/5/1950
EM899	GRANVILLE	LITTLE KILBURN	18/11/1966

Appendix C Previous Investigations Data

- Sirius Ground Investigation 2006; and,
- Atkins Ground Investigation 2013.

Appendix D Factual Data

D1 – Exploratory Hole Logs

- Machine Excavated Trial Pit Logs
- Rotary Borehole Logs; and,
- Window Sample Borehole Logs.

D2 – Laboratory Testing Data

- Environmental Testing
- Geotechnical Testing



Borehole Log

Borehole No.

RC01

Sheet 1 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31223.00 - 18631.00

Hole Type
BH

Location: South Derbyshire

Level: 131.50

Scale
1:50

Client: Harworths

Dates: 21/01/2019 - 22/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.05			0.05	131.45		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Firm to stiff dark grey to black very gravelly CLAY. Gravel is fine to coarse angular to subangular coal mudstone and brick. (MADE GROUND).	1
		2.00		N=52 (8,9/12,18,11,11)	2.50	129.00		Firm to stiff light grey very gravelly CLAY. Gravel is fine to coarse angular to subrounded coal and mudstone. (MADE GROUND).	2
		3.00 - 3.50	U100		4.00	127.50		Very soft black very gravelly organic CLAY. Gravel is angular fine coal. (MADE GROUND).	3
		5.00		N=16 (3,4/3,4,4,5)	4.50	127.00		Light brown mottled orange and black gravelly CLAY. Gravel is subangular to angular fine to coarse coal, mudstone and sandstone. (MADE GROUND).	4
		6.00 - 6.50	U100						5
		8.00		N=39 (6,7/7,6,12,14)					6
		9.00 - 9.50	U100						7
					9.50	122.00		SANDSTONE	8
									9
									10

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC01

Sheet 2 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31223.00 - 18631.00

Hole Type
BH

Location: South Derbyshire

Level: 131.50

Scale
1:50

Client: Harworths

Dates: 21/01/2019 - 22/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.00		50 (25 for 100mm/50 for 15mm)	11.00	120.50		MUDSTONE.	11
		14.00		50 (25 for 40mm/50 for 30mm)					12
									13
									14
									15
									16
					17.00	114.50		End of borehole at 17.00 m	17
									18
									19
									20

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC02

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31238.00 - 18743.00

Hole Type
BH

Location: South Derbyshire

Level: 128.00

Scale
1:50

Client: Harworths

Dates: 23/01/2019 - 23/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		2.50 - 2.95	U100		0.15	127.85		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
					0.50	127.50		Firm to stiff dark grey to black very gravelly CLAY. Gravel is fine to coarse angular to subangular coal mudstone and brick. (MADE GROUND).	
					2.00	126.00		Dense dark grey to black very clayey GRAVEL. Gravel is fine to coarse angular to subangular coal mudstone and brick. (MADE GROUND).	
					2.20	125.80		Very soft black organic SILT.	
					3.80	124.20		Light brown mottled orange and black gravelly CLAY. Gravel is subangular to angular fine to coarse coal, mudstone and sandstone. (MADE GROUND).	
					5.00	123.00		Dark brown clayey angular sandstone GRAVEL.	
					8.00	120.00		SILTSTONE.	
								End of borehole at 8.00 m	

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC03

Sheet 1 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31138.00 - 18608.00

Hole Type
BH

Location: South Derbyshire

Level: 130.00

Scale
1:50

Client: Harworths

Dates: 23/01/2019 - 24/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15	129.85		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Soft to firm dark grey to black very gravelly CLAY. Gravel is fine to coarse angular to subangular coal mudstone and brick. (MADE GROUND).	
					1.05	128.95		Firm to stiff dark grey to black very gravelly CLAY. Gravel is fine to coarse angular to subangular coal mudstone and brick. (MADE GROUND).	1
					2.50	127.50		Very soft black very silty very gravelly CALY. Gravel si fine to medium occasionally coarse subangular to angular black mudstone. (MADE GROUND).	2
		3.00 - 3.45	U100		2.80	127.20		Firm to stiff grey to black very gravelly CLAY. Gravel is fine to coarse angular to subangular coal mudstone and brick. (MADE GROUND).	3
									4
		4.50 - 4.95	U100						5
									6
									7
									8
									9
					9.50	120.50		Firm to stiff dark grey to black very gravelly CLAY. Gravel is fine to coarse angular to subangular coal mudstone and brick. (MADE GROUND).	10

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC03

Sheet 2 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31138.00 - 18608.00

Hole Type
BH

Location: South Derbyshire

Level: 130.00

Scale
1:50

Client: Harworths

Dates: 23/01/2019 - 24/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.55 - 11.00	U100					GROUND).	
									11
									12
									13
									14
									15
									16
					16.80	113.20			17
								SANDSTONE.	18
					18.50	111.50		End of borehole at 18.50 m	19
									20

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC04

Sheet 1 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31082.00 - 18684.00

Hole Type
BH

Location: South Derbyshire

Level: 126.50

Scale
1:50

Client: Harworths

Dates: 24/01/2019 - 25/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Black to grey very clayey GRAVEL of fine to coarse angular brick, mudstone, coal and siltstone.	1
					3.50	123.00		Grey SILTSTONE. Likely boulder.	2
					4.30	122.20		Light grey to black very clayey GRAVEL. Gravel is fine to coarse angular to subangular coal mudstone, ceramics and brick. (MADE GROUND).	3
									4
									5
									6
									7
									8
		8.00		N=23 (3,4/6,5,6,6)	8.00	118.50		Light grey to black very gravelly CLAY. Gravel is fine to coarse angular to subangular coal mudstone, ceramics and brick. (MADE GROUND).	9
									10
		9.00 - 9.45	U100						



Borehole Log

Borehole No.

RC04

Sheet 2 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31082.00 - 18684.00

Hole Type
BH

Location: South Derbyshire

Level: 126.50

Scale
1:50

Client: Harworths

Dates: 24/01/2019 - 25/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.00		N=24 (4,6/6,5,7,6)					11
		15.00 - 15.45	U100						12
		17.00 - 17.45	U100						13
									14
									15
									16
									17
									18
					18.40	108.10			19
									20
		20.00		N=33 (3,3/5,8,10,10)					

Light grey to black very clayey GRAVEL. Gravel is fine to coarse angular to subangular coal mudstone, ceramics and brick. (MADE GROUND).

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.



Borehole Log

Borehole No.

RC04

Sheet 3 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31082.00 - 18684.00

Hole Type
BH

Location: South Derbyshire

Level:	126.50
--------	--------

Scale
1:50

Client: Harworths

Dates: 24/01/2019 - 25/01/2019

Logged By
LD

[illegible]

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC05

Sheet 1 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31013.00 - 18829.00

Hole Type
BH

Location: South Derbyshire

Level: 124.50

Scale
1:50

Client: Harworths

Dates: 28/01/2019 - 28/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	124.30		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Light grey to grey clayey GRAVEL. Gravel is fine to coarse rounded to angular mudstone and siltstone. Timber and plastic inclusions. (MADE GROUND).	1
									2
									3
									4
									5
		3.50		N=7 (1,1/2,1,2,2)					6
									7
									8
									9
									10
		5.00		N=19 (4,4/8,6,2,3)					1
									2
									3
									4
									5
		6.50 6.50 - 7.00	U100	N=14 (2,2/3,4,3,4)	6.00	118.50		Firm to stiff light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse subrounded to angular mudstone.	6
									7
									8
									9
									10
		8.50 - 9.00	U100		9.00	115.50		Light grey to grey clayey GRAVEL. Gravel is fine to coarse rounded to angular mudstone and siltstone. Timber and plastic inclusions. (MADE GROUND).	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC05

Sheet 2 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31013.00 - 18829.00

Hole Type
BH

Location: South Derbyshire

Level: 124.50

Scale
1:50

Client: Harworths

Dates: 28/01/2019 - 28/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.00		N=21 (4,4/5,4,6,6)					11
		12.50 - 13.00	U100		12.00	112.50		Firm to stiff light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse subrounded to angular mudstone.	12
		14.00		N=31 (7,7/7,7,10,7)					13
					15.50	109.00		MUDSTONE.	14
					17.00	107.50		End of borehole at 17.00 m	15
									16
									17
									18
									19
									20

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC06

Sheet 1 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31090.00 - 18930.00

Hole Type
BH

Location: South Derbyshire

Level: 126.50

Scale
1:50

Client: Harworths

Dates: 29/01/2019 - 29/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			126.30		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Black to grey sandy clayey GRAVEL. Gravel is fine to coarse angular mudstone, coal, siltstone and occasional brick. (MADE GROUND).	1	
		2.00		N=11 (2,2/3,4,2,2)				2	
		3.50		N=3 (1,1/0,1,1,1)				3	
		5.00		N=8 (2,2/2,2,2,2)				4	
		6.50		N=8 (2,2/3,2,2,1)				5	
		8.00		N=7 (2,2/1,2,2,2)				6	
		9.00			117.50			7	
		9.50		N=5 (1,2/1,1,2,1)				8	
		Continued on next sheet							9
									10

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC06

Sheet 2 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31090.00 - 18930.00

Hole Type
BH

Location: South Derbyshire

Level: 126.50

Scale
1:50

Client: Harworths

Dates: 29/01/2019 - 29/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.00		N=10 (2,2/3,2,2,3)	11.50	115.00			11
								Grey to light grey clayey GRAVEL. Gravel is fine to coarse angular mudstone, coal and siltstone.	12
									13
									14
									15
									16
					17.00	109.50		Light grey weak to strong MUDSTONE. (GRADE C PENNINE MIDDLE COAL MEASURES).	17
									18
					18.50	108.00		End of borehole at 18.50 m	19
									20

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC07

Sheet 1 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30965.00 - 18885.00

Hole Type
BH

Location: South Derbyshire

Level: 123.50

Scale
1:50

Client: Harworths

Dates: 30/01/2019 - 30/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15			0.15	123.35		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Black to grey sandy gravelly CLAY. Gravel is fine to coarse angular mudstone, coal, siltstone and occasional brick. (MADE GROUND).	1
		2.00		N=9 (2,2/3,2,2,2)					2
		3.50		N=5 (1,1/1,1,1,2)					3
		5.00		N=3 (1,1/0,1,1,1)	5.00	118.50		Dark grey to grey very gravelly CLAY. Gravel is fine to coarse angular mudstone, coal and brick. Moderate angular mudstone cobble content. (MADE GROUND).	4
		6.50		N=31 (3,3/6,6,9,10)					5
		7.50 - 8.00	U100						6
									7
									8
									9
									10

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC07

Sheet 2 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30965.00 - 18885.00

Hole Type
BH

Location: South Derbyshire

Level: 123.50

Scale
1:50

Client: Harworths

Dates: 30/01/2019 - 30/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50 - 11.00	U100						11
					12.00	111.50			12
								Grey very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone. Moderate mudstone cobble content. (MADE GROUND).	13
									14
									15
									16
		16.50 - 17.00	U100						17
		17.00		N=28 (4,6/6,9,7,6)					18
									19
		19.00 - 19.50	U100						20

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC07

Sheet 3 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30965.00 - 18885.00

Hole Type
BH

Location: South Derbyshire

Level: 123.50

Scale
1:50

Client: Harworths

Dates: 30/01/2019 - 30/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					22.00	101.50			21
								Light grey weak to strong MUDSTONE. (GRADE C PENNINE MIDDLE COAL MEASURES).	22
									23
									24
					24.50	99.00		End of borehole at 24.50 m	25
									26
									27
									28
									29
									30

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC08

Sheet 1 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30945.00 - 18675.00

Hole Type
BH

Location: South Derbyshire

Level: 124.50

Scale
1:50

Client: Harworths

Dates: 31/01/2019 - 31/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	124.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Dark grey very sandy very clayey GRAVEL. Gravel is fine to coarse angular mudstone. Significant timber, plastics and bricks throughout. High angular mudstone cobble content. (MADE GROUND).	1
		2.00		N=10 (2,2/2,3,2,3)					2
		3.50		N=4 (2,2/1,1,1,1)					3
		5.00		N=3 (1,1/0,1,1,1)	4.70	119.80		Dark grey very sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone. Significant timber, plastics and bricks throughout. High angular mudstone cobble content. (MADE GROUND).	5
		6.50		N=16 (2,2/3,3,4,6)					6
		8.00		N=18 (4,3/3,4,6,5)					7
		9.50		N=20 (3,4/4,5,5,6)					8
									9
									10

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC08

Sheet 2 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30945.00 - 18675.00

Hole Type
BH

Location: South Derbyshire

Level: 124.50

Scale
1:50

Client: Harworths

Dates: 31/01/2019 - 31/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					11.20	113.30			11
								Grey sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone. Inclusions of brick, ceramic pipe and coal throughout. (MADE GROUND).	12
									13
		14.00		N=14 (3,3/3,4,3,4)					14
									15
									16
		17.00 - 17.50	U100						17
									18
									19
									20

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC08

Sheet 3 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30945.00 - 18675.00

Hole Type
BH

Location: South Derbyshire

Level: 124.50

Scale
1:50

Client: Harworths

Dates: 31/01/2019 - 31/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		21.00 - 21.50	U100						21
									22
									23
									24
									25
									26
									27
									28
		28.50 - 29.00	U100						29
									30

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC08

Sheet 4 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30945.00 - 18675.00

Hole Type
BH

Location: South Derbyshire

Level: 124.50

Scale
1:50

Client: Harworths

Dates: 31/01/2019 - 31/01/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					30.50	94.00		Light grey very gravelly CLAY. Gravel is fine to coarse angular mudstone and rare coal. (MADE GROUND).	31
									32
									33
									34
									35
									36
					36.40	88.10		Light grey SILTSTONE.	37
									38
					39.00	85.50		End of borehole at 39.00 m	39
									40

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC09

Sheet 1 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30925.00 - 18795.00

Hole Type
BH

Location: South Derbyshire

Level: 121.70

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		1.75 - 2.20 2.00	U100	N=12 (2,2/4,3,2,3)	0.20	121.50		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Black to grey very clayey GRAVEL. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber and ceramic inclusions. (MADE GROUND).	1	
					1.50	120.20			Black to grey very gravelly CLAY. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber and ceramic inclusions. (MADE GROUND).	2
										3
					3.00	118.70			Black to grey very clayey GRAVEL. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber and ceramic inclusions. (MADE GROUND).	4
		5.00	N=9 (2,2/2,2,2,3)	5						
		6.50	N=9 (2,1/2,2,3,2)	6.50	115.20		Black to grey very gravelly CLAY. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber and ceramic inclusions. (MADE GROUND).	7		
		8.00	N=4 (1,0/1,1,1,1)	8.00	113.70			8		
		9.50	N=8 (2,4/2,2,2,2)				Black to grey very clayey GRAVEL. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber and ceramic inclusions. (MADE GROUND).	9		
								10		
									Continued on next sheet	

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC09

Sheet 2 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30925.00 - 18795.00

Hole Type
BH

Location: South Derbyshire

Level: 121.70

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.00 11.00 - 11.45	U100	N=12 (3,3/2,4,3,3)	10.80	110.90		Black to grey very gravelly CLAY. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber and ceramic inclusions. (MADE GROUND).	11
		12.50		N=20 (2,3/4,4,7,5)					12
		14.00		N=17 (2,3/3,5,5,4)					13
		16.00							14
		18.00 - 18.45	U100		16.00	105.70		Black to grey very clayey GRAVEL. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber and ceramic inclusions. (MADE GROUND).	15
		18.50		N=23 (2,4/4,5,6,8)					16
									17
									18
									19
									20

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC09

Sheet 3 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30925.00 - 18795.00

Hole Type
BH

Location: South Derbyshire

Level: 121.70

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					23.00	98.70		Greyish brown gravelly CLAY. Gravel I sfine to coarse angular brick, mudstone, siltstone and some coal fragments. (OPEN HOLED - DRILLERS DESCRIPTION). (MADE GROUND).	21 22 23 24 25 26 27 28 29 30

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC09

Sheet 4 of 4

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30925.00 - 18795.00

Hole Type
BH

Location: South Derbyshire

Level: 121.70

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					33.30	88.40			31
									32
									33
									34
									35
					36.00	85.70			36
									37
									38
									39
									40

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC10

Sheet 1 of 6

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30815.00 - 18715.00

Hole Type
BH

Location: South Derbyshire

Level: 122.40

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 06/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	122.30		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.90			0.90	121.50		Dark brown gravelly CLAY. Gravel is fine to coarse angular brick and mudstone with occasional wood and coal. (MADE GROUND).	1
		2.20			2.20	120.20		Brown gravelly slightly sandy CLAY. (MADE GROUND).	2
		5.00 - 5.50	U100					Dark brown greyish gravelly CLAY. Gravel is fine to coarse angular birck mudstone and siltstone. (MADE GROUND).	3
		10.00 - 10.50	U100						4
									5
									6
									7
									8
									9
									10

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC10

Sheet 3 of 6

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30815.00 - 18715.00

Hole Type
BH

Location: South Derbyshire

Level: 122.40

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 06/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC10

Sheet 4 of 6

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30815.00 - 18715.00

Hole Type
BH

Location: South Derbyshire

Level: 122.40

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 06/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
									31
									32
									33
									34
									35
									36
									37
									38
									39
									40

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

RC10

Sheet 5 of 6

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30815.00 - 18715.00

Hole Type
BH

Location: South Derbyshire

Level: 122.40

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 06/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
									41
									42
									43
									44
									45
									46
									47
									48
									49
									50

Continued on next sheet

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.



Borehole Log

Borehole No.

RC10

Sheet 6 of 6

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30815.00 - 18715.00

Hole Type
BH

Location: South Derbyshire

Level:	122.40
--------	--------

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 06/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
									51	
									52	
									53	
									54	
									55	
									56	
									57	
									58	
		58.80			63.60				Light grey SILTSTONE.	59
		60.00			62.40				End of borehole at 60.00 m	60

Remarks

1. Wireline (Geobore-S) method adopted. 2. Where recovery is poor, SPT's to be undertaken. 3. Installed with groundwater/gas monitoring standpipe post drilling.





Borehole Log

Borehole No.

T1

Sheet 1 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 128.25

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	128.15		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.60	127.65		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone and coal. (Drillers description).	
								Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Continued on next sheet

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T1

Sheet 2 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 128.25

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					11.50	116.75			11
					12.00	116.25		Light brown sandstone. (Drillers description).	12
								End of borehole at 12.00 m	12
									13
									14
									15
									16
									17
									18
									19
									20

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T1a

Sheet 1 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 128.50

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	128.40		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.60	127.90		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone and coal. (Drillers description).	
								Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Continued on next sheet

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T1a

Sheet 2 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 128.50

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					11.70	116.80			11
					12.50	116.00		Light brown sandstone. (Drillers description).	12
								End of borehole at 12.50 m	13
									14
									15
									16
									17
									18
									19
									20

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T2

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 131.80

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	131.70		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.40	131.40		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone and coal. (Drillers description).	
								Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
									5
									6
									7
									8
					8.50	123.30		Light brown sandstone. (Drillers description).	9
					10.00	121.80		End of borehole at 10.00 m	10

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T2a

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 131.50

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	131.40		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.50	131.00		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone and coal. (Drillers description).	
								Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
									5
									6
									7
									8
					8.40	123.10		Light brown sandstone. (Drillers description).	
					9.00	122.50		End of borehole at 9.00 m	9
									10

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T3

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 127.50

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	127.40		Grass over topsoil. (TOPSOIL) (Drillers description). Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
					4.80	122.70		Light brown sandstone. (Drillers description).	5
					5.80	121.70		End of borehole at 5.80 m	6
									7
									8
									9
									10

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T3a

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 128.20

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	128.10		Grass over topsoil. (TOPSOIL) (Drillers description). Grey mudstone CLAY, opencast fill. (Drillers description).	1
					3.30	124.90		Light brown sandstone. (Drillers description).	2
					6.00	122.20		End of borehole at 6.00 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T4

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 126.00

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	125.90		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.40	125.60		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone and coal. (Drillers description). Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
					4.60	121.40		Light brown sandstone. (Drillers description).	5
									6
					6.00	120.00		End of borehole at 6.00 m	7
									8
									9
									10

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T4a

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 126.25

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	126.15		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.50	125.75		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone and coal. (Drillers description).	
								Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
									5
									6
									7
					7.50	118.75		Light brown sandstone. (Drillers description).	8
					8.50	117.75		End of borehole at 8.50 m	9
									10

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T5

Sheet 1 of 2

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 119.50

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

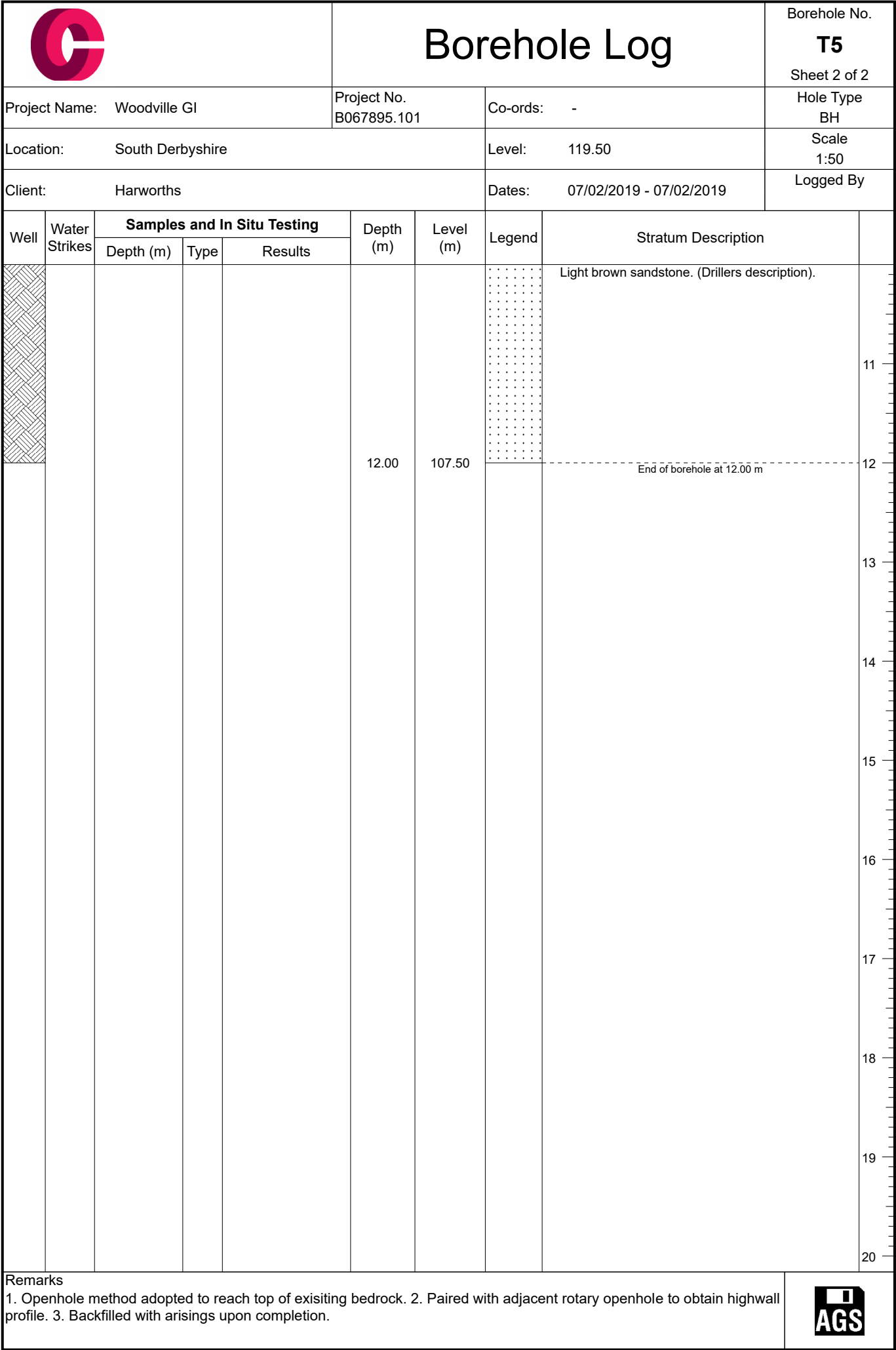
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	119.40		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.80	118.70		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone, coal and plastics. (Drillers description).	1
								Grey mudstone CLAY, opencast fill. (Drillers description).	2
									3
									4
									5
									6
									7
									8
									9
					9.90	109.60			10

Continued on next sheet

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.







Borehole Log

Borehole No.

T5a

Sheet 1 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 120.20

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	120.10		Grass over topsoil. (TOPSOIL) (Drillers description).	
					0.60	119.60		Brown gravelly CLAY. Gravel is fine to coarse angular brick, mudstone, sandstone, coal and glass. (Drillers description).	
								Grey mudstone CLAY, opencast fill. (Drillers description).	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Continued on next sheet

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Borehole Log

Borehole No.

T5a

Sheet 2 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 120.20

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Continued on next sheet

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.



Borehole Log

Borehole No.

T5a

Sheet 3 of 3

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

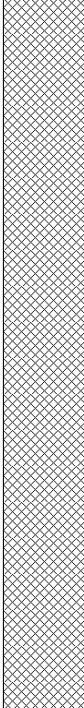
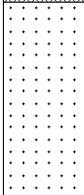
Level: 120.20

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					24.70	95.50			21
									22
									23
									24
								Light brown sandstone. (Drillers description).	25
									26
					26.00	94.20		26	
								27	
								28	
								29	
								30	

Remarks

1. Openhole method adopted to reach top of existing bedrock. 2. Paired with adjacent rotary openhole to obtain highwall profile. 3. Backfilled with arisings upon completion.





Trial Pit Log

Trialpit No

TP01

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31013.00 - 18829.00

Level: 131.50

Date

29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.10Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15			0.15	131.35		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).	
	0.40	ES					Soft to firm black to dark grey mottled brown orange sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal and mudstone with low cobble content of angular mudstone and whole bricks. Occasional timber inclusions (<600mm length) . Mild hydrocarbon odour. (MADE GROUND).	
	1.00	ES					<u>Hydrocarbon Odour</u> HV - 50/120/70	1
	1.20	B					<u>HV - 138/138/130</u>	
	1.40			1.40	130.10		Loose to dense black to grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular brick, coal and mudstone with moderate cobble content of angular mudstone and whole bricks. Occasional timber inclusions (<600mm length) . Mild hydrocarbon odour. (MADE GROUND).	2
	2.00	B						
	2.60			2.60	128.90		Loose to dense black slightly clayey GRAVEL. Gravel is fine to coarse angular coal, mudstone and brick with inclusions of ceramic pipework. Strong hydrocarbon odour. (MADE GROUND).	
	3.00	B					<u>Strong hydrocarbon odour</u>	3
	3.00	ES		3.10	128.40		End of pit at 3.10 m	
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP02

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31145.00 - 18565.00

Level: 129.50

Date

29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.00Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	129.40		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).	
	0.40	ES					Soft to firm black to dark grey mottled brown orange sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal and mudstone with low cobble content of angular mudstone and whole bricks. Occasional timber inclusions (<400mm length), Angular mudstone boulder encountered at 0.65m with width of 1.2m. Mild hydrocarbon odour. (MADE GROUND).	
	1.00	WAC					Mudstone boulder at 650mm length	
	1.50	B					HV - 75/76/82	1
							Mild hydrocarbon odour	
	3.00	B		3.00	126.50		Slow groundwater seepage	2
							End of pit at 3.00 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP03

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31090.00 - 18605.00
Level: 128.30Date
29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.80Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	128.20		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Soft to firm black to dark grey mottled brown and light brown very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and occasional brick. Low cobble content comprising whole bricks and angular mudstone. Strong hydrocarbon odour. (MADE GROUND). <u>Strong hydrocarbon odour</u> <u>Slow groundwater seepage</u>	1
	1.00	ES		1.20	127.10		Firm to stiff light grey mottled orange sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone, brick and occasional coal. (MADE GROUND).	2
	1.50	B						
	2.50	B		2.80	125.50		<u>Slow groundwater seepage</u> End of pit at 2.80 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP04

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31150.00 - 18650.00
Level: 129.50Date
29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.10Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20			0.20	129.30		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).	
	0.50	ES					Loose to dense black to dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse mudstone, brick and coal with inclusions of ceramic pipework, timber and metals. Metals comprise rusted bolts, cables and wires. (MADE GROUND).	1
	1.00	B						2
	2.10			2.10	127.40		Soft to firm black to dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse mudstone, brick and coal with inclusions of ceramic pipework, timber and metals. Metals comprise rusted bolts, cables and wires. (MADE GROUND).	
	2.50	ES					HV - 64/74/57	
	2.60	B					Slow groundwater seepage	
	3.10			3.10	126.40		End of pit at 3.10 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP05

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31055.00 - 18650.00
Level: 126.70Date
29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.80Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	ES		0.10	126.60		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).	
				0.40	126.30		Loose red very sandy fine to coarse rounded to subangular GRAVEL of sandstone and limestone. (MADE GROUND).	
				0.80	125.90		Firm to stiff light grey mottled orange sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone, brick and occasional coal. (MADE GROUND).	
	1.50 1.50	B ES					Loose to dense black to dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse mudstone, brick and coal with inclusions of plastics, ceramic pipework, timber and metals. Metals comprise rusted bolts and wires. (MADE GROUND).	1
							Slow groundwater seepage	
	2.50	B						2
				2.80	123.90		Mudstone boulder of 630mm length	
							End of pit at 2.80 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP06

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31140.00 - 18710.00

Level: 127.25

Date

29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.40Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10 0.20			0.10 0.20	127.15 127.05		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Loose red very sandy fine to coarse rounded to subangular GRAVEL of sandstone and limestone. (MADE GROUND). Loose to dense black to dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse mudstone, brick and coal with inclusions of ceramic pipework, timber and metals. Metals comprise rusted bolts, cables and wires. (MADE GROUND).	1
	1.00 1.00	B ES		1.10	126.15		Soft to firm black to dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse mudstone, brick and coal with inclusions of ceramic pipework, timber and metals. Metals comprise rusted bolts, cables and wires. (MADE GROUND). HV - 40	2
	2.50 2.50	B ES					HV - 42 HV - 45	3
				3.40	123.85		End of pit at 3.40 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP07

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31180.00 - 18740.00

Level: 127.50

Date

29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.20

Scale

1:25

Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	127.40		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).	
	0.30	B		0.40	127.10		Soft to firm black to dark grey mottled brown orange sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal and mudstone with low cobble content of angular mudstone and whole bricks. (MADE GROUND).	
	0.70	ES		1.10	126.40		Loose to dense black to grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular brick, coal and mudstone with moderate cobble content of angular mudstone and whole bricks. Occasional timber inclusions (<600mm length) . (MADE GROUND).	1
	1.40	B		1.50	126.00		Firm black to dark grey mottled brown orange sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal and mudstone with low cobble content of angular mudstone and whole bricks. (MADE GROUND).	
	2.00	B					Dense black to grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular brick, coal and mudstone with moderate cobble content of angular mudstone and whole bricks. Occasional timber inclusions (<600mm length) . (MADE GROUND).	2
				3.20	124.30		End of pit at 3.20 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP08

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31200.00 - 18680.00
Level: 130.50Date
29/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.40Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15			0.15	130.35		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Soft to firm black to dark grey mottled brown orange sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal and mudstone with low cobble content of angular mudstone and whole bricks. Moderate timber inclusions. (MADE GROUND).	
	0.50	B						
	0.50	ES						
							<u>Slow groundwater seepage</u>	
				1.20	129.30		Loose to dense black to grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular brick, coal and mudstone with moderate cobble content of angular mudstone and whole bricks. Regular timber inclusions (<900mm length) . (MADE GROUND).	
	2.00	ES						
	2.50	B						
				3.40	127.10		End of pit at 3.40 m	

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP09

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31230.00 - 18740.00
Level: 128.00Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.40Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	127.90		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Soft to firm black to dark grey mottled brown orange sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal and mudstone with low cobble content of angular mudstone and whole bricks. (MADE GROUND). <u>Mild hydrocarbon odour</u> <u>HV - 4</u>	1
	0.50	B						
	0.80	ES						
	1.00	D					<u>HV - 50</u>	
	1.50	WAC						
	1.70	B						2
	2.50	B						
	2.90			2.90	125.10		Loose to dense black to grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular brick, coal and mudstone with moderate cobble content of angular mudstone and whole bricks. (MADE GROUND). <u>Slow groundwater seepage</u>	3
	3.40			3.40	124.60		End of pit at 3.40 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP10

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31245.00 - 18645.00
Level: 131.50Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
1.20Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.08	B		0.10	131.40		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).	
	0.30	ES		0.50	131.00		Soft to firm black mottled grey very sandy very gravelly CLAY. Gravel is fine to coarse brick, mudstone, coal and concrete with regular ceramic inclusions. (MADE GROUND). <i>Mild hydrocarbon odour</i>	
				1.00	130.50		Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND). <i>Slow groundwater seepage</i>	1
				1.20	130.30		Very dense black sandy very clayey very gravelly COBBLES and BOULDERS of angular concrete and mudstone.	2
							End of pit at 1.20 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP11

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31190.00 - 18760.00
Level: 127.60Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.90Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	ES		0.10	127.50		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. Concrete sleeper encountered at 0.8m bgl.(MADE GROUND).	
	1.20	D		0.90	126.70		Firm black to dark grey mottled brown orange sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal and mudstone with low cobble content of angular mudstone and whole bricks. (MADE GROUND). <i>HV - 32/50/28</i>	1
	2.50	B		1.80	125.80		Dense black very sandy very clayey gravel with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND). <i>Steady groundwater flow</i>	2
				2.90	124.70		End of pit at 2.90 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP12

Sheet 1 of 1

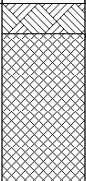
Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31190.00 - 18850.00
Level: 130.40Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
0.60Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	ES		0.10	130.30		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Loose black very sandy slightly clayey GRAVEL with high brick cobble content. Inclusions of concrete, metal cables and significant volumes of asbestos cement sheets.
				0.60	129.80		End of pit at 0.60 m
							1
							2
							3
							4
							5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP12a

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: -
Level: 130.50Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.20Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	130.40		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND).	
	1.00	WAC						1
	2.00	ES		1.80	128.70		Firm to stiff dark grey mottled yellow and grey very sandy very gravelly CLAY. Gravel is fine to coarse angular to subrounded coal, brick, concrete with ceramic and timber inclusions. Large metal cables encountered at 2.5m bgl. (MADE GROUND). <i>HV - 28/30/30</i>	2
				3.20	127.30		End of pit at 3.20 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP13

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31140.00 - 18860.00
Level: 128.50Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.40Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10	128.40		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).	
	1.00	B					Loose to dense black to dark grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, shale, coal, brick and ceramics.	1
	1.20	ES						
	2.00	B						2
	3.00	B						3
				3.40	125.10		End of pit at 3.40 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP14

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31110.00 - 18810.00

Level: 126.50

Date

30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.40

Scale

1:25

Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	ES		0.10	126.40		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Soft to firm dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Moderate angular mudstone cobble content. (MADE GROUND)	
	1.20	B		0.90	125.60		Dense dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Moderate angular mudstone cobble content. (MADE GROUND). <i>Rotten egg odour</i>	1
	3.20	B		2.60	123.90		Soft to firm dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Moderate angular mudstone cobble content. (MADE GROUND). <i>Slow groundwater seepage</i>	2
				3.40	123.10		End of pit at 3.40 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP15

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31125.00 - 18925.00

Level: 127.25

Date

30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.40

Scale

1:25

Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	B		0.05	127.20		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Light grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. (MADE GROUND).	1
	1.50	WAC		1.10	126.15		Light grey to black slightly sandy very clayey GRAVEL. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. (MADE GROUND). <u>Steady groundwater flow</u>	2
				2.30	124.95		Light grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. (MADE GROUND).	3
				3.40	123.85		End of pit at 3.40 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP16

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31090.00 - 18890.00
Level: 126.70Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.50Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	126.60		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Light grey to black slightly sandy very clayey GRAVEL. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. (MADE GROUND).	
	1.00 1.00	B ES						1
	1.50			1.50	125.20		Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. (MADE GROUND). <u>Steady groundwater flow</u>	2
	2.00	B						3
				3.50	123.20		End of pit at 3.50 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP17

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31055.00 - 18855.00
Level: 126.00Date
30/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.85Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.05			0.05	125.95		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).
	0.70	ES					Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. High mudstone and brick cobble content. (MADE GROUND).
	1.50	B					
	2.50	B					
	2.85			2.85	123.15		End of pit at 2.85 m

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP18

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31020.00 - 18845.00
Level: 124.50Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.40Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	124.40		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND).	
	1.00	ES						1
	1.20	B						
	2.10			2.10	122.40		Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. High mudstone and brick cobble content. (MADE GROUND). HV - 67/71/70	2
	2.30	B						
	2.70			2.70	121.80		Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND).	3
	3.40			3.40	121.10		End of pit at 3.40 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP19

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31030.00 - 18895.00

Level: 125.00

Date

31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
1.70Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	ES					Firm dark grey mottled yellow very sandy very gravelly CLAY. Gravel is fine to coarse subangular ot subrounded coal, brick and mudstone with high cobble content comprising angular mudstone and whole bricks. Large hydraulic cable encountered in pit. (MADE GROUND).	1
	1.00	B						
				1.70	123.30		End of pit at 1.70 m	2
								3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP20

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31065.00 - 31990.00
Level: 124.80Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.00Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10			0.10	124.70		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL).
	1.70	ES					Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND).
	2.70	D		2.50	122.30		Soft light brown to yellow very sandy very gravelly CLAY. Gravel is fine to coarse angular sandstone.
				3.00	121.80		End of pit at 3.00 m

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP21

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31005.00 - 18950.00
Level: 125.25Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.90Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.05			0.05	125.20		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. High mudstone and brick cobble content. (MADE GROUND).	
	0.70 0.80	D WAC					HV - 65/60	
	0.90			0.90	124.35		Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND).	1
	2.00	B						2
	2.90			2.90	122.35		End of pit at 2.90 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP22

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30930.00 - 18930.00
Level: 122.75Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.90Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.70	ES		0.10	122.65		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete with regular ceramic and timber inclusions. (MADE GROUND).	
	1.50	D		0.80	121.95		Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic and metal cables. High mudstone and brick cobble content. (MADE GROUND). HV - 28/48/32	1
	2.50	ES		1.90	120.85		Light brown very sandy very gravelly CLAY. Gravel is fine to coarse subangular to angular sandstone and brick. High cobble content comprising whole bricks and ceramics.	2
				2.90	119.85		End of pit at 2.90 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP23

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30935.00 - 18850.00
Level: 122.20Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.00Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.05			0.05	122.15		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. (TOPSOIL). Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete. (MADE GROUND).	
	0.50	B						
	1.00	B						1
				1.80	120.40		Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick. High mudstone and brick cobble content. (MADE GROUND).	2
	2.90	B		3.00	119.20		<u>Slow groundwater seepage</u>	3
							End of pit at 3.00 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP24

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31090.00 - 18750.00
Level: 125.60Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.90Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.25			0.25	125.35		Grass over light brown to red very gravelly CLAY with rootlets. Gravel is fine to medium rounded sandstone and occasional flint. Occasional brick cobbles. (MADE GROUND).	
	1.00	WAC					Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete. (MADE GROUND).	1
	1.50	B						
	1.80			1.80	123.80		Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick. High mudstone and brick cobble content. (MADE GROUND).	2
							<u>Slow groundwater seepage</u>	
							<u>HV - 80/66/69</u>	
	2.50	B						
	2.90			2.90	122.70		End of pit at 2.90 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP25

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 31030.00 - 18690.00
Level: 126.50Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.20Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10	126.40		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
				0.30	126.20		Soft red very sandy very gravelly CLAY. Gravel is rounded flint, sandstone and occasionally angular brick fragments. (MADE GROUND).	
							Dense black very sandy very clayey GRAVEL with occasional large clayey inclusions. Gravel is fine to coarse angular coal, brick and concrete. Regular timber inclusions. (MADE GROUND).	
	0.90	ES						1
	1.50	B						2
	2.50	B						3
				3.20	123.30		End of pit at 3.20 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP26

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30975.00 - 18615.00

Level: 126.60

Date

31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.10Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.05			0.05	126.55		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Grey to black slightly sandy very clayey GRAVEL. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, rubber belts, ceramic and metal cables. (MADE GROUND). <u>Slow groundwater seepage</u>	1
	1.00	ES						
	2.00	B						2
	2.20			2.20	124.40		Grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick with inclusions of timber, ceramic, rubber belts and metal cables. (MADE GROUND). <u>Slow groundwater seepage</u>	
	2.40	B						
	3.10			3.10	123.50		End of pit at 3.10 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP27

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30935.00 - 18650.00
Level: 126.10Date
31/01/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.10Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.05			0.05	126.05		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
	0.30	WAC					Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick. High mudstone and brick cobble content. (MADE GROUND).	
	0.50			0.50	125.60		Loose red very sandy GRAVEL. Gravel comprise fine to coarse angular brick fragments. (MADE GROUND).	
	0.60			0.60	125.50		Dark grey mottled black and brown slightly sandy very gravelly CLAY. Gravel is fine to medium angular to subangular coal, mudstone and brick. High mudstone and brick cobble content. (MADE GROUND).	
	1.00	B						1
							Concrete boulder of 800mm length	
	2.50	B						2
								3
				3.10	123.00		End of pit at 3.10 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP28

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30955.00 - 18710.00
Level: 125.00Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.10Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.05	124.95		Grass over light brown slightly gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Black to dark grey very sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone and coal. High brick and timber content. Occasional metal cables throughout. (MADE GROUND).	
							<i>Strong hydrocarbon odour</i>	1
				1.35	123.65		Black to dark grey very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and coal. High brick and timber content. Occasional metal cables throughout. (MADE GROUND).	2
				2.80	122.20		Black to dark grey very sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone and coal. High brick and timber content. Occasional metal cables throughout. (MADE GROUND).	3
				3.10	121.90		<i>Slow groundwater seepage</i> End of pit at 3.10 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP29

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30995.00 - 18765.00
Level: 124.40Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.60Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	124.30		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Loose red very sandy rounded limestone and sandstone GRAVEL. Moderate brick content. (MADE GROUND).	
	0.50	B						
	0.70			0.70	123.70		Black to dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone and coal. Moderate mudstone cobble content. Mild hydrocarbon odour. (MADE GROUND). <i>HV - 80/66/65</i>	1
	1.00	B						
	1.00	ES						
	1.20			1.20	123.20		Black to dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse angular mudstone and coal. Moderate mudstone cobble content. Mild hydrocarbon odour. (MADE GROUND). <i>Mudstone boulder of 760mm length</i>	2
	2.60			2.60	121.80		End of pit at 2.60 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP30

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30945.00 - 18785.00
Level: 123.00Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.20Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.70 0.80	B WAC		0.20	122.80		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. Moderate brick and cable content. (MADE GROUND). Black very sandy very gravelly CLAY. Gravel is fine to medium mudstone with occasional brick fragments. Timber inclusions throughout. (MADE GROUND). <u>HV - 26/34/40</u>	1
				1.20	121.80		Black very sandy very clayey GRAVEL. Gravel is fine to coarse mudstone with occasional brick fragments. Timber inclusions throughout. (MADE GROUND). <u>HV - 44/68/50</u>	2
	2.50	B					Slow groundwater seepage	3
				3.20	119.80		End of pit at 3.20 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP31

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30905.00 - 18745.00
Level: 123.60Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.70Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	123.50		Grass over black slightly gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone. (TOPSOIL). Black very sandy very gravelly CLAY. Gravel is fine to coarse mudstone with occasional whole brick and brick fragments. Timber inclusions throughout. (MADE GROUND).	
	0.30	B						
	0.60	ES						
	0.70			0.70	122.90		Black to dark grey sandy very clayey GRAVEL. Gravel is fine to medium mudstone with occasional whole brick and brick fragments. Timber inclusions throughout. (MADE GROUND).	1
	1.50	B						2
								3
								4
								5
				3.70	119.90		End of pit at 3.70 m	

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP32

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30865.00 - 18690.00
Level: 123.70Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.60Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10			0.10	123.60		Grass over red gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Loose red very sandy rounded limestone and sandstone GRAVEL. Moderate brick content. (MADE GROUND).
	0.45	ES		0.40	123.30		Dark grey very sandy very clayey GRAVEL. Gravel is fine to coarse angular mudstone. Significant timber, metal cables, plastics and bricks throughout. High angular mudstone cobble content.
	0.60	B					
	2.50	ES		2.60	121.10		End of pit at 2.60 m

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP33

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30860.00 - 18610.00
Level: 124.00Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.20Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.05			0.05	123.95		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Dark brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and coal. Inclusions of timber, metal cables, plastics and bricks throughout. (MADE GROUND). BOULDERS. <u>Concrete boulder of 650mm length</u>	
	0.90	ES						1
	1.70	B					<u>HV - 30/40/50</u> <u>Concrete boulder of 700mm length</u> <u>HV - 55/60/60</u>	2
	3.00	B						3
	3.20			3.20	120.80		End of pit at 3.20 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP34

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30850.00 - 18555.00
Level: 121.50Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.50Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	121.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Red very sandy very gravelly CLAY. Gravel is fine to coarse subangular to rounded limestone and sandstone gravel. Moderate brick content. (MADE GROUND).	
	0.30	ES		0.50	121.00		Black to light grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone and coal. Timber inclusions throughout. (MADE GROUND).	
	1.00	B						1
	2.00	B						2
								3
				3.50	118.00		End of pit at 3.50 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP35

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30865.00 - 18535.00
Level: 121.50Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.70Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	121.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Black to light grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone and coal. Timber inclusions throughout. (MADE GROUND). BOULDERS.	
	1.00	ES						1
	1.50	B					Mudstone boulder of 600mm length Mudstone boulder of 650mm length	
	1.75			1.75	119.75		Black to light grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone and coal. Timber inclusions throughout. (MADE GROUND). BOULDERS. HV - 73/56/60	2
	2.20	D						
	2.70			2.70	118.80		End of pit at 2.70 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP36

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30799.00 - 18590.00
Level: 119.20Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.30Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15			0.15	119.05		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
	0.50	ES					Light brown mottled black and grey sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and coal. Whole bricks throughout. (MADE GROUND).	
	0.60	B					<i>HV - 95/105/69</i>	
				0.80	118.40		Black to light grey sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone coal and brick. Timber inclusions throughout. (MADE GROUND). BOULDERS.	1
							<i>Mild hydrocarbon odour</i>	
	1.70	B						2
								3
				3.30	115.90		End of pit at 3.30 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP37

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30845.00 - 18645.00
Level: 122.80Date
04/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.90Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	122.70		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
	0.20			0.20	122.60		Loose red very sandy rounded limestone and sandstone GRAVEL. Moderate brick content. (MADE GROUND).	
	0.30	ES					Grey sandy clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone and brick. Inclusions of fabric, timber and plastic. (MADE GROUND).	
	0.50	WAC						
	1.00	B						
				1.30	121.50			
							Grey sandygravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and brick. Inclusions of fabric, timber and plastic. (MADE GROUND).	
							<u>Slow groundwater seepage</u>	
				2.90	119.90		End of pit at 2.90 m	

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP38

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30815.00 - 18715.00
Level: 120.15Date
05/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.00Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES		0.15	120.00		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).
	0.50	B		0.60	119.55		Yellow mottled orange and grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick and mudstone. (MADE GROUND). <i>HV - 44/34/40</i>
	1.50	B					Black to grey slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to subangular mudstone with rare coal. Timber inclusions from 1.6m. (MADE GROUND).
				3.00	117.15		<i>Slow groundwater seepage</i>
							End of pit at 3.00 m

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP39

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30780.00 - 18650.00
Level: 122.60Date
05/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.20Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20			0.20	122.40		Grass over brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
	0.60	ES		0.70	121.90		Red very sandy very gravelly CLAY. Gravel is fine to coarse subangular to rounded limestone and sandstone gravel. Moderate brick content. (MADE GROUND).	
	1.00	ES		1.20	121.40		Black sandy very clayey GRAVEL. Gravel is fine to coarse mudstone, coal and brick. High content of whole brick. (MADE GROUND).	1
				1.20	121.40		<u>Slow groundwater seepage</u>	
				1.50	121.10		Black sandy very gravelly CLAY. Gravel is fine to coarse mudstone, coal and brick. High content of whole brick. (MADE GROUND).	
				1.50	121.10		Black sandy very clayey GRAVEL. Gravel is fine to coarse mudstone, coal and brick. High content of whole brick. (MADE GROUND).	2
	3.00	B		3.20	119.40		End of pit at 3.20 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP40

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30795.00 - 18670.00

Level: 121.50

Date

05/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.60

Scale

1:25

Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.15	121.35		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
				0.45	121.05		Yellow mottled orange and grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick and mudstone. (MADE GROUND).	
							Red very sandy very gravelly CLAY. Gravel is fine to coarse subangular to rounded limestone and sandstone gravel. Moderate brick content. (MADE GROUND).	1
	1.20	WAC		1.10	120.40		Black sandy very gravelly CLAY. Gravel is fine to coarse mudstone, coal and brick. High content of whole brick. (MADE GROUND).	2
	2.50	B		2.60	118.90		End of pit at 2.60 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP41

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30845.00 - 18755.00
Level: 122.40Date
05/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.30Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	122.30		Grass over brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
	0.35			0.35	122.05		Red very sandy very gravelly CLAY. Gravel is fine to coarse subangular to rounded limestone and sandstone gravel. Moderate brick content. (MADE GROUND).	
	0.75			0.75	121.65		Black slightly sandy very gravelly CLAY. Gravel is fine to coarse mudstone, coal and brick. Moderate content of whole brick. (MADE GROUND).	
	1.00	B		1.00	120.90		Black sandy very clayey GRAVEL. Gravel is fine to coarse mudstone, coal and brick. Low content of whole brick. (MADE GROUND).	1
	1.50			1.50	120.90		Black slightly sandy very gravelly CLAY. Gravel is fine to coarse mudstone, coal and brick. (MADE GROUND).	2
	2.20	B		2.20	119.10			3
	3.30			3.30	119.10		End of pit at 3.30 m	4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP42

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30775.00 - 18775.00

Level: 119.60

Date

05/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
2.60Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	119.50		Grass over brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
	0.40			0.40	119.20		Red very sandy very gravelly CLAY. Gravel is fine to coarse subangular to rounded limestone and sandstone gravel. Moderate brick content. (MADE GROUND). Dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Regular timber fragments. (MADE GROUND).	
	0.70	ES						1
	1.50	B					HV - 46/65/55	
	1.70			1.70	117.90		Dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Regular timber fragments. (MADE GROUND).	2
	2.40	B						
	2.60			2.60	117.00		End of pit at 2.60 m	3
								4
								5

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Trial Pit Log

Trialpit No

TP43

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101Co-ords: 30870.00 - 18790.00
Level: 121.10Date
05/02/2019

Location: South Derbyshire

Dimensions
(m):Depth
3.10Scale
1:25Logged
LD

Client: Harworths

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.25	120.85		Grass over brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
	0.60	B					Dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Regular timber fragments and whole bricks. (MADE GROUND).	
	2.70	B		3.10	118.00			
							Heavy groundwater flow	
							End of pit at 3.10 m	

Remarks: 1. Area scanned with CAT prior to excavation. 2. Soils logged to BS8590:2015. 3. Backfilled with arisings upon completion.

Stability:





Borehole Log

Borehole No.

WS01

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31255.00 - 18590.00

Hole Type
BH

Location: South Derbyshire

Level: 131.50

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	131.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.80	ES					Firm to stiff black mottled grey, orange and yellow very sandy gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal, concrete and mudstone. ANGULAR COAL/ MUDSTONE GRAVEL 1.9 - 2.1 AND 4.2 - 4.3 (MADE GROUND).	1
		1.00		N=11 (2,2/3,2,3,3)					
		1.50	D						
		2.00		N=6 (3,2/1,1,2,2)					2
		3.00							
		3.00	D	N=15 (2,2/3,3,5,4)					3
		4.00		N=10 (3,2/2,3,4,1)					4
		5.00		N=16 (2,3/3,4,4,5)					5
		5.45			5.45	126.05		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS02

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31180.00 - 18555.00

Hole Type
BH

Location: South Derbyshire

Level: 129.50

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	129.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Black to light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and brick. (MADE GROUND).	1
		1.00	ES	N=11 (2,2/2,3,4,2)					
		2.00		N=23 (2,2/3,5,7,8)					2
		2.50			2.50	127.00		Yellow sandy coarse angular sandstone GRAVEL. (MADE GROUND).	
		2.60			2.60	126.90		Dark to light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and brick. (MADE GROUND).	3
		3.00	D	N=15 (2,2/3,3,4,5)					
		3.70			3.70	125.80		Black fine to coarse angular coal GRAVEL. (MADE GROUND).	
		3.90	D	N=18 (4,4/5,4,5,4)		125.60		Dark to light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and brick. (MADE GROUND).	4
		5.00		N=18 (5,5/5,5,3,5)					5
		5.45			5.45	124.05		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS03

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31225.00 - 18650.00

Hole Type
BH

Location: South Derbyshire

Level: 131.75

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		1.00 1.00	ES	N=6 (1,1/1,1,2,2)	2.30	129.45		Firm to stiff black mottled grey, orange and yellow very sandy gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal, concrete and mudstone. (MADE GROUND).	1
		2.00 2.00	D	N=30 (1,3/2,6,8,14)					2
		3.00		N=20 (5,5/6,5,5,4)					3
		4.00 4.00	D	N=10 (2,1/3,2,2,3)				Black to grey very clayey GRAVEL. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber inclusions. (MADE GROUND).	4
		5.00			5.45	126.30			5
								End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS04

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31145.00 - 18660.00

Hole Type
BH

Location: South Derbyshire

Level: 128.80

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	128.60		Grass over red gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.60	ES					Black to light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Occasional timber inclusions. (MADE GROUND).	1
		1.00	D	N=17 (3,4/4,4,5,4)	1.30	127.50		Black to light grey slightly sandy clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Occasional timber inclusions. (MADE GROUND).	2
		2.00	B	N=11 (3,2/2,3,2,4)					
		2.00 - 3.00							
		3.00		N=26 (3,2/3,6,12,5)					3
		4.00		N=13 (4,4/5,3,2,3)	4.00	124.80		Black to light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Occasional timber inclusions. (MADE GROUND).	4
		4.50	D						
		5.00		N=12 (3,3/2,2,4,4)					5
					5.45	123.35		End of borehole at 5.45 m	6

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS05

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31160.00 - 18725.00

Hole Type
BH

Location: South Derbyshire

Level: 127.50

Scale
1:50

Client: Harworths

Dates: 04/02/2019 - 04/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	127.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Firm to stiff black mottled grey, orange and yellow very sandy gravelly CLAY. Gravel is fine to coarse angular to subangular brick, coal, concrete and mudstone. (MADE GROUND).	1
		0.50	ES						
		1.00		N=7 (2,2/1,2,2,2)					
		2.00	D						
		2.00		N=7 (1,0/1,2,2,2)					
		3.00		N=3 (1,2/1,0,1,1)	3.00	124.50			
		4.00		N=20 (2,3/4,5,5,6)				Black to grey very clayey GRAVEL. Gravel is fine to coarse subangular to angular mudstone, coal and brick. Occasional timber inclusions. (MADE GROUND).	3
		4.00 - 5.00	B						
		5.00		N=15 (3,6/6,3,3,3)					
					5.45	122.05		End of borehole at 5.45 m	5
									6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS06

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31045.00 - 18655.00

Hole Type
BH

Location: South Derbyshire

Level: 126.70

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 05/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	126.60		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.50	ES					Dark to light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and brick. (MADE GROUND).	
		1.00		N=14 (6,5/4,3,3,4)	1.00	125.70		Black clayey very gravelly SAND. Gravel is fine to coarse angular coal and dark grey mudstone. (MADE GROUND).	1
		1.00 - 1.50	B					Dark to light grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and brick. (MADE GROUND).	
		2.00		N=15 (2,2/4,4,3,4)	1.50	125.20			2
		2.50	D						
		3.00		50 (2,6/50 for 185mm)	3.00	123.70		End of borehole at 3.00 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS07

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31045.00 - 18740.00

Hole Type
BH

Location: South Derbyshire

Level: 125.00

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 05/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	124.80		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	1
		1.00		N=8 (1,3/2,2,2,2)				Dark grey mottled brown and black sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Rare timber fragments. (MADE GROUND).	2
		2.00		N=13 (4,3/3,3,3,4)	2.10	122.90		Grey to dark grey slightly sandy very clayey GRAVEL. Gravel is fine to coarse angular mudstone, coal and brick. Moderate timber fragments. (MADE GROUND).	3
		3.00		N=8 (1,2/1,2,2,3)					4
		4.00		N=12 (1,0/1,3,5,3)					5
		5.00		N=5 (3,2/2,1,1,1)	5.45	119.55		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS08

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30965.00 - 18645.00

Hole Type
BH

Location: South Derbyshire

Level: 126.50

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 05/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	126.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.50	ES					Light brown to yellow mottled grey and black slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).	
		1.00		N=12 (4,4/3,3,3,3)	0.80	125.70		Dark grey to black very sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).	1
		2.00	D	N=4 (1,1/1,1,1,1)					2
		2.00			2.50	124.00		Grey to light grey very sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).	3
		3.00	D	N=9 (1,2/1,1,2,5)					4
		4.00		N=3 (1,1/0,1,1,1)					5
		5.00		N=8 (1,2/4,1,1,2)					6
					5.45	121.05		End of borehole at 5.45 m	7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS09

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30950.00 - 18750.00

Hole Type
BH

Location: South Derbyshire

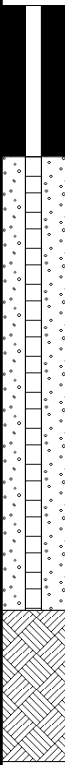
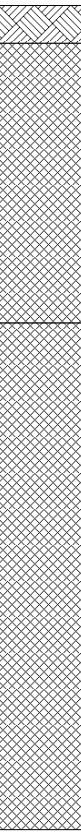
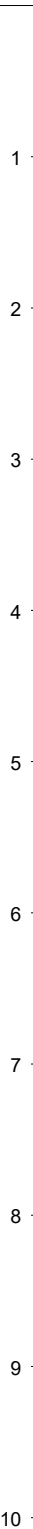
Level: 123.80

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 05/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25			0.25	123.55		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL). Black clayey GRAVEL. Gravel is fine to coarse angular mudstone and coal. (MADE GROUND). Light grey mottled orange and black very gravelly CLAY. Gravel is fine to coarse angular mudstone and coal. (MADE GROUND).	
		1.00 1.10	ES	N=7 (4,3/2,2,1,2)					
		2.00		N=5 (1,0/1,0,2,2)	2.10	121.70			
		2.90 3.00	D	N=5 (1,1/1,1,1,2)					
		4.00 4.00	D	N=22 (1,2/3,4,7,8)					
					5.45	118.35		End of borehole at 5.00 m	

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS10

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30890.00 - 18670.00

Hole Type
BH

Location: South Derbyshire

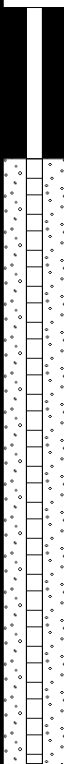
Level: 124.50

Scale
1:50

Client: Harworths

Dates: 05/02/2019 - 05/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.10			0.10	124.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	1		
		1.00 1.00 - 2.00	B	N=7 (3,2/2,1,2,2)				Dark grey to black very sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).			
		2.00		N=4 (1,2/1,1,1,1)	2.20	122.30		Grey to light grey very sandy very clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).	2		
		3.00 3.00 - 4.00	B	N=9 (2,2/2,3,2,2)					3		
		4.00		N=11 (1,1/2,2,3,4)					4		
		5.00		N=11 (1,2/3,2,3,3)	5.00	119.50			5		
		----- End of borehole at 5.45 m									6
											7
											8
											9
									10		

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS11

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 125.30

Scale
1:50

Client: Harworths

Dates: 06/02/2019 - 06/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10	125.20		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	1
		1.00		N=13 (2,3/4,3,3,3)	0.80	124.50		Firm dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse sub angular to angular mudstone, brick and coal. Occasional rootlets and plastic. (MADE GROUND).	
		2.00		N=2 (1,0/0,0,1,1)	2.10	123.20		Dark grey clayey fine to coarse sub rounded to angular GRAVEL of mudstone, sandstone, brick and coal. (MADE GROUND).	
		2.50	D					Soft light grey sandy gravelly CLAY. Gravel is fine to medium sub angular to angular of mudstone, brick and coal. (MADE GROUND).	
		3.00		N=3 (0,0/0,1,1,1)					
					4.00	121.30		End of borehole at 4.00 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS12

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 120.00

Scale
1:50

Client: Harworths

Dates: 06/02/2019 - 06/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	119.90		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.50	ES					Firm reddy brown grey slightly sandy very gravelly CLAY. Gravel is fine to coarse sub angular to angular of mudstone, sandstone, brick and coal. (MADE GROUND).	
		1.00		N=13 (1,1/2,2,4,5)	1.00	119.00		Soft to firm medium to dark grey sandy very gravelly CLAY. Gravel is fine to coarse sub angular to angular of mudstone, sandstone, brick and coal. (MADE GROUND).	1
		1.20	D						
		2.00		N=5 (2,1/1,2,1,1)					2
		3.00		N=1 (1,1/0,0,0,1)					3
		3.20	D						
		4.00		N=17 (2,2/3,4,4,6)					4
		5.00		N=24 (3,4/5,6,6,7)					5
		5.45			5.45	114.55		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS13

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 120.50

Scale
1:50

Client: Harworths

Dates: 06/02/2019 - 06/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=40 (5,5/14,15,4,7)	0.10	120.40		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	1
		0.50			0.70	119.80		Light grey sandy slightly gravelly CLAY. Gravel is fine to medium subrounded to subangular mudstone and brick. Rare timber inclusions. (MADE GROUND).	
		1.00						Dark grey to black sandy slightly clayey GRAVEL. Gravel is fine to coarse subrounded to angular mudstone, brick and coal. Occasional timber.(MADE GROUND).	
		2.00	D	N=26 (1,3/3,6,10,7)					2
		2.80			2.80	117.70			
		3.00			3.00	117.50		Grey sandy gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (MADE GROUND).	
		3.40			3.40	117.10		Dark grey to black sandy slightly clayey GRAVEL. Gravel is fine to coarse subrounded to angular mudstone, brick and coal. Occasional timber.(MADE GROUND).	
		3.60			3.60	116.90		Grey sandy gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (MADE GROUND).	
		4.00						Light grey sandy slightly clayey GRAVEL. Gravel is fine to coarse subrounded to angular mudstone. (MADE GROUND).	
		5.00			5.00	115.50			

End of borehole at 5.45 m

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS14

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 121.80

Scale
1:50

Client: Harworths

Dates: 06/02/2019 - 06/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15			0.15	121.65		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.50	ES					Dark grey mottled slightly sandy gravelly CLAY. Gravel is subrounded to angular fine to coarse mudstone, brick, ceramics and coal. (MADE GROUND).	1
		1.00		N=21 (3,4/6,5,4,6)	1.00	120.80		Dark grey to black clayey GRAVEL. Gravel is fine to coarse subangular mudstone and coal. Timber throughout. (MADE GROUND).	2
		2.00		N=3 (2,1/1,0,1,1)					
		3.00		N=28 (3,6/6,8,6,8)	3.00	118.80		Grey slightly sandy gravelly CLAY. Gravel is fine to medium subrounded to angular mudstone and coal. (MADE GROUND).	3
		3.50	D						
		4.00		N=27 (5,6/8,6,4,9)	3.90	117.90		Light grey sandy slightly gravelly CLAY. Gravel is fine to medium subrounded to subangular mudstone. (MADE GROUND).	4
		5.00		N=17 (7,6/5,5,2,5)					5
		5.45			5.45	116.35		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS15

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 123.40

Scale
1:50

Client: Harworths

Dates: 06/02/2019 - 06/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	123.30		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
		0.80			0.80	122.60		Redish brown mottled grey slightly gravelly very sandy CLAY. Gravel is fine to coarse rounded to angular mudstone sandstone and coal. (MADE GROUND).	1
		1.00		N=13 (5,4/3,3,3,4)				Dark grey to black slightly sandy very gravelly CLAY. Gravel is fine to coarse subrounded to angular mudstone and coal. (MADE GROUND).	
		2.00		N=3 (2,1/1,1,0,1)	2.00	121.40		Dark grey to black sandy slightly clayey GRAVEL. Gravel is fine to coarse subrounded to angular mudstone and coal. (MADE GROUND).	2
		3.00		N=5 (1,1/1,1,1,2)					3
		4.00		N=7 (1,0/0,0,3,4)	4.10	119.30		Dark grey to black slightly sandy very gravelly CLAY. Gravel is fine to coarse subrounded to angular mudstone and coal. (MADE GROUND).	4
		5.00		N=4 (1,1/1,1,1,1)					5
		5.45			5.45	117.95		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS16

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 120.50

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	120.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.50	ES		0.60	119.90		Dark grey mottled orange slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, brick and coal. (MADE GROUND).	
		1.00		N=7 (1,1/1,2,1,3)				Grey to dark grey slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to subangular mudstone and brick. (MADE GROUND).	1
		1.70	D		1.50	119.00		Dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone. (MADE GROUND).	
		2.00		N=7 (3,2/2,1,2,2)					2
		3.00		N=31 (4,3/4,7,8,12)					3
		3.70	D						
		4.00		N=19 (9,5/5,5,4,5)					4
								End of borehole at 4.00 m	
		5.00		N=9 (8,8/1,2,3,3)					5
					5.45	115.05			6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS17

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31140.00 - 18775.00

Hole Type
BH

Location: South Derbyshire

Level: 126.80

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10	126.70		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
					0.40	126.40		Light grey sandy slightly gravelly CLAY. Gravel is fine to medium subrounded to subangular mudstone and brick. Rare timber inclusions. (MADE GROUND).	
		1.00		N=6 (3,1/2,1,1,2)	1.00	125.80		Dark grey slightly clayey GRAVEL. Gravel is fine to coarse subangular to angular coal, brick and mudstone. (MADE GROUND).	1
		1.50	D					Dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).	
		2.00		N=8 (1,1/1,2,2,3)					2
		3.00		N=5 (3,3/2,1,1,1)	3.10	123.70		Dark grey slightly very clayey GRAVEL. Gravel is fine to coarse subangular to angular coal, brick and mudstone. (MADE GROUND).	3
		4.00		N=2 (1,0/0,1,0,1)					4
		5.00		N=21 (2,2/2,8,6,5)					5
					5.45	121.35		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS18

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31175.00 - 18820.00

Hole Type
BH

Location: South Derbyshire

Level: 129.00

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	128.90		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
		0.50	ES					Dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).	1
		1.00		N=8 (2,2/2,3,2,1)					
		2.00		N=6 (1,2/2,1,1,2)					2
		3.00		N=8 (2,2/2,3,2,1)	2.80	126.20		Light grey slightly clayey gravelly SAND. Gravel is fine to coarse mudstone and coal. (MADE GROUND).	3
		3.50	D		3.40	125.60		Dark grey very gravelly CLAY. Gravel is fine to coarse subangular to angular mudstone and coal. Occasional timber inclusions. (MADE GROUND).	
		4.00		N=8 (2,3/3,1,1,3)	3.80	125.20		Light grey slightly clayey gravelly SAND. Gravel is fine to coarse mudstone and coal. (MADE GROUND).	4
		5.00		N=6 (2,2/1,1,2,2)					5
		5.45			5.45	123.55		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS19

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31040.00 - 18865.00

Hole Type
BH

Location: South Derbyshire

Level: 125.50

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	125.40		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		0.50	ES					Dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, coal and brick. Regular timber fragments. (MADE GROUND).	1
		1.00		N=7 (3,3/2,2,2,1)					
		2.00	D						2
		2.00		N=8 (2,2/2,1,2,3)					
		2.45			2.45	123.05		Dark grey slightly silty fine to coarse angular mudstone GRAVEL. (MADE GROUND).	
		2.60			2.60	122.90		Light grey mottled brown and light brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular sandstone and mudstone. (MADE GROUND).	3
		3.00		N=8 (1,1/2,1,2,3)					
		4.00	D						4
		4.00		N=19 (2,2/3,4,6,6)					
		5.00		N=22 (5,4/6,6,5,5)					5
		5.45			5.45	120.05		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS20

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 31060.00 - 18940.00

Hole Type
BH

Location: South Derbyshire

Level: 126.30

Scale
1:50

Client: Harworths

Dates: 07/02/2019 - 07/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=10 (3,3/2,3,3,2)	0.10	126.20		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	1
		0.40			0.70	125.60		Dark grey mottled brown very gravelly CLAY. Gravel is fine to coarse subangular to angular mudstone, brick, sandstone and coal. (MADE GROUND).	
		1.00			1.60	124.70		Dark to light grey slightly sandy clayey GRAVEL. Gravel is fine to coarse subrounded to angular mudstone, coal and brick. (MADE GROUND).	
		2.00	D	N=1 (2,1/0,0,1,0)	2.00	124.30		Dark grey mottled brown very gravelly CLAY. Gravel is fine to coarse subangular to angular mudstone, brick, sandstone and coal. (MADE GROUND).	2
		2.40			2.40	123.90		Dark to light grey slightly sandy clayey GRAVEL. Gravel is fine to coarse subrounded to angular mudstone, coal and brick. (MADE GROUND).	
		3.00			3.00			Dark grey mottled brown very gravelly CLAY. Gravel is fine to coarse subangular to angular mudstone, brick, sandstone and coal. (MADE GROUND).	
		3.50			3.50				
		4.00			4.00				
		5.00			5.00				
		5.45		N=11 (2,3/3,2,3,3)	5.45	120.85		End of borehole at 5.45 m	5

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS21

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30965.00 - 18920.00

Hole Type
BH

Location: South Derbyshire

Level: 124.00

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By
ES

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	123.90		Grass over dark brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL). Grey slightly sandy very gravelly CLAY. Gravel is fine to coarse subangular to angular brick, coal and mudstone. (MADE GROUND).	1
		0.50	ES						
		1.00		N=9 (2,2/2,3,2,2)					
		1.30			1.30	122.70		Dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to angular coal and mudstone. (MADE GROUND).	
		2.00		N=10 (2,3/3,2,3,2)	2.00	122.00		Dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse subangular to angular coal and mudstone. (MADE GROUND).	2
		2.10	D		2.30	121.70		Dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse subangular to angular brick, coal and mudstone. (MADE GROUND).	
		3.00		N=10 (1,2/2,3,2,3)	2.80	121.20		Dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse subangular to angular coal and mudstone. (MADE GROUND).	3
		3.40	D						
		4.00		N=11 (1,1/1,3,4,3)					4
		5.00		N=17 (2,4/4,4,4,5)					5
					5.45	118.55		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS22

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: 30960.00 - 18830.00

Hole Type
BH

Location: South Derbyshire

Level: 123.30

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	123.20		Grass over brown gravelly CLAY. Gravel is fine to medium angular to subangular mudstone. (TOPSOIL).	
		1.00		N=9 (1,2/2,3,2,2)	1.00	122.30		Light to dark grey mottled black slightly sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone, coal and brick. Rare timber fragments. (MADE GROUND).	1
		1.20			1.20	122.10		Dark grey slightly clayey fine to coarse angular mudstone and coal GRAVEL. (MADE GROUND).	
		2.00		N=10 (2,2/2,3,2,3)	1.80	121.50		Light to dark grey mottled black slightly sandy very gravelly CLAY. Gravel is fine to coarse angular mudstone, coal and brick. Rare timber fragments. (MADE GROUND).	2
		3.00		N=6 (2,2/1,2,1,2)	2.80	120.50		Light to dark grey slightly sandy clayey GRAVEL. Gravel is fine to coarse angular to subangular mudstone, coal and brick. (MADE GROUND).	3
		4.00		N=0 (0,0/0,0,0,0)					4
		5.00		N=8 (2,2/3,2,1,2)					5
		5.45			5.45	117.85		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS23

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 133.50

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	133.30		Grass over brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
		1.00	ES	N=10 (1,2/2,3,2,3)	1.00			Light brown mottled grey slightly gravelly very sandy CLAY. Gravel is fine to medium angular to subangular mudstone and sandstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	1
		2.00		N=30 (4,6/8,8,7,7)	2.00	131.60		Black gravelly SILT. Gravel is fine to medium angular coal. (GRADE E PENNINE MIDDLE COAL MEASURES).	2
		2.70	D		2.70	131.00		Grey slightly gravelly very sandy CLAY. Gravel is fine to medium angular to subangular mudstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	3
		3.00		N=24 (2,7/4,7,6,7)	3.00	130.50		Black gravelly SILT. Gravel is fine to medium angular coal. (GRADE E PENNINE MIDDLE COAL MEASURES).	3
		3.30			3.30	130.20		Grey slightly gravelly very sandy CLAY. Gravel is fine to medium angular to subangular mudstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	4
		3.70	D		3.70			Grey slightly gravelly very sandy CLAY. Gravel is fine to medium angular to subangular mudstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	4
		4.00		50 (25 for 115mm/50 for 85mm)	4.00	129.50		Grey slightly gravelly very sandy CLAY. Gravel is fine to medium angular to subangular mudstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	4
								End of borehole at 4.00 m	
									5
									6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS24

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 132.50

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.15	132.35		Grass over brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
		0.70	D					Grey mottled orange slightly gravelly very sandy CLAY. Gravel is fine to medium angular to subangular mudstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	1
		1.00		N=14 (2,3/3,3,4,4)					
		1.80	D						
		2.00		N=35 (4,5/7,9,9,10)	2.00	130.50		Light grey very gravelly very sandy CLAY. Gravel is fine to coarse angular mudstone and siltstone. (GRADE E PENNINE LOWER COAL MEASURES).	2
		2.80	D						
		3.00		N=35 (5,5/8,9,9,9)					3
		4.00		N=45 (5,5/6,7,11,21)					4
		5.00		50 (5,7/50 for 175mm)					5
					5.45	127.05		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Borehole Log

Borehole No.

WS25

Sheet 1 of 1

Project Name: Woodville GI

Project No.
B067895.101

Co-ords: -

Hole Type
BH

Location: South Derbyshire

Level: 133.30

Scale
1:50

Client: Harworths

Dates: 08/02/2019 - 08/02/2019

Logged By
LD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25			0.25	133.05		Grass over brown gravelly CLAY. Gravel is fine to medium subangular to round sandstone and mudstone. (TOPSOIL).	
		0.50	ES					Light brown mottled grey slightly gravelly very sandy CLAY. Gravel is fine to medium angular to subangular mudstone and sandstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	
		1.00		N=6 (1,1/1,2,1,2)	1.00	132.30		Black gravelly SILT. Gravel is fine to medium angular coal. (GRADE E PENNINE MIDDLE COAL MEASURES).	1
		1.10	ES		1.30	132.00		Light brown mottled grey very gravelly very sandy CLAY. Gravel is fine to coarse angular to subangular sandstone. (GRADE E PENNINE MIDDLE COAL MEASURES).	2
		2.00	D	N=27 (2,6/6,6,7,8)					
		2.00							
		3.00	D	N=50 (5,5/50 for 295mm)					3
		3.00			3.45	129.85		End of borehole at 3.45 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. SPT's undertaken at 1m intervals. 2. Soils logged to BS8590:2015. 3. Installed with groundwater/gas monitoring well upon completion.





Lewis Doel
Curtins
Rose Wharf
Ground Floor
78-80 East Street
Leeds
LS9 8EE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

e: Lewis.Doel@curtins.com

Analytical Report Number : 19-29960

Replaces Analytical Report Number : 19-29960, issue no. 1

Project / Site name:	Woodville	Samples received on:	20/02/2019
Your job number:	67895	Samples instructed on:	20/02/2019
Your order number:	EBLE650	Analysis completed by:	22/07/2019
Report Issue Number:	2	Report issued on:	22/07/2019
Samples Analysed:	24 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 19-29960-2 Woodville 67895

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161499	1161500	1161501	1161502	1161503
Sample Reference				RC04	RC04	RC05	RC05	RC07
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				9.00-9.45	15.00-15.45	6.50-7.00	12.50-13.00	8.00-8.50
Date Sampled				24/01/2019	24/01/2019	28/01/2019	28/01/2019	30/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	16	9.0	12	17
Total mass of sample received	kg	0.001	NONE	0.32	0.40	0.41	0.43	0.44

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.9	6.7	6.7	6.9	5.6
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.72	1.2	0.53	1.1	1.8
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	717	1210	526	1140	1760
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	-	-

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	-

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161504	1161505	1161506	1161507	1161508
Sample Reference				RC07	RC08	RC08	RC09	RC09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				19.00-19.50	17.00-17.50	21.00-21.50	1.75-2.20	11.00-11.45
Date Sampled				30/01/2019	31/01/2019	31/01/2019	04/02/2019	04/02/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	11	13	14	11
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.44	0.39	0.40

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.6	6.9	6.9	7.3	7.3
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.55	0.58	0.31	0.90	0.31
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	548	580	313	896	311
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	-	-

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	-

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161509	1161510	1161511	1161512	1161513
Sample Reference				RC10	RC10	WS01	WS02	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				5.00-5.50	15.00-15.50	1.50	3.00	1.00
Date Sampled				05/02/2019	05/02/2019	04/02/2019	04/02/2019	04/02/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	6.0	13	15	13	12
Total mass of sample received	kg	0.001	NONE	0.43	0.38	0.56	0.52	0.56

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	7.4	6.6	6.7	6.9
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	0.447	0.274	0.991
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.56	0.59	2.1	0.99	2.7
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	564	594	2120	993	2710
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	17	23	32
Total Sulphur	%	0.005	MCERTS	-	-	0.388	0.240	0.690
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	290	160	500
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	150	78	250

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161514	1161515	1161516	1161517	1161518
Sample Reference				WS06	WS25	WS15	WS19	WS21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-1.50	2.00	3.50	4.00	3.40
Date Sampled				05/02/2019	08/02/2019	06/02/2019	07/02/2019	08/02/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	14	20	11	18
Total mass of sample received	kg	0.001	NONE	0.33	0.56	0.74	0.66	0.74

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	4.6	7.7	7.5	7.5
Total Sulphate as SO ₄	%	0.005	MCERTS	0.209	0.118	0.120	1.39	0.168
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.85	0.058	0.50	2.5	0.49
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	850	57.7	495	2520	485
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	56	2.5	43	56	170
Total Sulphur	%	0.005	MCERTS	0.586	0.042	0.682	1.11	0.128
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	75	11	65	220	94
Magnesium (leachate equivalent)	mg/l	2.5	NONE	38	5.5	33	110	47

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161519	1161520	1161521	1161522	
Sample Reference				WS09	WS11	WS13	WS16	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				2.90	2.50	2.90	1.70	
Date Sampled				05/02/2019	06/02/2019	06/02/2019	07/02/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	12	16	12	14	
Total mass of sample received	kg	0.001	NONE	0.64	0.87	0.74	0.87	

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	3.4	3.8	6.8	7.8	
Total Sulphate as SO ₄	%	0.005	MCERTS	0.848	0.943	0.409	0.074	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.5	2.4	1.8	0.32	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2520	2380	1820	324	
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	68	30	190	51	
Total Sulphur	%	0.005	MCERTS	1.06	0.482	0.378	0.301	
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	340	200	290	61	
Magnesium (leachate equivalent)	mg/l	2.5	NONE	170	100	150	31	

Analytical Report Number : 19-29960

Project / Site name: Woodville

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1161499	RC04	None Supplied	9.00-9.45	Grey clay.
1161500	RC04	None Supplied	15.00-15.45	Grey clay.
1161501	RC05	None Supplied	6.50-7.00	Grey clay.
1161502	RC05	None Supplied	12.50-13.00	Grey clay with gravel.
1161503	RC07	None Supplied	8.00-8.50	Grey clay.
1161504	RC07	None Supplied	19.00-19.50	Grey clay.
1161505	RC08	None Supplied	17.00-17.50	Grey clay.
1161506	RC08	None Supplied	21.00-21.50	Brown clay and sand.
1161507	RC09	None Supplied	1.75-2.20	Grey clay and sand.
1161508	RC09	None Supplied	11.00-11.45	Grey clay and sand with gravel.
1161509	RC10	None Supplied	5.00-5.50	Grey clay.
1161510	RC10	None Supplied	15.00-15.50	Grey clay and sand.
1161511	WS01	None Supplied	1.50	Grey clay.
1161512	WS02	None Supplied	3.00	Brown clay and sand with rubble.
1161513	WS04	None Supplied	1.00	Grey clay and sand.
1161514	WS06	None Supplied	1.00-1.50	Black sand.
1161515	WS25	None Supplied	2.00	Light brown clay.
1161516	WS15	None Supplied	3.50	Grey clay.
1161517	WS19	None Supplied	4.00	Grey clay with gravel and vegetation.
1161518	WS21	None Supplied	3.40	Brown clay with coal and brick.
1161519	WS09	None Supplied	2.90	Grey clay.
1161520	WS11	None Supplied	2.50	Light grey clay.
1161521	WS13	None Supplied	2.90	Grey clay.
1161522	WS16	None Supplied	1.70	Light grey clay.

Analytical Report Number : 19-29960

Project / Site name: Woodville

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests ^{***}	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Sample ID	Other ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
RC04		S	19-29960	1161499	c	pH in soil (automated)	L099-PL	c
RC04		S	19-29960	1161500	c	pH in soil (automated)	L099-PL	c



Classification Assessment Tool of Soil Wastes - Hazard Summary Sheet

Site Name	Woodville
Location	Woodville
Site ID	067895
Job Number	067895
Date	3/4/2019
User Name	russell.bowman@curtins.com
Company Name	Curtins Consulting Limited

Hole ID	Sample Depth	Hazardous Waste Y/N	HP1	HP2	HP3	HP4	HP5	HP6	HP7	HP8	HP9	HP10	HP11	HP12	HP13	HP14	HP15	HP16
TP34	0.30	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP32	0.45	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP42	0.70	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP01	3.00	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP19	0.50	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP12a	2.00	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP14	0.60	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP11	0.50	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP7	0.70	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP8	0.50	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP10	0.40	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS3	0.50	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS24	0.30	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP2	0.40	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP4	0.50	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP29	1.00	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP22	0.70	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No



4041

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Russell Bowman
 Site Name: Woodville
 Site Address: Not Given

SUMMARY REPORT

Summary of Moisture Content Test Results

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
 7 Woodshots Meadow
 Croxley Green Business Park
 Watford Herts WD18 8YS



Environmental Science

Client Reference: 19-27204
 Job Number: 19-27204
 Date Sampled: Not Given
 Date Received: 24/01/2019
 Date Tested: 09/02/2019
 Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC											
		Reference	Depth Top m	Depth Base m	Type														
1145830	RC101	Not Given	3.00	3.45	B	Grey slightly gravelly slightly sandy CLAY		25											
1145831	RC101	Not Given	6.00	6.45	B	Greyish brown slightly sandy gravelly CLAY		26											
1145832	RC101	Not Given	9.00	9.45	B	Mottled brown very gravelly CLAY with shale		12											
1145833	RC102	Not Given	2.50	2.95	B	Brown to grey CLAY		28											
1145834	RC103	Not Given	3.00	3.45	B	Brownish grey gravelly CLAY with coal		20											
1145835	RC103	Not Given	4.50	4.95	B	Grey slightly gravelly CLAY		18											
1145836	RC103	Not Given	7.55	8.00	B	Grey slightly gravelly CLAY		22											
1145837	RC103	Not Given	10.55	11.00	B	Dark grey gravelly CLAY		16											

Comments:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
 Date Reported: 15/02/2019

Signed: Darren Berrill
 Geotechnical General Manager

GF 099.10

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One Dimensional Consolidation Test

Tested in Accordance with: BS 1377-5: 1990: Clause 3

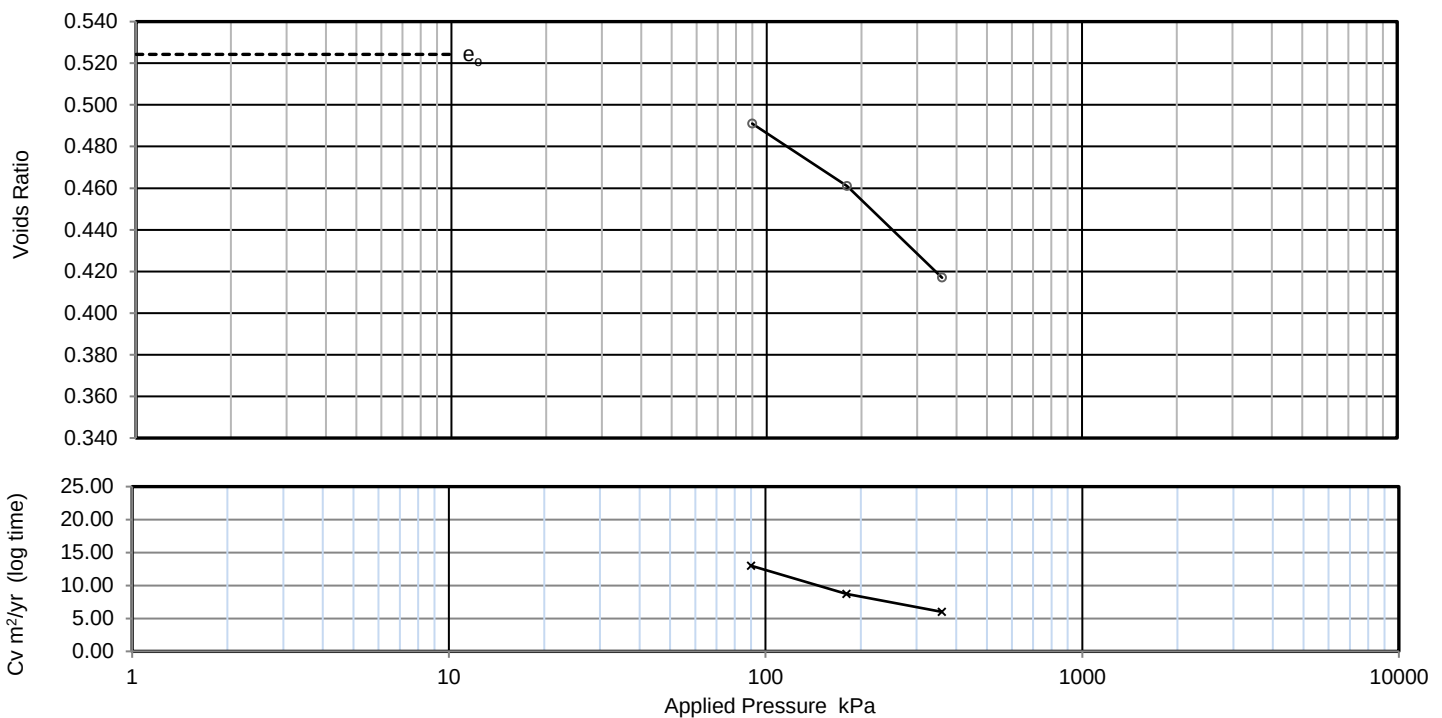
Client:	CURTINS
Client Address:	Rose Wharf, Ground Floor, 78-80 East Street, Leeds, LS9 8EE
Contact:	Russell Bowman
Site Name:	Woodville
Site Address:	Not Given

Client Reference: 19-27204
Job Number: 19-27204
Date Sampled: Not Given
Date Received: 24/01/2019
Date Tested: 04/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1145835
Hole No.: RC103
Sample Reference: Not Given
Sample Description: Grey slightly gravelly CLAY

Depth Top [m]: 4.50
Depth Base [m]: 4.95
Sample Type: B

[illegible]

Preparation

Index tests

Orientation of the sample

Particle density

Liquid limit

Plastic limit

Specimen details

Diameter

Height

Moisture Content

Bulk density

Dry density

Voids Ratio

Saturation

Avg. temperature for test

Swelling Pressure

Settlement on saturation

Vertical		
assumed	2.65	Mg/m3
N/A		%
N/A		%

Initial	Final	
50.10	-	mm
20.25	18.83	mm
18	19	%
2.05	2.23	Mg/m3
1.74	1.87	Mg/m3
0.524	0.417	
91	124	%
22.0		°C
Not measured		kPa
		%

Note: C_v corrected to 20°C

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 15/02/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 172.10

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4041

TEST CERTIFICATE**Unconsolidated Undrained****Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Environmental Science

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Russell Bowman
 Site Name: Woodville
 Site Address: Not Given

Client Reference: 19-27204
 Job Number: 19-27204
 Date Sampled: Not Given
 Date Received: 24/01/2019
 Date Tested: 09/02/2019
 Sampled By: Not Given

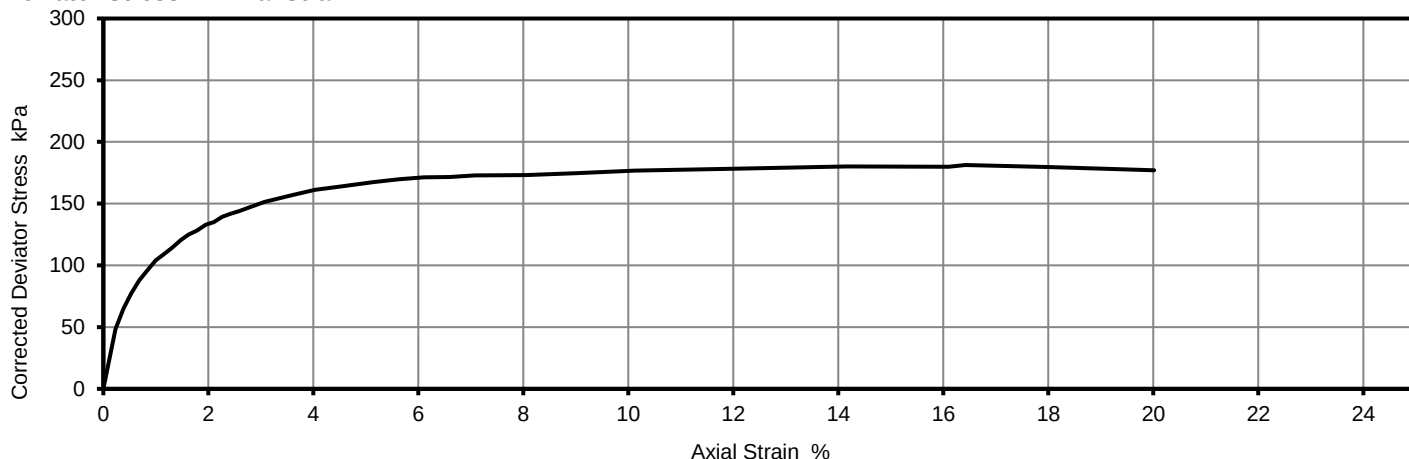
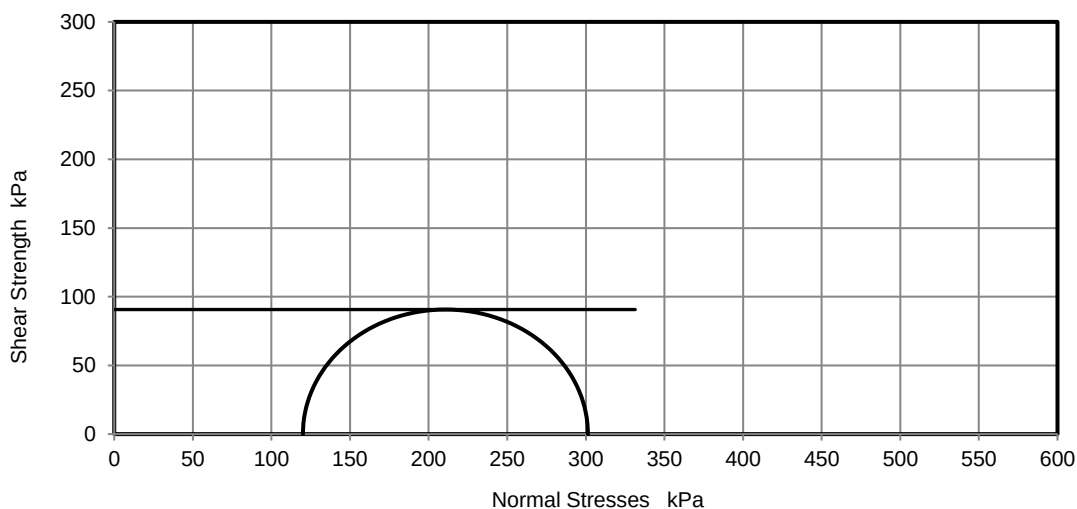
Test Result

Laboratory Reference: 1145831
 Hole No.: RC101
 Sample Reference: Not Given
 Sample Description: Greyish brown slightly sandy gravelly CLAY

Depth Top [m]: 6.00
 Depth Base [m]: 6.45
 Sample Type: B

Test Number	1
Length	205.65 mm
Diameter	102.51 mm
Bulk Density	1.98 Mg/m ³
Moisture Content	26 %
Dry Density	1.57 Mg/m ³
Membrane Correction	0.99 kPa

Rate of Strain	1.95 %/min
Cell Pressure	120 kPa
Axial Strain at failure	16.4 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	181 kPa
Undrained Shear Strength, c_u	91 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.31 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
 Date Reported: 15/02/2019

Darren Berrill
 Geotechnical General Manager

GF 184.6

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4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Environmental Science

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Russell Bowman
 Site Name: Woodville
 Site Address: Not Given

Client Reference: 19-27204
 Job Number: 19-27204
 Date Sampled: Not Given
 Date Received: 24/01/2019
 Date Tested: 09/02/2019
 Sampled By: Not Given

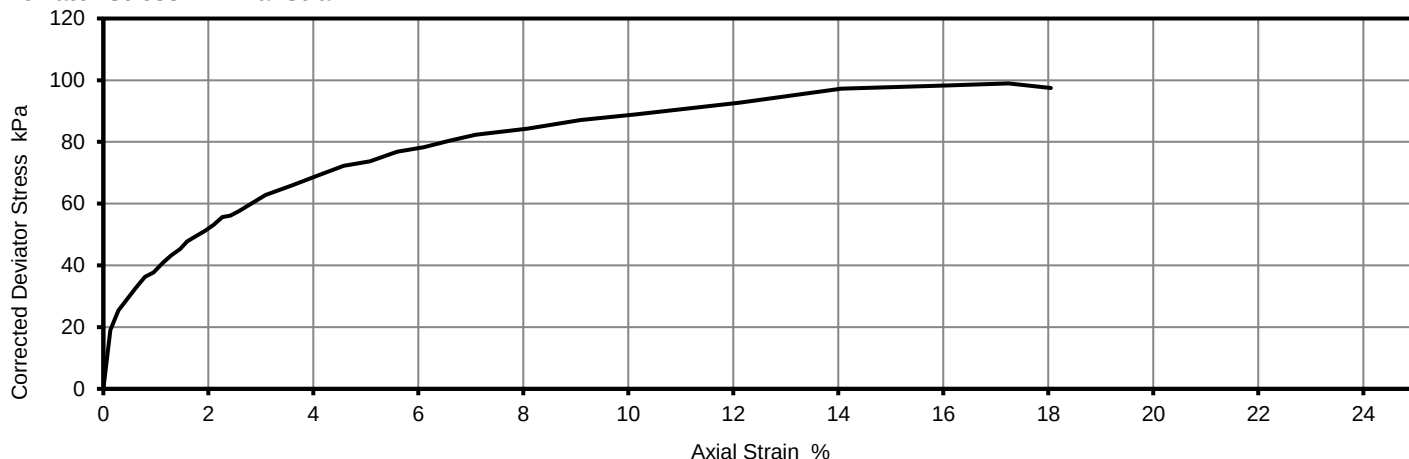
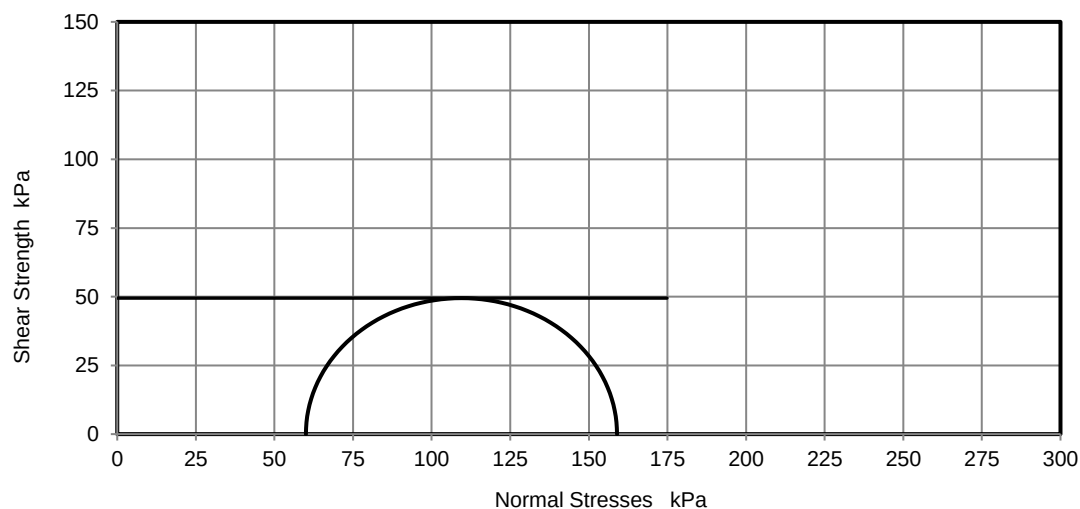
Test Result

Laboratory Reference: 1145834
 Hole No.: RC103
 Sample Reference: Not Given
 Sample Description: Brownish grey gravelly CLAY with coal

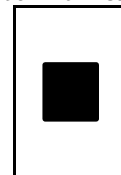
Depth Top [m]: 3.00
 Depth Base [m]: 3.45
 Sample Type: B

Test Number	1
Length	97.02 mm
Diameter	48.94 mm
Bulk Density	1.88 Mg/m ³
Moisture Content	20 %
Dry Density	1.57 Mg/m ³
Membrane Correction	2.22 kPa

Rate of Strain	2.00 %/min
Cell Pressure	60 kPa
Axial Strain at failure	17.2 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	99 kPa
Undrained Shear Strength, c_u	49 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Plastic
Membrane thickness	0.32 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks: Air void

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
 Date Reported: 15/02/2019

Signed: Darren Berrill
 Geotechnical General Manager

GF 184.6

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4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Environmental Science

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Russell Bowman
 Site Name: Woodville
 Site Address: Not Given

Client Reference: 19-27204
 Job Number: 19-27204
 Date Sampled: Not Given
 Date Received: 24/01/2019
 Date Tested: 09/02/2019
 Sampled By: Not Given

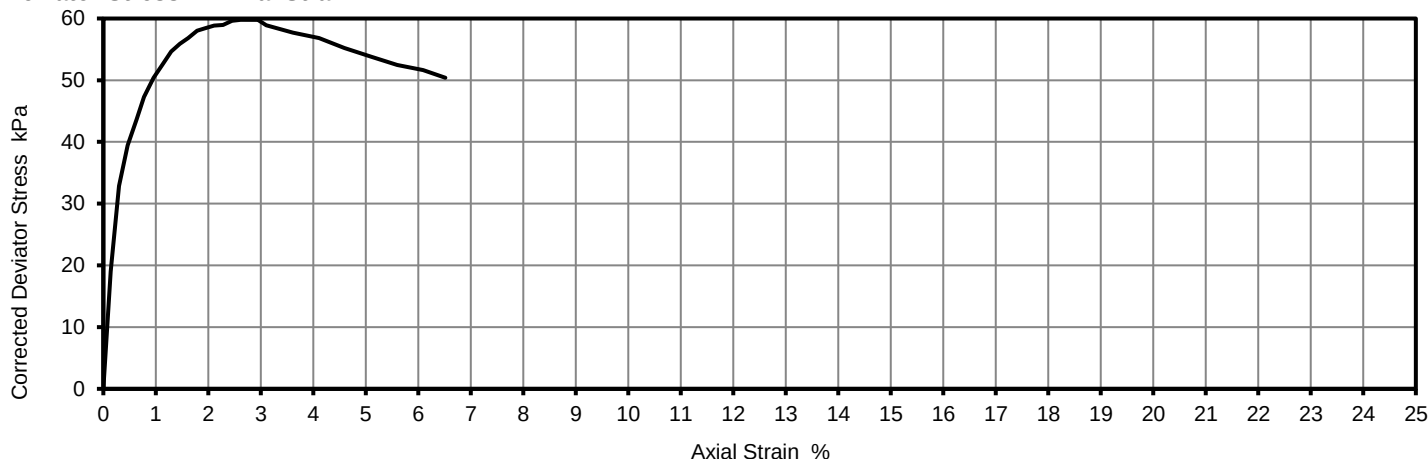
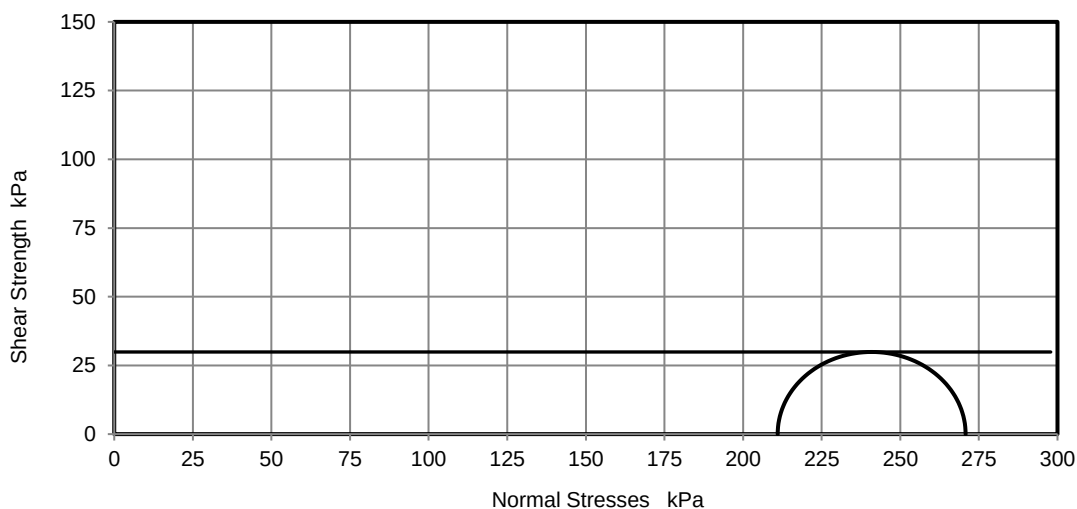
Test Result

Laboratory Reference: 1145837
 Hole No.: RC103
 Sample Reference: Not Given
 Sample Description: Dark grey gravelly CLAY

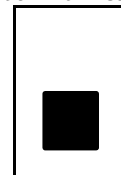
Depth Top [m]: 10.55
 Depth Base [m]: 11.00
 Sample Type: B

Test Number	1
Length	138.77 mm
Diameter	68.88 mm
Bulk Density	1.93 Mg/m ³
Moisture Content	16 %
Dry Density	1.66 Mg/m ³
Membrane Correction	0.39 kPa

Rate of Strain	2.00 %/min
Cell Pressure	211 kPa
Axial Strain at failure	2.9 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	60 kPa
Undrained Shear Strength, c_u	30 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Plastic
Membrane thickness	0.33 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks: Air void

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
 Date Reported: 15/02/2019

Signed: Darren Berrill
 Geotechnical General Manager

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Lewis Doel
Curtins
Rose Wharf
Ground Floor
78-80 East Street
Leeds
LS9 8EE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

e: Lewis.Doel@curtins.com

Analytical Report Number : 19-29960

Project / Site name:	Woodville	Samples received on:	20/02/2019
Your job number:	67895	Samples instructed on:	20/02/2019
Your order number:	EBLE650	Analysis completed by:	05/03/2019
Report Issue Number:	1	Report issued on:	05/03/2019
Samples Analysed:	24 soil samples		

Signed:

Marzena Babik
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161499	1161500	1161501	1161502	1161503
Sample Reference				RC04	RC04	RC05	RC05	RC07
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				9.00-9.45	15.00-15.45	6.50-7.00	12.50-13.00	8.00-8.50
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	16	9.0	12	17
Total mass of sample received	kg	0.001	NONE	0.32	0.40	0.41	0.43	0.44

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.9	6.7	6.7	6.9	5.6
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.72	1.2	0.53	1.1	1.8
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	717	1210	526	1140	1760
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	-	-

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	-

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161504	1161505	1161506	1161507	1161508
Sample Reference				RC07	RC08	RC08	RC09	RC09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				19.00-19.50	17.00-17.50	21.00-21.50	1.75-2.20	11.00-11.45
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	11	13	14	11
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.44	0.39	0.40

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.6	6.9	6.9	7.3	7.3
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.55	0.58	0.31	0.90	0.31
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	548	580	313	896	311
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	-	-

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	-

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161509	1161510	1161511	1161512	1161513
Sample Reference				RC10	RC10	WS1	WS2	WS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				5.00-5.50	15.00-15.50	1.50	3.00	1.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	6.0	13	15	13	12
Total mass of sample received	kg	0.001	NONE	0.43	0.38	0.56	0.52	0.56

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	7.4	6.6	6.7	6.9
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	0.447	0.274	0.991
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.56	0.59	2.1	0.99	2.7
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	564	594	2120	993	2710
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	17	23	32
Total Sulphur	%	0.005	MCERTS	-	-	0.388	0.240	0.690
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	290	160	500
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	150	78	250

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161514	1161515	1161516	1161517	1161518
Sample Reference				WS6	WS25	WS15	WS19	WS21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-1.50	2.00	3.50	4.00	3.40
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	14	20	11	18
Total mass of sample received	kg	0.001	NONE	0.33	0.56	0.74	0.66	0.74

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	4.6	7.7	7.5	7.5
Total Sulphate as SO ₄	%	0.005	MCERTS	0.209	0.118	0.120	1.39	0.168
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.85	0.058	0.50	2.5	0.49
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	850	57.7	495	2520	485
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	56	2.5	43	56	170
Total Sulphur	%	0.005	MCERTS	0.586	0.042	0.682	1.11	0.128
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	75	11	65	220	94
Magnesium (leachate equivalent)	mg/l	2.5	NONE	38	5.5	33	110	47

Analytical Report Number: 19-29960

Project / Site name: Woodville

Your Order No: EBLE650

Lab Sample Number				1161519	1161520	1161521	1161522	
Sample Reference				WS9	WS11	WS13	WS16	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				2.90	2.50	2.90	1.70	
Date Sampled				Deviating	Deviating	Deviating	Deviating	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	N/A	NONE	12	14
Total mass of sample received				kg	0.001	NONE	0.64	0.87

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	3.4	3.8	6.8	7.8	
Total Sulphate as SO ₄	%	0.005	MCERTS	0.848	0.943	0.409	0.074	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.5	2.4	1.8	0.32	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2520	2380	1820	324	
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	68	30	190	51	
Total Sulphur	%	0.005	MCERTS	1.06	0.482	0.378	0.301	
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	340	200	290	61	
Magnesium (leachate equivalent)	mg/l	2.5	NONE	170	100	150	31	

Analytical Report Number : 19-29960

Project / Site name: Woodville

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1161499	RC04	None Supplied	9.00-9.45	Grey clay.
1161500	RC04	None Supplied	15.00-15.45	Grey clay.
1161501	RC05	None Supplied	6.50-7.00	Grey clay.
1161502	RC05	None Supplied	12.50-13.00	Grey clay with gravel.
1161503	RC07	None Supplied	8.00-8.50	Grey clay.
1161504	RC07	None Supplied	19.00-19.50	Grey clay.
1161505	RC08	None Supplied	17.00-17.50	Grey clay.
1161506	RC08	None Supplied	21.00-21.50	Brown clay and sand.
1161507	RC09	None Supplied	1.75-2.20	Grey clay and sand.
1161508	RC09	None Supplied	11.00-11.45	Grey clay and sand with gravel.
1161509	RC10	None Supplied	5.00-5.50	Grey clay.
1161510	RC10	None Supplied	15.00-15.50	Grey clay and sand.
1161511	WS1	None Supplied	1.50	Grey clay.
1161512	WS2	None Supplied	3.00	Brown clay and sand with rubble.
1161513	WS4	None Supplied	1.00	Grey clay and sand.
1161514	WS6	None Supplied	1.00-1.50	Black sand.
1161515	WS25	None Supplied	2.00	Light brown clay.
1161516	WS15	None Supplied	3.50	Grey clay.
1161517	WS19	None Supplied	4.00	Grey clay with gravel and vegetation.
1161518	WS21	None Supplied	3.40	Brown clay with coal and brick.
1161519	WS9	None Supplied	2.90	Grey clay.
1161520	WS11	None Supplied	2.50	Light grey clay.
1161521	WS13	None Supplied	2.90	Grey clay.
1161522	WS16	None Supplied	1.70	Light grey clay.

Analytical Report Number : 19-29960

Project / Site name: Woodville

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests ^{***}	L038	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
RC04		S	19-29960	1161499	a			
RC04		S	19-29960	1161500	a			
RC05		S	19-29960	1161501	a			
RC05		S	19-29960	1161502	a			
RC07		S	19-29960	1161503	a			
RC07		S	19-29960	1161504	a			
RC08		S	19-29960	1161505	a			
RC08		S	19-29960	1161506	a			
RC09		S	19-29960	1161507	a			
RC09		S	19-29960	1161508	a			
RC10		S	19-29960	1161509	a			
RC10		S	19-29960	1161510	a			
WS1		S	19-29960	1161511	a			
WS11		S	19-29960	1161520	a			
WS13		S	19-29960	1161521	a			
WS15		S	19-29960	1161516	a			
WS16		S	19-29960	1161522	a			
WS19		S	19-29960	1161517	a			
WS2		S	19-29960	1161512	a			
WS21		S	19-29960	1161518	a			
WS25		S	19-29960	1161515	a			
WS4		S	19-29960	1161513	a			
WS6		S	19-29960	1161514	a			
WS9		S	19-29960	1161519	a			



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 26/02/2019
Sampled By: Not Given

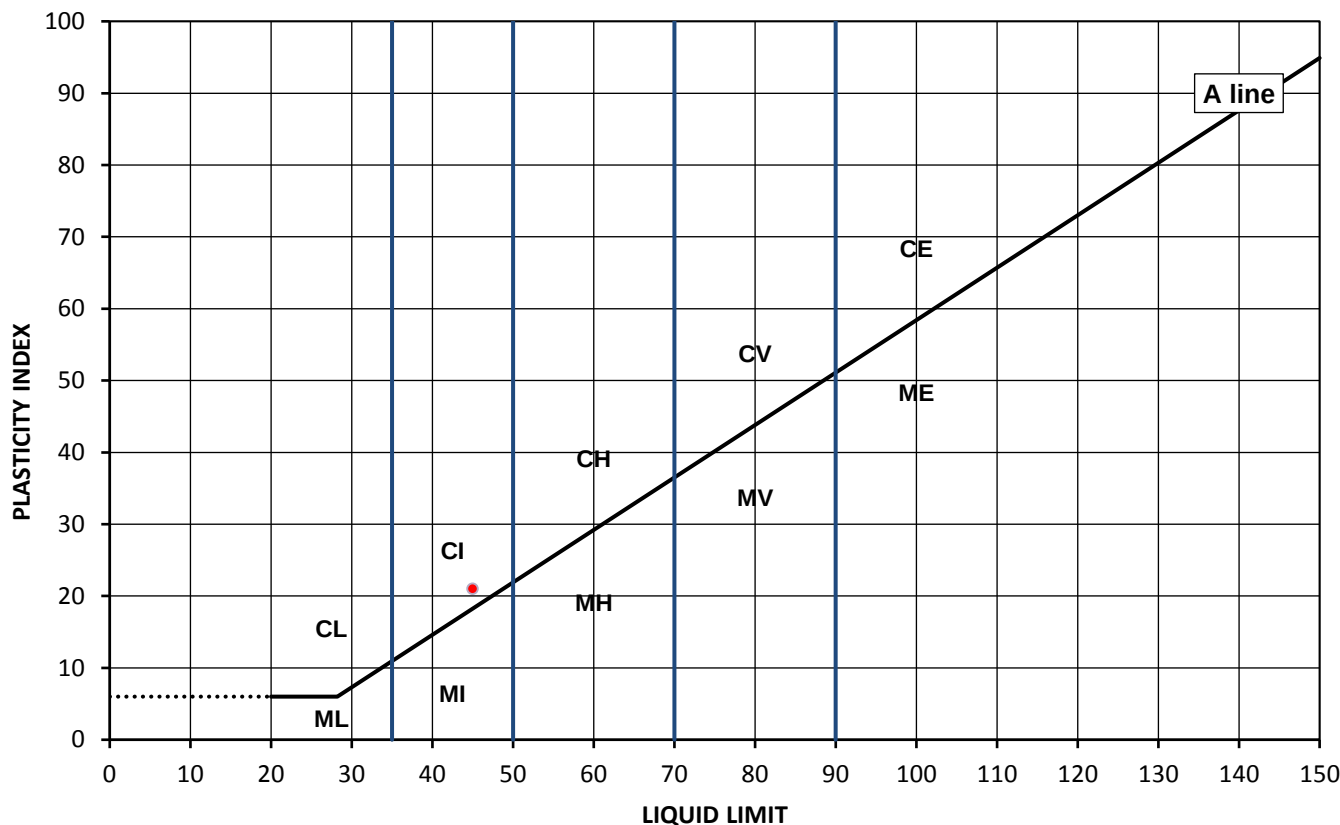
Test Results

Laboratory Reference: 1161422
Hole No.: RC04
Sample Reference: Not Given
Soil Description: Mottled grey slightly gravelly sandy CLAY

Depth Top [m]: 9.00
Depth Base [m]: 9.45
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	45	24	21	93



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 26/02/2019
Sampled By: Not Given

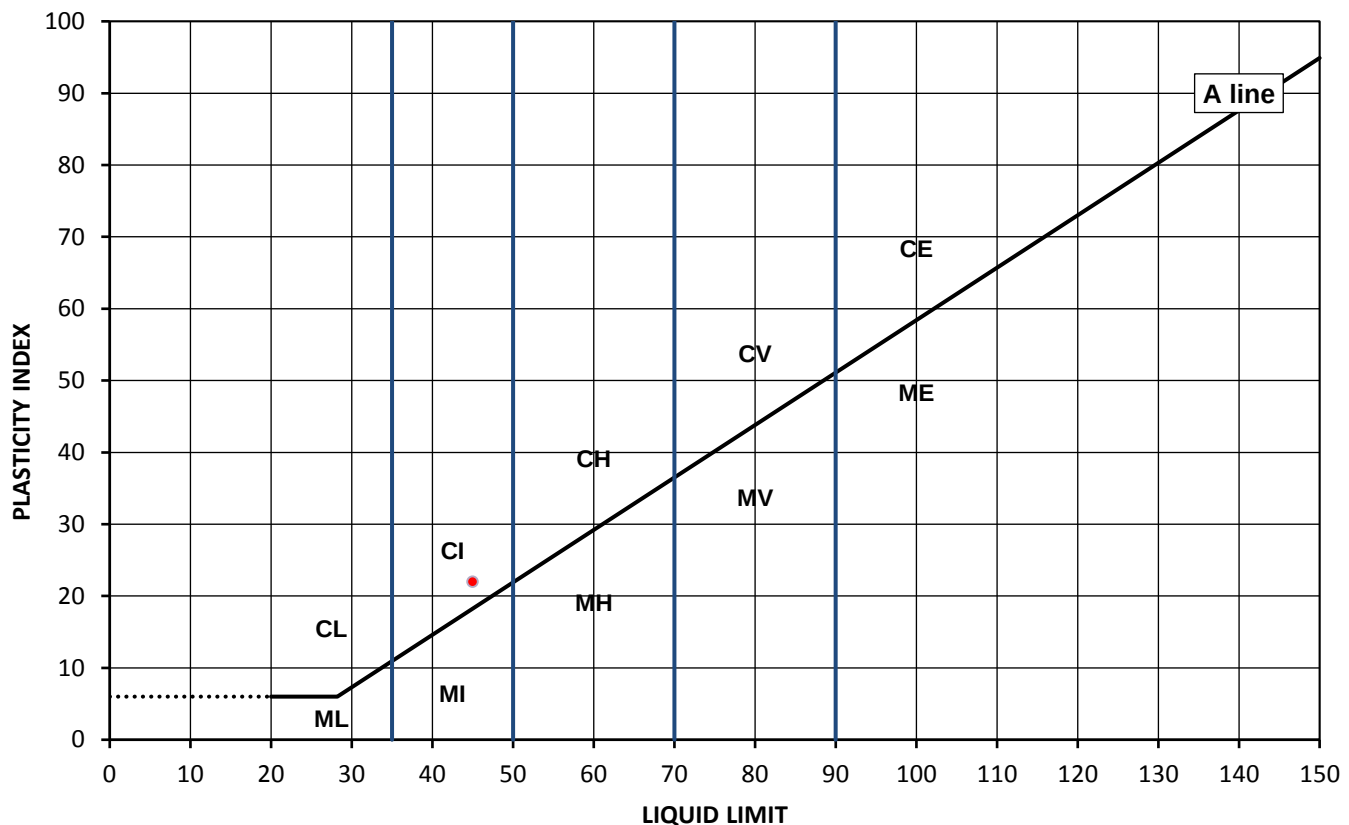
Test Results

Laboratory Reference: 1161424
Hole No.: RC05
Sample Reference: Not Given
Soil Description: Mottled grey slightly gravelly sandy CLAY

Depth Top [m]: 6.50
Depth Base [m]: 7.00
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	45	23	22	97



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	
M	Silt	
L	Low	below 35
I	Medium	35 to 50
H	High	50 to 70
V	Very high	70 to 90
E	Extremely high	exceeding 90
O	Organic	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 26/02/2019
Sampled By: Not Given

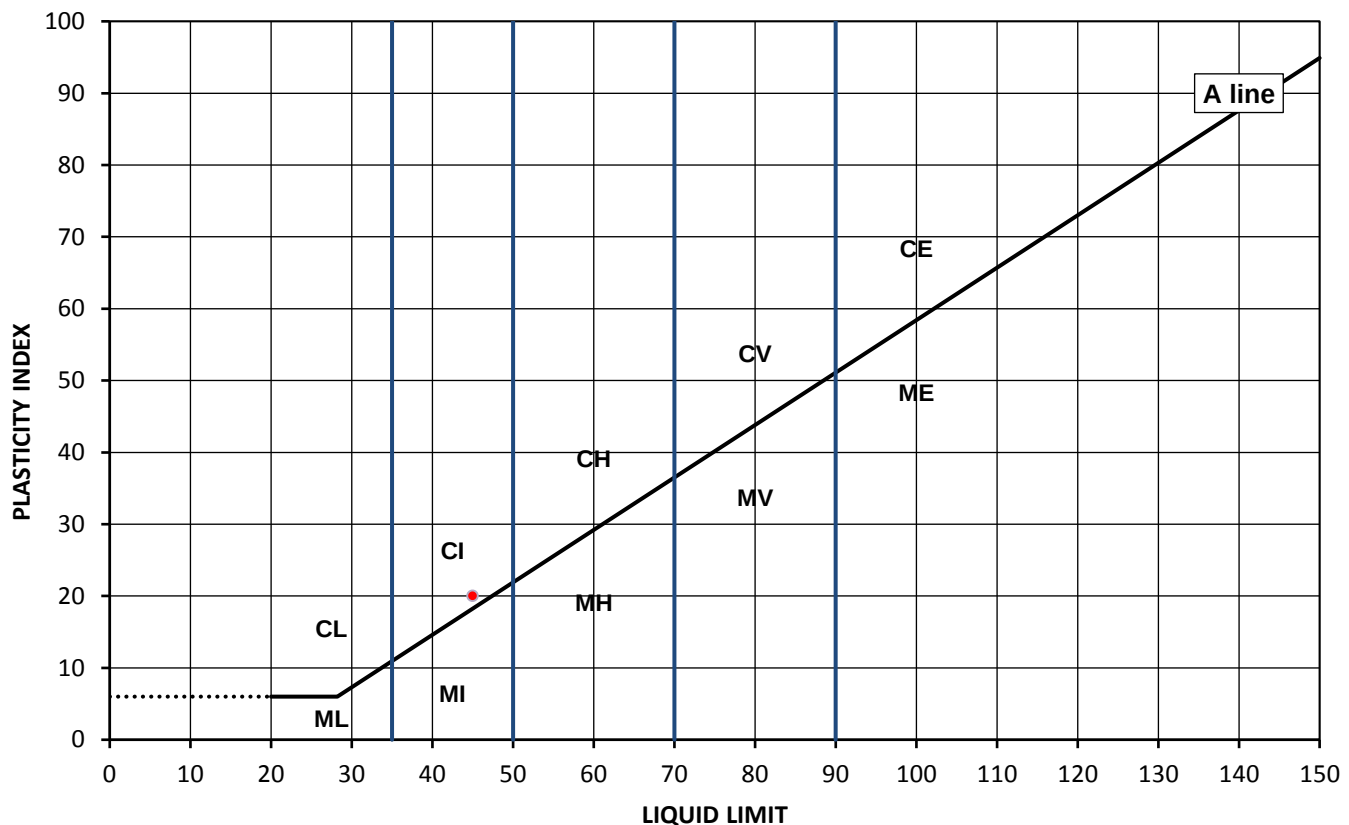
Test Results

Laboratory Reference: 1161426
Hole No.: RC07
Sample Reference: Not Given
Soil Description: Mottled grey slightly gravelly sandy CLAY

Depth Top [m]: 8.00
Depth Base [m]: 8.50
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
16	45	25	20	95



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C Clay	L Low	below 35
M Silt	I Medium	35 to 50
	H High	50 to 70
	V Very high	70 to 90
	E Extremely high	exceeding 90
Organic	O	append to classification for organic material (eg CHO)

Remarks:

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PL Geotechnical Laboratory Manager
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Darren Berrill
Geotechnical General Manager

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LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 26/02/2019
Sampled By: Not Given

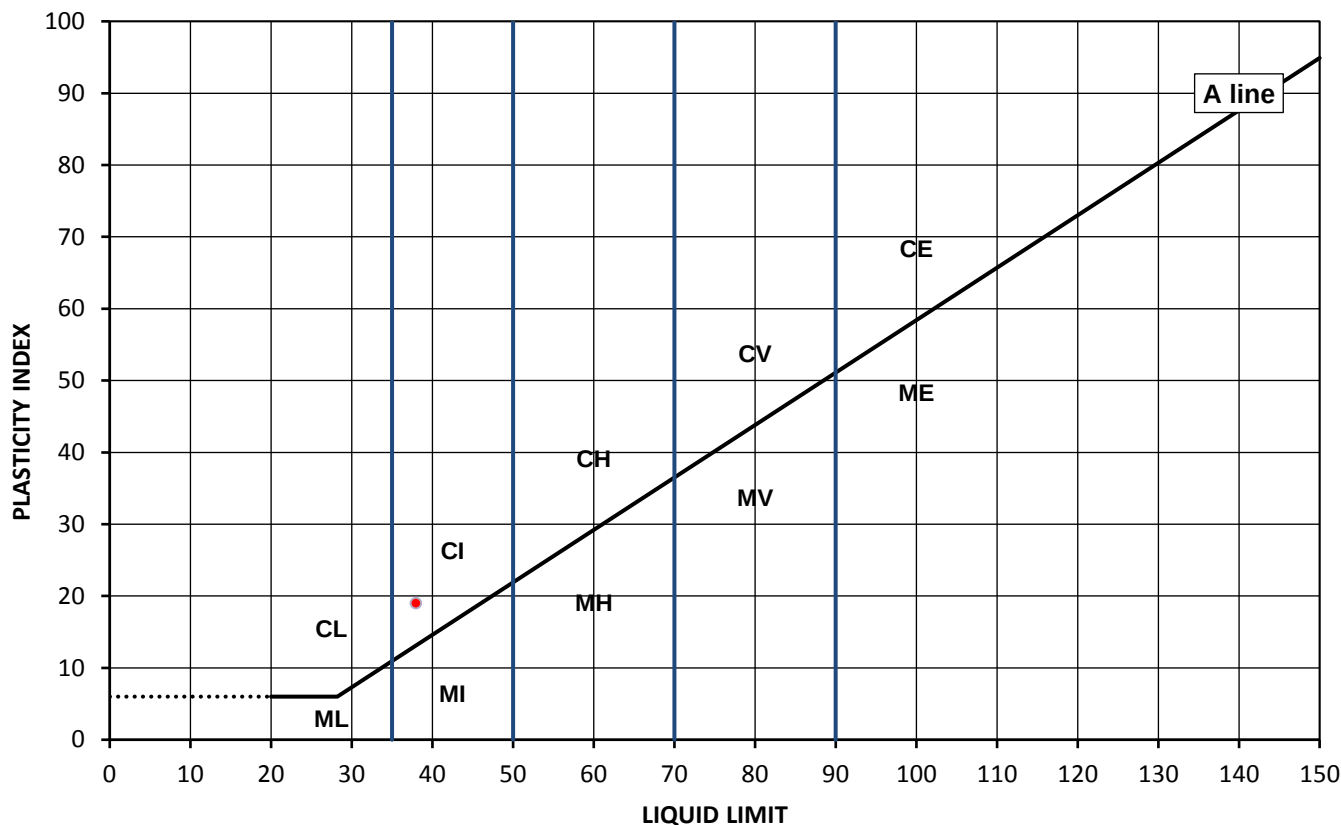
Test Results

Laboratory Reference: 1161431
Hole No.: RC09
Sample Reference: Not Given
Soil Description: Dark grey slightly gravelly sandy CLAY

Depth Top [m]: 11.00
Depth Base [m]: 11.45
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
13	38	19	19	84



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	L	Low	Liquid Limit	below 35
M	Silt		I	Medium		35 to 50
			H	High		50 to 70
			V	Very high		70 to 90
			E	Extremely high		exceeding 90
	Organic	O		append to classification for organic material (eg CHO)		

Remarks:

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PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 26/02/2019
Sampled By: Not Given

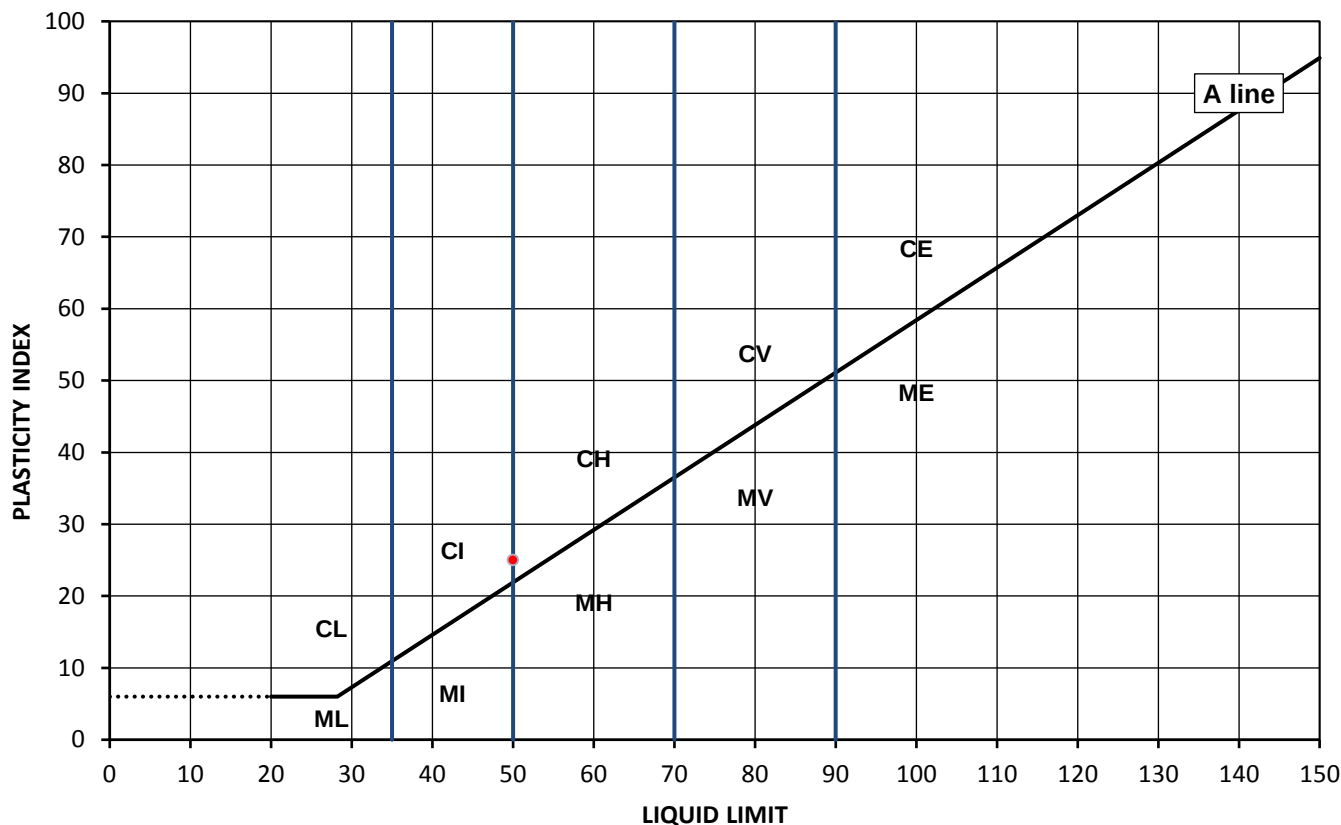
Test Results

Laboratory Reference: 1161432
Hole No.: RC10
Sample Reference: Not Given
Soil Description: Dark grey slightly gravelly slightly sandy CLAY

Depth Top [m]: 5.00
Depth Base [m]: 5.50
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	50	25	25	82



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

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LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

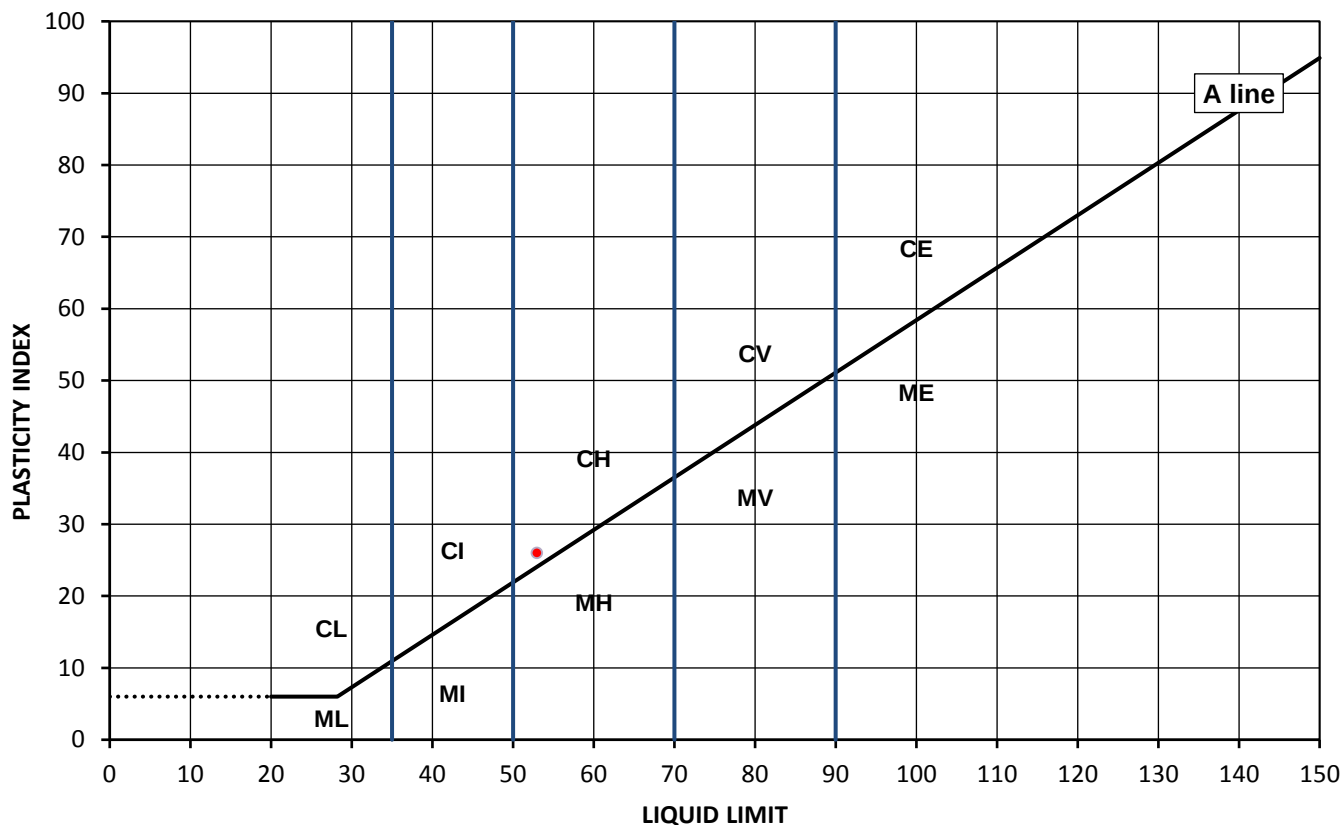
Test Results

Laboratory Reference: 1161434
Hole No.: WS8
Sample Reference: Not Given
Soil Description: Black slightly gravelly slightly sandy organic CLAY

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
24	53	27	26	76



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

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PL Geotechnical Laboratory Manager
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Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

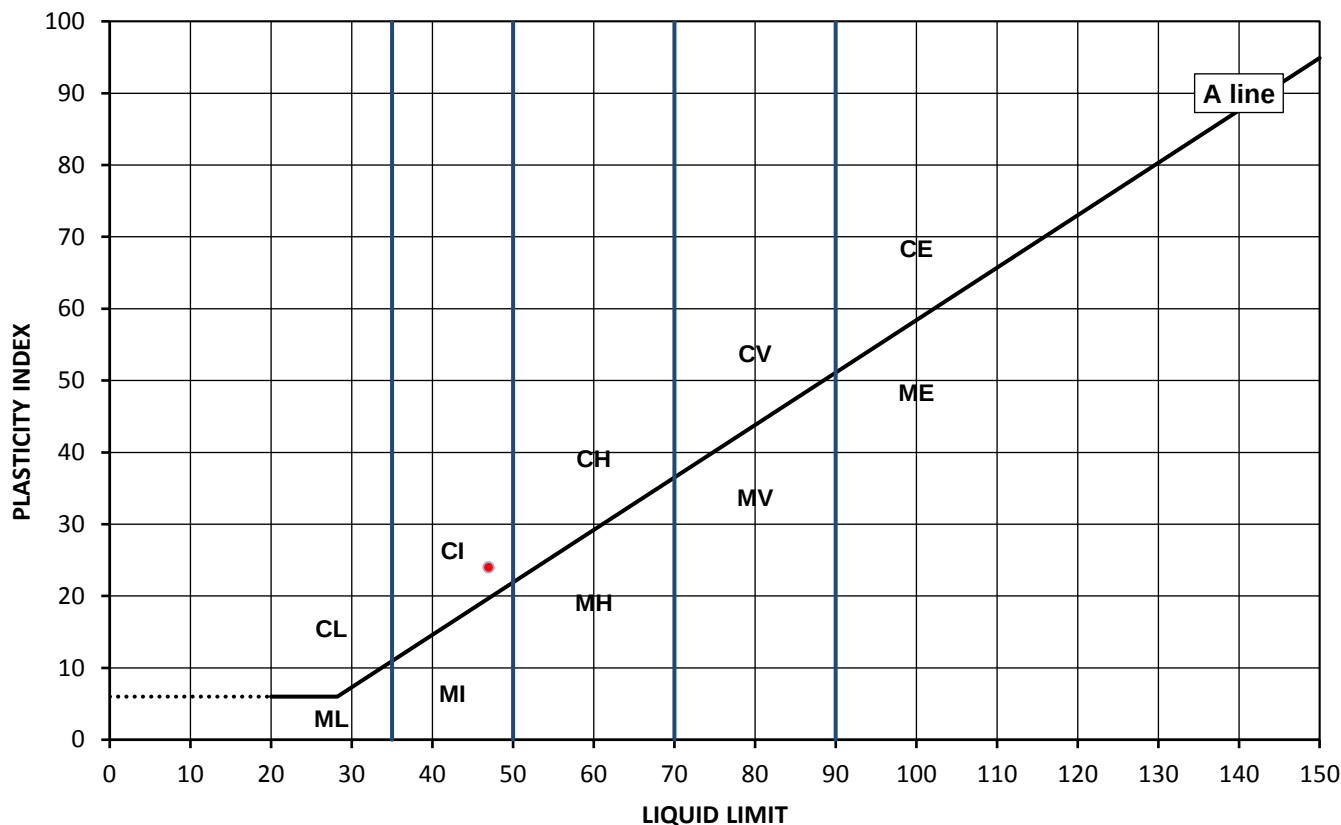
Test Results

Laboratory Reference: 1161435
Hole No.: WS10
Sample Reference: Not Given
Soil Description: Grey slightly gravelly slightly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 4.00
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
20	47	23	24	91



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

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PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

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Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

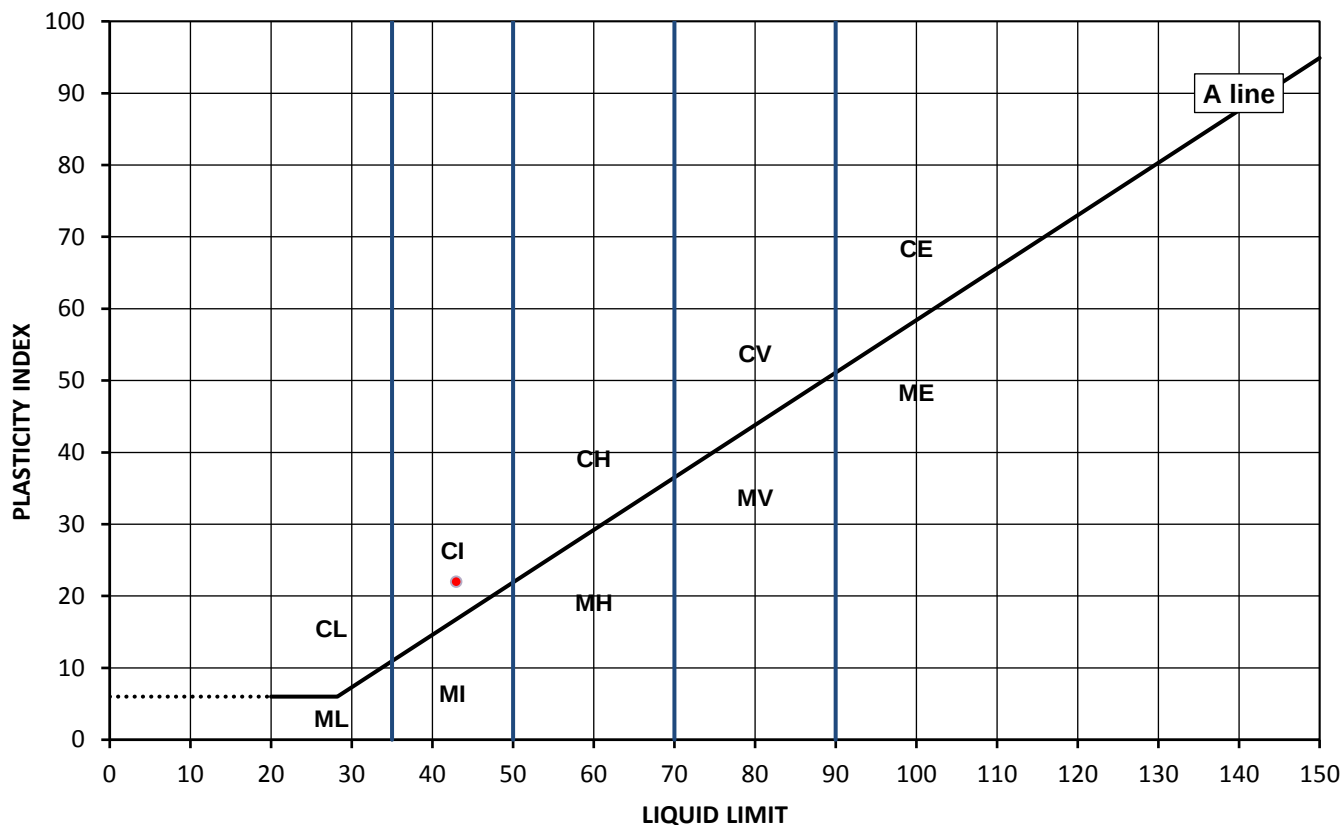
Test Results

Laboratory Reference: 1161436
Hole No.: WS16
Sample Reference: Not Given
Soil Description: Black slightly gravelly sandy organic CLAY

Depth Top [m]: 1.70
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
18	43	21	22	74



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

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PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

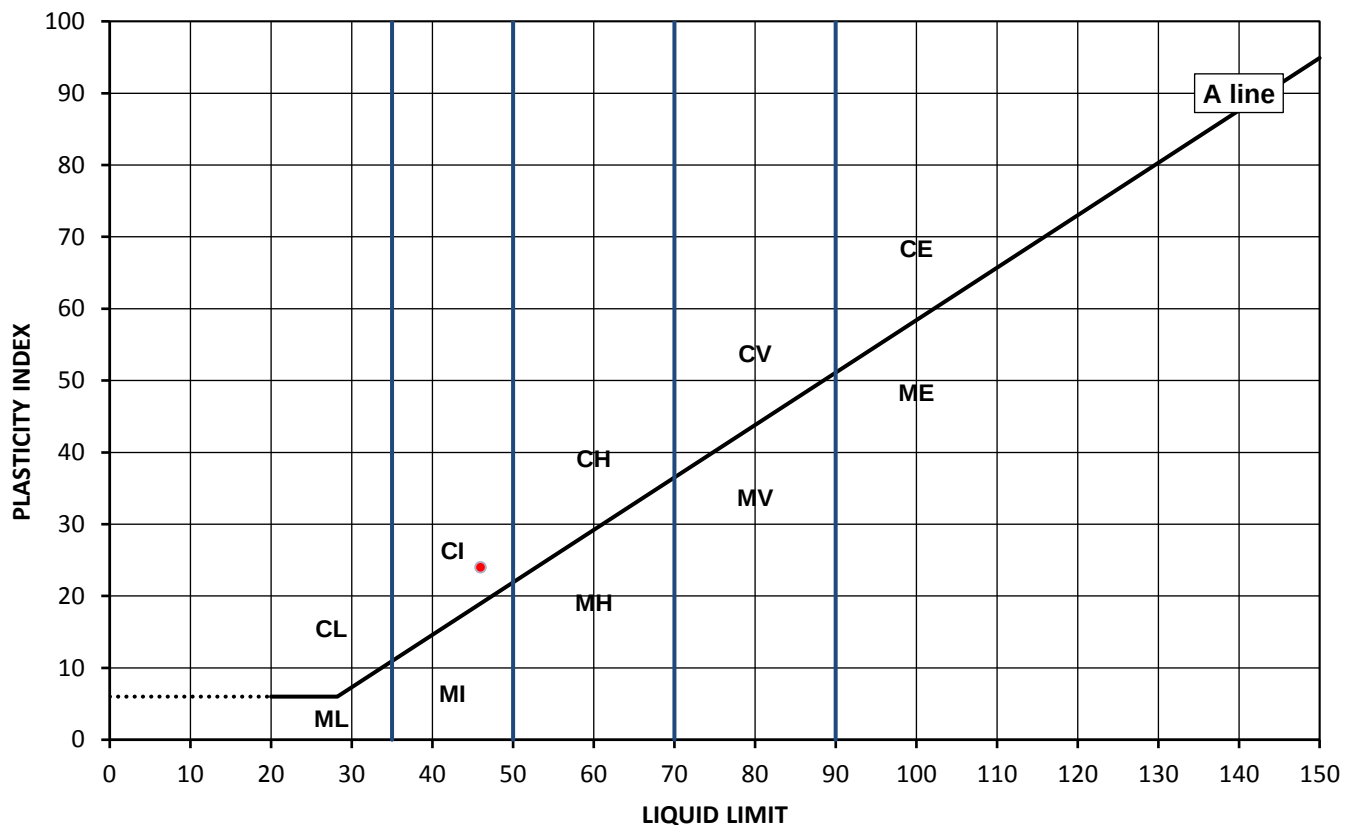
Test Results

Laboratory Reference: 1161437
Hole No.: WS14
Sample Reference: Not Given
Soil Description: Black slightly gravelly slightly sandy organic CLAY

Depth Top [m]: 3.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
21	46	22	24	75



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

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PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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Client: CURTINS
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LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

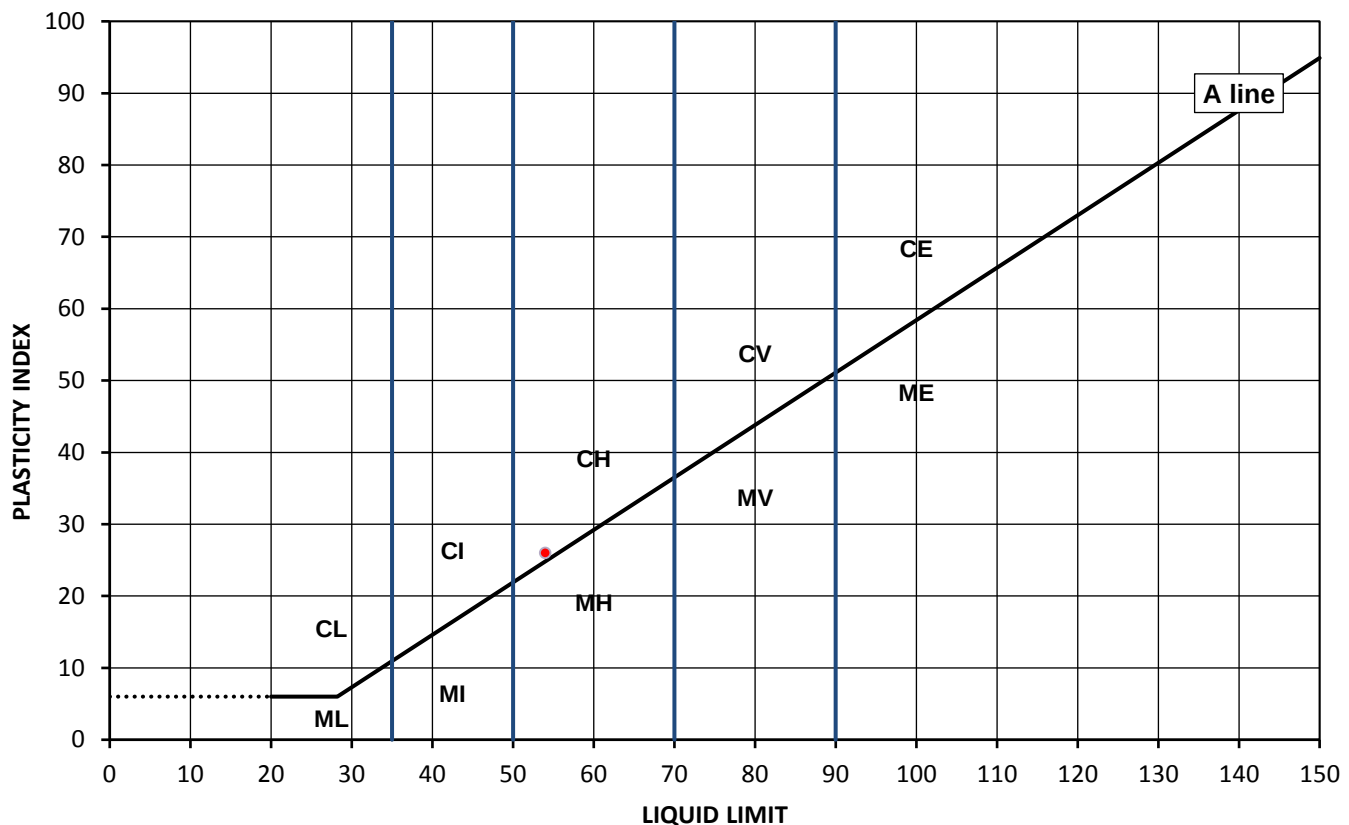
Test Results

Laboratory Reference: 1161447
Hole No.: WS2
Sample Reference: Not Given
Soil Description: Black slightly gravelly slightly sandy CLAY

Depth Top [m]: 4.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
21	54	28	26	83



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

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78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

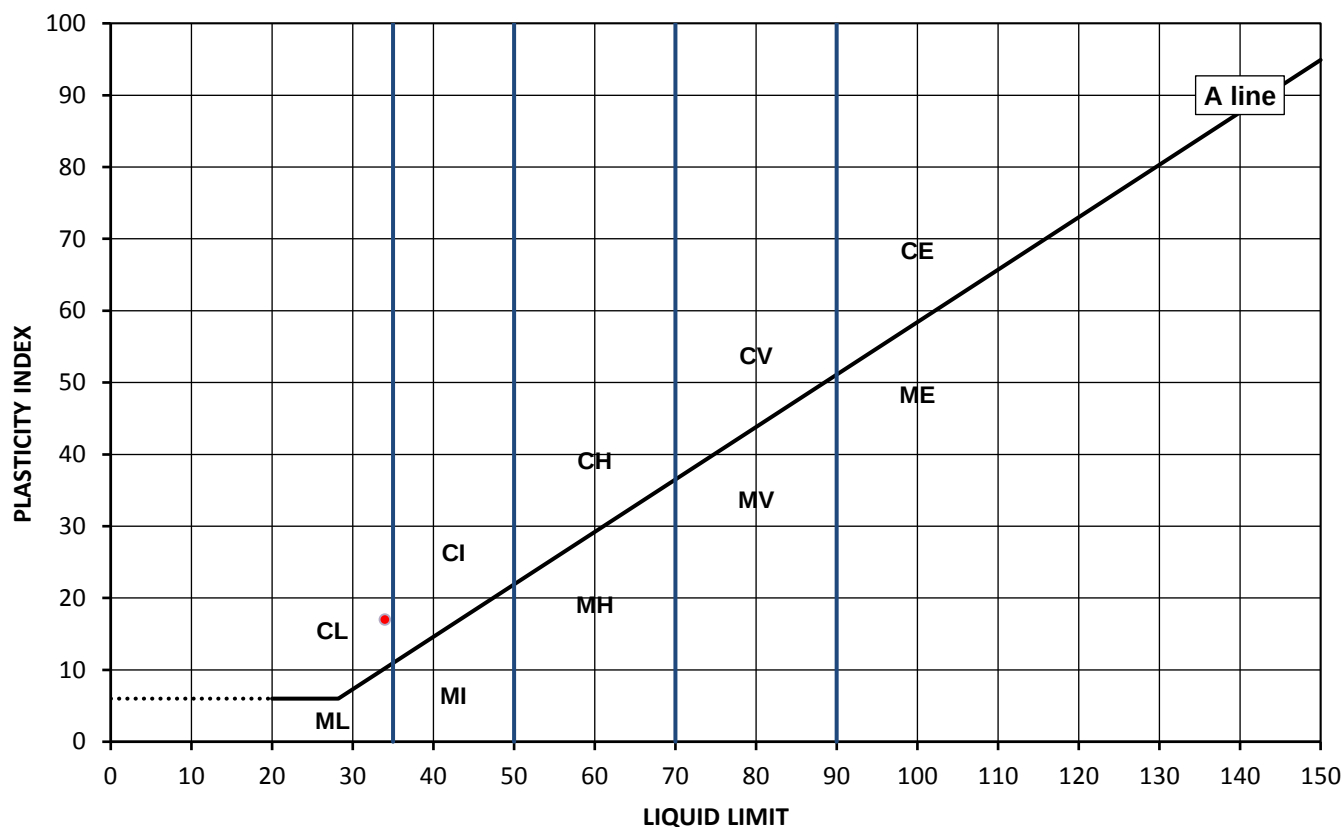
Test Results

Laboratory Reference: 1161448
Hole No.: WS4
Sample Reference: Not Given
Soil Description: Grey slightly gravelly very sandy CLAY

Depth Top [m]: 4.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	34	17	17	82



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

GF 232.3

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

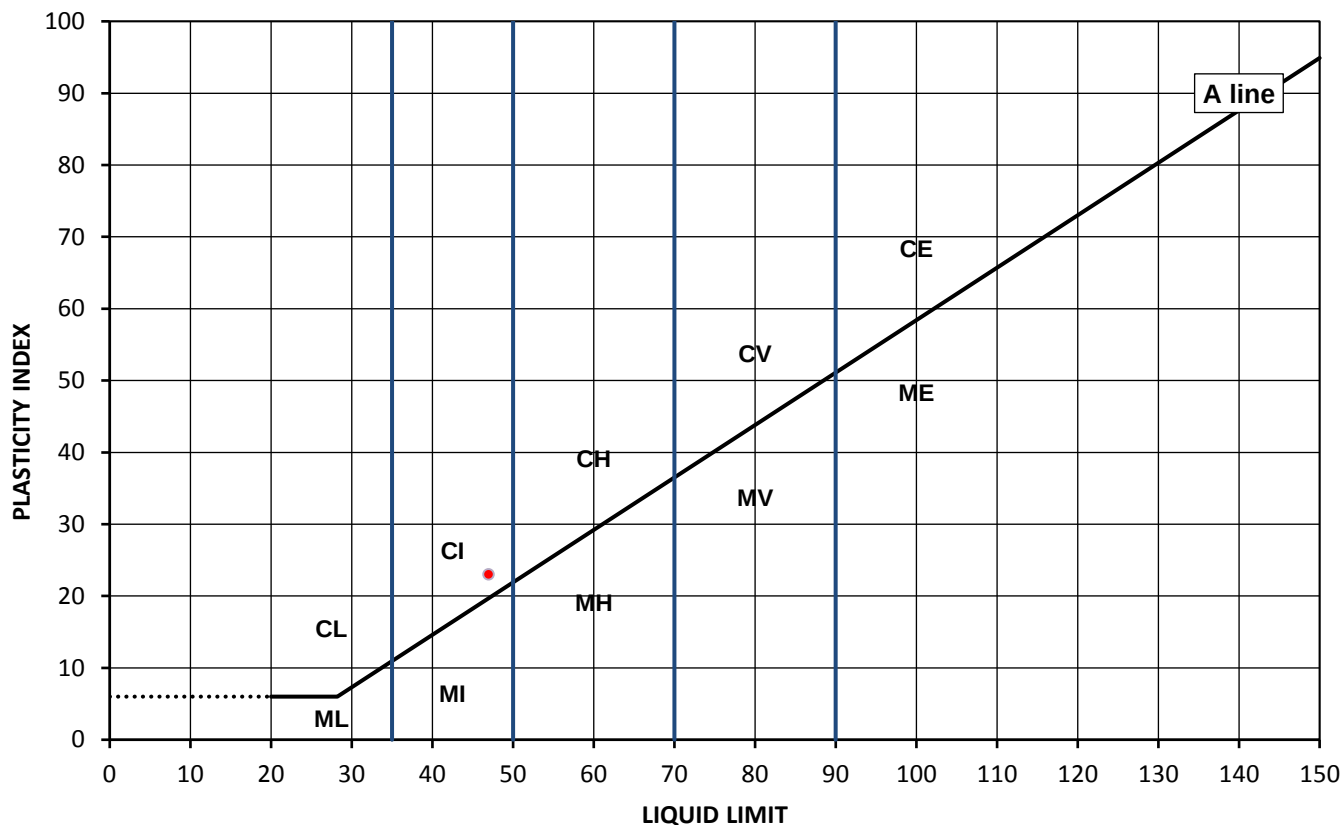
Test Results

Laboratory Reference: 1161449
Hole No.: WS17
Sample Reference: Not Given
Soil Description: Dark grey gravelly slightly sandy CLAY

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
24	47	24	23	55



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
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Watford Herts WD18 8YS



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

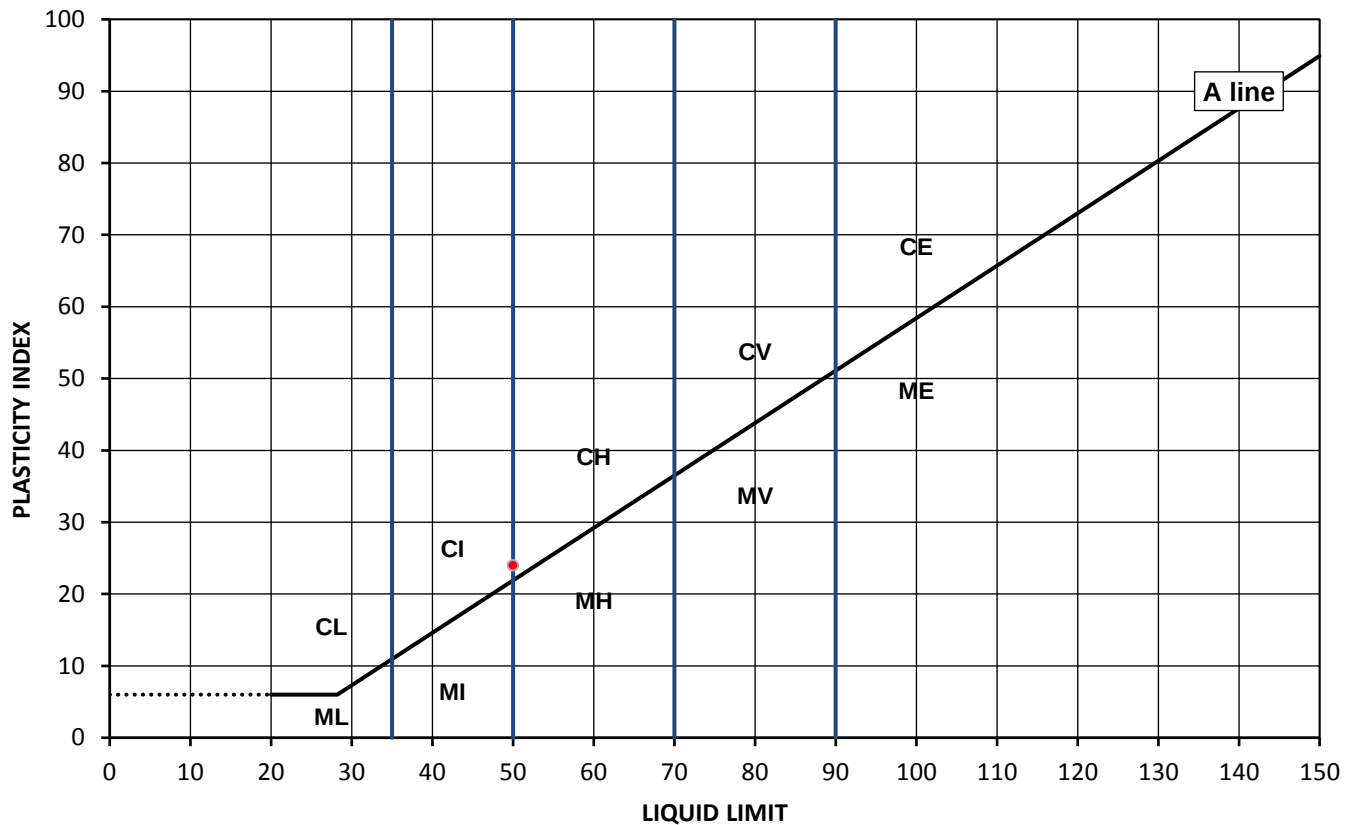
Test Results

Laboratory Reference: 1161450
Hole No.: WS20
Sample Reference: Not Given
Soil Description: Dark grey slightly gravelly slightly sandy CLAY

Depth Top [m]: 3.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
27	50	26	24	80



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

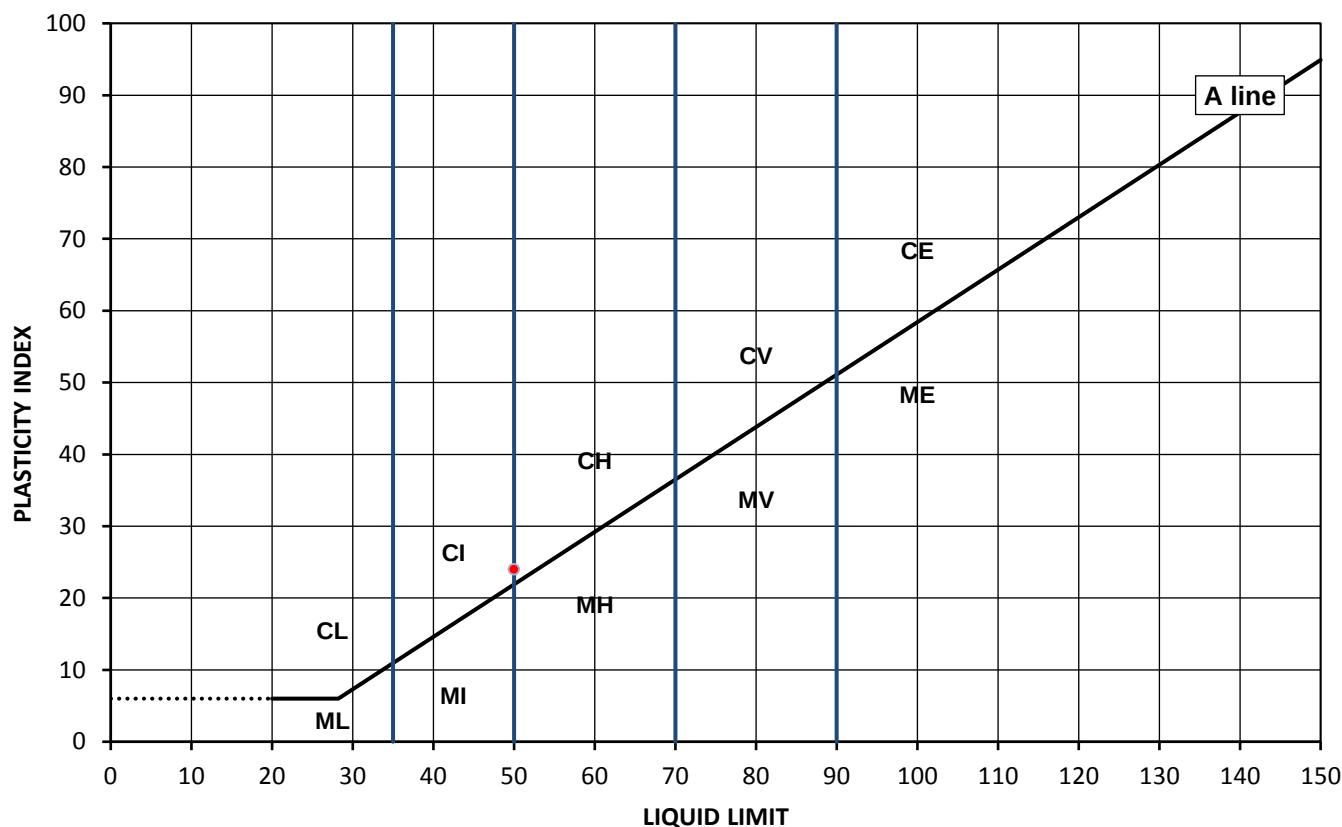
Test Results

Laboratory Reference: 1161451
Hole No.: WS22
Sample Reference: Not Given
Soil Description: Black slightly gravelly slightly sandy CLAY with fragments of coal

Depth Top [m]: 0.50
Depth Base [m]: 1.50
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	50	26	24	73



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C Clay	L Low	below 35
M Silt	I Medium	35 to 50
	H High	50 to 70
	V Very high	70 to 90
	E Extremely high	exceeding 90
Organic	O	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

GF 232.3

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

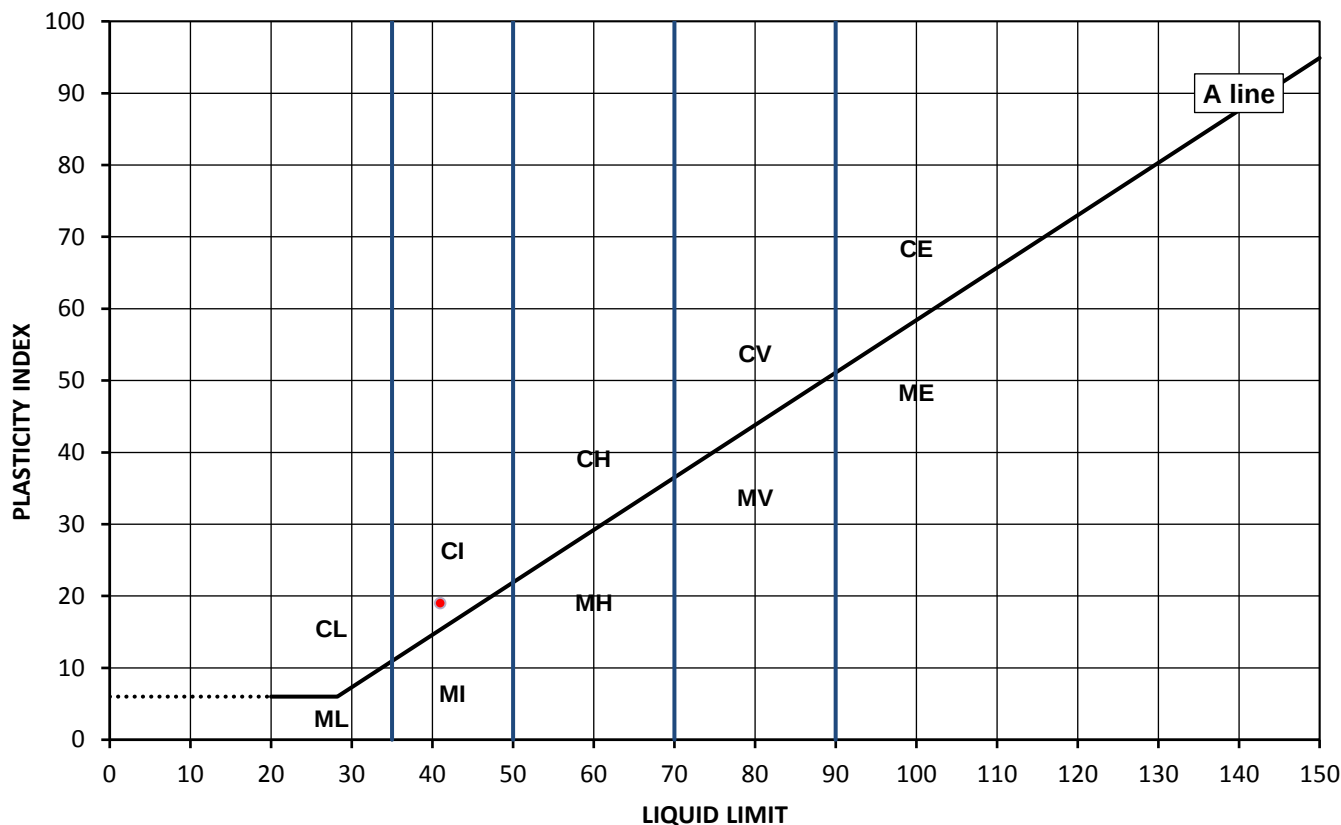
Test Results

Laboratory Reference: 1161452
Hole No.: WS6
Sample Reference: Not Given
Soil Description: Black slightly gravelly sandy organic CLAY

Depth Top [m]: 2.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
22	41	22	19	77



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 28/02/2019
Sampled By: Not Given

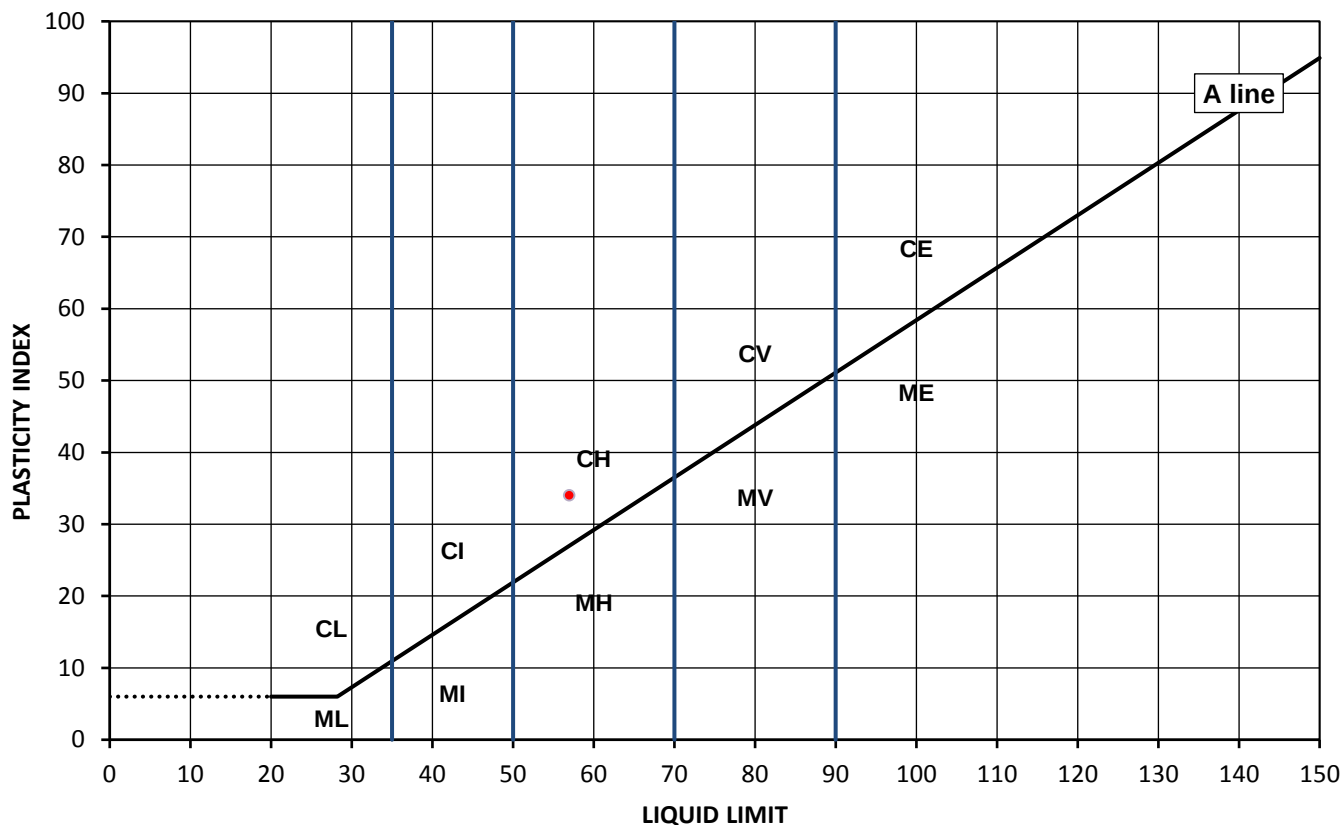
Test Results

Laboratory Reference: 1161453
Hole No.: WS23
Sample Reference: Not Given
Soil Description: Dark grey slightly sandy CLAY

Depth Top [m]: 2.70
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	57	23	34	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
	Organic	O	append to classification for organic material (eg CHO)

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

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4041

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Lewis Doel
 Site Name: Woodville
 Site Address: Not Given

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
 7 Woodshots Meadow
 Croxley Green Business Park
 Watford Herts WD18 8YS



Client Reference: 67895

Job Number: 19-29949

Date Sampled: Not Given

Date Received: 20/02/2019

Date Tested: 26/02/2019

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC#	Atterberg#				Density		Total Porosity				
		Reference	Depth Top m	Depth Base m	Type				% Passing 425um	LL	PL	PI	bulk Mg/m3	PD Mg/m3					
1161422	RC04	Not Given	9.00	9.45	U	Mottled grey slightly gravelly sandy CLAY	Atterberg 1 Point	14	93	45	24	21							
1161423	RC04	Not Given	15.00	15.45	U	Grey slightly gravelly slightly sandy CLAY		21											
1161424	RC05	Not Given	6.50	7.00	U	Mottled grey slightly gravelly sandy CLAY	Atterberg 1 Point	17	97	45	23	22							
1161425	RC05	Not Given	12.50	13.00	U	Grey slightly gravelly slightly sandy CLAY		22											
1161426	RC07	Not Given	8.00	8.50	U	Mottled grey slightly gravelly sandy CLAY	Atterberg 1 Point	16	95	45	25	20							
1161427	RC07	Not Given	19.50	20.00	U	Grey slightly gravelly slightly sandy CLAY		19											
1161428	RC08	Not Given	17.00	17.50	U	Grey gravelly slightly sandy CLAY		14											
1161429	RC08	Not Given	21.00	21.50	U	Mottled brown gravelly slightly sandy CLAY		19											
1161430	RC09	Not Given	1.75	2.20	U	Grey gravelly slightly sandy CLAY		12											
1161431	RC09	Not Given	11.00	11.45	U	Dark grey slighty gravelly sandy CLAY	Atterberg 1 Point	13	84	38	19	19							

Note: # UKAS accredited; NP - Non plastic

Comments:

Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
 Date Reported: 06/03/2019

Signed:

Darren Berrill
 Geotechnical General Manager

GF 234.5

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4041

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Lewis Doel
 Site Name: Woodville
 Site Address: Not Given

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
 7 Woodshots Meadow
 Croxley Green Business Park
 Watford Herts WD18 8YS



Client Reference: 67895

Job Number: 19-29949

Date Sampled: Not Given

Date Received: 20/02/2019

Date Tested: 26/02 - 28/02/2019

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC#	Atterberg#				Density		Total Porosity				
		Reference	Depth Top m	Depth Base m	Type				% Passing 425um %	LL %	PL %	PI %	bulk Mg/m3	PD Mg/m3					
1161432	RC10	Not Given	5.00	5.50	U	Dark grey slightly gravelly slightly sandy CLAY	Atterberg 1 Point	15	82	50	25	25							
1161433	RC10	Not Given	15.00	15.50	U	Grey gravelly slightly sandy CLAY		21											
1161435	WS10	Not Given	3.00	4.00	B	Grey slightly gravelly slightly sandy CLAY	Atterberg 1 Point	20	91	47	23	24							
1161437	WS14	Not Given	3.50	Not Given	D	Black slightly gravelly slightly sandy organic CLAY	Atterberg 1 Point	21	75	46	22	24							
1161436	WS16	Not Given	1.70	Not Given	D	Black slightly gravelly sandy organic CLAY	Atterberg 1 Point	18	74	43	21	22							
1161449	WS17	Not Given	1.50	Not Given	D	Dark grey gravelly slightly sandy CLAY	Atterberg 1 Point	24	55	47	24	23							
1161447	WS2	Not Given	4.00	Not Given	D	Black slightly gravelly slightly sandy CLAY	Atterberg 1 Point	21	83	54	28	26							
1161450	WS20	Not Given	3.50	Not Given	D	Dark grey slightly gravelly slightly sandy CLAY	Atterberg 1 Point	27	80	50	26	24							
1161451	WS22	Not Given	0.50	1.50	B	Black slightly gravelly slightly sandy CLAY with fragments of coal	Atterberg 1 Point	15	73	50	26	24							
1161453	WS23	Not Given	2.70	Not Given	D	Dark grey slightly sandy CLAY	Atterberg 1 Point	17	100	57	23	34							

Note: # UKAS accredited; NP - Non plastic

Comments:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
 Date Reported: 06/03/2019

Signed: Darren Berrill
 Geotechnical General Manager

GF 234.5

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4041

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Lewis Doel
 Site Name: Woodville
 Site Address: Not Given

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
 7 Woodshots Meadow
 Croxley Green Business Park
 Watford Herts WD18 8YS



Client Reference: 67895

Job Number: 19-29949

Date Sampled: Not Given

Date Received: 20/02/2019

Date Tested: 28/02/2019

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC#	Atterberg#				Density		Total Porosity				
		Reference	Depth Top m	Depth Base m	Type				% Passing 425um	LL	PL	PI	bulk	PD					
								%	%	%	%	%	Mg/m3	Mg/m3	%				
1161448	WS4	Not Given	4.50	Not Given	D	Grey slightly gravelly very sandy CLAY	Atterberg 1 Point	19	82	34	17	17							
1161452	WS6	Not Given	2.50	Not Given	D	Black slightly gravelly sandy organic CLAY	Atterberg 1 Point	22	77	41	22	19							
1161434	WS8	Not Given	2.00	Not Given	D	Black slightly gravelly slightly sandy organic CLAY	Atterberg 1 Point	24	76	53	27	26							

Note: # UKAS accredited; NP - Non plastic

Comments:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
 Date Reported: 06/03/2019

Signed:

Darren Berrill
 Geotechnical General Manager

GF 234.5

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



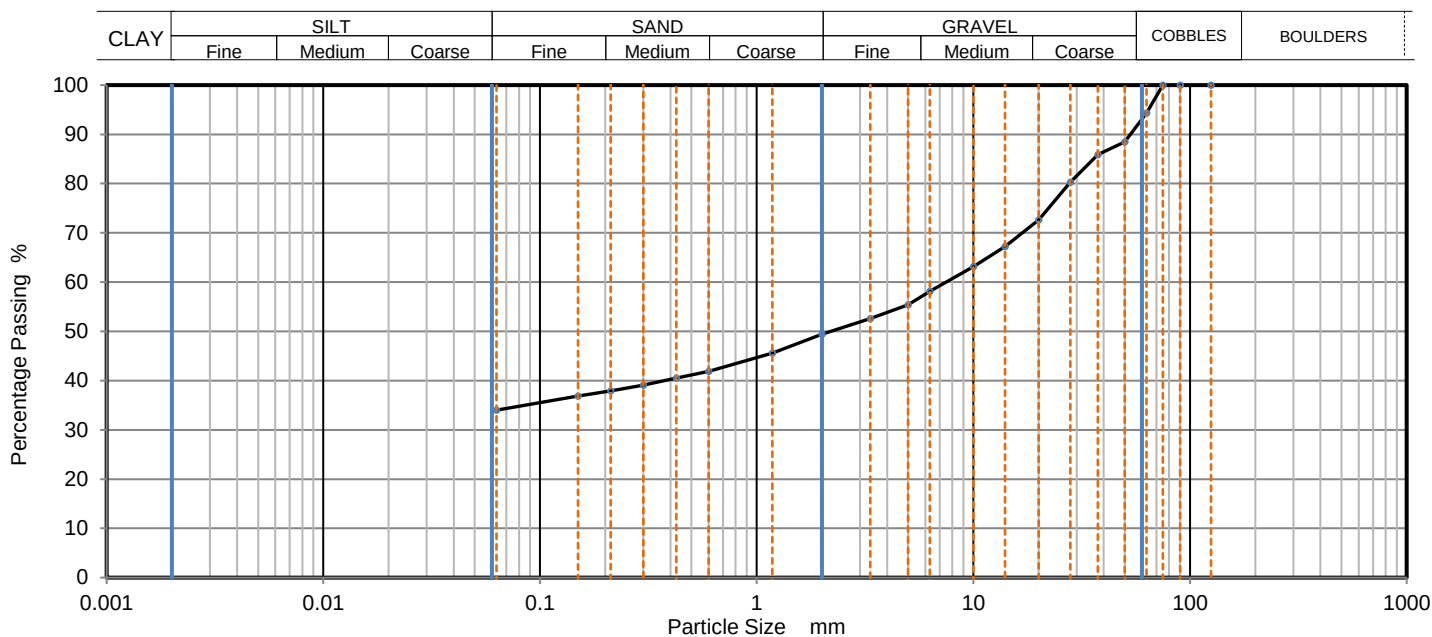
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161438
Hole No.: TP9
Sample Reference: Not Given
Sample Description: Mottled grey sandy very clayey GRAVEL with cobbles

Depth Top [m]: 2.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	89		
37.5	86		
28	80		
20	73		
14	67		
10	63		
6.3	58		
5	55		
3.35	53		
2	49		
1.18	46		
0.6	42		
0.425	41		
0.3	39		
0.212	38		
0.15	37		
0.063	35		

Dry Mass of sample [g]: 5435

Sample Proportions	% dry mass
Very coarse	5.70
Gravel	44.90
Sand	14.90
Fines <0.063mm	34.50

Grading Analysis	
D100	mm 75
D60	mm 7.49
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



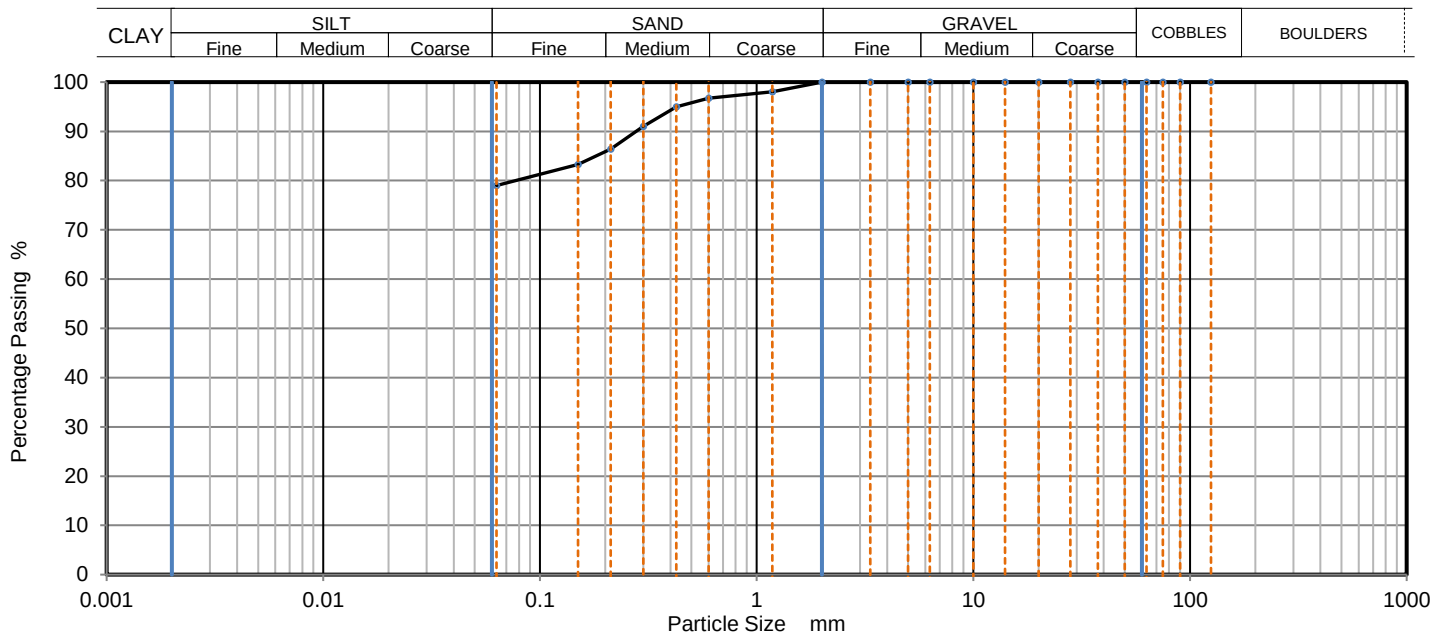
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161439
Hole No.: TP3
Sample Reference: Not Given
Sample Description: Mottled brown slightly sandy CLAY

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	98		
0.6	97		
0.425	95		
0.3	91		
0.212	86		
0.15	83		
0.063	79		

Dry Mass of sample [g]: 277

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	21.00
Fines <0.063mm	79.00

Grading Analysis		
D100	mm	2
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

GF 100.10

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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Croxley Green Business Park
Watford Herts WD18 8YS



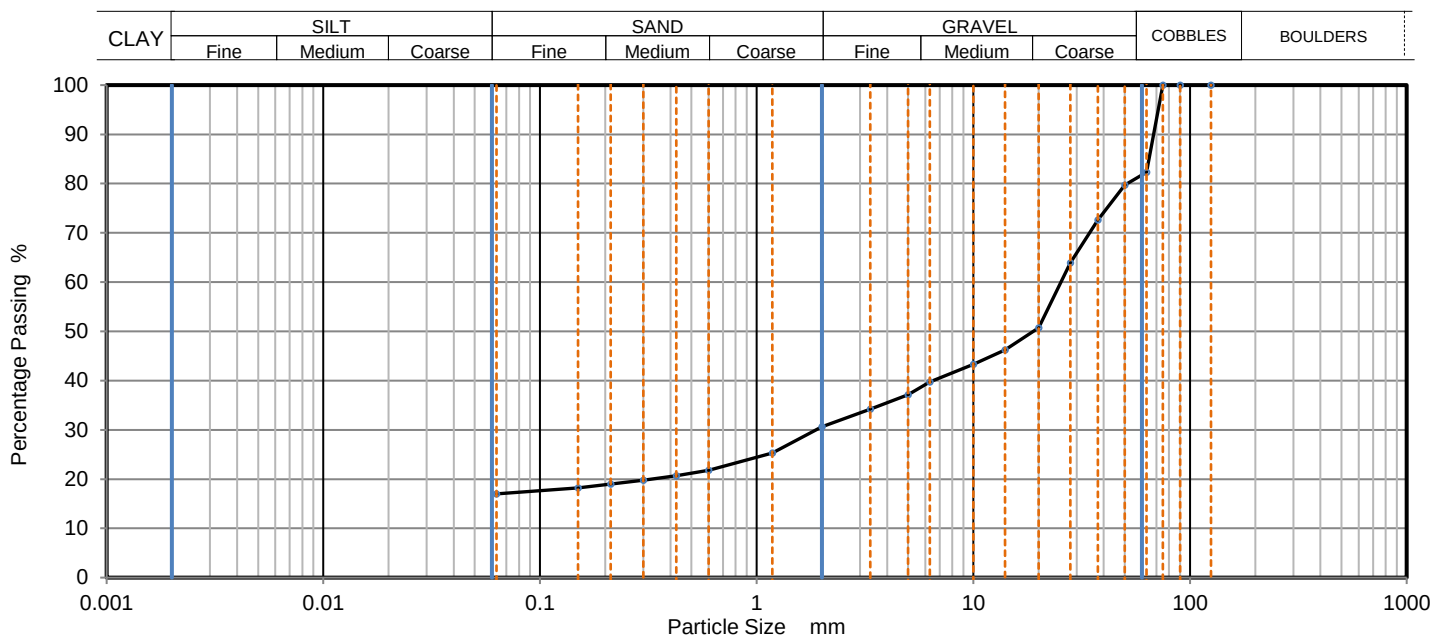
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161440
Hole No.: TP17
Sample Reference: Not Given
Sample Description: Dark grey clayey sandy GRAVEL with cobbles

Depth Top [m]: 2.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	82		
50	80		
37.5	73		
28	64		
20	51		
14	46		
10	43		
6.3	40		
5	37		
3.35	34		
2	31		
1.18	25		
0.6	22		
0.425	21		
0.3	20		
0.212	19		
0.15	18		
0.063	17		

Dry Mass of sample [g]: 6541

Sample Proportions	% dry mass
Very coarse	17.70
Gravel	51.70
Sand	13.50
Fines <0.063mm	17.00

Grading Analysis		
D100	mm	75
D60	mm	25.4
D30	mm	1.89
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



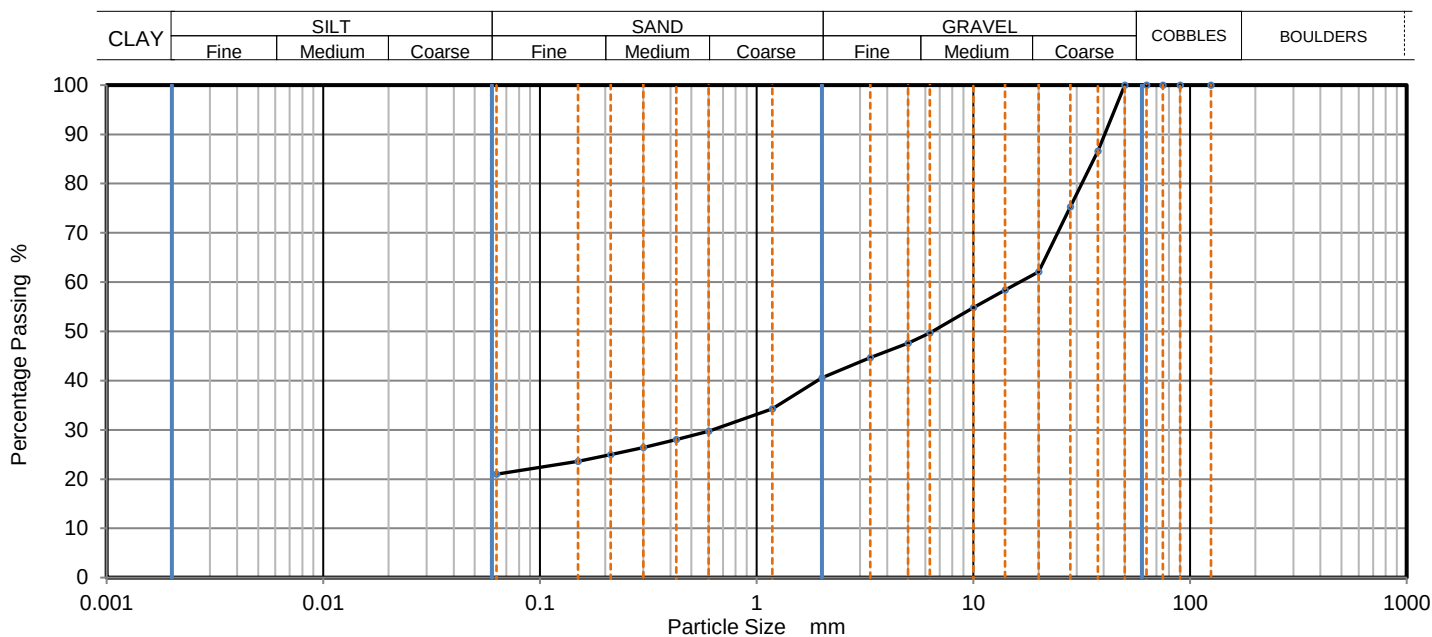
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161441
Hole No.: TP21
Sample Reference: Not Given
Sample Description: Dark grey sandy very clayey GRAVEL

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	87		
28	75		
20	62		
14	58		
10	55		
6.3	50		
5	48		
3.35	45		
2	41		
1.18	34		
0.6	30		
0.425	28		
0.3	26		
0.212	25		
0.15	24		
0.063	22		

Dry Mass of sample [g]: 5563

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	59.40
Sand	19.10
Fines <0.063mm	21.50

Grading Analysis		
D100	mm	50
D60	mm	16.4
D30	mm	0.63
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

GF 100.10

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



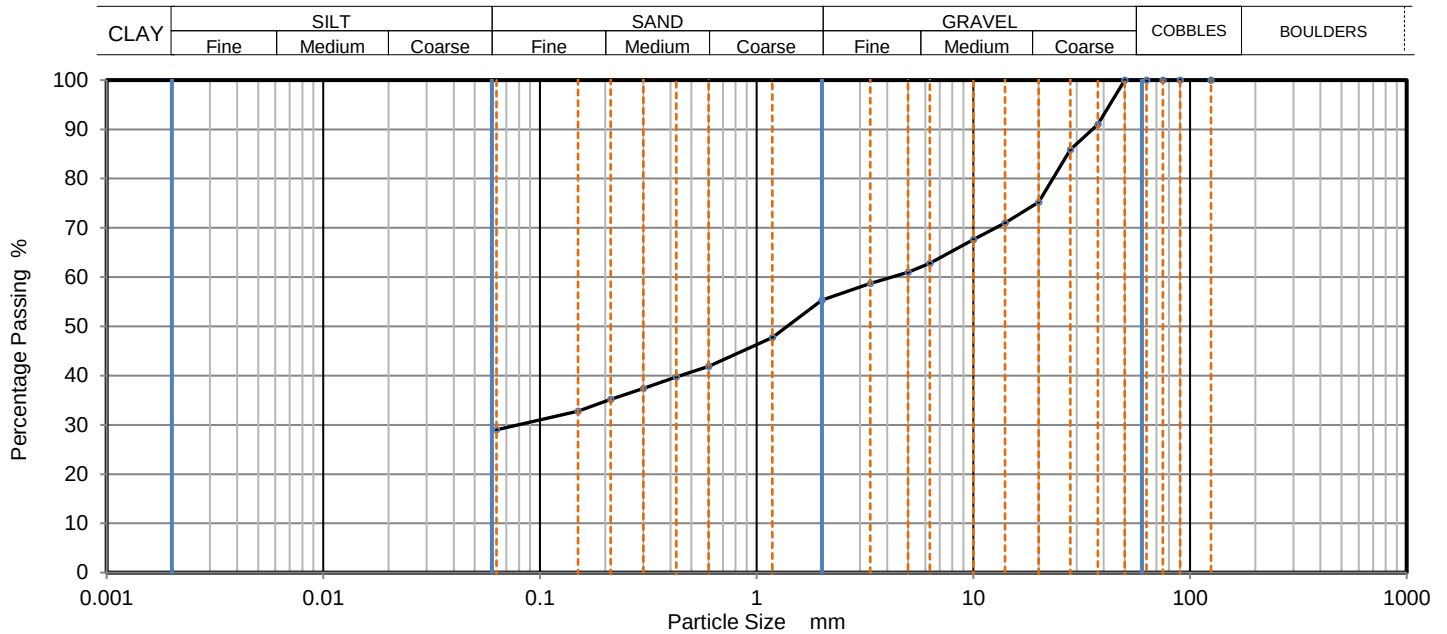
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161442
Hole No.: TP41
Sample Reference: Not Given
Sample Description: Dark grey very clayey very sandy GRAVEL

Depth Top [m]: 1.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	91		
28	86		
20	75		
14	71		
10	68		
6.3	63		
5	61		
3.35	59		
2	55		
1.18	48		
0.6	42		
0.425	40		
0.3	37		
0.212	35		
0.15	33		
0.063	29		

Dry Mass of sample [g]: 7591

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	44.70
Sand	26.00
Fines <0.063mm	29.30

Grading Analysis		
D100	mm	50
D60	mm	4.2
D30	mm	0.0747
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



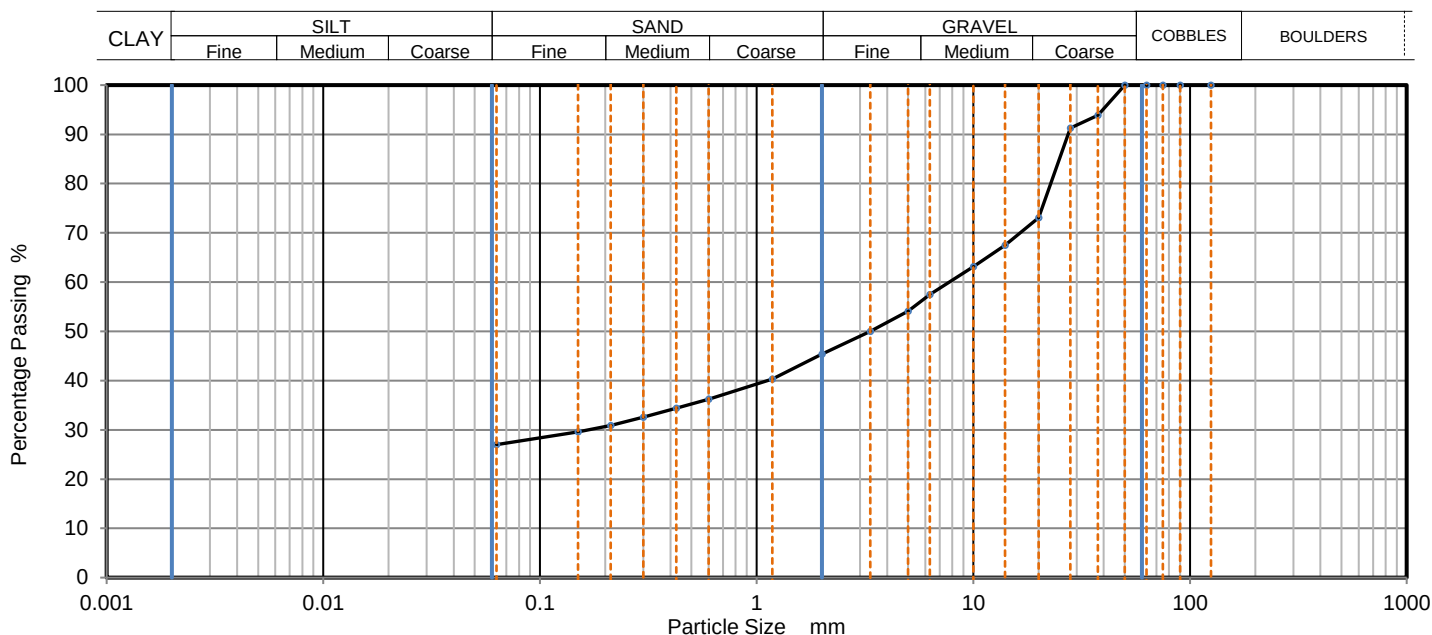
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161443
Hole No.: TP37
Sample Reference: Not Given
Sample Description: Dark grey sandy very clayey GRAVEL

Depth Top [m]: 1.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	91		
20	73		
14	68		
10	63		
6.3	58		
5	54		
3.35	50		
2	45		
1.18	40		
0.6	36		
0.425	34		
0.3	33		
0.212	31		
0.15	30		
0.063	28		

Dry Mass of sample [g]: 1407

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	54.60
Sand	17.90
Fines <0.063mm	27.50

Grading Analysis		
D100	mm	50
D60	mm	7.76
D30	mm	0.166
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

GF 100.10



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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Croxley Green Business Park
Watford Herts WD18 8YS



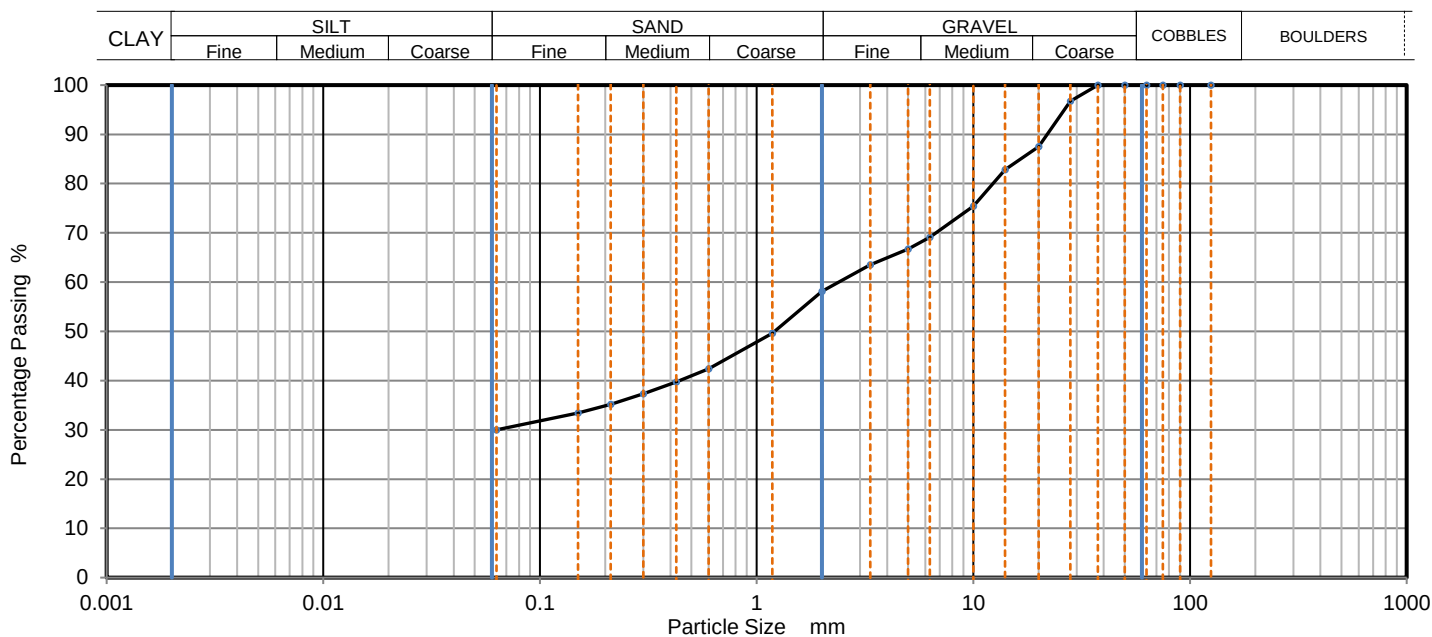
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161444
Hole No.: TP24
Sample Reference: Not Given
Sample Description: Dark grey very clayey very sandy GRAVEL

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	88		
14	83		
10	75		
6.3	69		
5	67		
3.35	64		
2	58		
1.18	50		
0.6	42		
0.425	40		
0.3	37		
0.212	35		
0.15	33		
0.063	31		

Dry Mass of sample [g]: 1747

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	41.90
Sand	27.40
Fines <0.063mm	30.70

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

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Particle Size Distribution

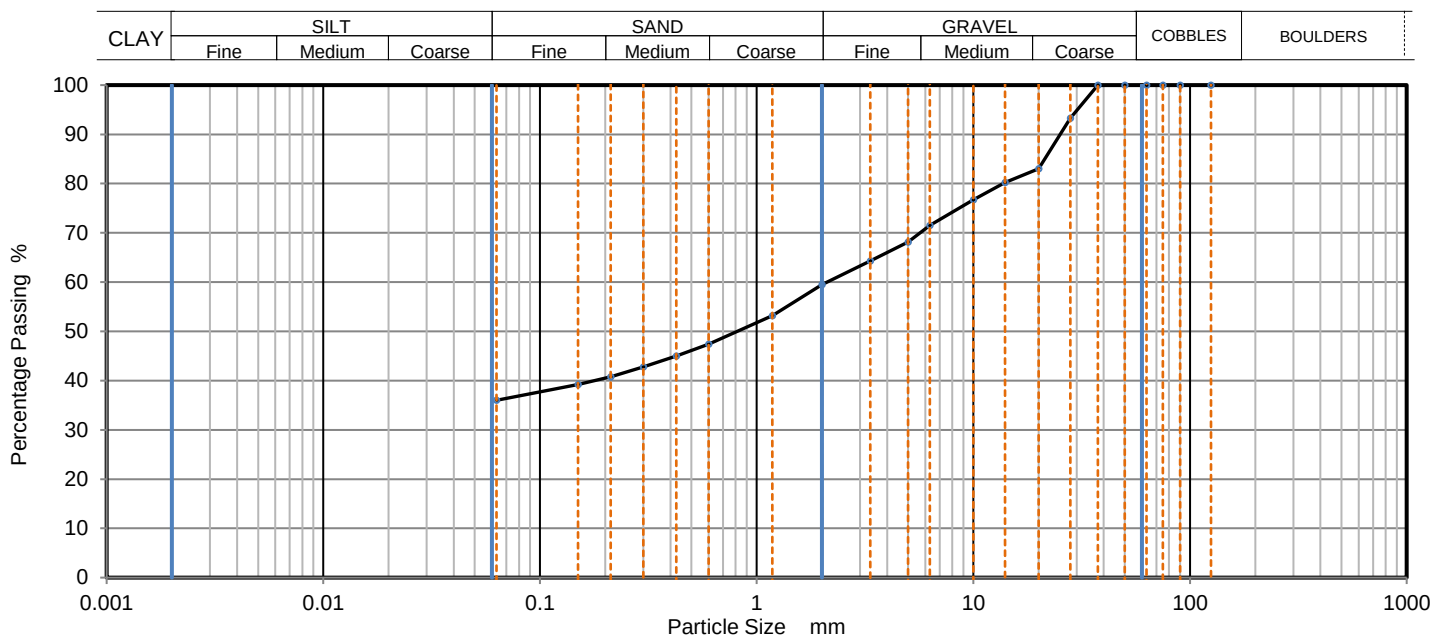
i2 Analytical Ltd
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Croxley Green Business Park
Watford Herts WD18 8YS



Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Laboratory Reference: 1161461
Hole No.: TP25
Sample Reference: Not Given
Sample Description: Dark grey very clayey very sandy GRAVEL

Depth Top [m]: 2.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	83		
14	80		
10	77		
6.3	72		
5	68		
3.35	64		
2	60		
1.18	53		
0.6	47		
0.425	45		
0.3	43		
0.212	41		
0.15	39		
0.063	37		

Dry Mass of sample [g]: 1577

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	40.50
Sand	23.00
Fines <0.063mm	36.60

Grading Analysis		
D100	mm	37.5
D60	mm	2.1
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



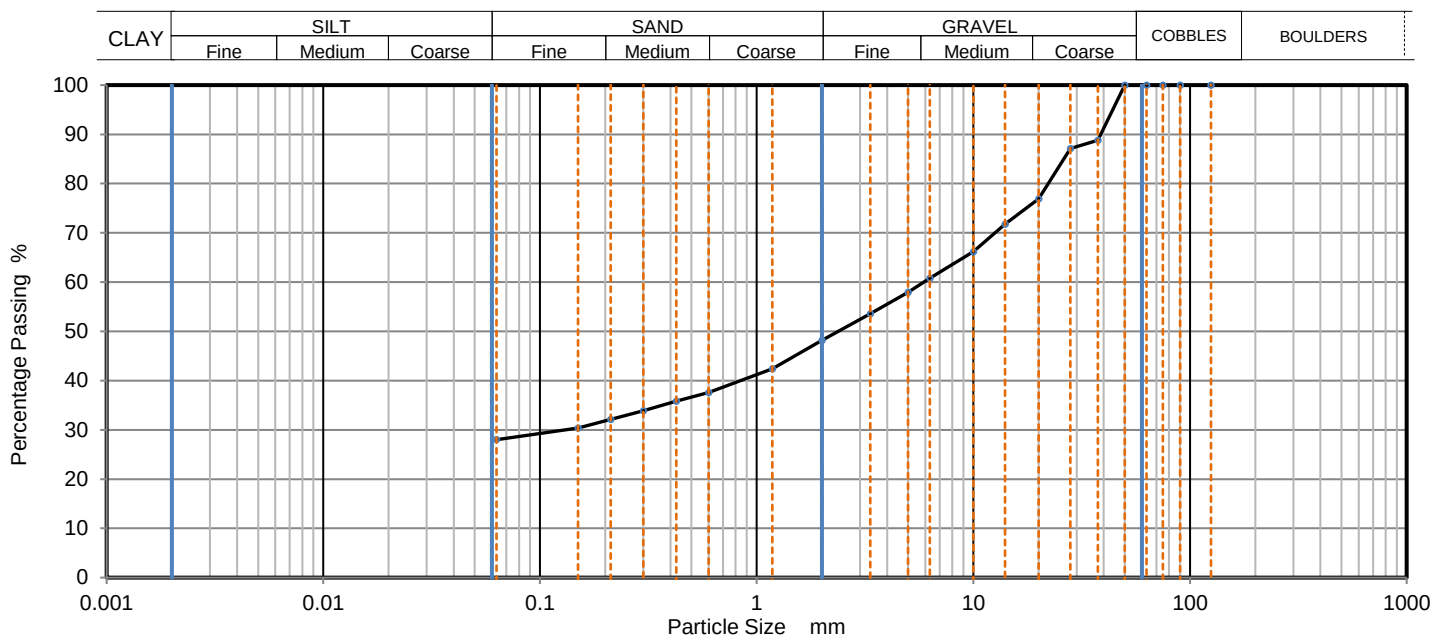
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 27/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161462
Hole No.: TP26
Sample Reference: Not Given
Sample Description: Dark grey sandy very clayey GRAVEL

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	87		
20	77		
14	72		
10	66		
6.3	61		
5	58		
3.35	54		
2	48		
1.18	42		
0.6	38		
0.425	36		
0.3	34		
0.212	32		
0.15	30		
0.063	28		

Dry Mass of sample [g]: 1473

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	51.80
Sand	19.80
Fines <0.063mm	28.40

Grading Analysis		
D100	mm	50
D60	mm	5.91
D30	mm	0.125
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



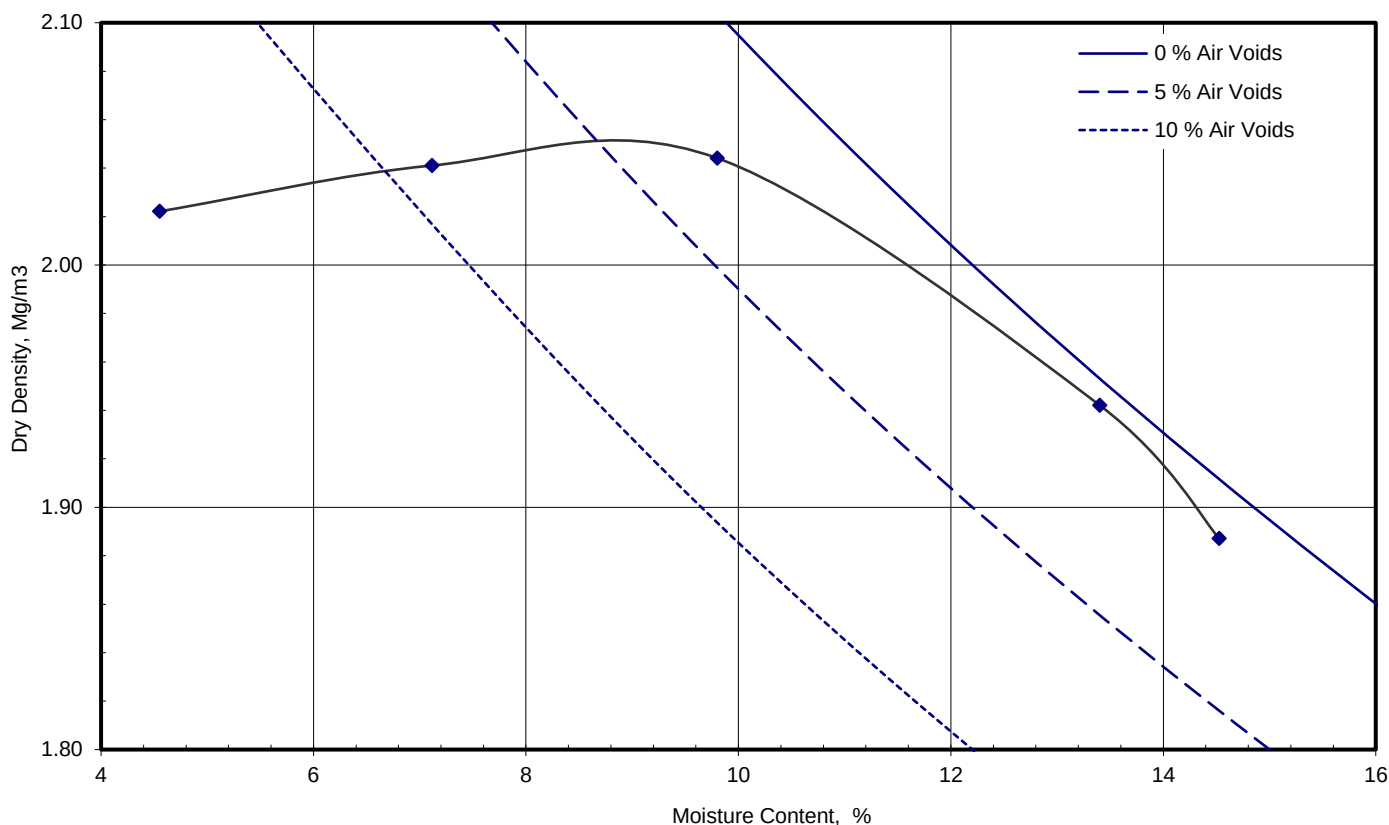
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161445
Hole No.: TP1
Sample Reference: Not Given
Sample Description: Dark grey CLAY with shales

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Assumed	Mg/m³	2.65
As received Moisture Content	%	13
Maximum Dry Density	Mg/m³	2.04
Optimum Moisture Content	%	9.8

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 110.14

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



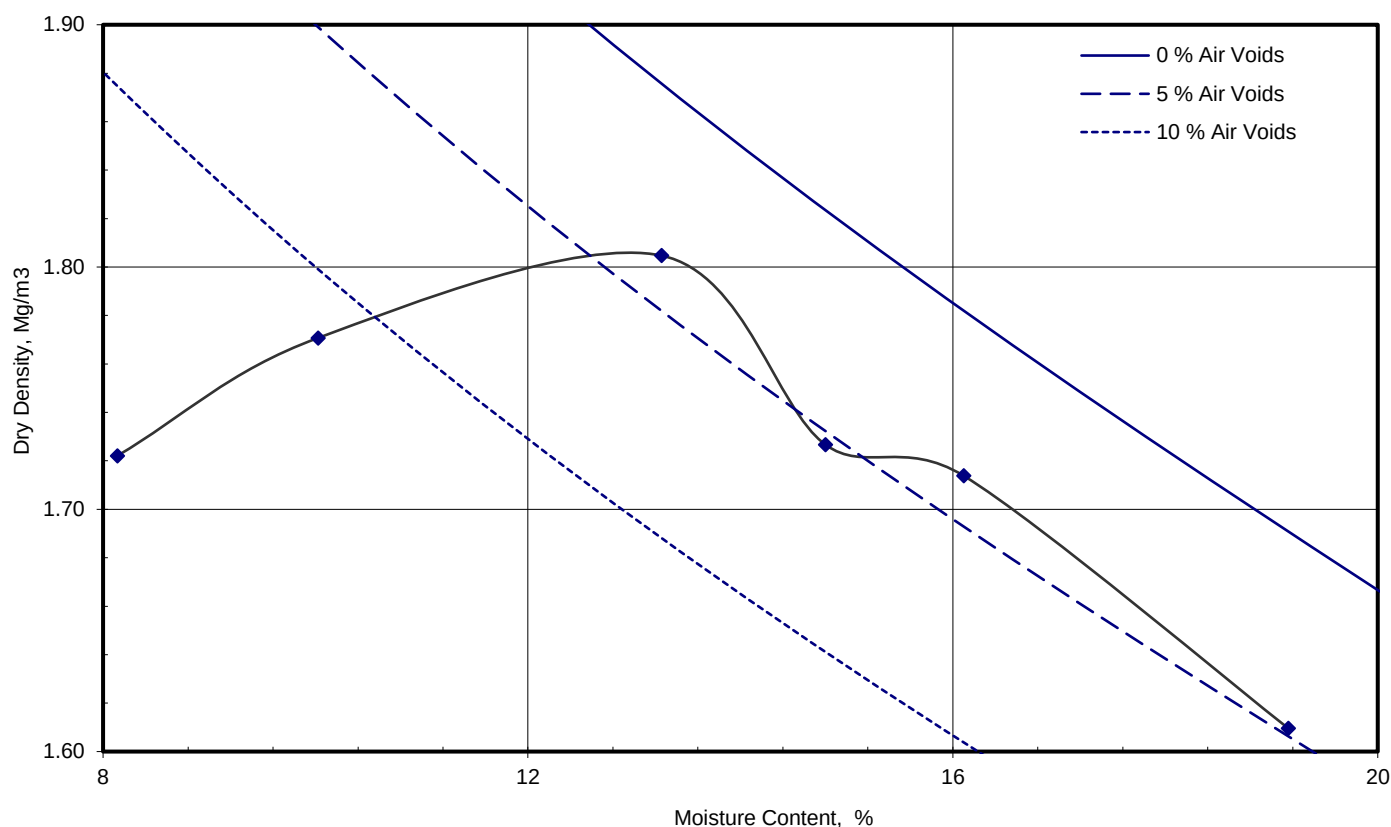
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161446
Hole No.: TP13
Sample Reference: Not Given
Sample Description: Dark grey CLAY with shales

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	2
Material Retained on 20.0 mm Sieve	%	16
Particle Density - Assumed	Mg/m ³	2.50
As received Moisture Content	%	13
Maximum Dry Density	Mg/m ³	1.80
Optimum Moisture Content	%	13

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 110.14

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4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

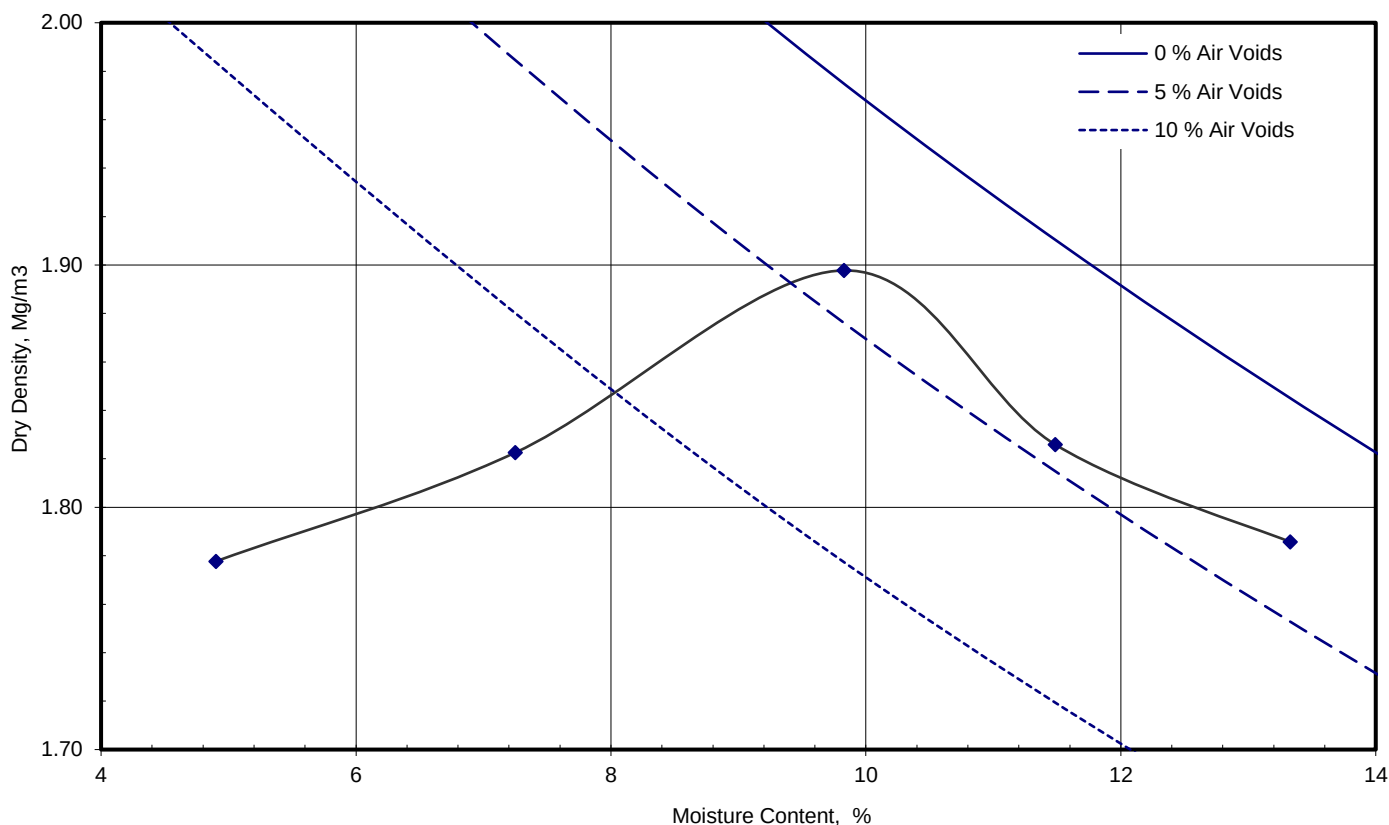
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161454
Hole No.: TP18
Sample Reference: Not Given
Sample Description: Dark grey with CLAY with shales

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	10
Material Retained on 20.0 mm Sieve	%	12
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	9.8
Maximum Dry Density	Mg/m³	1.90
Optimum Moisture Content	%	9.8

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Zone X - test carried out as per client request.

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Darren Berrill
Geotechnical General Manager

GF 110.14

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4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

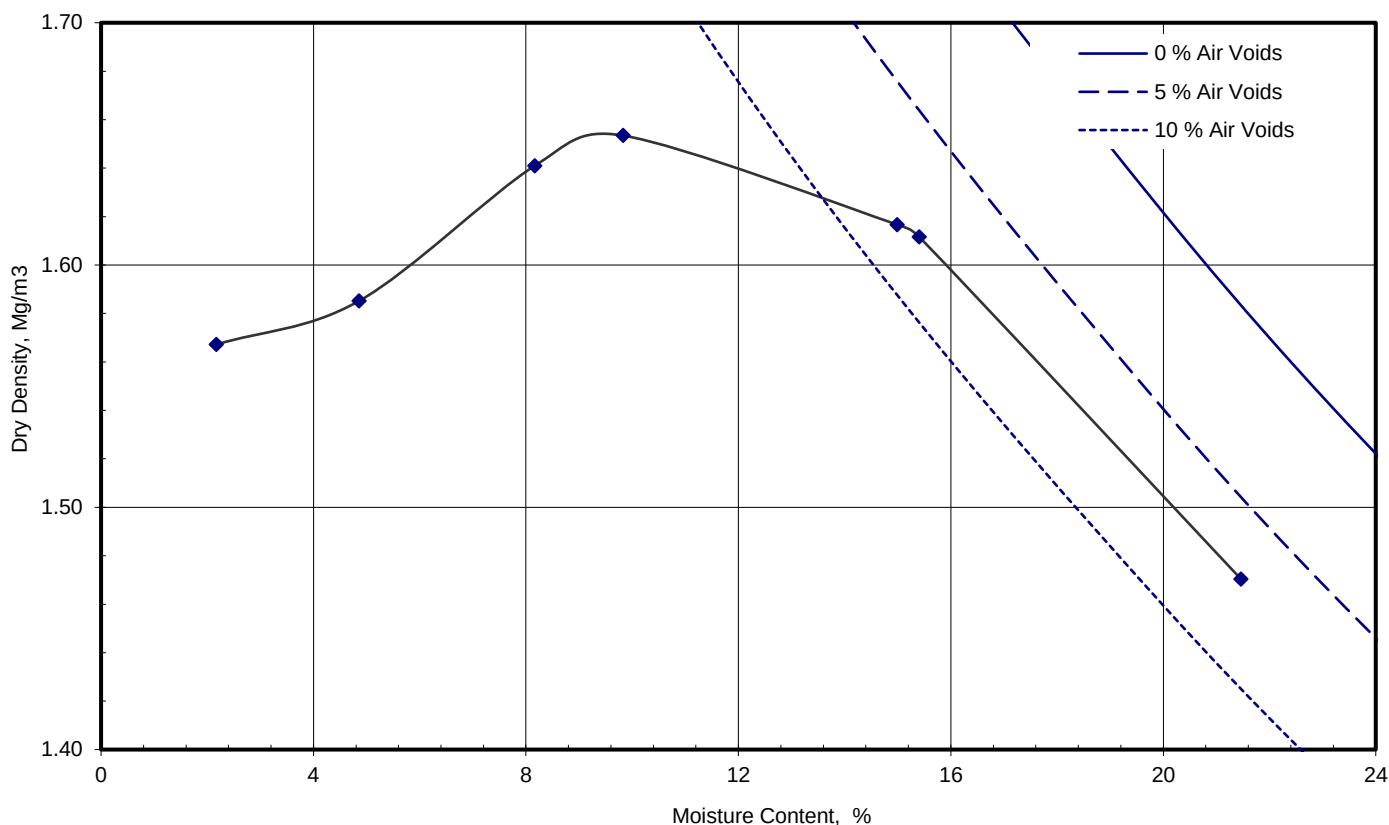
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161455
Hole No.: TP25
Sample Reference: Not Given
Sample Description: Dark grey sandy CLAY with shales

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	9
Material Retained on 20.0 mm Sieve	%	26
Particle Density - Assumed	Mg/m³	2.40
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	1.65
Optimum Moisture Content	%	9.8

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Zone X - test carried out as per client request.

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 110.14

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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Croxley Green Business Park
Watford Herts WD18 8YS



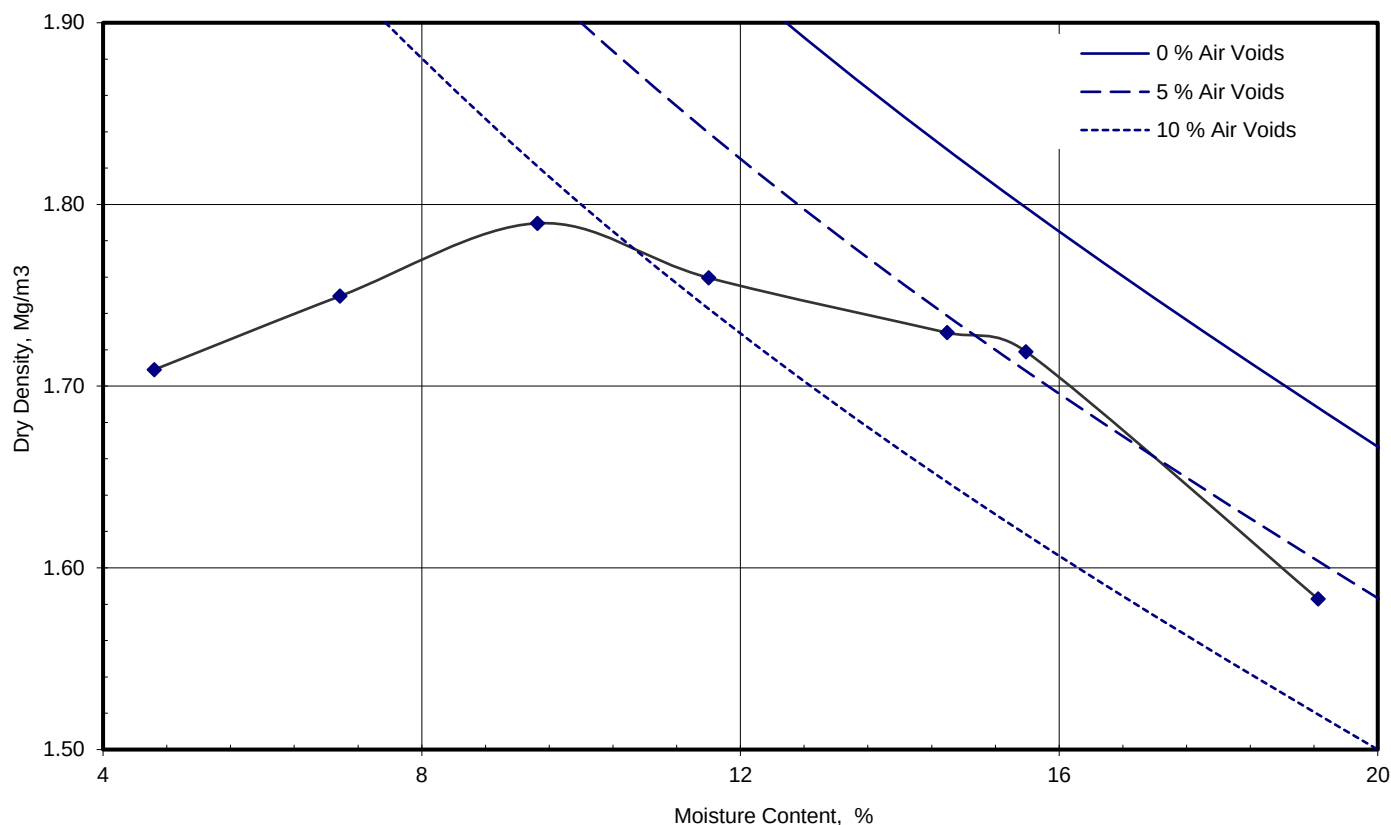
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161456
Hole No.: TP26
Sample Reference: Not Given
Sample Description: Dark grey sandy CLAY with shales

Depth Top [m]: 2.40
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	6
Material Retained on 20.0 mm Sieve	%	17
Particle Density - Assumed	Mg/m³	2.50
As received Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.79
Optimum Moisture Content	%	9.5

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 110.14

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



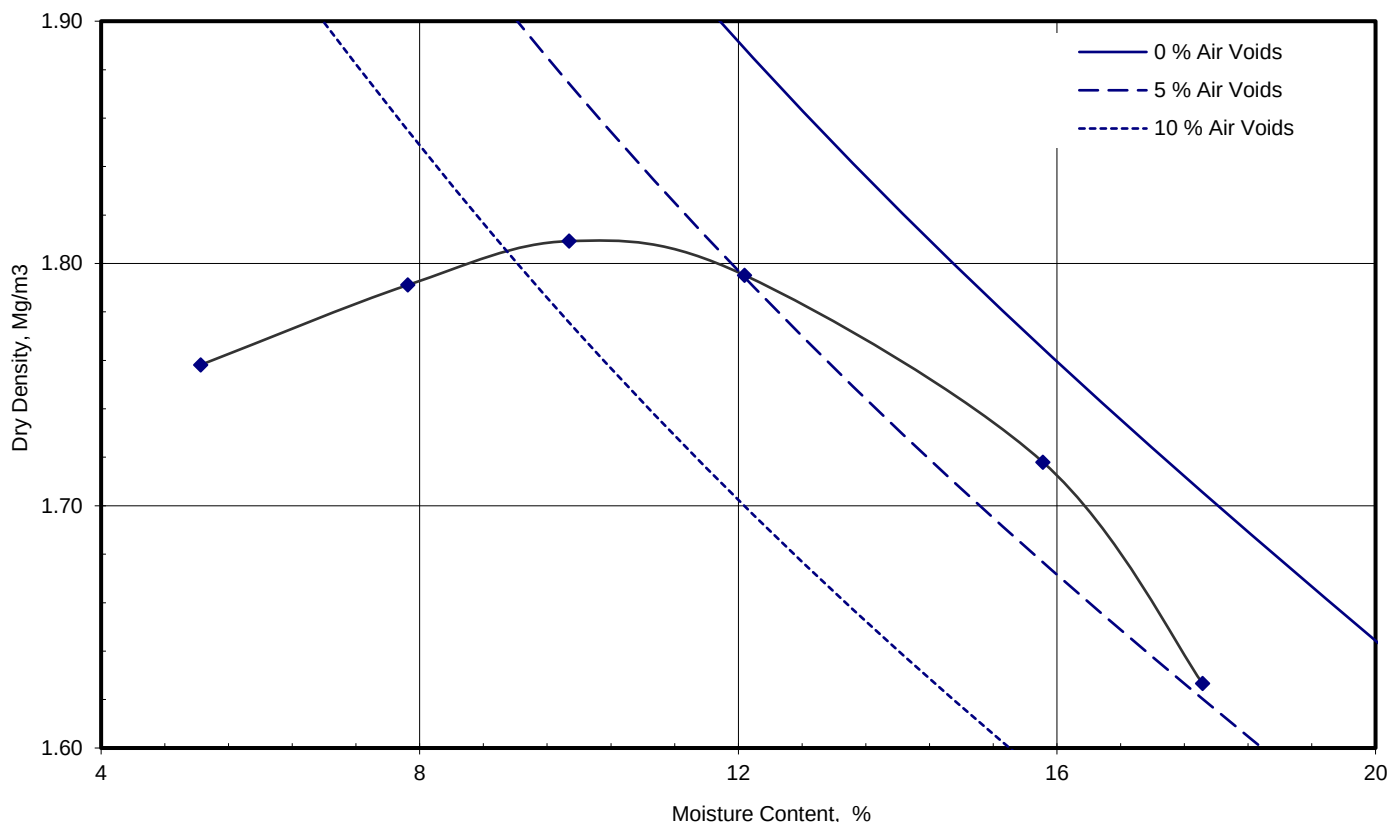
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161457
Hole No.: TP31
Sample Reference: Not Given
Sample Description: Dark grey CLAY with shales

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.81
Optimum Moisture Content	%	10

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed:

Darren Berrill
Geotechnical General Manager

GF 110.14

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4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



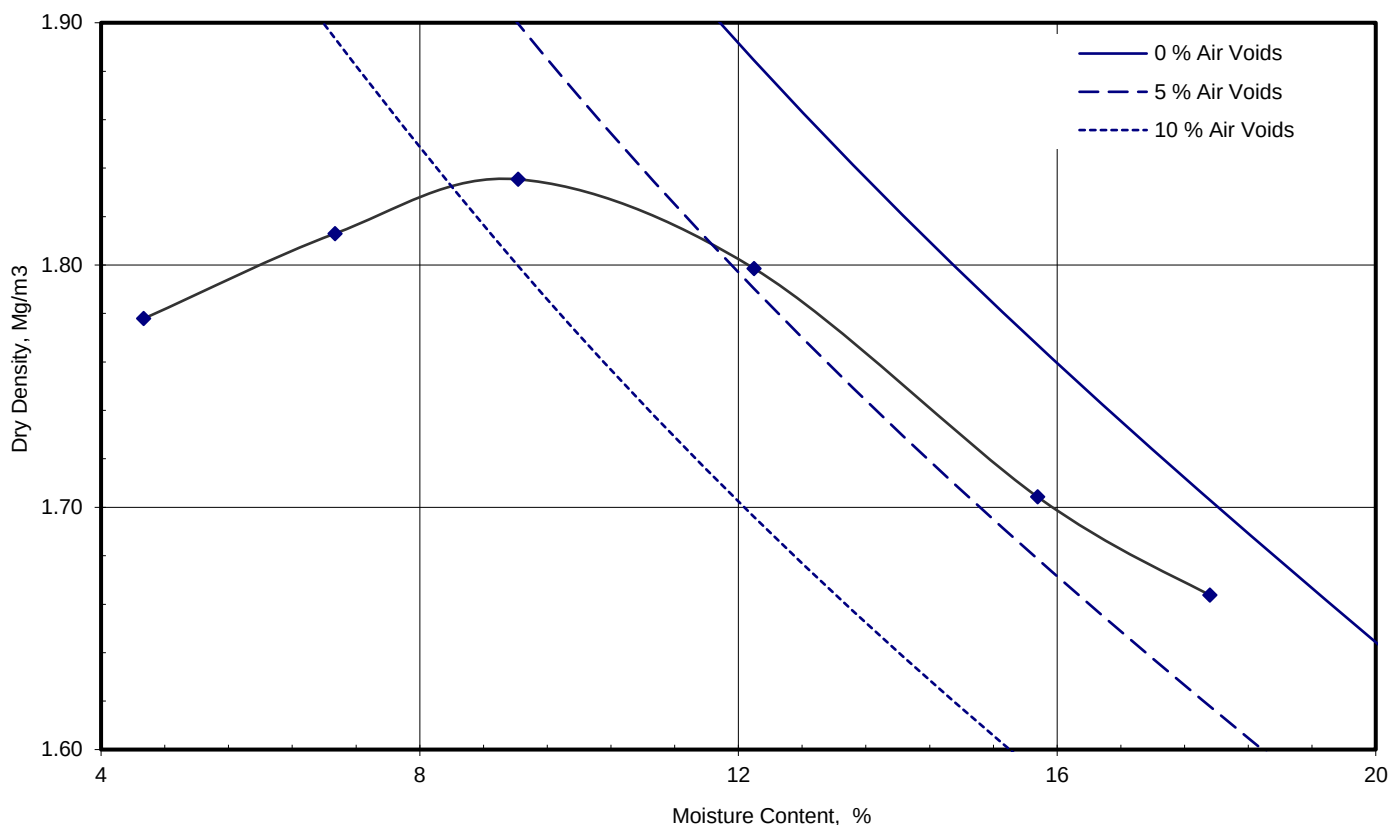
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161458
Hole No.: TP43
Sample Reference: Not Given
Sample Description: Dark grey CLAY with shales

Depth Top [m]: 0.60
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.84
Optimum Moisture Content	%	9.3

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



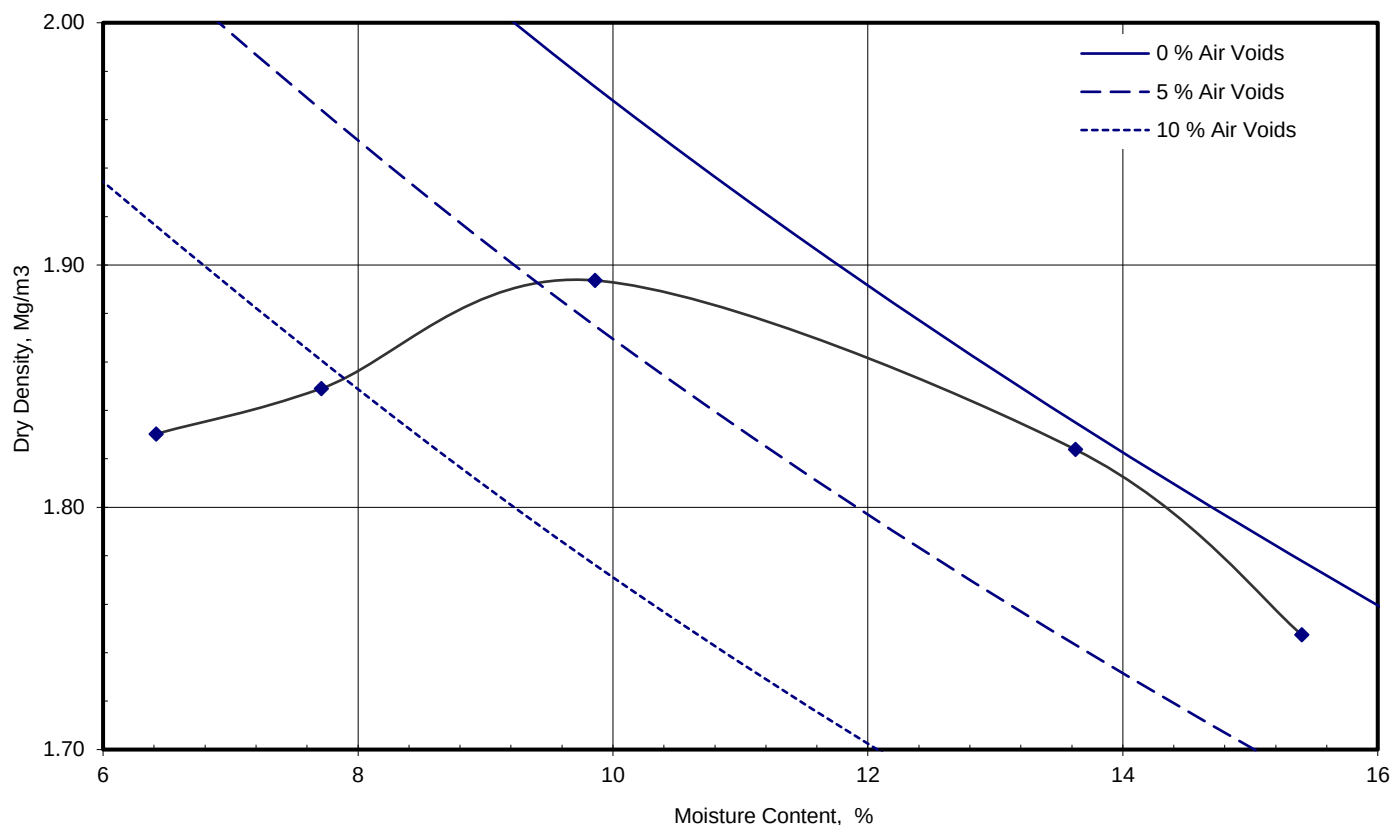
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161459
Hole No.: TP39
Sample Reference: Not Given
Sample Description: Dark grey sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m ³	2.45
As received Moisture Content	%	14
Maximum Dry Density	Mg/m ³	1.89
Optimum Moisture Content	%	9.9

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed:

Darren Berrill
Geotechnical General Manager

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TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

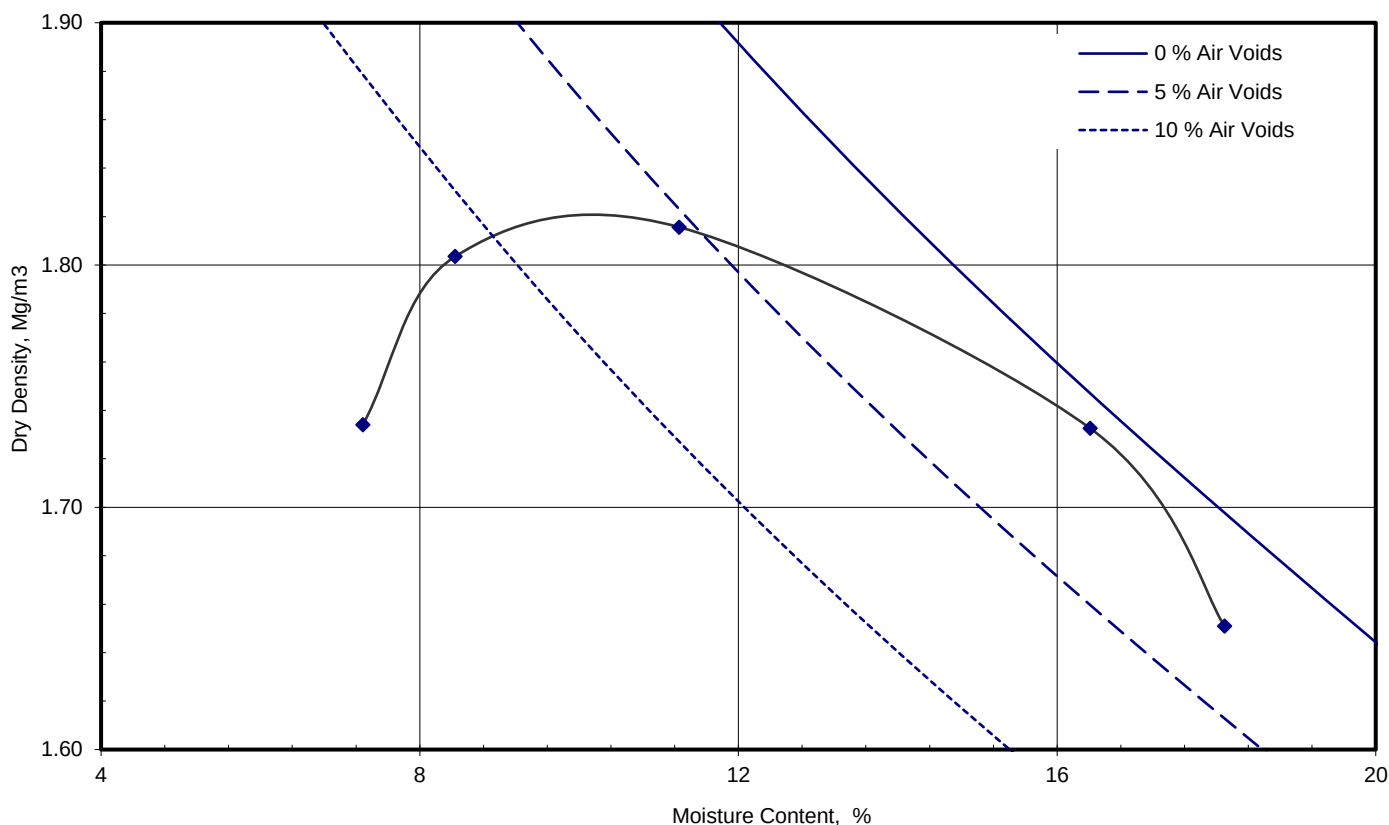
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 05/03/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161460
Hole No.: TP35
Sample Reference: Not Given
Sample Description: Dark grey sandy CLAY with shales

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	8
Material Retained on 20.0 mm Sieve	%	17
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.82
Optimum Moisture Content	%	11

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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TEST CERTIFICATE

One Dimensional Consolidation Test

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

Tested in Accordance with: BS 1377-5: 1990: Clause 3

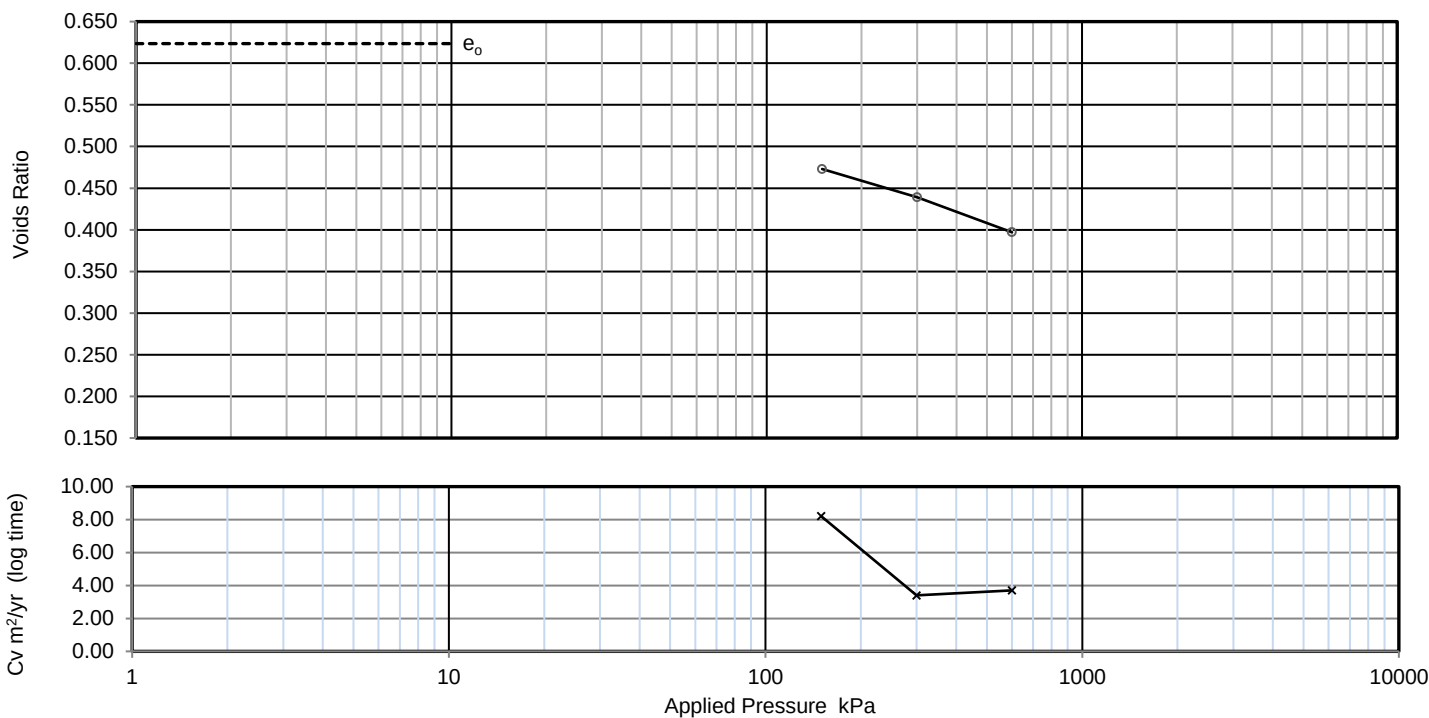
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 25/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161423
Hole No.: RC04
Sample Reference: Not Given
Sample Description: Grey slightly gravelly slightly sandy CLAY

Depth Top [m]: 15.00
Depth Base [m]: 15.45
Sample Type: U



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
0	0.624	-	-	-	-
150	0.473	0.62	8.2	13	0.0014
300	0.439	0.15	3.4	4.6	0.0016
600	0.397	0.097	3.7	3.8	0.0019

Preparation

Index tests

Orientation of the sample

Particle density

Liquid limit

Plastic limit

Specimen details

Diameter

Height

Moisture Content

Bulk density

Dry density

Voids Ratio

Saturation

Avg. temperature for test

Swelling Pressure

Settlement on saturation

Vertical		
assumed	2.65	Mg/m3
N/A		%
N/A		%

Initial	Final	
50.02	-	mm
20.08	17.28	mm
21	19	%
1.98	2.26	Mg/m3
1.63	1.90	Mg/m3
0.624	0.397	
91	126	%
22.0		°C
Not measured		kPa
		%

Note: Cv corrected to 20°C

Remarks: specimen contains gravel particle

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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TEST CERTIFICATE

One Dimensional Consolidation Test

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



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Tested in Accordance with: BS 1377-5: 1990: Clause 3

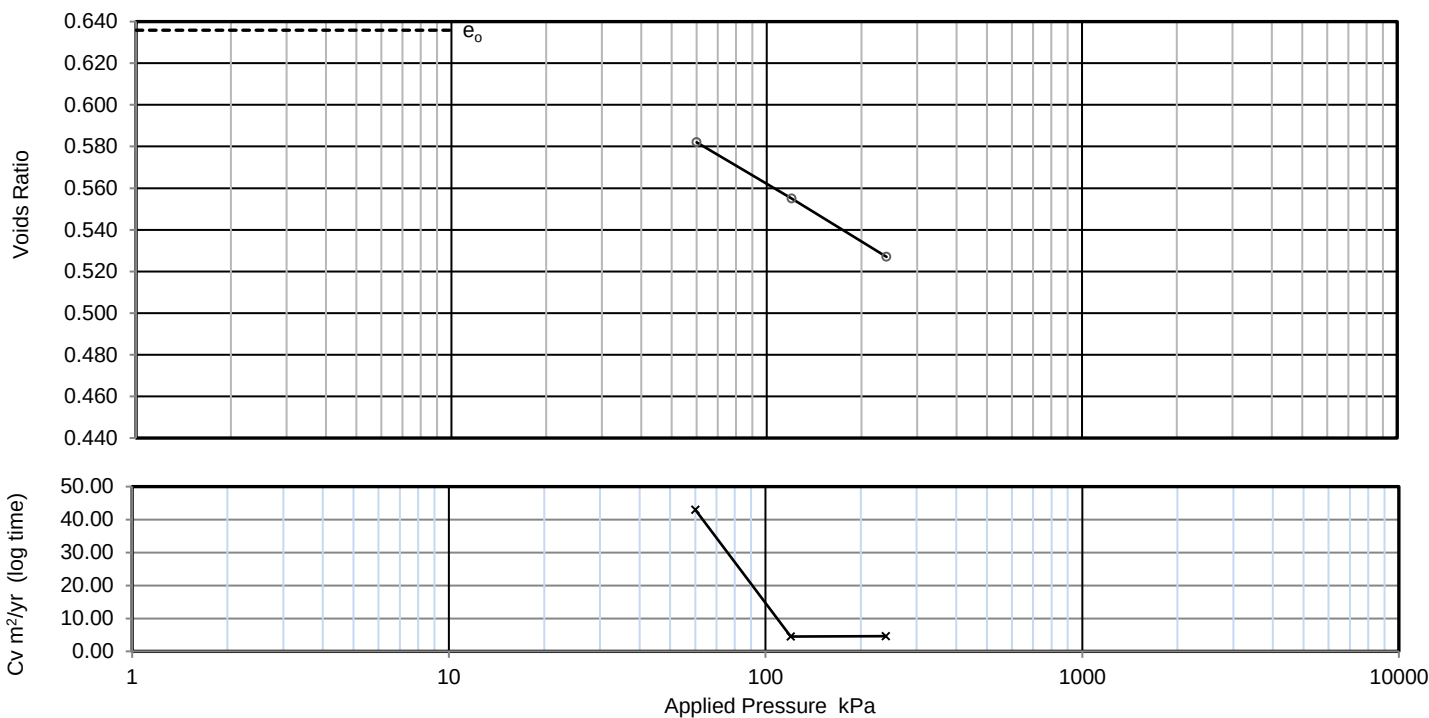
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 25/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161425
Hole No.: RC05
Sample Reference: Not Given
Sample Description: Grey slightly gravelly slightly sandy CLAY

Depth Top [m]: 12.50
Depth Base [m]: 13.00
Sample Type: U



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
0	0.636	-	-	-	-
60	0.582	0.55	43	57	0.0013
120	0.555	0.28	4.5	9.4	0.001
240	0.527	0.15	4.6	7.5	0.0016

Preparation

Index tests

Orientation of the sample

Particle density

Liquid limit

Plastic limit

Specimen details

Diameter

Height

Moisture Content

Bulk density

Dry density

Voids Ratio

Saturation

Avg. temperature for test

Swelling Pressure

Settlement on saturation

Vertical		
assumed	2.65	Mg/m3
N/A		%
N/A		%

Initial	Final	
50.08	-	mm
19.99	18.66	mm
22	21	%
1.97	2.10	Mg/m3
1.62	1.74	Mg/m3
0.636	0.527	
91	106	%
22.0		°C
Not measured		kPa
		%

Note: Cv corrected to 20°C

Remarks: specimen contains gravel particle

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed:

Darren Berrill
Geotechnical General Manager

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i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



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Tested in Accordance with: BS 1377-5: 1990: Clause 3

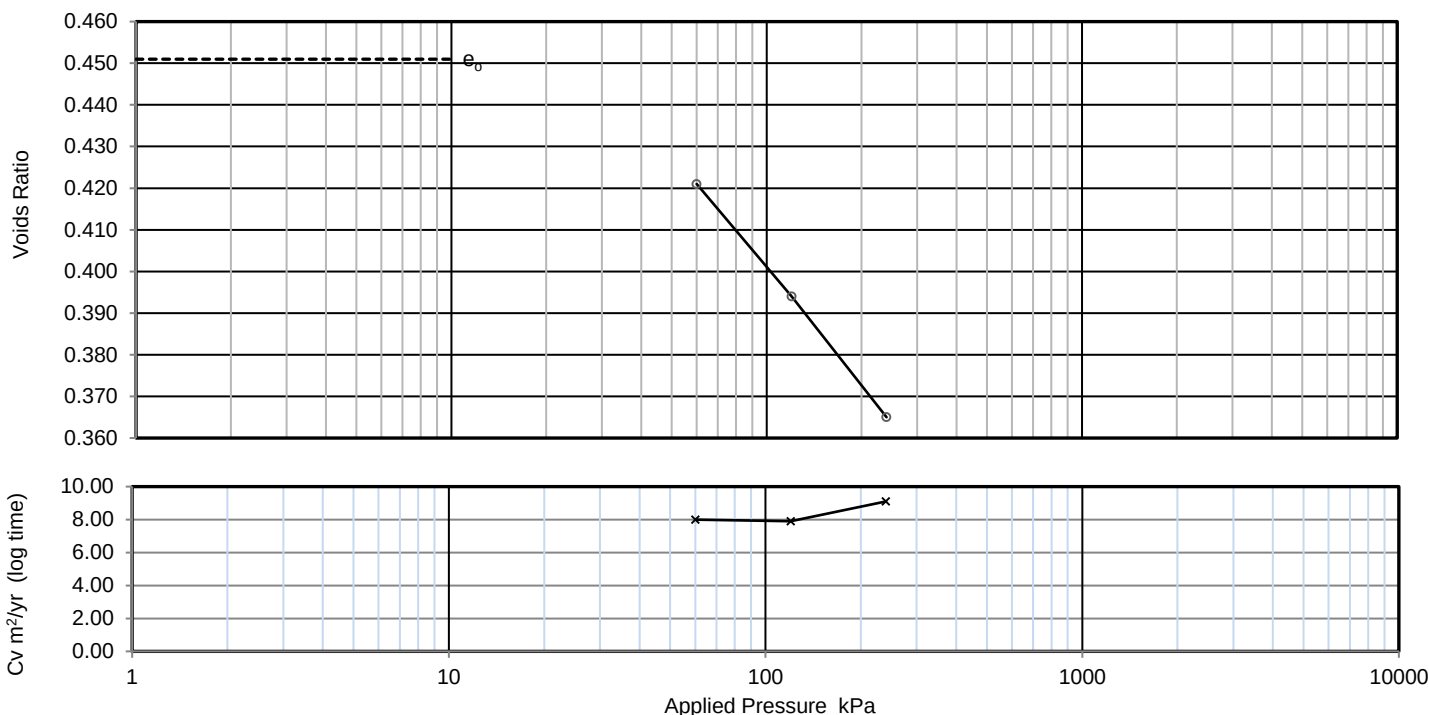
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 25/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161428
Hole No.: RC08
Sample Reference: Not Given
Sample Description: Grey gravelly slightly sandy CLAY

Depth Top [m]: 17.00
Depth Base [m]: 17.50
Sample Type: U



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
0	0.451	-	-	-	-
60	0.421	0.34	8	11	0.0011
120	0.394	0.32	7.9	10	0.00068
240	0.365	0.17	9.1	15	0.00087

Preparation

Index tests

Orientation of the sample

Particle density

Liquid limit

Plastic limit

Specimen details

Diameter

Height

Moisture Content

Bulk density

Dry density

Voids Ratio

Saturation

Avg. temperature for test

Swelling Pressure

Settlement on saturation

Vertical		
assumed	2.65	Mg/m3
N/A		%
N/A		%

Initial	Final	
50.02	-	mm
20.05	18.86	mm
14	18	%
2.08	2.29	Mg/m3
1.83	1.94	Mg/m3
0.451	0.365	
83	131	%
22.0		°C
Not measured		kPa
		%

Note: Cv corrected to 20°C

Remarks: specimen contains gravel particle

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PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

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Geotechnical General Manager

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Croxley Green Business Park
Watford Herts WD18 8YS



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Tested in Accordance with: BS 1377-5: 1990: Clause 3

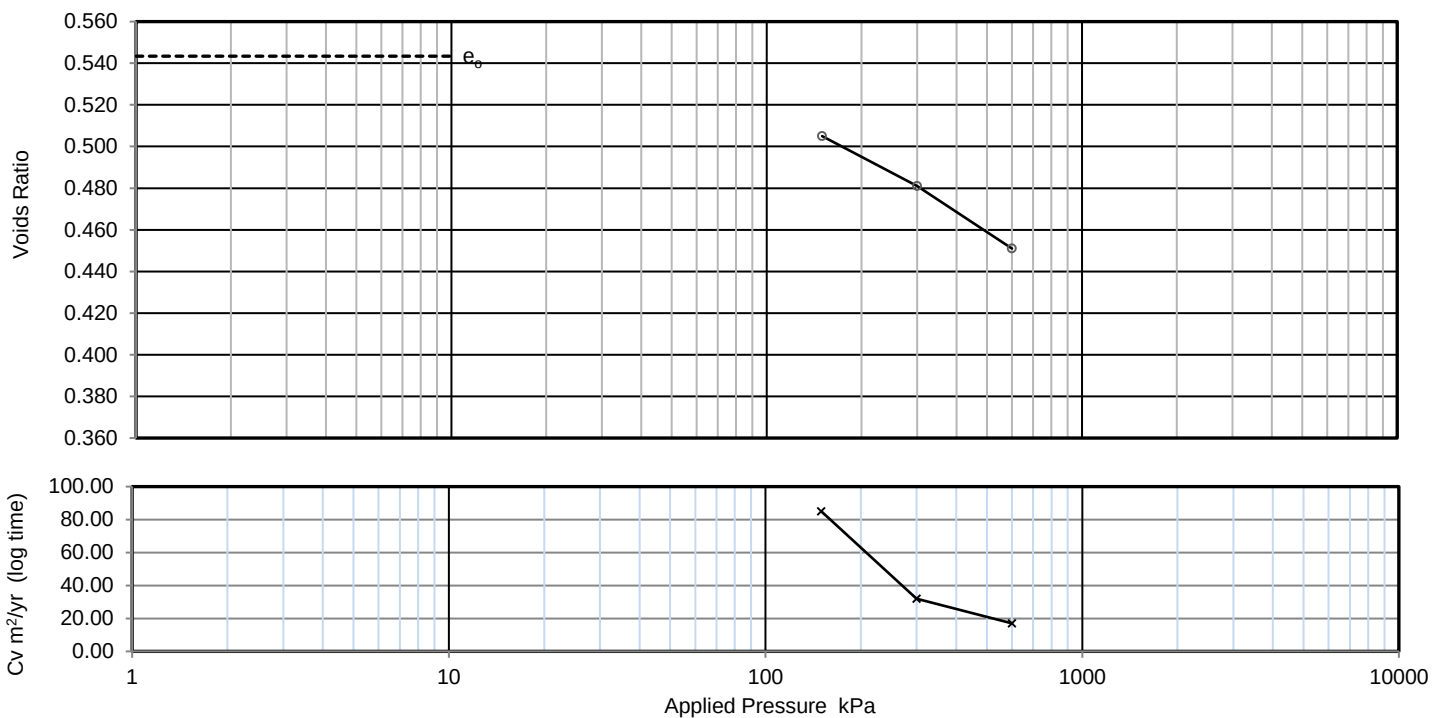
Client: CURTINS
Client Address: Rose Wharf, Ground Floor,
78-80 East Street, Leeds,
LS9 8EE
Contact: Lewis Doel
Site Name: Woodville
Site Address: Not Given

Client Reference: 67895
Job Number: 19-29949
Date Sampled: Not Given
Date Received: 20/02/2019
Date Tested: 25/02/2019
Sampled By: Not Given

Test Results:

Laboratory Reference: 1161429
Hole No.: RC08
Sample Reference: Not Given
Sample Description: Mottled brown gravelly slightly sandy CLAY

Depth Top [m]: 21.00
Depth Base [m]: 21.50
Sample Type: U



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
0	0.543	-	-	-	-
150	0.505	0.17	85	97	0.00071
300	0.481	0.11	32	67	0.0012
600	0.451	0.067	17	26	0.0015

Preparation

Index tests

Orientation of the sample

Particle density

Liquid limit

Plastic limit

Specimen details

Diameter

Height

Moisture Content

Bulk density

Dry density

Voids Ratio

Saturation

Avg. temperature for test

Swelling Pressure

Settlement on saturation

Vertical		
assumed	2.65	Mg/m3
N/A		%
N/A		%

Initial	Final	
50.00	-	mm
20.07	18.87	mm
19	16	%
2.04	2.12	Mg/m3
1.72	1.83	Mg/m3
0.543	0.451	
92	94	%
22.0		°C
Not measured		kPa
		%

Note: Cv corrected to 20°C

Remarks: specimen contains gravel particle

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
Geotechnical General Manager

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4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Environmental Science

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Lewis Doel
 Site Name: Woodville
 Site Address: Not Given

Client Reference: 67895
 Job Number: 19-29949
 Date Sampled: Not Given
 Date Received: 20/02/2019
 Date Tested: 26/02/2019
 Sampled By: Not Given

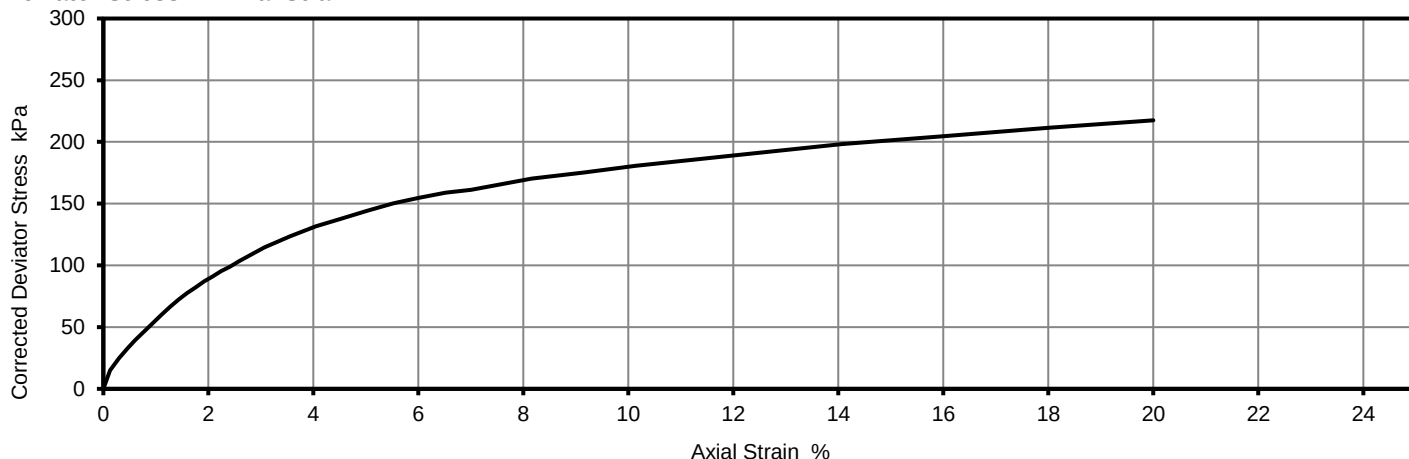
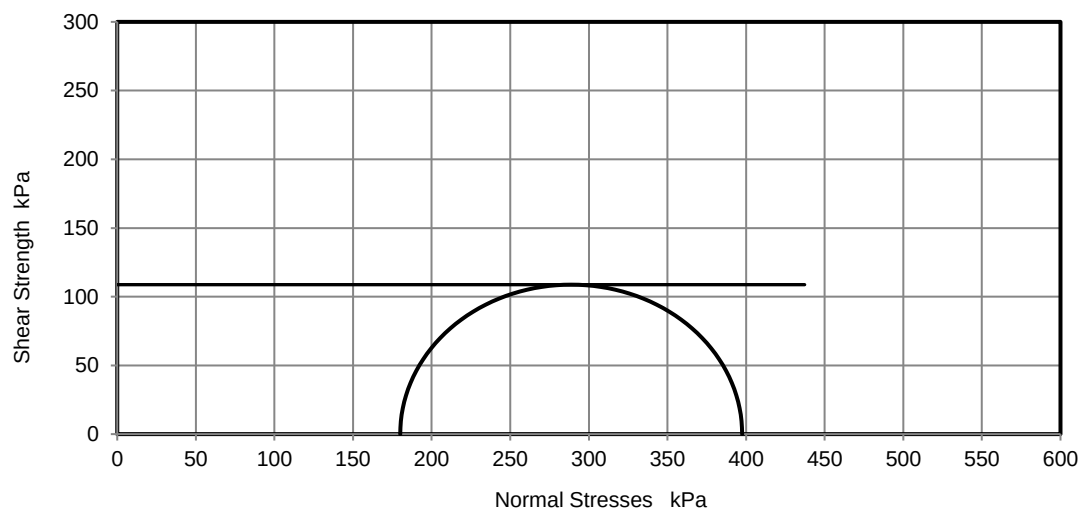
Test Result

Laboratory Reference: 1161422
 Hole No.: RC04
 Sample Reference: Not Given
 Sample Description: Mottled grey slightly gravelly sandy CLAY

Depth Top [m]: 9.00
 Depth Base [m]: 9.45
 Sample Type: U

Test Number	1
Length	200.25 mm
Diameter	101.98 mm
Bulk Density	2.11 Mg/m ³
Moisture Content	14 %
Dry Density	1.86 Mg/m ³
Membrane Correction	1.09 kPa

Rate of Strain	2.00 %/min
Cell Pressure	180 kPa
Axial Strain at failure	20.0 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	218 kPa
Undrained Shear Strength, c_u	109 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Plastic
Membrane thickness	0.29 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
 Geotechnical General Manager

GF 184.6

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TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Environmental Science

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Lewis Doel
 Site Name: Woodville
 Site Address: Not Given

Client Reference: 67895
 Job Number: 19-29949
 Date Sampled: Not Given
 Date Received: 20/02/2019
 Date Tested: 26/02/2019
 Sampled By: Not Given

Test Result

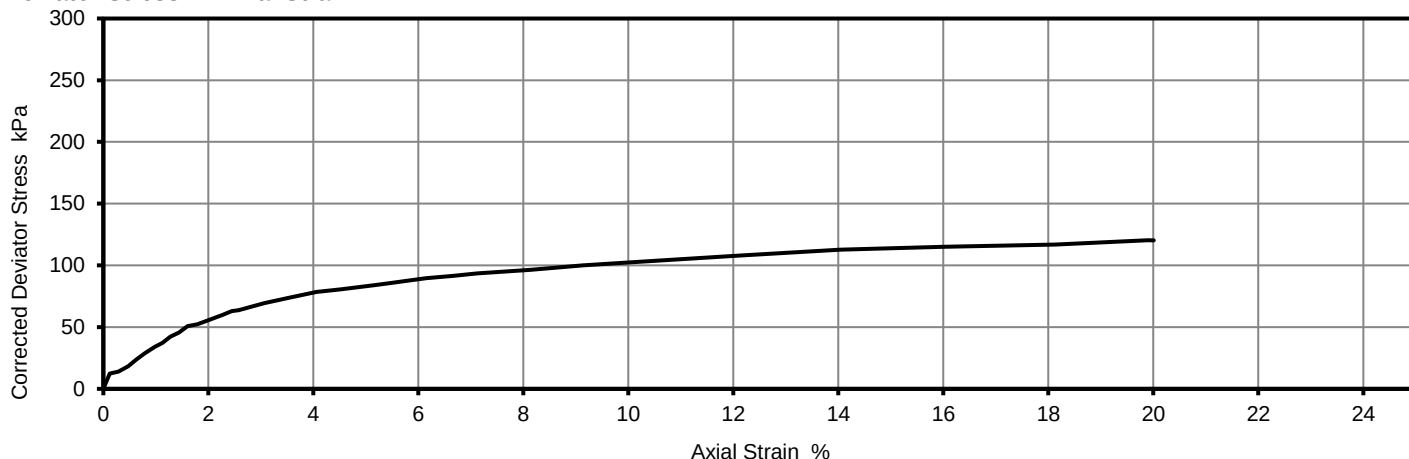
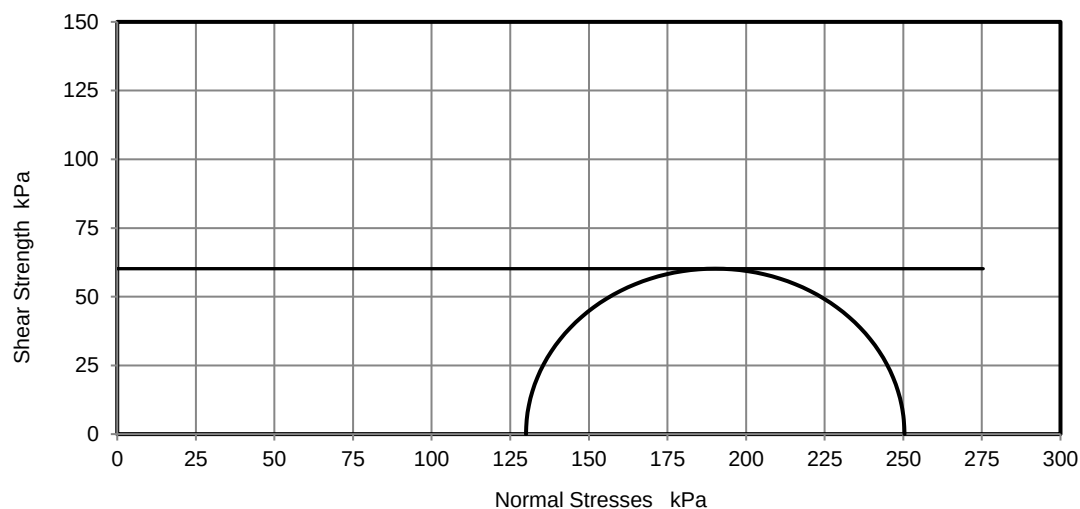
Laboratory Reference: 1161424
 Hole No.: RC05
 Sample Reference: Not Given
 Sample Description: Mottled grey slightly gravelly sandy CLAY

Depth Top [m]: 6.50
 Depth Base [m]: 7.00
 Sample Type: U

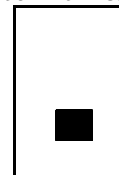
Test Number	1
Length	73.67 mm
Diameter	38.03 mm
Bulk Density	2.03 Mg/m ³
Moisture Content	17 %
Dry Density	1.74 Mg/m ³
Membrane Correction	3.02 kPa

Rate of Strain
 Cell Pressure
 Axial Strain at failure
 Deviator Stress, ($\sigma_1 - \sigma_3$)_f
 Undrained Shear Strength, c_u
 Mode of Failure
 Membrane thickness

1.99	%/min
130	kPa
19.9	%
120	kPa
60	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Compound	
0.30	mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
 Geotechnical General Manager

GF 184.6

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TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Environmental Science

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Lewis Doel
 Site Name: Woodville
 Site Address: Not Given

Client Reference: 67895
 Job Number: 19-29949
 Date Sampled: Not Given
 Date Received: 20/02/2019
 Date Tested: 26/02/2019
 Sampled By: Not Given

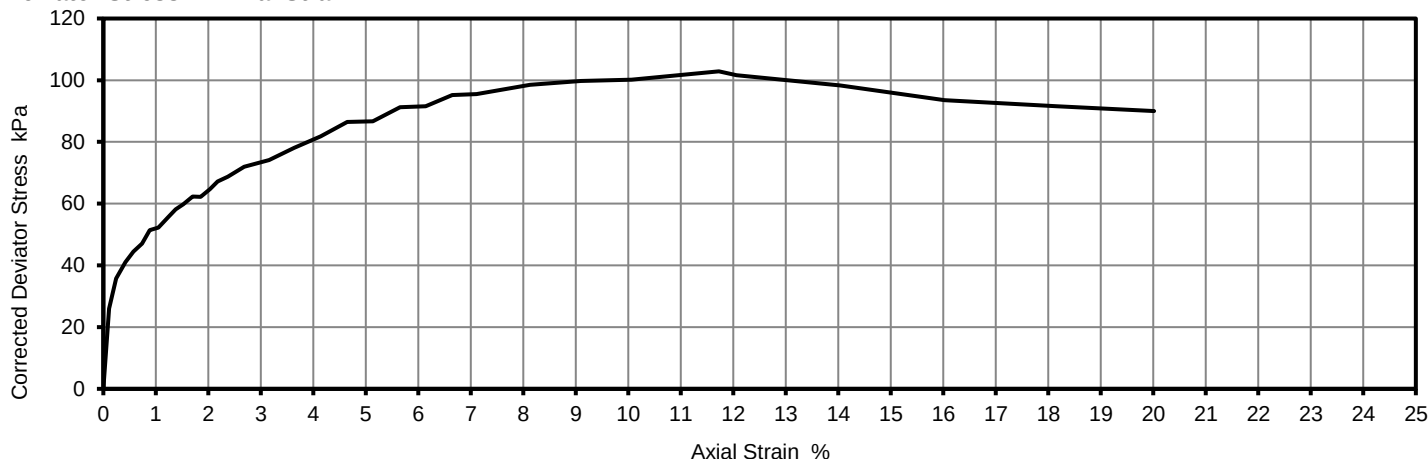
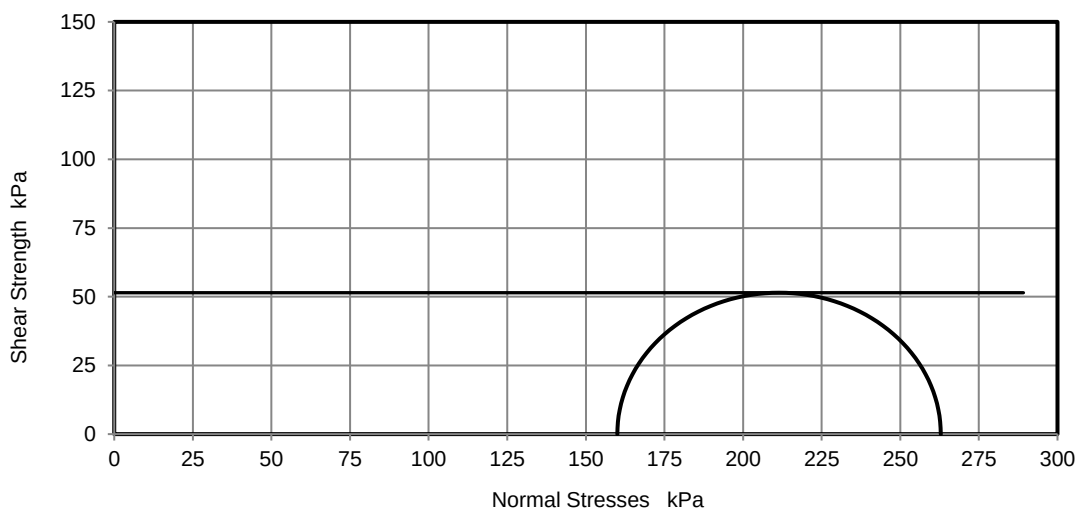
Test Result

Laboratory Reference: 1161426
 Hole No.: RC07
 Sample Reference: Not Given
 Sample Description: Mottled grey slightly gravelly sandy CLAY

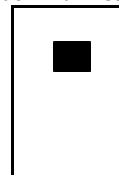
Depth Top [m]: 8.00
 Depth Base [m]: 8.50
 Sample Type: U

Test Number	1
Length	73.45 mm
Diameter	37.66 mm
Bulk Density	1.96 Mg/m ³
Moisture Content	16 %
Dry Density	1.69 Mg/m ³
Membrane Correction	1.73 kPa

Rate of Strain	2.00 %/min
Cell Pressure	160 kPa
Axial Strain at failure	11.7 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	103 kPa
Undrained Shear Strength, c_u	51 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.26 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
 Geotechnical General Manager

GF 184.6

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 The results included within the report are representative of the samples submitted for analysis.
 The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Environmental Science

Client: CURTINS
 Client Address: Rose Wharf, Ground Floor,
 78-80 East Street, Leeds,
 LS9 8EE
 Contact: Lewis Doel
 Site Name: Woodville
 Site Address: Not Given

Client Reference: 67895
 Job Number: 19-29949
 Date Sampled: Not Given
 Date Received: 20/02/2019
 Date Tested: 26/02/2019
 Sampled By: Not Given

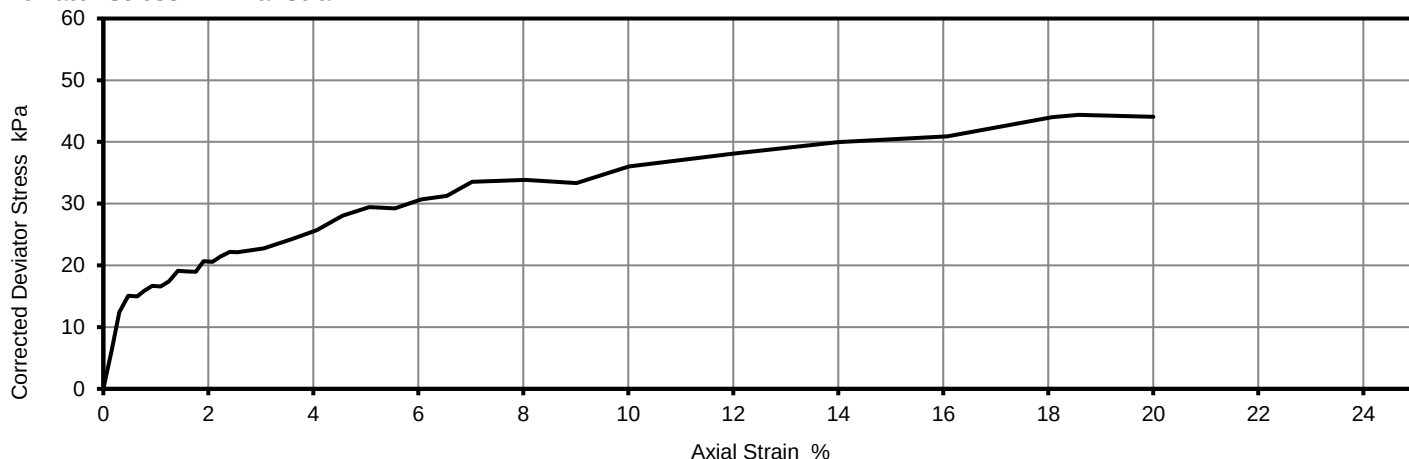
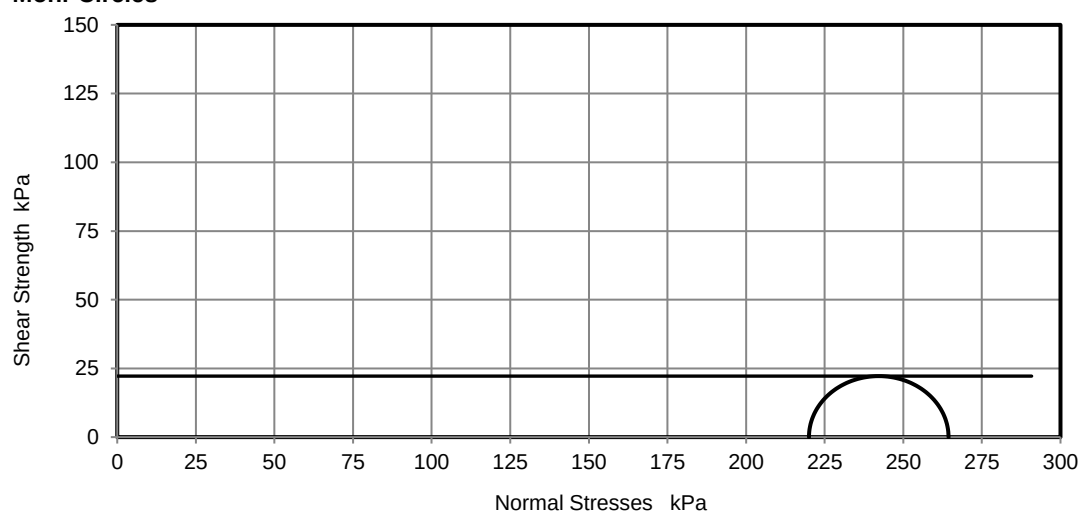
Test Result

Laboratory Reference: 1161431
 Hole No.: RC09
 Sample Reference: Not Given
 Sample Description: Dark grey slightly gravelly sandy CLAY

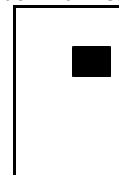
Depth Top [m]: 11.00
 Depth Base [m]: 11.45
 Sample Type: U

Test Number	1
Length	76.00 mm
Diameter	37.68 mm
Bulk Density	2.08 Mg/m ³
Moisture Content	13 %
Dry Density	1.83 Mg/m ³
Membrane Correction	3.07 kPa

Rate of Strain	2.00 %/min
Cell Pressure	220 kPa
Axial Strain at failure	18.6 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	44 kPa
Undrained Shear Strength, c_u	22 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.32 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks:

Approved: Dariusz Piotrowski
 PL Geotechnical Laboratory Manager
Date Reported: 06/03/2019

Signed: Darren Berrill
 Geotechnical General Manager

GF 184.6

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 The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

Appendix E Gas and Groundwater Monitoring Results

Curtins

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



GAS MONITORING LOG SHEET

Project: Woodville**Date:** 06.03.19 - 07.03.19**Job Number:** 067895**Visit:** 1**Client:** Harworth**Weather:** Windy and light rain**Barometric State:** State**Ground Conditions:** Damp and muddy

Borehole Reference	Barometric Pressure mb	Flow		Methane		Carbon Dioxide		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		l/hr		%		%							
		Max	SS	Max	SS	Max	SS						
RC01	964	0.0	0.0	0.0	0.0	8.7	8.7	10.3	1	0	3.73	9.80	16
RC02	967	0.3	0.2	0.0	0.0	1.1	0.5	19.3	1	0	1.00	7.36	
RC03	966	0.0	0.0	0.0	0.0	15.6	15.6	1.0	2	0	8.99	17.18	
RC04	968	4.5		0.0	0.0	4.2	4.2	1.8	1	0	5.64	20.03	6
RC05	967	3.3		0.0	0.0	0.8	0.7	17.4	1	0	4.33	15.70	11
RC06		2.2		0.4	0.4	9.3	9.3	5.6	1	0	4.56	16.90	12
RC07	968	2.8		0.0	0.0	4.9	0.0	20.1	1	0	2.91	16.01	8
RC08	967	4.5	0.4	1.2	1.2	29.1	29.1	0.7	0	0	5.85	14.78	1
RC09											1.96	19.96	
RC10	968	0.2	0.0	1.6	0.6	10.3	6.9	7.4	2	0	4.05	19.00	
WS01	964	0.0	0.0	0.0	0.0	20.7	20.6	0.5	1	1	dry	5.26	2
WS02	968	2.4		0.0	0.0	12.4	12.4	-0.1	2	17	5.46	5.46	
WS03	964	0.7	0.5	0.0	0.0	14.7	7.3	10.9	1	0	1.23	5.37	
WS04	967	3.6		0.0	0.0	9.2	9.2	6.2	1	0	3.09	3.83	7,15
WS05	965	2.4		2.0	2.0	9.6	9.6	-0.1	0	0			3,17
WS06	967	0.0	0.0	1.7	1.6	15.3	7.7	3.0	1	0	2.57	3.46	16
WS07	967	2.1		0.4	0.4	2.2	2.2	0.3	2	10	4.20	4.25	4
WS08	967	0.5	0.0	4.1	4.1	8.8	8.8	-0.1	1	0	3.01	5.21	5
WS09	967	2.1		3.0	3.0	8.1	8.1	0.0	0	0	3.01	5.12	
WS10	967	0.2	0.0	0.2	0.0	9.5	0.3	20.2	1	0	3.14	5.12	
WS11	967	0.4	0.0	0.0	0.0	0.5	0.1	20.3	1	0	2.79	3.85	16
WS12	967	0.0	0.0	0.0	0.0	6.8	6.8	6.3	0	0	3.09	4.55	
WS13	967	0.4	0.0	0.0	0.0	10.4	10.4	0.3	1	0	dry	5.32	
WS14	968	-0.7	0.0	1.3	1.2	10.8	10.8	0.0	1	0	4.52	5.21	
WS15	967	0.0	0.0	0.3	0.3	9.7	9.6	0.8	1	0	4.53	5.29	
WS16	967	0.1	0.0	0.5	0.0	7.3	7.3	6.8	1	1	2.73	4.71	
WS17	967	3.1		1.6	1.6	6.3	6.3	-0.1	1	0	3.14	4.90	14

WS18	967	4.2		0.0	0.0	9.5	8.9	8.7	0	0	4.48	4.48	13
WS20	968	8.6		0.0	0.0	11.9	11.9	5.4	1	0	3.38	5.08	10
WS21	967	3.1		0.8	0.8	20.3	20.3	12.3	1	0	3.14	5.02	9
WS24													1

Notes

- 1 No bung. Installed for next visit.
- 2 Fluctuating flow throughout between 1.7 and 2.4 l/hr
- 3 Fluctuating flow throughout between 1.2 and 2.4 l/hr. GWL not recorded.
- 4 Fluctuating flow throughout between 0.2 and 2.1 l/hr
- 5 Fluctuating flow throughout between 0.2 and 2.1 l/hr
- 6 Fluctuating flow throughout between 3.9 and 4.5 l/hr
- 7 Fluctuating flow throughout between 2.9 and 3.6 l/hr
- 8 Fluctuating flow throughout between 0.0 and 2.8 l/hr
- 9 Fluctuating flow throughout between 0.0 and 3.1 l/hr
- 10 Rising flow throughout from 1.3 and 8.6 l/hr
- 11 Fluctuating flow throughout between 1.3 and 3.3 l/hr
- 12 Fluctuating flow throughout between 0.0 and 2.2 l/hr
- 13 Fluctuating flow throughout between 1.3 and 4.2 l/hr
- 14 Fluctuating flow throughout between 0.5 and 3.1 l/hr
- 15 No steady state achieved for CO₂, near steady state reading listed
- 16 No steady state achieved for O₂, near steady state reading listed
- 17 Water readings not recorded

Logged by

ES

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

Curtins

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



GAS MONITORING LOG SHEET

Project:	Woodville	Date:	21.03.19 - 22.03.19
Job Number:	067895	Visit:	2
Client:	Harworth	Weather:	Mild and breezy
Barometric State:	Fluctuating	Ground Conditions:	Dry

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
RC01	1009	0.1	0.0	0.0	0.0	2.9	2.9	12.3	1	0	6.35	9.81	
RC02	1010	0.0	0.0	0.0	0.0	0.6	0.4	20.2	1	0	1.05	7.06	
RC03	1017	0.0	0.0	0.0	0.0	5.2	5.2	15.9	1	0	9.55	17.11	
RC04	1017	1.5		0.0	0.0	0.1	0.1	20.5	1	0	5.62	20.00	1
RC05	1010	2.3		0.0	0.0	3.5	3.5	9.2	0	0	4.42	15.60	2,6
RC06	1010	1.2	0.0	0.0	0.0	1.7	1.7	17.8	1	0	3.92	17.03	5,6
RC07	1009	-0.6	0.0	0.0	0.0	0.1	0.0	20.3	1	0	3.64	15.84	
RC08	1016	5.4	0.1	1.2	1.2	28.6	27.3	36.4	3	0	6.24	17.83	
RC09	1016	0.0	0.0	0.0	0.0	5.6	3.7	11.8	1	0	2.18	8.67	5,6
RC10													3
WS01	1009	-1.2	0.0	0.0	0.0	5.7	5.7	16.4	1	0	dry	5.25	
WS02	1016	-1.3	-1.1	0.0	0.0	0.2	0.0	20.7	1	0	5.37	5.37	
WS03	1010	0.0	0.0	0.0	0.0	0.1	0.1	20.4	1	0	0.90	5.35	
WS04	1016	0.0	0.0	0.0	0.0	0.9	0.9	20.1	1	0	3.00	4.82	
WS05	1016	-0.5	0.0	0.1	0.1	3.9	3.9	3.8	0	0	4.40	4.47	6
WS06	1018	0.0	0.0	0.0	0.0	1.2	1.1	18.7	1	0	2.31	4.36	
WS07	1016	0.0	0.0	0.0	0.0	0.7	0.7	18.9	1	10	4.06	5.09	6
WS08	1016	0.0	0.0	1.1	1.1	2.5	2.4	15.6	1	0	2.97	4.26	
WS09	1016	0.0	0.0	1.0	0.9	3.1	2.7	12.7	2	0	2.27	5.13	5,6
WS10	1016	0.0	0.0	0.0	0.0	0.7	0.7	18.6	2	0	2.97	5.12	6
WS11	1016	0.0	0.0	0.0	0.0	0.7	0.7	19.5	1	0	2.45	3.85	5,6
WS12	1016	0.0	0.0	0.0	0.0	4.0	4.0	11.6	2	0	3.08	4.54	5,6
WS13	1016	0.0	0.0	0.0	0.0	3.9	3.9	12.7	2	1	5.31	5.31	5,6
WS14	1017	0.0	0.0	0.3	0.3	4.9	4.9	11.3	2	10	3.15	5.20	
WS15	1017	0.0	0.0	0.0	0.0	3.4	3.4	9.0	1	0	4.24	5.23	
WS16	1017	0.0	0.0	0.0	0.0	3.4	3.4	14.4	2	0	2.47	4.71	5,6

WS17	1009	0.9	0.0	1.6	1.5	8.2	8.2	0.0	1	0	2.71	4.82	
WS18	1009	0.7		0.0	0.0	6.2	6.2	3.7	1	0	dry	4.46	4,6
WS20	1010	0.0	0.0	0.0	0.0	8.0	8.0	9.0	1	0	3.25	5.08	5,6
WS21	1010	0.3	0.0	1.2	1.2	11.6	11.6	0.5	1	0	3.16	5.06	6
WS24	1009	0.0	0.0	0.0	0.0	0.2	0.0	20.3	1	0	0.85	0.85	

Notes

Logged by

ES

- 1 Fluctuating flow throughout between 1.2 and 1.5 l/hr. Continues fluctuating after 5 minutes.
- 2 Fluctuating flow throughout between 0.5 and 2.3 l/hr. Steady state of 0.0 l/h reached after 5 minutes.
- 3 Level logger installed
- 4 Fluctuating flow throughout between 0.0 and 0.7 l/hr. Continues fluctuating after 5 minutes.
- 5 No steady state achieved for CO₂, near steady state reading listed
- 6 No steady state achieved for O₂, near steady state reading listed

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

Curtins

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



GAS MONITORING LOG SHEET

Project:	Woodville	Date:	25.03.19
Job Number:	067895	Visit:	3
Client:	Harworth	Weather:	mild and sunny
Barometric State:	fluctuating	Ground Conditions:	dry

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
RC01													6
RC02													6
RC03	1016	0.0	0.0	0.0	0.0	2.5	2.5	16.1	1	0	9.64	17.10	2, 3
RC04	1016	2.5		0.0	0.0	1.6	0.8	18.8	2	0	3.20	20.00	5
RC05	1018	0.0	0.0	0.0	0.0	4.0	4.0	9.8	1	0	4.50	15.90	
RC06	1016	0.0	0.0	0.0	0.0	2.4	2.4	16.4	2	0	4.30	12.00	3
RC07	1020	0.0	0.0	0.0	0.0	5.4	0.1	20.5	2	-10	3.80	16.80	
RC08	1018	0.6		1.9	1.2	31.9	31.9	1.8	1	0	6.25	< 25	4
RC09													6
RC10													1
WS01	1015	0.0	0.0	0.0	0.0	5.2	5.2	16.6	1	0	2.75	5.40	2,3
WS02	1018	-2.8	-0.9	0.0	0.0	0.3	0.0	20.2	1	0	5.39	5.39	
WS03													6
WS04													6
WS05	1016	0.0	0.0	0.0	0.0	3.4	3.4	15.0	2	0	4.50	15.90	2,3
WS06	1017	0.0	0.0	0.0	0.0	1.6	0.2	18.7	1	0	2.37	3.44	
WS07													6
WS08	1016	0.0	0.0	3.9	3.9	8.4	8.4	1.0	1	0	2.99	5.28	
WS09													6
WS10	1020	0.0	0.0	0.1	0.0	9.2	2.4	16.9	1	0	3.01	5.12	2, 3
WS11													6
WS12													6
WS13													6
WS14													6
WS15													6
WS16	1020	0.0	0.0	0.0	0.0	6.0	6.0	9.1	2	0	3.20	4.80	3

WS17	1021	0.0	0.0	0.0	0.0	0.8	0.8	19.5	2	0	3.10	5.10	
WS18	1017	0.0	0.0	0.0	0.0	2.4	0.6	19.9	2	0	4.20	5.60	2,3
WS20	1016	0.0	0.0	0.0	0.0	6.9	0.4	20.4	1	0	3.50	6.30	
WS21	1021	0.0	0.0	0.2	0.2	7.1	7.1	8.0	2	0	3.50	5.60	2,3
WS24													6

Notes

Logged by

- 1 Level logger installed
- 2 No steady state achieved for CO₂, near steady state reading listed
- 3 No steady state achieved for O₂, near steady state reading listed
- 4 Fluctuating flow throughout between 0.0 and 0.6 l/hr. Steady state flow of 0.0 l/hr reached by 5 minutes.
- 5 Fluctuating flow throughout between 0.0 and 2.5 l/hr. Steady state flow of 0.3 l/hr reached by 4 minutes.
- 6 Well not monitored as stable flow levels on previous visit (3/4 days earlier)

DG

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

Curtins

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



GAS MONITORING LOG SHEET

Project:	Woodville	Date:	11.04.19 - 12.04.19
Job Number:	067895	Visit:	4
Client:	Harworth	Weather:	Mild and sunny
Barometric State:	fluctuating	Ground Conditions:	dry

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
RC01	1009	0.0	0.0	0.0	0.0	1.4	1.4	19.8	2	0	6.47	9.80	
RC02	1012	0.3	0.0	0.0	0.0	2.7	2.2	13.9	1	0	1.38	7.10	
RC03	1008	0.0	0.0	0.0	0.0	11.8	11.8	9.7	1	0	9.85	17.05	
RC04	1009	0.0	0.0	0.0	0.0	0.0	0.0	20.4	1	0	5.52	14.67	
RC05	1010	0.1	0.0	0.0	0.0	2.2	2.2	12.2	0	0	4.46	15.66	
RC06	1011	0.0	0.0	0.0	0.0	0.5	0.5	19.5	1	0	4.24	16.96	2
RC07	1009	0.0	0.0	0.0	0.0	0.4	0.3	19.8	0	0	3.92	15.86	
RC08	1009	0.0	0.0	0.8	0.8	37.8	37.2	0.0	1	0	2.20	>25	3
RC09	1010	0.0	0.0	0.0	0.0	1.4	0.4	19.4	2	0	2.23	19.87	
RC10													1
WS01	1008	0.0	0.0	0.0	0.0	7.3	7.3	15.2	1	0	dry	5.27	3
WS02	1010	-0.1	0.0	0.0	0.0	0.0	0.0	20.3	1	0	5.38	5.38	
WS03	1008	0.0	0.0	0.0	0.0	6.8	6.8	16.4	1	0	3.93	4.37	
WS04	1009	0.0	0.0	0.0	0.0	2.4	2.4	16.5	1	0	3.01	4.83	2,3
WS05	1009	0.1	0.0	0.0	0.0	1.6	1.6	16.9	1	0	4.10	5.25	2,3
WS06	1009	0.0	0.0	0.3	0.3	5.0	5.0	11.8	1	0	2.61	3.44	
WS07	1010	0.0	0.0	0.0	0.0	0.6	0.6	19.5	1	0	4.05	4.27	
WS08	1009	0.0	0.0	0.0	0.0	0.3	0.2	18.9	1	0	2.99	4.24	
WS09	1011	0.2	0.0	2.0	2.0	7.2	7.2	3.1	1	0	3.44	5.14	
WS10	1009	0.5	0.0	0.0	0.0	2.6	2.6	17.3	0	0	3.13	5.12	
WS11	1009	0.1	0.0	0.0	0.0	0.8	0.8	19.4	0	0	2.54	3.82	2,3
WS12	1010	0.0	0.0	0.0	0.0	1.5	1.5	19.3	1	0	3.24	4.48	
WS13	1011	0.0	0.0	0.0	0.0	0.8	0.8	17.7	1	0	5.32	5.32	3
WS14	1010	0.0	0.0	0.0	0.0	0.1	0.0	20.3	1	0	5.21	5.21	
WS15	1010	0.2	0.0	0.0	0.0	1.0	0.9	17.9	1	0	4.74	5.33	
WS16	1011	0.0	0.0	0.0	0.0	0.7	0.7	19.2	1	0	2.73	4.70	

WS17	1007	0.0	0.0	0.0	0.0	3.8	3.8	11.1	1	0	3.10	368.00	2,3
WS18	1012	0.0	0.0	0.0	0.0	7.3	6.4	12.1	1	0	5.35	5.35	2,3
WS20	1012	0.0	0.0	0.0	0.0	0.6	0.6	19.6	1	0	3.41	5.08	2,3
WS21	1010	0.0	0.0	0.0	0.0	0.8	0.8	18.6	1	0	3.23	5.05	3
WS24	1010	0.0	0.0	0.0	0.0	1.1	1.1	19.8	1	0	dry	1.50	

Notes

- 1 Level logger installed
- 2 No steady state achieved for CO₂, near steady state reading listed
- 3 No steady state achieved for O₂, near steady state reading listed

Logged by

ES

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

Curtins

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



GAS MONITORING LOG SHEET

Project: Woodville**Date:** 24.04.19 - 25.04.19**Job Number:** 067895**Visit:** 5**Client:** Harworth**Weather:** breezy, showers**Barometric State:** Fluctuating**Ground Conditions:** damp

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
RC01	977	0.0	0.0	0.0	0.0	12.7	12.6	5.9	1	0	8.66	9.72	2
RC02	977	0.2	0.0	0.0	0.0	7.1	7.1	2.8	1	0	1.61	7.07	3
RC03	974	-0.1	0.0	0.0	0.0	22.7	22.7	2.9	2	0	9.74	6.94	3
RC04	981	-1.4		0.0	0.0	0.9	0.9	17.3	0	0	5.50	20.00	2,3,5
RC05	978	0.7	0.0	0.0	0.0	4.5	4.5	9.4	1	0	4.52	15.66	
RC06	979	0.1	0.0	0.0	0.0	4.9	4.9	11.5	1	0	4.26	17.00	3
RC07	979	1.0	0.0	0.0	0.0	0.2	0.2	20.1	1	0	3.78	15.81	
RC08	974	0.0	0.0	0.6	0.6	39.1	39.1	0.0	2	0	5.82	>25	4
RC09	978	0.0	0.0	0.0	0.0	0.8	0.5	19.1	1	0	2.02	19.93	2,3
RC10													1
WS01	977	0.0	0.0	0.0	0.0	7.3	5.8	16.7	1	0	dry	5.27	2,3
WS02	975	0.5		0.0	0.0	0.4	0.0	13.1	2	0	5.38	5.38	6
WS03	978	0.1	0.0	0.0	0.0	8.3	8.3	14.8	2	0	3.85	5.38	2,3
WS04	979	0.2	0.0	0.0	0.0	0.7	0.6	19.7	0	0	3.07	4.85	
WS05	977	0.3	0.0	0.0	0.0	1.4	1.3	17.6	2	0	5.38	5.38	2,3
WS06	973	0.2	0.0	1.6	1.6	9.4	9.4	2.6	2	0	2.65	3.45	
WS07	979	0.0	0.0	0.0	0.0	0.9	0.0	20.4	1	0	4.09	5.28	
WS08	973	0.0	0.0	0.0	0.0	0.1	0.1	20.7	1	0	3.11	4.26	
WS09	979	2.0		2.2	2.2	7.6	7.6	2.3	1	0	3.54	5.10	3,7
WS10	973	0.0	0.0	0.0	0.0	9.7	9.7	3.0	2	0	3.08	5.13	2,3
WS11	973	0.0	0.0	0.0	0.0	0.4	0.4	20.5	1	0	2.58	3.86	
WS12	973	0.0	0.0	0.0	0.0	7.2	7.2	6.1	1	0	3.35	4.54	2,3
WS13	974	0.1	0.0	0.0	0.0	8.2	8.2	5.5	2	0	5.33	5.33	2,3
WS14	973	0.0	0.0	0.4	0.3	7.6	7.6	4.6	2	0	5.19	5.19	
WS15	975	0.0	0.0	0.0	0.0	5.8	5.8	9.0	2	0	4.65	5.35	2,3
WS16	974	0.0	0.0	0.0	0.0	0.8	0.8	18.3	2	0	2.76	4.73	2,3

WS17	978	1.5		0.0	0.0	8.9	8.9	1.0	1	0	2.69	4.79	2,3,8
WS18	979	0.0	0.0	0.0	0.0	7.0	7.0	8.5	1	0	5.30	5.30	2,3
WS20	981	0.3	0.0	0.0	0.0	2.4	2.3	17.6	1	0	3.40	5.07	2,3
WS21	979	0.4	0.0	0.0	0.0	0.7	0.7	19.6	2	0	3.01	5.06	
WS24	977	0.2	0.0	0.0	0.0	0.8	0.8	20.1	1	0	dry	1.50	

Notes

- 1 Level logger installed
- 2 No steady state achieved for CO₂, near steady state reading listed
- 3 No steady state achieved for O₂, near steady state reading listed
- 4 No steady state achieved for CH₄, near steady state reading listed
- 5 Fluctuating flow throughout between 0.0 and -1.2 l/hr. Steady state flow of 0.0 l/hr reached when checked at 30 minutes.
- 6 Fluctuating flow throughout between 0.0 and 0.5 l/hr. Still fluctuating when checked back at 30 mins and 2 hours. Left overnight and recorded between 0.0 and 0.3 l/hr the next day.
- 7 Fluctuating flow throughout between 0.0 and 2.0 l/hr. Still fluctuating at the same levels when checked back at 30 mins and 2 hours.
- 8 Fluctuating flow throughout between 0.0 and 1.5 l/hr. Still fluctuating, between 0.0 and 0.4 l/hr when checked back at 30 mins and 1 hour.

Logged by

ES

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

Curtins

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Fax: 0161 228 7902



GAS MONITORING LOG SHEET

Project:	Woodville	Date:	14.05.19 - 15.05.19
Job Number:	067895	Visit:	6
Client:	Harworth	Weather:	warm, gentle breeze
Barometric State:	fluctuation	Ground Conditions:	dry

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
RC01	1013	0.0	0.0	0.0	0.0	1.7	1.7	18.7	1	0	5.95	9.77	
RC02	1012	0.0	0.0	0.0	0.0	3.2	0.9	18.6	1	0	1.49	7.02	1,2
RC03	1020	0.0	0.0	0.0	0.0	2.9	2.9	18.8	2	0	10.21	16.82	
RC04	1020	1.4	0.0	0.0	0.0	0.9	0.9	16.6	2	0	5.05	20.01	2,4
RC05	1018	0.2	0.0	0.0	0.0	6.0	6.0	3.6	1	-10	4.64	15.67	
RC06	1015	0.0	0.0	0.0	0.0	5.1	5.1	11.3	2	0	4.59	16.95	1,2
RC07	1016	0.0	0.0	0.0	0.0	0.8	0.8	19.2	1	0	4.06	15.86	2
RC08	1015	0.0	0.0	0.6	0.6	39.5	39.2	15.1	2	0	6.19	> 25	1,2
RC09	1016	0.0	0.0	0.0	0.0	0.3	0.1	21.3	3	0	2.40	8.70	
RC10													3
WS01	1011	0.0	0.0	0.0	0.0	6.3	6.3	16.5	1	0	dry	5.26	1,2
WS02	1020	-0.1	0.0	0.0	0.0	0.6	0.5	15.1	2	0	dry	5.38	2
WS03	1014	0.0	0.0	0.0	0.0	7.5	7.5	14.8	2	0	4.14	5.36	1,2
WS04	1015	0.1	0.0	0.1	0.1	5.3	5.3	10.4	1	-10	3.01	4.85	1,2
WS05	1012	0.4	0.3	0.0	0.0	4.3	4.3	14.2	1	-10	dry	3.84	1,2,6
WS06	1018	0.0	0.0	0.0	0.0	5.1	5.0	9.5	2	0	2.69	3.43	2
WS07	1015	2.1	1.8	0.0	0.0	2.1	2.1	7.4	2	0	4.29	5.26	5
WS08	1018	0.0	0.0	0.0	0.0	4.4	4.4	8.3	1	0	3.17	4.26	1,2
WS09	1015	0.0	0.0	2.1	2.1	7.2	7.2	2.2	3	0	3.74	5.15	1,2
WS10	1015	0.0	0.0	0.0	0.0	0.9	0.9	19.0	2	0	3.07	5.10	2
WS11	1015	0.0	0.0	0.0	0.0	1.0	1.0	19.9	2	0	2.59	3.83	1,2
WS12	1018	0.0	0.0	0.0	0.0	7.4	7.4	7.4	2	0	3.34	4.52	1,2
WS13	1016	0.1	0.0	0.0	0.0	9.2	9.2	3.3	2	0	dry	5.34	1,2
WS14	1019	0.0	0.0	0.0	0.0	7.5	7.5	3.7	2	0	5.19	5.19	
WS15	1016	0.0	0.0	0.0	0.0	4.0	4.0	11.9	2	0	4.68	5.33	1,2
WS16	1017	0.0	0.0	0.0	0.0	6.7	6.7	6.4	3	0	2.78	4.73	1,2

WS17	1012	0.0	0.0	0.0	0.0	1.1	0.5	10.3	2	0	3.24	4.88	
WS18	1010	0.0	0.0	0.0	0.0	9.8	9.8	2.4	2	0	dry	5.39	
WS20	1014	0.0	0.0	0.0	0.0	3.8	3.8	14.1	2	1	4.09	5.04	1,2
WS21	1015	0.0	0.0	0.0	0.0	5.6	5.6	9.8	1	0	3.09	5.05	1,2
WS24	1012	0.0	0.0	0.0	0.0	0.9	0.9	20.3	2	0	dry	1.50	

Notes

Logged by

ES

- 1 No steady state achieved for CO₂, near steady state reading listed
- 2 No steady state achieved for O₂, near steady state reading listed
- 3 Level logger installed
- 4 Fluctuating flow throughout between 0.3 and 1.4 l/hr. Steady state of 0.0 l/h reached when checked after 20 minutes.
- 5 Fluctuating flow throughout between 1.3 and 2.1 l/hr. Steady state of 1.8 reached by 2 minutes.
- 6 Fluctuating flow throughout between 0.1 and 0.4 l/hr. Steady state of 0.3 reached after 20 minutes.

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

Appendix F Tier 1 Thresholds

- *Curtins - Residential with Home Grown Produce.*

Adopted Soil Generic Assessment Criteria
Sandy loam with 6% SOM



Contaminants	Residential <u>with</u> home grown produce	Residential <u>without</u> home grown produce	Allotments	Commercial	Public open space near residential housing POS _{resi}	Public park POS _{park}
Metals						
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11,000	45	240,000	21,000	46,000
Cadmium	10⁽¹³⁾ 22	85⁽¹³⁾ 150	1.8 3.9	230 410	120 220	560 880
Chromium III	910	910	18,000	8,600	1,500	33,000
Chromium VI	6 21	6 21	1.8 170	33 49	7.7 21	220 250
Lead	200	310	80	2,300	630	1,300
Mercury (<i>elemental</i>)	1	1	26	26	16	26⁽⁸⁾ [30]
Mercury (<i>inorganic</i>)	170	240	80	3600	120	240
Nickel	130⁽¹⁰⁾	180⁽¹⁰⁾	53⁽¹¹⁾	980⁽¹⁰⁾	230	800
Vanadium	410	1200	91	9000	2000	5000
Copper	2400	7100	520	68000	12000	44000
Zinc	3700	40000	620	730000	81000	170000
Semi-Metals and non-metals						
Arsenic	32⁽¹²⁾ 37	35⁽¹²⁾ 40	43⁽¹²⁾ 49	640⁽¹²⁾ 640	79 79	170 170
Antimony		550		7500	1500	3300
Selenium	350	600	120	13000	1100	1800
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
<i>Aliphatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₆	160	160	3900	12000	600000	180000
EC ₅₋₆ - EC ₈	530	530	13000	40000	620000	320000
EC ₅₋₈ - EC ₁₀	150	150	1700	11000	13000	21000
EC ₁₀₋₁₀ - EC ₁₂	760	770	7300	47000	13000	24000
EC ₁₂₋₁₂ - EC ₁₆	4300	4400	13000	90000	13000	26000
EC ₅₋₁₆ - EC ₃₅	110000	110000	270000	1800000	250000	490000
EC ₃₅₋₃₅ - EC ₄₄	110000	110000	270000	1800000	250000	490000
<i>Aromatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₇	300	1400	57	86000	56000	92000
EC ₅₋₇ - EC ₈	660	3900	120	180000	56000	100000
EC ₅₋₈ - EC ₁₀	190	270	51	17000	5000	9300
EC ₁₀₋₁₀ - EC ₁₂	380	1200	74	34000	5000	10000
EC ₁₂₋₁₂ - EC ₁₆	660	2500	130	38000	5000	10000
EC ₅₋₁₆ - EC ₂₁	930	1900	260	28000	3800	7800
EC ₂₁₋₂₁ - EC ₃₅	1700	1900	1600	28000	3800	7900
EC ₃₅₋₃₅ - EC ₄₄	1700	1900	1600	28000	3800	7900
Aliph + Arom EC >44-70	1900	1900	3000	28000	3800	7900
Aromatic						
Benzene	0.33 0.87	1.0 3.3	0.07 0.18	95 98	73 140	110 230
Ethyl benzene	350	840	90	2800⁽⁸⁾ [66000]	2800⁽⁸⁾ [25000]	2800⁽⁸⁾ [27000]
Toluene	610	2700	120	4400⁽⁸⁾ [190000]	4400⁽⁸⁾ [56000]	4400⁽⁸⁾ [100000]
Xylene ⁽⁹⁾	230	290	160	2600⁽⁸⁾ [32000]	2600⁽⁸⁾ [43000]	2600⁽⁸⁾ [31000]
Phenol	420	520	280	3200⁽¹⁴⁾ (38000)	3200⁽¹⁴⁾ (10000)	3200⁽¹⁴⁾ (9300)
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	13	13	24	1100	4900	3000
Acenaphthylene	920	6000	160	100000	15000	30000
Acenaphthene	1100	6000	200	100000	15000	30000
Fluorene	860	4500	160	71000	9900	20000
Phenanthrene	440	1500	90	23000	3100	6300
Anthracene	11000	37000	2200	540000	74000	150000
Fluoranthene	890	1600	290	23000	3100	6400
Pyrene	2000	3800	620	54000	7400	15000
Benz(a)anthracene	13	15	13	180	29	62
Chrysene	27	32	19	350	57	120
Benzo(b)fluoranthene	3.7	4.0	3.9	45	7.2	16.0
Benzo(k)fluoranthene	100	110	130	1200	190	440
Benzo(a)pyrene	3.0 5.0	3.2 5.3	3.5 5.7	36 77	5.7 10	13 21
Indeno(123cd)pyrene	41	46	39	510	82	180
Dibenzo(ah)anthracene	0.3	0.32	0.43	3.6	0.58	1.4
Benzo(ghi)perylene	350	360	640	4000	640	1600
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	0.0014	0.0015	0.0018	0.12	3.5	5.4
Trichloroethene (TCE)	0.075	0.08	0.21	5.7	120	120
1,1,1,2 Tetrachlorethane	6.4	8.2	4.4	560	1400	2100
Tetrachlorethane (PCE)	0.90	0.92	3.6	95	1400	1500
1,1,1 Trichlorethane	39	40	240	3000	140000	100000

Notes

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs**
- Soil organic matter (SOM) is assumed to be 6% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m⁻³
- Based on vapour saturation limit as suggested by EA / [] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable

Adopted Soil Generic Assessment Criteria
Sandy loam with 2.5% SOM



Contaminants	Residential <u>with</u> home grown produce	Residential <u>without</u> home grown produce	Allotments	Commercial	Public open space near residential housing POS _{resi}	Public park POS _{park}
Metals						
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11,000	45	240,000	21,000	46,000
Cadmium	10⁽¹³⁾ 22	85⁽¹³⁾ 150	1.8 3.9	230 410	120 220	560 880
Chromium III	910	910	18,000	8,600	1,500	33,000
Chromium VI	6 <u>21</u>	6 <u>21</u>	1.8 <u>170</u>	33 <u>49</u>	7.7 <u>21</u>	220 <u>250</u>
Lead	<u>200</u>	<u>310</u>	<u>80</u>	<u>2,300</u>	<u>630</u>	<u>1,300</u>
Mercury (elemental)	1	1	26	26	16	26 ⁽⁸⁾ [30]
Mercury (inorganic)	170	240	80	3600	120	240
Nickel	130 ⁽¹⁰⁾	180 ⁽¹⁰⁾	53 ⁽¹¹⁾	980 ⁽¹⁰⁾	230	800
Vanadium	410	1200	91	9000	2000	5000
Copper	2400	7100	520	68000	12000	44000
Zinc	3700	40000	620	730000	81000	170000
Semi-Metals and non-metals						
Arsenic	32⁽¹²⁾ 37	35⁽¹²⁾ 40	43⁽¹²⁾ 49	640⁽¹²⁾ 640	79 <u>79</u>	170 <u>170</u>
Antimony		550		7500	1500	3300
Selenium	350	600	120	13000	1100	1800
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
<i>Aliphatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅ - EC ₆	78	78	1700	5900	590000	130000
EC ₆ - EC ₈	230	230	5600	17000	610000	220000
EC ₈ - EC ₁₀	65	65	770	4800	13000	18000
EC ₁₀ - EC ₁₂	330	330	4400	23000	13000	23000
EC ₁₂ - EC ₁₆	2400	2400	13000	82000	13000	25000
EC ₁₆ - EC ₃₅	92000	92000	270000	1700000	250000	480000
EC ₃₅ - EC ₄₄	92000	92000	270000	1700000	250000	480000
<i>Aromatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅ - EC ₇	140	690	27	46000	56000	84000
EC ₇ - EC ₈	290	1800	51	110000	56000	95000
EC ₈ - EC ₁₀	83	110	21	8100	5000	8500
EC ₁₀ - EC ₁₂	180	590	31	28000	5000	9700
EC ₁₂ - EC ₁₆	330	2300	57	37000	5100	10000
EC ₁₆ - EC ₂₁	540	1900	110	28000	3800	7700
EC ₂₁ - EC ₃₅	1500	1900	820	28000	3800	7800
EC ₃₅ - EC ₄₄	1500	1900	820	28000	3800	7800
Aliph + Arom EC >44-70	1800	1900	2100	28000	3800	7800
<i>Aromatic</i>						
Benzene	0.16	0.49	0.035	50	72	100
Ethyl benzene	150	380	39	1200⁽⁸⁾ [35000]	1200⁽⁸⁾ [24000]	1200⁽⁸⁾ [22000]
Toluene	270	1300	51	1900⁽⁸⁾ [110000]	1900⁽⁸⁾ [56000]	1900⁽⁸⁾ [95000]
Xylene ⁽⁹⁾	98	120	70	1200⁽⁸⁾ [14000]	1200⁽⁸⁾ [42000]	1200⁽⁸⁾ [23000]
Phenol	290	420	140	1500⁽¹⁴⁾ (35000)	1500⁽¹⁴⁾ (10000)	1500⁽¹⁴⁾ (8300)
<i>Polycyclic Aromatic Hydrocarbons (PAH)</i>						
Naphthalene	5.6	5.6	10	460	4900	1900
Acenaphthylene	420	4600	69	97000	15000	30000
Acenaphthene	510	4700	85	97000	15000	30000
Fluorene	400	3800	67	68000	9900	20000
Phenanthrene	220	1500	38	22000	3100	6200
Anthracene	5400	35000	950	540000	74000	150000
Fluoranthene	560	1600	130	23000	3100	6300
Pyrene	1200	3800	270	54000	7400	15000
Benz(a)anthracene	11	14	6.5	170	29	56
Chrysene	22	31	9.4	350	57	110
Benzo(b)fluoranthene	3.3	4.0	2.1	44	7.2	15
Benzo(k)fluoranthene	93	110	75	1200	190	410
Benzo(a)pyrene	2.7	3.2	2	35	5.7	12
Indeno(123cd)pyrene	36	46	21	510	82	170
Dibenzo(ah)anthracene	0.28	0.32	0.27	3.6	0.57	1.3
Benzo(ghi)perylene	340	360	470	4000	640	1500
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	0.00087	0.001	0.001	0.077	3.5	5
Trichloroethene (TCE)	0.034	0.036	0.091	2.6	120	91
1,1,1,2 Tetrachlorethane	2.8	3.5	1.9	250	1400	1800
Tetrachlorethane (PCE)	0.39	0.4	1.5	42	1400	1100
1,1,1 Trichlorethane	18	18	110	1300	140000	76000

Notes

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs
- Soil organic matter (SOM) is assumed to be 2.5% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m⁻³
- Based on vapour saturation limit as suggested by EA [] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable

Adopted Soil Generic Assessment Criteria
Sandy loam with 1% SOM



Contaminants	Residential <u>with</u> home grown produce	Residential <u>without</u> home grown produce	Allotments	Commercial	Public open space near residential housing POS _{resi}	Public park POS _{park}
Metals						
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11,000	45	240,000	21,000	46,000
Cadmium	10⁽¹³⁾ 22	85⁽¹³⁾ 150	1.8 3.9	230 410	120 220	560 880
Chromium III	910	910	18,000	8,600	1,500	33,000
Chromium VI	6 21	6 21	1.8 170	33 49	7.7 21	220 250
Lead	200	310	80	2,300	630	1,300
Mercury (<i>elemental</i>)	1	1	26	26	16	26⁽⁸⁾ [30]
Mercury (<i>inorganic</i>)	170	240	80	3600	120	240
Nickel	130 ⁽¹⁰⁾	180 ⁽¹⁰⁾	53 ⁽¹¹⁾	980 ⁽¹⁰⁾	230	800
Vanadium	410	1200	91	9000	2000	5000
Copper	2400	7100	520	68000	12000	44000
Zinc	3700	40000	620	730000	81000	170000
Semi-Metals and non-metals						
Arsenic	32⁽¹²⁾ 37	35⁽¹²⁾ 40	43⁽¹²⁾ 49	640⁽¹²⁾ 640	79 79	170 170
Antimony		550		7500	1500	3300
Selenium	350	600	120	13000	1100	1800
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
<i>Aliphatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₆	42	42	730	3200	570000	95000
EC ₆₋₆ - EC ₈	100	100	2300	7800	600000	150000
EC ₈₋₈ - EC ₁₀	27	27	320	2000	13000	14000
EC ₁₀₋₁₀ - EC ₁₂	130	130	2200	9700	13000	21000
EC ₁₂₋₁₂ - EC ₁₆	1100	1100	11000	59000	13000	25000
EC ₁₆₋₁₆ - EC ₃₅	65000	65000	260000	1600000	250000	450000
EC ₃₅₋₃₅ - EC ₄₄	65000	65000	260000	1600000	250000	450000
<i>Aromatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₇	70	370	13	26000	56000	76000
EC ₇₋₇ - EC ₈	130	860	22	56000	56000	87000
EC ₈₋₈ - EC ₁₀	34	47	8.6	3500	5000	7200
EC ₁₀₋₁₀ - EC ₁₂	74	250	13	16000	5000	9200
EC ₁₂₋₁₂ - EC ₁₆	140	1800	23	36000	5100	10000
EC ₁₆₋₁₆ - EC ₂₁	260	1900	46	28000	3800	7600
EC ₂₁₋₂₁ - EC ₃₅	1100	1900	370	28000	3800	7800
EC ₃₅₋₃₅ - EC ₄₄	1100	1900	370	28000	3800	7800
Aliph + Arom EC >44-70	1600	1900	1200	28000	3800	7800
Aromatic						
Benzene	0.08	0.3	0.017	28	72	90
Ethyl benzene	65	170	16	520⁽⁸⁾ [17000]	520⁽⁸⁾ [24000]	520⁽⁸⁾ [17000]
Toluene	120	610	22	860⁽⁸⁾ [59000]	860⁽⁸⁾ [56000]	860⁽⁸⁾ [87000]
Xylene ⁽⁹⁾	41	53	28	480⁽⁸⁾ [69000]	480⁽⁸⁾ [41000]	480⁽⁸⁾ [17000]
Phenol	180	310	66	760⁽¹⁴⁾ (31000)	760⁽¹⁴⁾ (10000)	760⁽¹⁴⁾ (7600)
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	2.3	2.3	4.1	190	4900	1200
Acenaphthylene	170	2900	28	83000	15000	29000
Acenaphthene	210	3000	34	84000	15000	29000
Fluorene	170	2800	27	63000	9900	20000
Phenanthrene	95	1300	15	22000	3100	6200
Anthracene	2400	31000	380	520000	74000	150000
Fluoranthene	280	1500	52	23000	3100	6300
Pyrene	620	3700	110	54000	7400	15000
Benz(a)anthracene	7.2	11	2.9	170	29	49
Chrysene	15	30	4.1	350	57	93
Benzo(b)fluoranthene	2.6	3.9	0.99	44	7.1	13
Benzo(k)fluoranthene	77	110	37	1200	190	370
Benzo(a)pyrene	2.2	3.2	0.97	35	5.7	11
Indeno(123cd)pyrene	27	45	9.5	500	82	150
Dibenzo(ah)anthracene	0.24	0.31	0.14	3.5	0.57	1.1
Benzo(ghi)perylene	320	360	290	3900	640	1400
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	0.00064	0.00077	0.00055	0.059	3.5	4.8
Trichloroethene (TCE)	0.016	0.017	0.041	1.2	120	70
1,1,1,2 Tetrachlorethane	1.2	1.5	0.79	110	1400	1500
Tetrachlorethane (PCE)	0.18	0.18	0.65	19	1400	810
1,1,1 Trichlorethane	8.8	9	48	660	140000	57000

Notes

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs**
- Soil organic matter (SOM) is assumed to be 1% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m⁻³
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- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable

Appendix G Risk Assessment Rationale

The site-specific risk assessment, presented in this report, follows the principle of establishing whether there is a viable linkage between a contaminant source to a potential receptor, via an exposure pathway.

The risk assessment corresponds with the total site area and incorporates both descriptive (qualitative) and, where available, numerical (quantitative) lines of evidence.

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risk to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected to the source by one or several exposure pathways such as direct contact for example. Risks are generally managed by isolating the receptor or intercepting the exposure pathway or by isolating or removing the hazard.

Without the three essential components of a source, pathway and receptor there can be no risk. Therefore, the presence of contaminant source on a site does not necessarily mean there is a risk.

The risk assessment considers the likelihood of a particular event taking place (accounting for the presence of the source and receptor and the viability of the exposure pathway) in conjunction with the severity of the potential consequence (accounting for the potential severity of the hazard and the sensitivity of the receptor).

In the risk assessment the consequence of the hazard has been classified as severe or medium or mild or minor and the probability (likelihood) of the circumstances actually occurring classified as high likelihood or likely or low likelihood or unlikely.

The consequences and probabilities are subsequently cross-correlated to give a qualitative estimation of the risk using Department of the Environment risk classifications as detailed in the table below and as referenced in CIRIA C552.

		Consequence			
		Severe	Medium	Mild	Minor
Probability (Likelihood)	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

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In accordance with DoE guidance, the following categorisation of **consequence** has been developed.

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem or organisation forming part of such ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of such ecosystem.	Concentration of a contaminant from site exceeds the generic or site-specific assessment criteria. Leaching of contaminants from a site to a Principal or Secondary A aquifer. Death of a species within a designated nature reserve. Lesser toxic and asphyxiate effects
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater (inc. Secondary B aquifers). Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

Ground Investigation Report

In accordance with DoE guidance, the following categorisation of **probability** has been developed.

Classification	Definition
High Likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

In accordance with DoE guidance, the following categorisation of **risk** has been developed.

Classification	Definition
Very High Risk	There is a <i>high probability</i> that <i>severe harm</i> could arise to a designated receptor from an identified hazard at the site without appropriate further action.
High Risk	<i>Harm is likely to arise</i> to a designated receptor from an identified hazard at the site without appropriate further action.
Moderate Risk	<i>It is possible</i> that without appropriate further action <i>harm could arise</i> to a designated receptor. It is relatively <i>unlikely</i> that any such harm would be <i>severe</i> , and if any harm were to occur it is <i>more likely</i> that such harm would be <i>relatively mild</i> .
Low Risk	<i>It is possible</i> that <i>harm could arise</i> to a designated receptor from an identified hazard. It is <i>likely</i> that, at worst, if any harm was realised any effects would be <i>mild</i> .
Very Low Risk	The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor.

The term 'risk' in this instance refers to the risk that the source, pathway, receptor linkage for a given source of contamination is complete. It does not refer to immediate risk to individuals or features present on the site from potential contaminants and is intended to be used as a tool to assess the necessity of further investigation.

Appendix H Coal Encounter Summary

Records of Coal Encountered During Ground Investigation Works

Opencast Mine		
Atkins Ground Investigation		
Hole number	Depth to top	Depth to base
CP1	5	5.23
Sirius ground Investigation		
BHR1	3.8	5
	6.1	6.2
	9.3	9.5
	16.5	17
BHR2	2.6	2.7
	5.5	5.7
	6.5	6.7
	8.5	9.5
	17.5	18
	19.4	20.3
	21.8	33
BHR3	1.8	2.4
	9.9	11.2
	15.1	15.3
	23.7	23.9
BHR4	1.5	1.8
	3.1	3.8
	12	13.2
	14	14.3
	14.6	14.9
	19.5	19.8
	23.1	23.3
BHR5	3	3.6
	13.8	14.1
	15	15.5
	24.3	24.5
	27	27.7
BHR11	7.9	8.2
	9.2	9.6
	16.2	17
	18.4	19
	32.1	32.8

Records of Coal Encountered During Ground Investigation Works

Within Opencast Mine		
Sirius ground Investigation		
Hole number	Depth to top	Depth to base
BHR6	0.5	0.6
	8.5	8.7
	14	14.4
	22.2	22.3
	25.2	25.4
BHR7	6	6.2
	11.2	11.9
	25.1	25.5
BHR8	14.6	15
	26.5	26.7
BHR9	2.5	3
	13.1	13.3
	14.5	15
	15.3	15.6
	16	16.4
	27.1	27.3
BHR12	33	33.6
	43.2	43.5
BHR13	32	32.7
	43.1	43.3
BHR14	33	33.5
	36.2	37
	43.8	44
BHR15	36.8	37.5
	43.6	43.9
BHR16	24.4	25
	37.5	37.7
BHR17	14.5	15
	15.8	16.6
BHR18	6.1	6.5
	25.2	25.7
BHR19	10.2	10.7
	27	27.6
BHR20	27.9	28.3
	44.3	44.9
BHR21	31.5	32.2
	42.4	42.8
BHR22	43.5	43.7
BHR23	42.4	43.1
BHR24	42.4	42.8
BHR25	42.4	42.8

Records of Coal Encountered During Ground Investigation Works

Within Opencast Mine		
Sirius ground Investigation		
Hole number	Depth to top	Depth to base
BHR26	42.9	43.4
BHR30	27	27.2
	40	41.2
	41.4	41.9
BHR31	42.1	43
BHR32	33.5	34.6
	35	35.5
BH2	7.9	8.1
BH4	7.9	8.5
BH6	9.9	10.2
BH15	18.2	18.4
Within Opencast Mine		
BGS Exploratory holes		
SK31NW289	5.48	6.7
	6.88	8.25
SK31NW6	3.96	14.65
	14.95	17.39
	19.84	25.02
	25.61	25.93
	26.85	27.14
	28.06	29.98
SK31NW292	2.46	3.38
	3.68	5.82

Our Locations

Birmingham

2 The Wharf
Bridge Street
Birmingham
B1 2JS
T. 0121 643 4694
birmingham@curtins.com

Bristol

Quayside
40-58 Hotwell Road
Bristol
BS8 4UQ
T. 0117 302 7560
bristol@curtins.com

Cambridge

50 Cambridge Place
Cambridge
CB2 1NS
T. 01223 631 799
cambridge@curtins.com

Cardiff

3 Cwrt-y-Parc
Earlswood Road
Cardiff
CF14 5GH
T. 029 2068 0900
cardiff@curtins.com

Douglas

Varley House
29-31 Duke Street
Douglas
Isle of Man
IM1 2AZ
T. 01624 624 585
douglas@curtins.com

Dublin

39 Fitzwilliam Square
Dublin 2
Ireland
T. 00353 1 507 9447
dublin@curtins.com

Edinburgh

1a Belford Road
Edinburgh
EH4 3BL
T. 0131 225 2175
edinburgh@curtins.com

Glasgow

Queens House
29 St Vincent Place
Glasgow
G1 2DT
T. 0141 319 8777
glasgow@curtins.com

Kendal

28 Lowther Street
Kendal
Cumbria
LA9 4DH
T. 01539 724 823
kendal@curtins.com

Leeds

Rose Wharf
Ground Floor
Leeds
L29 8EE
T. 0113 274 8509
leeds@curtins.com

Liverpool

51-55 Tithebarn Street
Liverpool
L2 2SB
T. 0151 726 2000
liverpool@curtins.com

London

40 Compton Street
London
EC1V 0BD
T. 020 7324 2240
london@curtins.com

Manchester

Merchant Exchange
17-19 Whitworth Street West
Manchester
M1 5WG
T. 0161 236 2394
manchester@curtins.com

Nottingham

56 The Ropewalk
Nottingham
NG1 5DW
T. 0115 941 5551
nottingham@curtins.com