LITHOS

Geoenvironmental Appraisal

Land at Black Cats, Blackmoorfoot Road, Huddersfield

For Vistry Homes, Countryside Partnerships, Miller Homes (the Developers) & Empire Knight Group (the Vendor)

Report no: 4486/2B

Date: December 2023

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SUMMARY OF GEOENVIRONMENTAL ISSUES

Job No.	4486	**Site area/ha**	29.3 (red line)
Client:	Vistry Homes, Countryside Partnerships, Miller Homes (the Developers) & Empire Knight Group (the Vendor)	**NGR:**	SE 113 147
Site:	Black Cats, Blackmoorfoot Road, Huddersfield	**Nearest postcode:**	HD4 7AD

The site is located off Blackmoorfoot Road, approximately 3.5km southwest of Huddersfield town centre. The site can be divided into two distinct parcels:-

- **Area A:** Fireworks Factory – located in the centre of site and comprising a range of buildings, roadways and storage yards. Total area of 17.8 ha (60% of the total red line area).
- **Area B:** Agricultural land – located in the east, west and south. Total area of 11.5ha (c.40% of the total red line area)

Land generally falls to the east with several terraces, ramps, steep slopes and retaining walls across Area A and relatively gentle slopes across Area B. Significant quarry highwalls are visible in the south and in the northwest of the site.

It is understood that consideration is being given to redevelopment of the site with 770 domestic dwellings, local centre, extra care facility, associated gardens, POS, adoptable roads and sewers.

Lithos have been commissioned by the developers to provide a geoenvironmental appraisal of the site, which it is understood is to be redeveloped with housing. Lithos' investigation included a review of 3rd party reports, the site's history and environmental setting, and a ground investigation comprising 200 trial pits, 20 trial trenches, 11 foundation pits, 16 window sample boreholes, 50 probeholes/stitch lines and 33 gas / groundwater monitoring wells.

A summary of salient geoenvironmental issues is provided in the table below.

Issue	Remarks
Made ground	Beyond the quarries (but within Area A), ground conditions generally comprise a veneer of Hardstand (tarmac or concrete), Made Ground Topsoil or Topsoil overlying Reworked Natural, Ash & Clinker & Cohesive & Granular Made Ground to depths between 0.1m and 3.7m (average c. 1.0m). Within the quarries, ground conditions comprise a veneer of hardstand & Made Ground Topsoil overlying Ash & Clinker, Granular Made Ground & Quarry Backfill to depths between 6.0m and 24m.
Natural ground	Natural ground typically comprises Granular Residual Soils overlying Rough Rock Sandstone bedrock encountered from depths of between 1m and 3m (beyond former quarries) and between 6m and 24m (within former quarries).
Mining & quarrying	This site is located beyond the CA's defined coalfields. Quarry highwalls have been located at 37 locations (trenching and stitch probeholes) and appear to be very steep/vertical with benches of irregular width and height. Additionally, unworked sandstone 'pillars/roads' were recorded in 5 locations. Backfilled quarries occupy c. 35% of the Firework Factory (Area A) and c. 20% of the total site area, and reach depths of between 6m and 24m. The approximate outline and depth of quarry backfill is shown on Drawing 4486/11. At this stage, it is considered that the presence of deep backfill will have implications for foundations, drainage, new utilities and highways.
Contamination	Elevated concentrations of metals have been recorded in the made ground along with asbestos fibres and fragments of asbestos containing material (ACM). Two isolated pockets (TP306, TP322) of organic contamination were also identified and further areas of more onerous organic contamination than that identified to date may be present. The made ground also contains materials that would generally be considered unsuitable as near surface garden or landscaped materials. Where made ground remains beneath gardens and landscaped areas following earthworks turnover and regrade, it should be isolated beneath a minimum of 600mm thick clean soil cover layer and 150mm 'hard dig' layer. Topsoil typically 300mm thick is present across most of Area B. Testing suggests this material is chemically suitable for re-use. However, Topsoil, sporadically present across Area A is not considered suitable for re-use.
Hazardous gas	The site is in an area where 5% to 10% of homes are estimated to be above the radon action level, and basic radon protection measures are required in new dwellings. There are known areas of landfill and historical quarrying both within and beyond the site's boundary. Consequently, there is a plausible risk of hazardous gas generation and 30 monitoring wells have been installed shallow rotary probeholes across the site. A further 3 shallow gas monitoring installations have been driven into the ground on the eastern boundary of the southern field. Gas monitoring is underway and a hazardous gas risk assessment will be issued on completion in April 2024.

This brief summary should not be assumed to represent a complete account of all the potential geo-environmental issues that may exist at the site. As such it is strongly recommended that the report be read in its entirety.

SUMMARY OF GEOENVIRONMENTAL ISSUES

Job No.	4486	**Site area/ha**	29.3 (red line)
Client:	Vistry Homes, Countryside Partnerships, Miller Homes (the Developers) & Empire Knight Group (the Vendor)	**NGR:**	SE 113 147
Site:	Black Cats, Blackmoorfoot Road, Huddersfield	**Nearest postcode:**	HD4 7AD

Issue	Remarks
Remediation & earthworks	The made ground requires turnover earthworks with further ground improvement required in areas of deep made ground (former quarries).
Foundations	Beyond former sandstone quarries and where made ground is <2.5m thick on completion of turnover earthworks, the natural ground is suitable for strip/trench fill footings from a minimum depth of 0.6m. Within the footprint of former quarries and beyond influencing distance of quarry highwalls, following turnover earthworks and ground improvement techniques, the re-engineered fill should be suitable for rafts or heavily reinforced strip foundations, providing the fill is placed to an end product specification and appropriately validated. Due to issues associated with thickness of fill and differential settlement, plots over or adjacent to quarry highwalls will require piled foundations. Significant obstructions are present throughout the quarry backfill and highwalls are anticipated to be near vertical. Therefore, piles will require pre-boring, casing and socketing into competent sandstone bedrock.
Groundwater & excavations	Based on the results of the investigation it is considered unlikely that major groundwater flows will be encountered in shallow excavations. The stability of even shallow excavations is likely to be poor, most notably in loose made ground, and therefore allowance should be made for shoring and overbreak of excavation walls. Re-engineering & processing of made ground is likely to improve stability of excavations for foundations and deep drainage.
Flooding & drainage	The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low. Due to the presence of very deep made ground, soakaways will not provide a suitable drainage solution for surface water run-off in Area A. Consequently, it will be necessary to consider alternative sustainable drainage systems (SuDS), and there may be a need for surface water balancing. Drainage Engineers could use the infiltration rates for testing undertaken in Area B to determine the feasibility of soakaways as a solution for the discharge of surface water run-off.
Highways	Where the made ground is re-engineered it is considered that a CBR value of at least 3% should be achievable. Beyond areas of deep made ground, the Granular Residual Soil should provide a CBR value of at least 5%. These values should be verified prior to or during construction.

Significant developer abnormals relating to geoenvironmental issues at the site (notably within Area A) are:

- Deep quarry backfill – Backfilled quarries occupy c. 20% of the total site area and reach depths of between 6m and 24m depth
- Ground improvement – turnover of the uppermost 4m of made ground with further ground improvement in areas of deeper made ground in the former quarries.
- Quarry highwalls – piled foundations will be required for plots within influencing distance of quarry highwalls. Given the ground conditions encountered (steep gradients, boulders), piles will likely require pre-boring, casing and socketing into competent bedrock.
- Buried highwalls, pillars, roadways within the Quarry Backfill which will likely require piles to be pre-bored, casing and socketing into competent bedrock.

Some further work is required, most notably:

- Preparation of a Remediation Strategy.
- A minimum of a post-demolition trial pit investigation will be required in order to remove residual uncertainties with respect to ground, and provide more definitive recommendations with respect to contamination and foundations.
- To quantify the risk and provide realistic settlement estimates, some load testing (embankment or zone load tests) with an inundation phase is recommended. Results will help inform the final depth of turnover and type of ground improvement required.
- If a detention basin is proposed, water table levels should be taken from borehole monitoring wells over 4 consecutive seasons, for at least 3 points in the basin area.

This brief summary should not be assumed to represent a complete account of all the potential geo-environmental issues that may exist at the site. As such it is strongly recommended that the report be read in its entirety.

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01	Environmental setting
02	Ground investigation fieldwork
03	Geotechnical testing
04	Contamination laboratory analysis & interpretation
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06	Soakaways

Appendix B - Drawings

Drawing	Revision	Title
4486/1	-	Site Location Plan
4486/2	-	Proposed Site Layout
4486/3	-	Site Features
4486/3A	-	Site Features – Numbered Plan
4486/3B	-	Historical Quarries
4486/3C	-	Site Features – Standard Fireworks Plan
4486/3D	-	Site Areas
4486/4	-	Site Photographs
4486/5	-	Preliminary Conceptual Site Model
4486/6	-	3rd Party Exploratory Hole Locations

Drawing	Revision	Title
4486/6A	A	Lithos Exploratory Hole Locations (All)
4486/6B	-	Lithos Trial Pits & Trenches Locations
4486/6C	-	Lithos Boreholes Locations
4486/6D	-	Lithos Monitoring Well Locations
4486/6E	-	Lithos Trial Pits (West fields)
4486/6F	-	Lithos Trial Pits (East fields)
4486/7	-	Revised Conceptual Site Model
4486/8	A	Ecology & Invasive Plants
4486/9	-	Identified Asbestos Locations
4486/10	-	Recorded Landfills
4486/11	-	Approximate quarry depths
4486/12	-	Geological cross section line A
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Appendix C – Site Photographs

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Appendix G - Search responses#

From	Date	Content
Landmark	30 11 2022	Environmental search data

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Appendix M	PHs 02, 9-11, 19-21, 24-25, 28, 30, 32, 37, 40, 42-44 & 48 (Stitch Lines)
Appendix N	PH101 to PH130 (Monitoring wells)

Appendix O - Chemical test results

Appendix P - Geotechnical test results

Appendix Q – Gas monitoring results

Appendix R – Soakaway test results

Some of this data is not included within the paper or PDF copies of this report but can be provided on request.

FOREWORD (GEOENVIRONMENTAL APPRAISAL REPORT)

This report has been prepared for the sole internal use and reliance of the Client named on page 1. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Lithos Consulting Limited (Lithos); such authorisation not to be unreasonably withheld. If any unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill.

This report has been reviewed by a Competent Person, as defined in the National Planning Policy Framework. We ensure that all projects are managed by individuals with necessary experience, relevant qualifications, and current membership of a relevant professional organisation. Records of engineers, project managers and reviewers involved in this project are maintained by us. Lithos QA/QC procedures for all our work forms an integral part of our ISO9001 accreditation and as such is regularly audited.

The report presents observations and factual data obtained during our site investigation and provides an assessment of geoenvironmental issues with respect to information provided by the Client regarding the proposed development. Further advice should be sought from Lithos prior to significant revision of the development proposals.

The report should be read in its entirety, including all associated drawings and appendices. Lithos cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context. However, it should be noted that in order to keep the number of pages to a minimum, some information (e.g. full copy of the Landmark/Groundsure Report) is not included in the PDF; by request it can be provided.

The findings and opinions conveyed in this report (including review of any third-party reports) are based on information obtained from a variety of sources as detailed within this report, and which Lithos believes are reliable. Reasonable care and skill has been applied in examining the information obtained. Nevertheless, Lithos cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

Intrusive investigation can only investigate shallow ground beneath a small proportion of the total site area. It is possible therefore that the intrusive investigation undertaken by Lithos, whilst fully appropriate, may not have encountered all significant subsurface conditions. Consequently, no liability can be accepted for conditions not revealed by the exploratory holes. Any opinion expressed as to the possible configuration of strata between or below exploratory holes is for guidance only and no responsibility is accepted as to its accuracy.

It should be borne in mind that the timescale over which the investigation was undertaken may not allow the establishment of equilibrium groundwater levels. Particularly relevant in this context is that groundwater levels are susceptible to seasonal and other variations and may be higher during wetter periods than those encountered during this commission.

Where the report refers to the potential presence of invasive weeds such as Japanese Knotweed, or the presence of asbestos containing materials, it should be noted that the observations are for information only and should be verified by a suitably qualified expert.

Lithos cannot be responsible for the consequences of changing practices, revisions to waste management legislation etc that may affect the viability of proposed remediation options.

The report represents the findings and opinions of experienced geoenvironmental consultants. Lithos does not provide legal advice and the advice of lawyers may also be required.

GEOENVIRONMENTAL APPRAISAL
of land at
BLACK CATS, BLACKMOORFOOT ROAD, HUDDERSFIELD

1 INTRODUCTION

1.1 The commission and brief

1.1.1 Lithos Consulting Limited were commissioned by Vistry Homes, Countryside Partnerships, Miller Homes (the Developers) & Empire Knight Group (the Vendor) to carry out a geoenvironmental appraisal of land at Black Cats, Blackmoorfoot Road, Huddersfield.

1.1.2 This document is a revision of the Geoenvironmental Appraisal (Report 4486/2) issued by Lithos in November 2023; Report 4486/2 is now superseded. This document now includes the findings of supplementary trial pitting undertaken across the eastern and western fields (Area B) at the site, with the only significant revisions to Report 4486/2 having been made in Sections 8 to 12, 14 & 15.

1.1.3 Correspondence regarding Lithos' appointment, including the brief for this investigation, is included in Appendix C. The agreed scope of works included:

- A review of third party reports
- A site walkover and inspection
- An assessment of the land use history
- Determination of the site's environmental setting
- An intrusive ground investigation comprising 200 trial pits with 8 soakaway tests, 20 trial trenches, 11 foundation pits, 16 window sample boreholes, 50 probeholes & stitch lines and 33 gas \ groundwater monitoring wells
- Assessment of the geotechnical properties of the near surface deposits to enable provision of foundation and highway recommendations
- A qualitative assessment of contamination risks
- Recommendations for the necessary site preparatory and remediation works

1.1.4 Primary aims of this phase of investigation were to identify salient geoenvironmental issues affecting the site to support the submission of a planning application, and also to enable the Developers to obtain budget costs for: foundations; gas protection measures; and site preparatory and remediation works.

1.2 The proposed development

1.2.1 It is understood that consideration is being given to redevelopment of the site with 770 domestic dwellings, associated gardens, POS, adoptable roads and sewers within the red line area. A local centre and extra care facility are proposed in the south of site. In addition, there is POS in the form of two linear parks, a village green, a natural play area and a community parkland within the blue line area.

1.2.2 A site layout has been provided by the Developers (Drawing reference n1939 005 Rev B, dated 16th February 2023) which is reproduced as Drawing 4486/2 in Appendix B to this report.

1.3 Report format and limitations

1.3.1 All standard definitions, procedures and guidance are contained within Appendix A, which includes background, generic information on:

- Assessment of the site's environmental setting
- Ground investigation fieldwork
- Geotechnical testing
- Contamination testing
- Hazardous gas
- Soakaways

1.3.2 General notes and limitations relevant to all Lithos geoenvironmental investigations are described in the Foreword and should be read in conjunction with this report. The text of the report draws specific attention to any modification to these procedures and to any other special techniques employed.

1.3.3 In accordance with the agreed scope of works, the ground investigation reported here is not fully compliant with Eurocode 7 (EC7) and this report does not purport to be a Ground Investigation Report, nor a Geotechnical Design Report as defined by EC7. The ground appraisal, parametric assessment and preliminary design guidance presented are intended to assist others as they prepare the design of the proposed works.

2 SITE DESCRIPTION

2.1 General

2.1.1 The site's location is shown on Drawing 4486/1 presented in Appendix B to this report. Site details are summarised in the table below.

Detail	Remarks
Location	3.5 km southwest of Huddersfield town centre
NGR	SE 113 147
Approximate area	29.3ha (72 acres)
Known services	Underground electric, sewer, drainage. It is understood all electric services were disconnected during the soft strip of buildings.

2.2 Site features

2.2.1 Lithos completed a walkover survey of the site on the 17th March 2023.

2.2.2 A selection of site photographs are included in Appendix C, with photograph locations shown on Drawing 4486/4.

2.2.3 Site access is off Standard Drive in the southeast via a private road leading to a security booth and vehicle barrier. A tarmacked car park is present to the east of the vehicle barrier.

2.2.4 Existing salient features, at the time of the walkover are presented on Drawing 4486/3 in Appendix B to this report and summarised in the table below.

Feature	Remarks
Current access	Off Standard Drive
Topography	Land falls from around 250m AoD in the west (adjacent to Felks Stile Road) to around 203m AoD in the east (close to Crosland Hill Road). Relatively flat within the footprint of the former fireworks factory, but with a number of development plateaux, bounded by low retaining walls. Land to the north (within the blue line boundary and beyond) falls very steeply (c. 1 in 2, 25˚) to the north.
Approximate areas	19,000m² buildings 112,000m² hardstand 162,000m² grass
Nature of boundaries	All boundaries surrounding the firework factory comprise grey palisade fencing. All field boundaries comprise dry stone walls.
Surrounding land uses	North – steeply sloping grassland (blue line boundary), with residential housing beyond. East – residential housing in the northeast, caravan storage area (empty at the time of walkover) and warehouse building (unknown if this is in use). South – Blackmoorfoot Road with Johnsons Wellfield Quarries and The Sands House Public House beyond. West – Felks Stile Road with Crosland Heath Golf Club beyond.

2.2.5 The site can be divided into two:-

- **Area A:** Fireworks Factory – located in the centre of site and comprising a range of buildings, roadways and storage yards. Three residential buildings are located in the centre south, off Standard Drive. Total area of 17.8 ha (60% of the total red line area).
- **Area B:** Agricultural land – located in the east, west and south. Total area of 11.5ha (c.40% of the total red line area)

Area A – Black Cat Fireworks

2.2.6 An employee of Black Cat Fireworks escorted Lithos during the site walkover and provided some background information on the various processes and building uses.

2.2.7 The topography of Black Cat Fireworks is relatively flat, with the exception of localised slopes between buildings.

2.2.8 All boundaries of the Firework Factory comprise grey palisade fencing.

2.2.9 There are a large number of buildings present on site which formerly had a variety of uses. Each building has a **reference number** (see Drawing 4486/3A). It was explained by the employee that red numbers indicate buildings where explosives were stored and blue numbers indicate buildings where no explosives were stored.

2.2.10 Black Cats have a licence from the HSE for each red building. In addition, Black Cats hold a licence to sell fireworks, from the West Yorkshire Fire Brigade, which is believed to expire in December 2023.

2.2.11 It was explained that all of the buildings are located sufficiently far enough apart to allow for explosions/fires to be contained within the source building.

2.2.12 The table below provides a summary of each building's previous use and construction:

Building#	Area (m^2)	Use	Description & construction
1	87	Sparkler testing. Sparklers are placed in a wooden rack and lit.	Block of garages. Brick construction with corrugated asbestos roof
3	330	Office block	Brick walls.
4	488	Maintenance shed and equipment storage.	Brick base with corrugated asbestos roof.
5	40	Training school containing desks and a screen.	Brick walls with corrugated metal roof.
8	162	Maintenance shed.	Brick base with corrugated asbestos and glass roof.
12	216	Security cabin.	Brick walls with corrugated asbestos roof.
15	659	Shop. Open to the public at the end of October and first week in November.	Corrugated metal shed.
16	210	Storage magazine (1.4 fireworks).	Corrugated metal shed.
24	943	Firework storage	Metal shipping containers
26	425	Maintenance shed.	Brick bases with corrugated asbestos roof.
28	20	Substation.	Brick with a felted roof.
30	29	Storage magazine.	Corrugated metal shed.
31	212		
34	226	Carton shed containing packaging materials.	Concrete walls with metal roof
35A-C	84	'Catherine Wheel Alley'. Manufacture of Catherine Wheels until 1998.	Brick walls with corrugated asbestos roof.
36A-K & L	344		
37	1465	'Rolling Sheds' containing palettes, shrink wrapping and fork trucks.	
39	45	Quality control and storage of damaged/faulty fireworks.	
40A-C	195	Storage of dummy fireworks for sales representatives. Small number of live fireworks stored.	
52A	52	'Technical'. Assessment of fireworks.	
53A-D	242	Firework storage (1.3 fireworks & display fireworks).	
66	202	Storage of rock salt, spades, shovels and tractors.	
69	18	Technical. Assessment of fireworks.	
83	211	Storage magazine.	Corrugated metal shed.
84	211		
85	202		
86	203		
88	107		
89	112		
90	98		
91	501		
93	229		
99A-C	229		
100	200		
111	641	Dispatch magazine.	Brick base with metal roof.
115	181	Storage magazine.	Corrugated metal shed.

Building#	Area (m^2)	Use	Description & construction
131	156		Brick base with corrugated metal walls and roof.
132A & B	113		Corrugated metal shed.
133	253		
134	87		
143	13	Detonators and bell wire storage.	
144A-D	705	Packing warehouse. Area where firework packs are made and stored.	Brick base with metal roof.
145	123	Office block.	Brick base with metal roof.
146	385	Storage magazine.	Corrugated metal shed.
150	363	Canteen (derelict).	Brick walls with corrugated asbestos roof.
152	157	Pair of semi-detached bungalows. Now empty.	Single storey brick walls.
165A-C	1036	Dispatch magazine.	Brick base with metal roof.
166A-F	2156		
167A-C	1096		
217A-B	291	'Sparkler Shed'. Manufacture of sparklers until 1998.	Brick walls with corrugated asbestos roof. Glass windows.
232	920	Firework storage, professional fireworks.	Metal shipping containers.
235	31	Storage of packaging material.	Brick walls with metal roof.
237	17	Storage of fireworks seized by the police.	Earth wall bunded metal storage container.
240	166	Two storey house	Double storey sandstone brick walls.

See Drawing 4486/3A for building locations.

2.2.13 In addition to the buildings listed above, there are a number of additional buildings across Area A that are not numbered on the plan provided by Black Cats, details of which are provided below.

2.2.14 To the west of Building 144 is a row of single storey brick buildings (which appear to be in a state of disrepair) containing **boilers**. Lithos understands these boilers were used by Standard Fireworks to heat the manufacturing sheds.

2.2.15 To the north of Building 144 is single storey brick-built toilet block, this also appears to not have been used since Black Cat acquired the site in 1998.

2.2.16 Other unlabelled 'buildings' include multiple smaller brick buildings with metal safes inside. These contained **gunpowder** when the site operated as Standard Fireworks pre-1998. Notices on the doors of each safe detail the amount of gunpowder stored in each safe, which ranged from 455kg to 1,800kg.

2.2.17 These gunpowder storage areas are located to the south of Buildings 30 & 143, in the mounded grass area known to staff as 'Badger Hill'.

2.2.18 In addition to the gunpowder storage buildings, '**Badger Hill**' comprises an overgrown area containing mounded hills of heather, trees and brambles. Multiple burrows were noted in the side of the hill, which employees suggested were badger and fox burrows. The staff member also indicated badgers are known to live under Building 88.

2.2.19 To the north of Building 1 is a row of garages (total area of 360m^2), one of which is labelled '**Fire Station**' (approx. 175m^2 in area). A fine engine was stored in this shed but never used, and was eventually sold. It is understood only water was used to put out fires, and there has not been any storage of firefighting foam.

2.2.20 Whilst not viewed by Lithos, there are known **basements** beneath Buildings 3 & 37. The size and depths of the basements are not known.

2.2.21 There are also 3 "outside" areas associated with the fireworks factory:

Area	Use	Description & construction
Testing Area	Was used historically to test fireworks after manufacture. At present day only used to test new products.	Former quarry, partially backfilled.
Burn Area	Used to destroy illegal or faulty fireworks. Fireworks are soaked in water in IBC tanks for 7 days prior to burning in metal cages. Fireworks are burned 5 days a week.	Former quarry, partially backfilled, western and southern highwall still exposed.
UN Testing Area	Overgrown grass and mature trees. Concrete pad in the centre with multiple breezeblock shelters.	It is understood construction of the UN Testing Area was never complete due to land ownership issues. However, a square concrete pad and at least two breeze block structures are present.

2.2.22 To the east of Building 66 and south of Buildings 36A-K is a c. 3m deep **reservoir** with wooden ladders for access. The reservoir was drained, and has likely not been used since Black Cat Fireworks acquired the site.

2.2.23 A wooden shed on brick foundations is located to the west of the reservoir, which likely housed hoses and a pump in case of a fire. To the east of the reservoir is a brick building (approx. 95m^2 in area), which appears similar to Buildings 36A-K and was likely used for the manufacture of fireworks.

2.2.24 Three **trailer parks** are located on site, which comprise a macadam gravel surface with concrete strips. In between each building tarmac access roads are present, with concrete pads in front of buildings 165A-C, 166A-F and 167A-C to allow for the lorries to be loaded.

2.2.25 Numerous **tanks** are located on site close to:

- Building 152 (semi-detached bungalows) – dark green plastic **heating oil** tank in the garden of each bungalow. Tank in the garden of the most northern bungalow was placed on a concrete pad, but not bunded. Tank in the garden of the southern bungalow was placed on a concrete pad with a 2m high brick wall. The wall was broken and unstable at the time of the walkover.
- Building 240 – a bunded **red diesel** tank located to the north of Building 240. The tank was raised off the ground and appeared in good condition. A blue bin containing a used spill kit was located next to this tank.
- Fire station – an underground **white diesel** tank was previously located to the north of the former 'fire station', south of Building 12. Lithos understands this tank has been removed, but the above ground infrastructure remains in place.
- Shop 15 – a raised and bunded green plastic tank containing **red diesel** is located to the north of the shop (Building 15). At the time of the walkover, no obvious fuel spillages or staining was noted at the base of the tank.
- Building 37 – a green plastic tank was located on the hardstanding to the west of Building 37. The tank did not appear to be in use and may have been prepared for transfer or storage at the time of the walkover.
- Building 143 – a bunded **red diesel** tank is located in a breeze block brick bay to the west of Building 143. No obvious spills were noted, however, the tarmac on which the tank sat was wet and not in good condition at the time of the walkover.

2.2.26 The location of the tanks mentioned above are highlighted on Drawing 4486/3A.

2.2.27 Multiple **IBCs** filled with water were located across Area A, used to soak the fireworks prior to burning in the designated '**burn area**'. It is understood all wastewater from the IBC's was tankered off site.

2.2.28 In addition, multiple skips filled with the ash from the 'burn area' were noted across site. The skips are collected and disposed off-site as hazardous waste.

Area B – Fields

2.2.29 Grassed fields are located to the east and west of the Black Cat Fireworks site and comprise c. 40% of the total site area (11.5 ha).

2.2.30 There are three fields located in the east, used for grazing cattle. Access into these fields is gained via two metal fences off Farmhouse Court.

2.2.31 Six grassed fields are located in the west of site.

2.2.32 The fields in the west can be accessed via a metal gate off Felks Stile Road, with access in between the fields being gained via a gap in the stone wall boundaries between each field.

Blue Line Area

2.2.33 The blue line area comprises a steeply sloping area of rough grassland used by the public; mostly dog walkers.

2.2.34 A former **quarry** is located in the southwest of the blue line area, which does not appear to have been backfilled and contains a disused square building, likely associated with former quarrying operations.

2.2.35 A second area of historical quarrying is evident in the southeast of the blue line area, which comprises hummocky ground with large sandstone boulders.

Invasive Weeds

2.2.36 Ebsford Environmental Ltd have produced a drawing showing the locations of Japanese **Knotweed** and Himalayan **Balsam** on the site (Drawing Ref. CB/20399/F2); this has been reproduced as Drawing 4486/8 included in Appendix B.

2.3 Site operations

2.3.1 Since 1998, Area A has only been used for the **storage** of fireworks by Black Cat.

2.3.2 Between 1910 and 1998, the **manufacture** of fireworks was undertaken by Standard Fireworks.

Black Cat Fireworks Ltd operations – 1998 to 2023

2.3.3 Lithos have obtained a list of **dangerous substances** contained within fireworks that were stored in 40 magazines around Area A. The composition of fireworks varies according to the type of firework and their intended effect (i.e. flame, strobe effect, noise, whistle etc).

2.3.4 The typical composition of HT3 & HT4 fireworks stored by Black Cat on site is included in the table below. Maximum quantities stored in any one magazine is 40 tonnes of HT4 fireworks (display fireworks) or 3 tonnes of HT3 fireworks (household fireworks).

Substance	Typical composition % (HT4 fireworks)	Typical composition % (HT3 fireworks)
Aluminium powder	1.6	3.3
Barium Nitrate	18.1	9.2
Bismouth Oxide	0.45	-
Carbon	8.8	18.3
Copper Oxide	7.3	4.1
Cryolite (Trisodium hexafluoro aluminate)	0.97	-
Dextrine	0.32	0.59
Iron	2.8	-
Lac (shellac)	0.57	0.14
Magnesium-Aluminium Alloy powder	11.4	8.9
Phenolic Resin	2.4	1.8
Polyvinyl Chloride powder	2.3	2.0
Potassium benzoate	1.39	-
Potassium hydrogen phthalate	0.73	-
Potassium Nitrate	20.9	23.9
Potassium Perchlorate	10.9	19.2
Rice Starch	0.09	0.65
Sodium Oxalate	-	0.28
Strontium Carbonate	2.4	0.96
Sulphur	4.3	5.7
Titanium	2.2	1.1

2.3.5 Black Cat has now vacated the site and relocated to York. As part of their vacation plan, Black Cat Fireworks submitted a decommissioning plan to the HSE. An extract of the plan has been obtained by Lithos, details of which are summarised below:

'The active ingredient in fireworks is black powder, which is a mixture of potassium nitrate, carbon and sulphur. Given that potassium nitrate, the main ingredient, is soluble in water, the easiest way to deactivate the powder is through wetting.

The drenching process will likely include the addition of surfactant (washing up liquid or similar) to ensure complete wetting of the surfaces and allow increased penetration.

Prior to wetting, all visible traces of firework ingredients will have been removed in accordance with on-site spill procedures. Consequently, it is considered the quantity of free carbon and sulphur will be minimal.'

Standard Fireworks operations – 1910 to 1998

2.3.6 West Yorkshire Archive Service (Kirklees office) holds a collection (Ref. WYK1841) which contains Standard Firework's 'recipes' for the manufacture of fireworks, in addition to detailed site plans and accounts.

2.3.7 Lithos visited the archives on the 16th May 2023 to inspect the records. Site plans, with corresponding numbers and HSE explosive licenses were studied; findings are summarised in a table in Annex III.

2.3.8 To aid understanding of descriptions given on the licences, it should be noted that an expense magazine is a building used for the storage of partly manufactured or unpacked explosive. Furthermore, the types of fireworks stored are noted to contain chlorate, or not contain chlorate. Chlorate is a strong oxidiser which is prone to combustion when in contact with other explosive chemicals.

2.3.9 Data sheets for each firework manufactured were also inspected. Compounds identified as 'hazardous' on the data sheets include the following;

Substance	
Potassium nitrate	Ethyl cellulose
Avedex	Methylated spirit
Potassium perchlorate	Strontium oxalate
Aluminium	Whistle plastic
Copper carbonate	Anthracene
Barium nitrate	Antimony sulphide
Ammonium perchlorate	Sulphur
Barium carbonate	Alcopol
Potassium benzoate	Polyester resin
Strontium nitrate	Aluminium shellac

3 SITE HISTORY

3.1 In order to investigate the development history and previous land uses at the site and immediate surrounding land, site centred extracts from Ordnance Survey (OS) plans dating back to 1854 have been examined. These plans are presented in Appendix E to this report.

3.2 The table below provides a summary of the salient points relating to the history of the site with respect to the proposed end use. It is not the intention of this report to describe in detail all the changes that have occurred on or adjacent to the site. Significant former uses/operations are highlighted in **bold** text for ease of reference.

Date	Site	Surrounding land
1854	Predominantly open fields. **Waterhouse Quarry** in the centre of site. **Crosland Hill Quarry** in the far north of site. Thewlis Lane running east to west through the centre of site.	Spring Grove (house) directly west of site. Long Wood (woodland) directly north of site Crosland Hall 30m southeast. Crosland Moor House, Sand House, Moor Side directly south of site. Un-named **sandstone quarry** 190m west, 95m northeast.
1892	Waterhouse Quarry no longer shown. Crosland Hill Quarry expanded. **Spinkwell Quarries** present in the southeast of site. Comprising 4 quarries and 6 spoil heaps.	Houses built directly east 'Crosland Hill'.
1904	Spinkwell Quarries expanded, 4 areas of 'old' quarry. Crosland Hill Quarry expanded.	Two small quarries c.100m southeast.
1916	Spinkwell Quarries now shown as 'old quarries'. **Standard Fireworks Factory** located in the footprint of Spinkwell Quarries. Row of buildings constructed for the firework factory. **Matlock House Quarry** in the centre-north	Quarries c.100m southeast expanded, now labelled **Wellfield Quarries**. **Manor House Quarry** c.100m east. **Malley Hole Quarry** c.60m northeast. **Chapel Field Quarry** 120m east. **Old Park Quarry** c.180m southeast. **Moorfield Quarry** 35m south
1930	Firework factory expanded.	Crosland Heath Golf Course and club house directly west. **Chemical works** directly northeast **Moorfield Quarry** 35m south
1963	Majority of quarries backfilled as firework factory expanded west. Crosland Hill Quarry, Matlock House Quarry, Spinkwell Quarries and central quarries shown as **refuse tip**.	Manor House Quarry, Wellfield Quarry & Moorfield Quarries shown as **refuse tip**. Chemical works no longer shown
1984	Further expansion of firework factory.	Depot constructed in the footprint of backfilled Manor House Quarry c.100m east.
1993	Crosland Hill Quarry appears mostly backfilled, public footpaths crossing land directly north. Addition of metal storage containers and dispatch units in the west of the Fireworks Factory.	No significant changes.
2003	No significant changes	Houses constructed directly east (Masons Court).
2009	Small 'square' buildings in the northeast demolished and turned into trailer parks.	No significant changes.

3.3 The 3 quarries are anticipated to underlie c. 7 ha (c. 20% of the total site area).

3.4 The site was bought by James Greenhalgh of Standard Fireworks in 1910. The manufacture of fireworks took place on site between 1910 and 1998, with a break in manufacturing during the First and Second World Wars, when manufacturing ceased to allow the production of munitions to aid the war efforts. In 1998, Black Cat Fireworks purchased the site, and imported fireworks from China for storage in the former sheds.

3.5 Many of the buildings used for firework manufacture by Standard Fireworks (1910 – 1988) have not been used by Black Cat Fireworks. This was evidenced during the walkover by broken windows, collapsing roofs and buildings being in a general state of disrepair.

4 ENVIRONMENTAL SETTING

4.1 General

4.1.1 Notes describing how the site's environmental setting has been assessed are included in Appendix A to this report. Reference has been made to publicly available Government held digital data via QGIS (an Open Source Geographic Information System). The extracts from the Landmark Report are presented in Appendix G.

Issue	Data reviewed	
Geology	1:50,000 BGS map (Sheet 77) 1:10,000 BGS map (Sheet SE11SW)	Drift soils – None mapped. Solid (bedrock) – Rough Rock sandstone. Shallowest coal seam – Upper Meltham coal (thin) at c. 90m bgl. Strata Dip – 3 ˚ to 5 ˚ east & southeast. Faults – None recorded.
Mining	Coal Authority	This site is located beyond the Coal Authority's defined coalfields.
Quarrying	Historical OS plans	The site has been subject to extensive quarrying; see Section 4.2.
Radon	Public Health England	The site lies in an area where 5-10% of homes are estimated to be above the action level. Therefore, basic protection measures are required.
Hydrogeology	Environment Agency electronic open data via QGIS	Source Protection Zone? None. Aquifer Secondary A Aquifer (Solid). Groundwater abstractions? Johnsons Wellfield Quarries have borehole 105m east in Millstone Grit for quarrying operations. Crosland Heath Golf club abstract from Millstone Grot 150m southwest for golf course spray irrigation. Soil leaching potential - High. Pollution incidents? None recorded.
Hydrology	Envirocheck Report	Nearest watercourse(s) – River Colne flows east 1km north. Water quality – ecologically moderate, chemical fail. Pollution incidents? Septic tank effluent into freshwater stream/river on site in 1991. Abstractions? None within 1km of site. Discharge consents? None recorded.
Flood risk	Environment Agency electronic open data via QGIS	The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low. In accordance with Chapter 14 of the National Planning Policy Framework, a site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency).

4.2 Quarrying

4.2.1 Multiple quarries are located within and within the vicinity of the site, most of which are now disused and have been backfilled. A summary of quarries within the vicinity of the site is given in the tables below.

On-site

NGR	Name	Dates	Approx. extent (m²) within red line
SE 115 145	Matlock House Quarry	c.1910 to 1995	10,000 centre-south. Also known as Spinkwell Quarry.
SE 110 147	Crosland Hill Quarry	Pre-1850 to present*1	32,000 northwest
SE 113 147	Waterhouse Quarry	Pre 1850 to present	15,000 central

*1 Mostly backfilled by 1960, but still evident in far northwest (burning ground)

4.2.2 The above 3 quarries are expected to contain deep made ground and underlie c. 7ha (c. 25% of the total site area).

4.2.3 There is significant uncertainty regarding the lateral extent of each quarry. Historical maps only provide a 'snapshot' every 10 to 20 years and might show the presence of several small quarries which are actually all part of a single, larger quarry.

Off-site

NGR	Name	Dates	Remarks
SE 115 146	Spinkwell Quarries	1890 to 1980	Located within the footprint of Lowdhams caravan sales. Lithos investigation in 2020 found backfill to depths of between 11m and 23m, average 17m.
SE 114 144	Moorfield Quarry	1908 to 1980	15m southwest of site, south of Blackmoorfoot Road.
SE 116 147	Manor House	Shown on the 1969 1:10,000 map	10m southeast of site, approx. 4,000m²
SE 116 145	Wellfield & Waterholes Quarry	1890 to present	South of Blackmoorfoot Road. Believed to be up to 25m deep.
SE 115 149	Croft House Quarry	Pre-1850 to present*2	At eastern end of blue line land.

*2 Mostly backfilled by 1980

4.2.4 Lithos undertook investigation on the adjacent Lowdhams' caravan site in 2020 and found backfill within the former Spinkwell Quarries (also sandstone) to depths of between 11m and 23m; average **17m**. The quarry backfill was found to predominantly comprise reworked natural ground arisings - clayey sandy gravel, but with a significant proportion of cobbles and **boulders** of sandstone; boulders typically increased in size and frequency with depth.

4.2.5 Lithos have obtained **photos** of the adjacent Spinkwell Quarry, and also quarries being operated by W Mallinson & Sons and Boothroyd & Sons in 1926. Quoted grid references for these latter photographs suggest they may be showing Matlock House Quarry in the South of site. These photos suggest the quarries are deep (>10m). Photos are included in Appendix F.

4.2.6 In addition, Wellfield & Waterholes Quarries, immediately south of Blackmoorfoot Road, are understood to be up to 25m deep.

4.2.7 Given the quarries on site extracted the same sandstone, it is likely made ground depths within the footprint of the quarries reach up to 25m in some areas.

4.2.8 Given that Matlock House Quarry is recorded as a historic landfill, backfill material may be significantly more variable than that encountered by Lithos at Lowdhams.

4.3 Potential issues associated with historic landfill

4.3.1 Quarries in the north (Crosland Hill) and centre (Waterhouse) were probably backfilled prior to the Control of Pollution Act 1974; these areas are not recognised as historic landfill. However, the quarry in the south (Matlock House) was infilled more recently and is a recorded historic landfill.

4.3.2 The presence of a recorded historic landfill may have implications for preparatory earthworks. If the landfilled material was placed under a Waste Management License (or similar) it cannot be retained and re-used in accordance with the CL:AIRE Code of Practice because the Environment Agency have indicated they would consider such material waste, irrespective of its suitability for reuse. It is likely the EA would require a recovery of waste permit (or similar) to control reuse; application for such a permit would have both financial and time implications and approval is by no means certain.

4.3.3 It is worth noting that the description of this site as a historic landfill is the reason re-use on site is more problematic than it would be on a 'traditional' Brownfield site which contains made ground. This is because the EA indicate that where material has been placed in any landfill, the material is clearly being discarded and is therefore waste, irrespective of age. However, Lithos do not agree with this stance and as such could discuss with the EA.

4.3.4 The nature of the landfilled material is a critical factor. Ground investigation will need to determine whether the material is essentially inert and suitable for retention / re-use (and therefore can reasonably be considered not to be waste), or it contains a significant proportion of putrescible / degradable matter or material that could be classified as hazardous waste (road planings, asbestos, plaster board etc) and therefore is clearly not suitable for re-use, in which case it would still be considered waste, regardless of treatment / sorting. Based on review of the e3p logs, it seems more likely the former is true here.

4.4 Landfills

4.4.1 Known or suspected areas of landfill in the vicinity of the proposed development site are summarised below:

NGR	Name	Remarks
SE 115 145 (**on-site**)	Blackmoorfoot Road (Former Matlock House Quarry)	Accepted inert and commercial waste. License issued to Standard Fireworks in 1977 and surrendered in 1988. This landfill is shown in QGIS, but not the Landmark Envirocheck.
SE 115 150 (30m northeast, within blue line boundary)	Quarry Road (former Croft House Quarry)	Input date, nature of landfill and license holder not known. Currently grassland.
SE 116 145 (20m south)	Wellfield Quarry Landfill	Currently accepting inert landfill to unknown depth. License holder is Johnsons Wellfield Quarries Limited, issued June 2006 by EA.

4.4.2 In addition to the above, deep quarry backfill is anticipated in two on-site quarries:

NGR	Name	Remarks
SE 110 147 (**on-site**)	Crosland Hill Quarry	Shown on the 1963 1:2,500 historical map but not recorded elsewhere. Area now used as 'burn area' and appears to have only been partially backfilled.
SE 115 146 (**on-site**)	Spinkwell Quarries	Shown as a refuse tip on the 1963 1:2,500 historical maps.

4.4.3 Matlock House Quarry is recorded as a historic landfill, and this backfill may be significantly more variable than that in other quarries. See also comments in Section 4.3 above.

4.5 Hazardous gas

Methane & carbon dioxide

4.5.1 The site might be affected by sources of hazardous gas generation as it is:

- Located within 250m of known former & current landfill sites
- Anticipated to be underlain by significant areas of deep quarry backfill

4.5.2 Consequently, monitoring is recommended in order to determine appropriate gas protection measures for the proposed dwellings.

Radon

4.5.3 Requirements with respect radon measures are set out in Building Regulations Approved Document C. Probability bandings (based on the proportion of properties in a given area that exceed the Action Level; currently 200 $Bq.m^{-3}$) are used to determine whether a property requires no, basic or full measures.

4.5.4 At present Approved Document C advocates basic measures for the probability banding 3% to 10% (full measures if >10%). However, the UK Health Security Agency (HSA) would like to see all new build include basic measures.

4.5.5 The HSA website radon map indicates that the site is in an area where **5% to 10%** of homes are estimated to be above the action level, and **basic** radon protection measures are required in new dwellings.

4.5.6 In accordance with BR211:2015[1], basic radon measures simply comprise a barrier (membrane) laid within the floor construction, which is linked to a damp-proof course (DPC) within the walls of the building.

4.5.7 The DPC to cavity walls should be in the form of a cavity tray to prevent radon entering the building through the cavity. Sealing of joints in the barrier and sealing around service penetrations are also required. A 1200-gauge polythene membrane should suffice, and sub-floor ventilation is not essential.

4.5.8 However, a building site is a harsh environment and barriers can easily become damaged during construction by operatives or equipment moving across or working over a completed section of barrier. As a consequence, where there is a risk of puncturing the membrane, stronger materials such as thicker or reinforced polyethylene sheet should be considered, and it should be ensured that the membrane is well protected with sand or lean mix concrete before advancing construction.

4.5.9 BRE211:2015 highlights the importance of good practice and workmanship to ensure radon membranes are installed to a high standard and suggests regular supervision and inspection. Whilst there are no specific statutory requirements to inspect radon barriers, BRE and Lithos strongly recommend a programme of inspections.

4.5.10 It is not deemed necessary to inspect each barrier before it is covered but Lithos would suggest the first plot is inspected and 1 in 20 plots thereafter.

[1] *BRE Report BR211, 2007: "Radon: guidance on protective measures for new buildings"*

4.6 Detailed UXO Risk Assessment

4.6.1 The term UXO refers to any unexploded ordnance which may occasionally be encountered within the ground. UXO is typically divided into 1 of 3 categories:

- Land Service Ammunition (LSA)- Fired, thrown or placed from a land-based gun (larger than a machine gun)/mortar/person. Includes bullets, shells, mortars and grenades.
- Small Arms Ammunition (SSA) – Fired from a machine gun & smaller. Comprises bullets.
- Air Dropped Weapons – Fired from a plane/blimp. Includes bombs, incendiaries, missiles and rockets in a variety of sizes (<25kg to >1ton).

4.6.2 UXO presence is generally caused by one of the following:

- German bombing of Britain during WW1 and WW2
- Anti-Aircraft batteries used to counter German attacks during WW2
- Military training and exercises from 1700's to present day
- Ordnance manufacture from 1700's to present day. Most intensively during WW1 (Kings Ordnance factories) and WW2 (National filling factories).

4.6.3 Whilst UXOs are generally stable (buried bombs are often considered to be as stable as the day they were dropped), disturbance by excavation, impact, vibration or heat can activate and detonate a hidden UXO. It is therefore important to try to avoid impact and disturbing bombs in the ground.

4.6.4 Although the site is shown to lie within a UXO Low Risk Area, it was considered prudent to obtain a Stage 2 Detailed UXO Risk Assessment given the site's association with manufacture of explosives during the first and second world wars.

4.6.5 A brief summary of the findings of Brimstone's risk assessment, which focuses on issues affecting proposed intrusive investigation, as well as implications for the proposed development, is included below:

- No official documented evidence has been found to suggest that the site area or its immediate surroundings (500m radius) were subject to bombing incidents.
- The quarries on site were backfilled post WWII; if backfilling occurred relatively soon after WWII, rubble and debris from bomb damaged structures may have been used as fill, as indicated by previous experience with quarries. UXBs obscured within the rubble may have gone unnoticed and could have been used as part of the fill. However, given that Huddersfield did not sustain a significant amount of damage, such occurrence is unlikely.
- Anecdotal evidence suggests the munitions produced at the factory during WWI & WWII included hand grenades, practice ammunition, Very pistol stars, Thunderflash sticks, parachute flares and possibly 2" mortars.
- It is considered the testing of munitions occurred in areas of the site away from the main factory buildings; suitable areas include the undeveloped area in the south-west and the disused quarry areas. It is possible that faulty/surplus munitions used in these tests, as well as untested ammunition stored at the factory, may have been discarded or discretely buried in such areas.
- A geo-data set held in-house indicates that an Explosive Ordnance Clearance (EOC) task occurred in the northeast of site in 1979, uncovering 123 items of live and 1,075 items of expended UXO. Although no further information on this task was readily available, it is possible that the items found included those aforementioned as being tested, possibly highlighting a testing location, or dumping area.

4.6.6 Given the significant amount of munitions produced/stored on site, as well as evidence suggesting testing occurred, the recorded EOC task and the potential for a dumping area to have been present is assessed as being of **Moderate Risk** (of encountering Allied UXO).

4.6.7 In summary, risks here are predominantly expected to be associated with on-site disposal of munitions (faulty or surplus grenades, mortars), rather than bombs dropped from German aircraft.

4.6.8 A non-intrusive magnetometer survey of the greenfield land (east, west and south of the site) is recommended.

4.6.9 A UXO site safety Awareness Briefing should be given to all personnel prior to intrusive works commencing. An EOD engineer should also be present during the ground investigation to supervise activities and scan proposed exploratory hole locations.

4.7 Other issues (COMAH Regulations)

4.7.1 Storage of hazardous substances is covered by the "Control of Major Accident Hazards (COMAH) Regulations 2015" and is regulated by the HSE who hold details of the substances and quantities stored. Based on the quantities held, sites are either "Lower Tier" or "Upper Tier".

4.7.2 The HSE draw a Consultation Distance (CD) around each COMAH site, the CD comprises 3 zones (inner, middle & outer), based on a detailed assessment of hazards and risks.

4.7.3 The HSE notifies the Local Planning Authority (LPA) of all CDs in their area and the LPA is required to consult the HSE about all applications which result in an increase in population within the CD. Taking the risk into account the HSE advises the LPA against the proposed development or notes it does not advise against it.

4.7.4 The site, operated by Black Cat Fireworks Limited, is an Upper Tier establishment subject to the COMAH regulations (COMAH Ref. H12174). Furthermore, as an importer, supplier and distributor of fireworks, Black Cat also have an explosive licence (No. X1/4111/228/55), issued by the HSE under the Explosive Regulations 2014. The licence allows the storage up to 5½ thousand tonnes of explosive material.

4.7.5 It is understood that prior to development commencing the Explosives Licence would need to be surrendered and the COMAH site designation revoked.

5 PREVIOUS INVESTIGATION FINDINGS

5.1 General

5.1.1 The Vendor has provided Lithos with copies of the following reports:

- Report 1 – Phase 1 & Phase II Geo-Environmental Site Assessment (Ref 11-822-3-1-2) issued by e3p in February 2018 to Gerald Eve.
- Report 2 – Outline foundation options appraisal (Ref 11-822-L4) issued by e3p on 17th May 2022 to YK Siu Fung Investments.
- Historic Environment Desk-based Assessment (Ref. JAC26512) issued by RPS in July 2020 to Empire Knight Group.
- Flood Risk Assessment & Drainage Strategy (Ref. 13354) issued by Campbell Reith in July 2020 to Empire Knight Group.

5.1.2 To date, a copy of the Gaia Environmental Report (Ref. 151862.610.00, dated September 2013) has not been located for review.

5.1.3 Lithos have also obtained a copy of a site plan showing drainage runs.

5.2 Summary of third-party findings

Report 1 – e3p 2018

5.2.1 E3p's ground investigation works comprised:

- 35 trial pits (TPs 101 to 135).
- 45 mini-boreholes (window sample)
- 2 cable percussive boreholes (CP101 & CP102)
- Monitoring wells were installed in WSs 101, 104, 106, 110, 114 – 117, 119, 123, 126, 130 & CP101, with response zones sealed in both made ground and residual soils.
- Geotechnical classification tests (Atterberg Limits, pH, soluble sulphate etc).
- Chemical laboratory tests including
  - 37 samples for metals (13 made ground, 7 made ground topsoil, 5 topsoil & 12 natural soil)
  - 21 pH & water soluble sulphate (8 made ground, 4 made ground topsoil; 3 topsoil & 6 natural soil)
  - 23 samples for asbestos ID (11 made ground, 7 made ground topsoil, 5 topsoil)
  - 4 samples for asbestos quantification (all <0.001%).
  - 35 samples for speciated PAH (11 made ground, 7 made ground topsoil, 5 topsoil & 12 natural soil)
  - 7 samples for leachable metals, PAH & TPH.
- Gas monitoring; 6 visits between May and August 2017, with atmospheric pressures in range 996mb to 1006mb. Flows were recorded between -0.52 and 0.13.

5.2.2 E3p's exploratory hole locations are copied here on Drawing 4486/6 in Appendix B.

5.2.3 Ground conditions encountered by e3p are summarised in Annex 4, Table 1.

5.2.4 Made ground was not encountered in greenfield areas to the east, west and south of the firework factory. Made ground was also sometimes absent across the 'general factory' area. Elsewhere, beyond backfilled quarries, made ground was encountered to depths of between 0.5m and 2.0m (average depth of 0.9m).

5.2.5 Brick and sandstone cobbles and boulders were encountered within the infilled quarries. The majority of exploratory holes did not prove the full depth of made ground, although CP101 recorded sandstone at 7.8m in Waterhouse Quarry. WS101 suggests Crosland Hill quarry is deeper than 5.5m. CP102 recorded 2.5m of made ground in Matlock House Quarry.

5.2.6 Residual Soil, referred to as 'drift' by e3p generally comprised gravelly fine to medium Sand, or sandy Gravel with gravel and cobbles of angular sandstone bedrock.

5.2.7 Sandstone bedrock was only recorded in 6 of the 82 exploratory holes, although remarks on the logs suggest that 18 of the 35 trial pits terminated on rock – average depth (beyond quarries) of 1.6m.

5.2.8 No groundwater was encountered by e3p.

5.2.9 Contaminant results are summarised in Tables 2 & 3 of Annex 4. Contaminants that yielded concentrations in excess of Tier 1 screening values for a residential end use were predominantly asbestos, PAHs, TPH and heavy metals. E3p suggest exceedances are all associated with made ground; most notably within quarry backfill in the north and south. This appears to be true, with the exception of made ground topsoil in TP108a, which also yielded exceedances.

5.2.10 No elevated hydrocarbon concentrations were reported in samples recovered in the vicinity of an AST & UST.

5.2.11 E3p recommended placement of 600mm clean soil cover in proposed garden areas underlain by made ground.

5.2.12 Preliminary gas monitoring undertaken by e3p between May and August 2017 suggests the site can be classified as CS1/Green.

Report 2 – e3p 2022

5.2.13 This report undertaken by e3p includes an outline foundation options appraisal using ground investigation data from 2018.

5.2.14 It was considered that approximately 40% of properties in the east of site will require Vibro Replacement Stone Columns or piled foundation. It was recommended that the remaining 60% of proposed homes could be founded on mass trench fill foundations at depths of between 1.5m and 2.0m.

5.2.15 A clean cover system comprising 450mm subsoil and 150mm topsoil was recommended for houses in the east of site due to the presence of asbestos and elevated concentrations metals and PAH.

Report 3 – RPS 2020

5.2.16 This report includes a desk-based assessment of the historic environment, undertaken by RPS in 2020.

5.2.17 The proposed development includes mitigation inherent to the design, such as retention of extant stone wall boundaries and provision of a community park. The Grade II listed Crosland Hall directly east will be partially affected as agricultural fields will be lost, however, areas surrounding Crosland Hall are currently designated as POS.

Report 4 – Campbell Reith 2020

5.2.18 This report comprises a Flood Risk Assessment and Drainage Strategy, undertaken by Campbell Reith in July 2020.

5.2.19 Infiltration testing was undertaken by Ground Solve in July 2020, in areas underlain by sand. Four of 5 trial pits successfully drained water, indicating that soakaways would be a feasible option for the disposal of surface water run-off. However, soakaways will not work in areas of the site underlain by Clay.

5.2.20 A pre-planning enquiry from Yorkshire Water has confirmed that surface water can "discharge to Crosland Hill Road at a rate not exceeding 27 litres/second and to Blackmoorfoot Road at a rate not exceeding 61 litres/second.

5.2.21 The Preliminary Drainage Strategy demonstrated that runoff from the proposed development can be attenuated on-site, with post-development discharge rates restricted to agreed runoff rates.

5.2.22 The pre-planning response received from Yorkshire Water also confirmed that foul water can drain to the public combined sewer network on Blackmoorfoot Road and Crosland Hill Road. Based on the existing topography, it was proposed that flows from the north of the development are discharged via a gravity system to the 300mm public combined sewer on Crosland Hill Road, with the south of the development discharging via gravity to the 225mm public combined sewer on Blackmoorfoot Road.

5.3 Lithos comments

5.3.1 E3p's 2018 investigation is considered very **'thin'** in terms of scope; Lithos consider it to provide an 'exploratory' phase of investigation only.

5.3.2 A total of 82 exploratory holes across and area of 29.3 ha equates to an average spacing of **60m** – very wide for a brownfield site such as this. A more reasonable 40m spacing, with a locally 'tighter' grid to target areas of interest would require c. 200 trial pits.

5.3.3 Similarly, monitoring well spacing should be between 25m and 50m for moderate gas hazard sites with a high sensitivity development. Even if monitoring was restricted to the 17.8 ha factory site, a 50m spacing would require c. 70 wells (cf. 13 installed to date). The e3p report recommended that a full gas assessment should be completed.

5.3.4 The desk study concludes with a relatively generic initial Conceptual Site Model, which makes no reference to potential geotechnical issues (e.g. quarries, high walls, slope stability, below ground obstructions and/or structures etc).

5.3.5 Many of the exploratory holes within the former **backfilled quarries** failed to 'bottom out' made ground. Furthermore, there is some doubt as to whether the few holes that reportedly encountered natural strata truly did; some may have terminated on large sandstone boulders and others might actually be located beyond quarry footprints (there are no levels or coordinates on the e3p logs). E3p's drawings showing 'depth of made ground' and 'depth to bedrock' are **potentially misleading**.

5.3.6 There is also significant uncertainty regarding the **lateral extent** of each quarry. The e3p Report makes no mention of '**highwalls**' nor does it consider implications of building on deep made ground that likely contains large **boulders**.

5.3.7 The number of samples analysed for contaminant testing is low, further testing of c. 80 samples of made ground and 16 samples of topsoil is recommended. Soil cover thickness might need to be increased following further testing of made ground samples (e3p only tested 11 samples).

5.3.8 The Flood Risk Assessment and Drainage Strategy relies on results from 5 soakaway pits. With the exception of SA4A, only 1 fill was undertaken in each pit. In order to obtain approvals from the LLFA, Highways etc, the drainage designer is likely to require further testing: (a) within 25m of proposed chamber locations; and (b) to include 3 fills.

5.3.9 If the soakaway test results are satisfactory, it may also be necessary to install groundwater monitoring wells to depths of around 5m in at least 3 boreholes. Given the anticipated depth to bedrock, these boreholes might need to be advanced by rotary probing.

5.3.10 Furthermore, if a detention basin is proposed, water table levels should be taken from borehole monitoring wells over 4 consecutive seasons; for at least 3 points in the basin area.

6 PRELIMINARY CONCEPTUAL SITE MODEL

6.1 Potential contaminants

6.1.1 In addition to potential contaminants, originating from stored fireworks given in Section 2, an assessment of potential contaminants associated with the former uses has been undertaken with reference to CLR8 and the following DETR Industry Profiles: Chemical Works; explosives, propellants, pyrotechnics manufacturing works.

6.1.2 As a consequence of this assessment, anticipated potential contaminants, within soil and/or groundwater include:

- Inorganics (metals, asbestos associated with made ground)
- Inorganic compounds associated with firework manufacture (nitrates, chlorates, perchlorates and chromates, alkaline earth metals, potassium dichromate, potassium perchlorate, ammonium nitrate)
- Metals and metal compounds associated with firework manufacture (magnesium, aluminium, strontium, copper, titanium, bariummercuric thiocyanantimony sulphide, arsenic disulphide)
- Non-metals (boron, phosphorous, including red phosphorous)
- Organic compounds associated with firework manufacture (waxes, ammonium picrate)
- TPH & PAH (fuels, oils associated with machinery use and maintenance, heating oils / diesel tanks identified during the walkover)

6.1.3 Areas where firework manufacturing is known to have taken place, namely 'Catherine Wheel Alley and areas of gunpowder storage) should be targeted during site investigation. In addition, known tanks and backfilled quarries should also be targeted.

6.1.4 The conceptual model will likely be subject to modification in light of data arising from the proposed intrusive ground investigation.

7 GROUND INVESTIGATION DESIGN

7.1 Anticipated ground conditions & potential issues

7.1.1 Based on the data reviewed in Sections 4 (Environmental Setting) and 5 (Previous Investigation Findings), anticipated ground conditions are expected to comprise:

Anticipated condition	Remarks
Made ground	Anticipated at shallow depth across the factory site. Deeper made ground (up to 25m) likely present within the footprint of backfilled quarries.
Natural soils	Residual soils (gravelly sand), particularly in undeveloped fields to the east, west and south of site. Localised areas of sandy clay.
Bedrock	Sandstone bedrock anticipated at shallow depth (c. 2m).
Mineworkings	None anticipated
Groundwater	Deep (in rock)

7.1.2 In summary, 3 areas of deep made ground (quarry backfill) are anticipated and quarry backfill is likely to predominantly comprise reworked natural ground arisings - clayey sandy gravel, with a significant proportion of cobbles and boulders of sandstone.

7.1.3 However, Matlock House Quarry is recorded as a historic landfill, and this backfill may be significantly more variable.

7.1.4 Beyond backfilled quarries, made ground is typically relatively thin; typically <1m across the former factory area and typically absent within the surrounding fields.

7.1.5 Natural ground is expected to predominantly comprise sandy gravel (completely weathered bedrock) over sandstone.

7.1.6 Based on the data above and that in Sections 2 (Site Description) and 3 (History), potential ground-related issues associated with this site are likely to include:

Type of issue	Specific issue	Remarks
Potential on-site contamination sources	1. Reworked topsoil (inorganics, organics) 2. Fuel tanks (AST/UST) 3. Backfilled quarries 4. Raw material storage 5. Firework testing 6. Burn area	1. Associated with farming in the east, south and west 2. Fuel leakage/spillage. Kerosene, red diesel, heating oil, white diesel all known to have been stored on site. 3. Deep made ground, possibly containing fireworks. Potential cause of migrating hazardous ground gas. 4. Pre 1998 many chemicals likely stored across site. Post 1998 contamination is less likely. 5. Sparkler shed, testing area and 'technical' all likely to contain some contamination from testing of fireworks. 6. Fireworks soaked for 7 days in IBCs then burned in metal cages. Lots of ash and debris noted during walkover.
Potential off-site contamination sources	1. Landfill (backfilled quarry) 2. Former chemical works directly north	1. Wellfield Quarry & Croft House Quarry off site are both known landfills, possible migrating landfill gas. 2. Unknown what was manufactured at the works, possibly linked to firework manufacture. May have caused inorganic & organic contamination, particularly in the northeast of site.
Potential geotechnical hazards	1. Relict buried obstructions 2. Deep MG 3. Steep slopes 4. Quarries 5. Soft ground	1. No air raid shelters known, foundations of former Standard Firework buildings remain beneath the Trailer Parks (northeast corner of site). 2. Made Ground potentially up to 25m deep within former quarries, likely variable in composition, including cobbles and boulders. 3. Steep slope along the northern boundary of the blue line area. 4. Quarry highwalls present within the footprint of the backfilled quarries. The western highwalls of Matlock House Quarry and Crosland Hill Quarry (burn area) still visible. 5. Potential for soft ground within backfilled quarries.
Other potential constraints	1. Underground and/or overhead utilities 2. Invasive plants 3. Badgers	1. Will require relocating/diversion. 2. JKW & Himalayan balsam has been identified in multiple areas. This will require treatment and removal by specialists. Investigation works to give a 7m buffer zone around identified JKW. 3. Known badger sets beneath 'badger hill' and Building 88. Investigation works to avoid land within 30m of confirmed badger setts.

7.2 Ground investigation design & strategy

7.2.1 The site consists of a single parcel of land (c. 42 ha), although residential development is restricted to c. 29 ha outlined red on Drawing PL1713-AB-005, Rev 02, issued by Planit. The red line area can be divided in two:

- **Agricultural land** to the east, west & south; c. 11.5 ha (c. 40% of the total red line area).
- **Fireworks factory** area; c. 17.8 ha (60% of the total red line area).

7.2.2 At this stage, no significant intrusive investigation is proposed within the 12.5 ha of land outlined blue.

7.2.3 The information considered in Sections 2 to 6 above has been used as a basis for design of an appropriate ground investigation, the scope of which is summarised below.

Exploratory holes	Purpose
c. 200 Trial Pits	**Greenfield area:** To determine the nature, distribution and thickness of shallow natural soils, including suitability of the ground for founding structures and highways. To determine the general nature of localised areas of made ground soils and deeper backfill associated with Matlock House Quarry. **Brownfield area:** To determine the general nature of made ground, and deeper quarry backfill, including: • visual/olfactory evidence of potential contamination and the proportion of undesirable elements e.g. biodegradable matter, relict foundations etc • the proportion of "oversize", boulder-sized material • the nature of existing internal floor slabs (where access, and possibly thickness / reinforcement allows) • the nature of existing foundations (pits excavated adjacent to external walls) To determine the nature, distribution and thickness of shallow natural soils, including suitability of the ground for founding structures and highways.
Including at least 8 Trial Pits	To determine whether soakaways could be utilised for storm water drainage
and c. 15 Trial Trenches	To determine the location and extent of the quarries, including locate the line of quarry high walls.
c. 25 Rotary Probeholes	To confirm quarry depths
c. 25 'stitch lines', comprising 4 to 8 probeholes	To determine highwall location and approximate steepness
c. 30 Rotary Probeholes	To install monitoring wells across the site in order to monitor for hazardous gas

7.2.4 Given findings of the detailed **UXO** Risk Assessment (see Section 4.6), ground investigation activities will need to be supervised by a UXO specialist in addition to the geoenvironmental engineer (Lithos).

7.2.5 Proposed exploratory hole locations were selected to provide a representative view of the strata beneath the site and to target potential areas of interest identified in Section 4 above. A nominal 30m grid spacing was proposed. Additional exploratory locations might be scheduled by the site engineer in light of the ground conditions actually encountered.

7.2.6 The number of representative samples taken will be reflective of the geological complexity actually encountered. However, in general about 3 samples will be taken from most trial pits.

8 FIELDWORK

8.1 Objectives

8.1.1 The original investigation strategy is outlined in Section 7.2 above.

8.1.2 Due to constraints associated with UXO clearance, trial pitting within Area B (Fields) was delayed, but has now been undertaken and findings are included in the remaining sections of this Report.

8.2 Exploratory hole location constraints

8.2.1 No access was available within 30m of known **badger setts** or within 7m of **invasive plants** (Japanese Knotweed and Himalayan Balsam).

8.2.2 In addition, due to dense overgrowth and **woodland**, no access was available in the far northeast, and the far south of site.

8.2.3 Window sampling was the only practical investigation within buildings due to restricted access through doorways. It should be noted that window sampling allows only a limited inspection of the ground (especially made ground with a significant proportion of coarse material). Furthermore, assessment of the strength of cohesive soils, via hand vane tests, is difficult due to disturbance caused by drilling.

8.3 Scope of works

8.3.1 Fieldwork within Area A was supervised by Lithos between the 24th August and 19th September 2023. Supplementary investigation within Area B (fields) was supervised by Lithos between 30th October and 3rd November 2023. Fieldwork comprised:

Area	Technique	Exploratory holes	Final depth(s)	Remarks
A	Trial pitting (machine dug)	TPs 301 to 437	0.2m to 5.0m	Trial pits within quarries were typically unstable.
	Trial Trenching (machine dug)	TTs 301 to 320	1.2m to 3.6m	Undertaken to locate quarry highwalls
	Foundation pits (machine dug)	FP301 to 311	0.6m to 1.0m	Excavated adjacent to buildings to determine foundation depths.
	Window sample boreholes	WS301 to 316	0.6m to 5.0m	Undertaken within buildings to determine concrete floor thickness.
	Rotary open-hole probeholes	PH01 to PH50 PH101 to PH130	5.0m to 29.3m 6.0m	Stitch lines undertaken across quarry highwalls Monitoring wells installed.
	19mm galvanised steel pipes	Piezos 131 to 133	1m	Shallow gas monitoring installations (lower 500mm slotted, upper 500mm solid)
B	Trial pitting (machine dug)	TPs 500 to 549	0.8m to 2.4m	Undertaken on the **western fields** Vane tests undertaken in cohesive soils where possible Trial pits terminated in weathered bedrock **Soakaway** tests undertaken in TPs 513, 514, 516, 518 & 519
		TPs 600 to 613	1.5m to 2.5m	Undertaken on the **eastern fields** Trial pits terminated in weathered bedrock **Soakaway** tests undertaken in TPs 611, 612 & 613

8.3.2 Notes describing ground investigation techniques, in-situ testing and sampling are included in Appendix A to this report.

8.3.3 Exploratory hole logs are presented in Appendices H to N to this Report. These logs include details of the:

- Samples taken
- Descriptions of the solid strata, and any groundwater encountered.
- Results of the in-situ testing
- The monitoring wells installed

8.3.4 All Lithos' exploratory hole locations are shown on Drawing 4486/6A presented in Appendix B; exploratory holes were picked-up by a surveyor and co-ordinates/ground levels are included on the logs in Appendices H to N.

8.3.5 However, for clarity, further Drawings are included in Appendix B; namely:

- 4486/6B which just shows the locations of Lithos Trial Pits & Trenches
- 4486/6C which just shows the locations of Lithos boreholes (rotary probeholes and WS mini-boreholes)
- 4486/6D which just shows the locations of Lithos boreholes within which monitoring wells are installed
- 4486/6E which just shows the location of the trial pits within the western fields
- 4486/6F which just shows the location of the trial pits within the eastern fields

9 GROUND CONDITIONS

9.1 General

9.1.1 A complete record of strata encountered beneath the proposed development site is given on the various exploratory hole records, presented in Appendices H to N.

9.1.2 Typical ground conditions encountered within Areas A & B are described below in Sections 9.2 (made ground) and 9.4 (natural ground), with a summary provided in Annex I.

9.2 Made ground

9.2.1 Made ground was encountered in 123 of 136 trial pits across **Area A**. Ground conditions are variable but Area A can be divided into two distinct sub-areas; **within quarries** and **beyond quarries**.

9.2.2 A total of 60 trial pits and 17 trial trenches encountered evidence of quarrying.

9.2.3 The made ground on site is a heterogeneous mixture of materials and it is unlikely, even with a huge amount of sampling, that it could be accurately characterised. Nonetheless, the bulk of the made ground can be categorised as one of the following broad types:

- **Made Ground Topsoil:** encountered from surface in 14 trial pits within quarries and 10 trial pits beyond quarries. Maximum depth to base of 1.4m where excavated within a soil mound, average depth to base of 0.3m.
- **Macadam Hardstand:** encountered from surface in 38 trial pits within quarries and 33 trial pits beyond quarries. Maximum depth to base of 0.2m, average depth to base of 0.1m.
- **Concrete Hardstand:** encountered from surface in 7 trial pits within quarries and 9 trial pits beyond quarries. Thickness ranging from 0.05m to 0.2m, the majority of which was reinforced.
- **Sub-base:** encountered in 12 trial pits within quarries and 26 trial pits beyond quarries beneath macadam hardstand to between 0.2m and 0.7m depth. Comprised a gravel of sandstone or limestone.
- **Brickfill:** encountered in TP322 (beyond quarries) between 0.2m and 0.3m depth.
- **Reworked Natural:** within the quarries reworked natural ground was only encountered in TP428 beneath Made Ground Topsoil between 0.3m and 0.9m depth and comprised an orangish brown gravelly fine to coarse Sand. Beyond quarries, Reworked Natural Ground was encountered in 15 trial pits to depths of between 0.8m and 2.0m.
- **Granular Made Ground:** encountered in 35 trial pits within quarries and 44 trial pits beyond quarries to a maximum depth of 3.0m, average depth to base of 0.8m. Typically comprised a sandy Gravel of mixed lithologies including sandstone, brick, concrete, clinker, red shale, coal, limestone, mudstone and tarmac.
- **Cohesive Made Ground:** encountered in 4 trial pits within quarries and 4 trial pits beyond quarries to a maximum depth of 3.7m, average depth to base of 1.6m. Typically comprised a sandy Clay with gravel of mixed lithologies including brick, sandstone, concrete, metal, glass and wood.
- **Ash & Clinker:** encountered in 29 trial pits within quarries and 13 trial pits beyond quarries to a maximum depth of 4.9m, average depth to base of 1.8m. Typically comprised a fine to coarse Sand with gravel of clinker, tarmac, burnt shale and coal.
- **Quarry Backfill:** Sand and/or Gravel with a high cobble content. Gravel and cobbles are of sandstone. Encountered in 75 trial pits/trenches to a maximum depth of 5.0m in machine excavated pits, and to a maximum depth of 24.3m in probeholes. Flush was often lost during the rotary probehole drilling in the quarry backfill. On occasion, penetration through the quarry backfill during rotary drilling occurred without rotation, with the rods "pushed" in.

9.2.4 Review of trial pit logs suggests that made ground is present across c. 90% of Area A, with thicknesses varying from 0.5m to 24.3m (maximum depth of recorded quarries). Beyond the areas of quarrying, made ground thicknesses ranged from 0.1m to 3.7m (average depth to base of 1.0m). Made ground in excess of 2m deep was encountered in 82 trial pits/trenches and 79 probeholes.

9.2.5 The approximate distribution of made ground is shown on Drawing 4486/11.

9.2.6 Across **Area B**, made ground was only encountered in 3 trial pits (TPs 538, 547 & 549) in the far south of the western fields adjacent to Blackmoorfoot Road and Felks Stile Road. This made ground comprised:

- **Made Ground Topsoil** – Encountered in the 3 pits from surface to 0.3m depth comprising dark brown clayey silty fine to coarse Sands with rare sandstone gravel.
- **Granular Made Ground** – Encountered to between 0.7m and 1.3m in the 3 pits comprising dark greyish brown very silty fine to medium Sands with gravel and cobbles of sandstone.

9.2.7 No made ground was encountered in the eastern fields.

9.3 Obstructions

9.3.1 It is apparent from a review of historical OS Plans (see Section 3) and/or the site visit that buildings have been present on about 6% of the total site area (10% of Area A). Furthermore, concrete and tarmac **hardstand**, which is typically 100mm thick, covers approximately 112,000m^2. Drawing 4486/3 shows the footprints of the former structures, and areas of hardstand.

9.3.2 Constraints associated with existing buildings, underground utilities and ecology (badger setts) prevented trenching to identify and assess the nature/extent of the existing building foundations. However, where possible, some trial pits were excavated down the **outside of buildings** to determine foundation depths. Obstructions encountered in these trenches are summarised below:

Hole	Area of site/former feature	Depth (m)	Obstruction encountered
FP301	Building 53D	0.1	Concrete floor slab foundation 150mm thick, protruding 100mm.
FP302	Building 146	0.2	Concrete foundation 150mm thick protruding 200mm, sloping at 45° to allow service entry through brick.
FP303	Building 91	0.1	Concrete floor slab foundation 100mm thick protruding 50mm.
FP304	Building 84	0.1	Concrete foundation 150mm thick, protruding 150mm.
FP305	Building 93	0.2	Concrete foundation 100mm thick (highly weathered) protruding 300mm.
FP306	Building 132A-B	0.2	Concrete foundation (highly weathered) 50mm to 100mm thick, with protrusion.
FP307	Building 111	0.4	Concrete foundation, 100mm thick protruding 100mm to 150mm.
FP308	Building 232	0.1	Concrete foundation for wall 200mm thick, protruding 50mm to 100mm.
FP309	Building 165C	0.2	Concrete foundation for structural column. 600mm x 500mm protruding 150mm. Foundation along wall (highly weathered) 50mm thick protruding 50mm.
FP310	Building 99B	0.2	Brick wall laid on sandstone cobbles overlying reworked natural ground. No concrete foundations apparent.
FP311	Un-numbered building between Buildings 144C-D and 145	0.25	Concrete foundation 150mm thick, protruding 150mm.

9.3.3 In addition, 16 window sample boreholes were drilled within a selection of buildings to assess **floor slab thickness**.

Hole	Building number	Floor Slab thickness (m)	Remarks
WS301	Building 8	0.17	Concrete floor underlain by Relict Topsoil & Granular Residual Soil.
WS302	Building 53A	0.15	Concrete floor underlain by Made Ground to 0.7m depth.
WS303	Building 91	0.15	Concrete (5mm reinforcement) floor underlain by Sub-base & Granular Made Ground.
WS304	Building 146	0.16	Concrete (5mm reinforcement) floor underlain by Sub-base & Granular Made Ground.
WS305	Building 34	0.12	Concrete (5mm reinforcement) floor underlain by Made Ground to >4.0m depth.
WS306	Building 144A-B	0.18	Concrete floor underlain by Made Ground to >5.0m depth.
WS307	Building 144A-B	0.14	Concrete (5mm reinforcement) floor underlain by Ash & Clinker to 0.55m. Second concrete obstruction encountered at 0.6m depth.
WS308	Building 166F	0.10	Concrete floor underlain by **void** (potential basement?). At 3.6m, possible concrete floor.
WS309	Building 166D	0.16	Concrete floor underlain by **void** (potential basement?). At 1.45m, possible concrete floor.
WS310	Building 15	0.19	Concrete (5mm reinforcement) floor underlain by Made Ground to 2.2m depth.
WS311	Building 37	0.16	Concrete (5mm reinforcement) floor underlain by Made Ground to 1.1m depth.
WS312	Building 37	0.18	Concrete (5mm reinforcement) floor underlain by Made Ground to >2.0m depth.
WS313	Building 165A	0.16	Concrete (5mm reinforcement) floor underlain by Made Ground to 1.2m. At 1.2m depth, obstruction.
WS314	Building 165C	0.14	Concrete floor underlain by Made Ground to 1.4m. At 1.4m depth, obstruction.
WS315	Building 167A	0.18	Concrete floor underlain by Sub-base to 0.3m depth.
WS316	Building 111	0.15	Concrete (5mm reinforcement) floor underlain by Sub-base to 1.7m depth.

9.3.4 Given the above, it is apparent that the buildings on site do not appear to have deep foundations. The maximum foundation depth encountered of 0.4m, and the thickest floor slab was 190mm. It should be noted that two possible basements were encountered in Building 166, and further basements should be anticipated.

9.3.5 Some of the buildings in the northern and central parts of Area A had wooden floors which prevented access with the window sample rig.

9.3.6 In addition to obstructions associated with buildings on site, multiple obstructions were encountered within the **backfilled quarries**, which will need to be taken into account when designing ground improvement works and foundation solutions. Boulders and obstructions noted in trial pits/trenches are detailed in the table below.

Hole	Depth (m)	Remarks
TP311	4.5	From 4.5 to 5.0m, sandstone boulder (c. 1m diameter) in base of pit.
TP325	2.8	At 2.8m, sandstone boulder c.1.5m in size.
TP340	1.6	At 1.6m, sandstone boulder excavated circa 1.0m x 1.0m in size
TP342	0.9	At 0.9m, concrete floor slab (excavated with machine). Brick wall in north face of the pit
TP343	1.5	At 1.5m, sandstone boulder 2.0m in diameter.
TP348	2.0	From 2.0m to 2.6m, sandstone boulders up to 1.0m diameter.
TP349	2.8	At 2.8m, refusal on hard obstructions (likely boulders >1m diameter).
TP357	1.6	From 1.6m, frequent boulders up to c.50cm in size.
TP365	2.2	At 2.2m, refusal on hard obstruction (boulder >1m diameter).
TP391E	2.8	At 2.8m, sandstone boulder (2m diameter)
TP397	1.5	At 1.5m, unable to continue excavation due to boulders and constraints associated with concrete surfacing.
TP409	1.0	At 1.0m, 2.5m diameter sandstone boulder.
TP421	1.0	Between 1.0m and 2.0m, sandstone boulder up to 2m diameter.
TP424	2.0	From 2.0m, large diameter boulders (up to 1.5m)
TP432	3.4	From 3.4m, sandstone boulders randomly orientated.
TP434	2.8	Refusal on hard obstruction (likely boulder > 1.5m diameter).
TT301C	0.55	From 0.55m, boulders up to 1.0m diameter.
TT310S	0.6	At 0.6m, concrete boulder slab (2.5m diameter).
TT319S	3.0	At 3.0m, large diameter (1.5m) boulders of sandstone.
TP301	1.2	At 1.2m, concrete boulder circa 1.2m in size.
TP351	0.4	At 0.4m, concrete slab 1.6m x 1.6m x 0.2m in size excavated. At 0.7m, concrete slab at base of pit.
TP414	2.1	At 2.1m, refusal or obstruction (likely sandstone boulder or bedrock across base of pit and >2.5m diameter).
TT303C	0.4	At 0.4m, sandstone boulder (1.0 x 1.5 x 0.5m).

9.3.7 It is apparent from the table above that frequent **boulders** (usually sandstone) have been encountered during the pitting, up to 2.5m diameter. The presence of boulders was also noted throughout the quarry backfill, during the rotary probehole drilling. However, due to the drilling technique, the size of the boulders is difficult to assess.

9.3.8 Given redevelopment proposals, removal of obstructions and oversize from the near surface will likely be required.

9.3.9 Given the frequency and size of the boulders, the presence of **localised voids** created by boulders spanning gaps beneath cannot be ruled out and should be expected.

9.4 Natural ground

9.4.1 Natural ground was encountered in the majority of the exploratory holes, and within **Area A** typically comprised:

- **Topsoil:** encountered in 13 trial pits beyond quarries to depths of between 0.1m and 0.6m (average depth to base of 0.3m). Typically comprised a Sand with gravel of sandstone.
- **Relict Topsoil:** within the footprint of the quarries, Relict Topsoil was encountered in TPs 302, 420 & 426 and TT306S beneath Quarry Backfill (around the quarry perimeter) to depths of between 0.6m and 2.1m (average depth to base of 1.4m).

  Typically comprised a dark brown silty Sand/silty Clay with occasional rootlets.

  Beyond of quarried areas, Relict Topsoil was encountered in 13 trial pits beneath a range of made ground types to depths of between 0.3m and 1.8m.
- **Granular Residual Soil:** encountered beneath quarry backfill in 10 trial pits to depths of between 1.3m and 3.8m (average depth to base of 2.3m).

  Beyond areas of quarrying, Granular Residual Soils were encountered in 150 trial pits/trenches to depths of between 0.9m and 3.4m (average depth to base of 1.9m).

  Typically comprising a fine to coarse Gravel of sandstone, with a low to medium cobble content.
- **Cohesive Residual Soil:** encountered within areas of quarrying in TP420, TP421, TT306S & TT316N to depths of between 2.3m and 3.7m, average depth to base of 3.0m.

  Encountered in TP350, TP358, TP433 & TP347 located beyond areas of quarrying to depths of between 0.9m and 2.6m, average depth to base of 1.6m.

  Typically comprising a firm silty Clay with gravel of sandstone.

9.4.2 Where **Rough Rock Sandstone (bedrock)** was encountered, trial pits typically refused. Bedrock was encountered and excavated in 18 trial pits to depths of between 0.2m and 3.0m. The average penetration within the 18 trial pits was 0.3m.

9.4.3 Typically, within natural ground (light brown Sand & Gravels of sandstone) trenches were stable and becoming difficult to excavate from 2m depth using a JCB 3CX.

9.4.4 Across **Area B**, natural ground comprised:

- **Topsoil** – Encountered in 60 trial pits to an average depth of 0.3m, comprising dark brown, clayey, silty, fine to coarse Sand, with rare sandstone gravel and frequent rootlets.
- **Cohesive Residual Soil** – Encountered in 8 pits to between 1.0m and 2.5m depth (average 1.6m), comprising firm to stiff, light brown Clays, with gravels of sandstone and siltstone lithorelicts.
- **Granular Residual Soil** – Encountered in 61 pits to between 0.6m and 2.2m depth (average 1.4m) comprising light brown and orangish brown, very silty, fine to coarse Sands, with gravels and cobbles of sandstone or light brown, very sandy, subangular fine to coarse Gravel of sandstone, with low to high cobble content.

9.4.5 Where **Rough Rock Sandstone (bedrock)** was encountered, trial pits typically refused. Bedrock was encountered and excavated in 61 of the 64 pits from between 0.6m and 2.2m depth (average 1.4m). Penetration of bedrock ranged between 0.1m and 0.9m using a JCB 3CX.

9.4.6 Rough Rock Sandstone comprised weak to moderately strong, light yellowish brown, fine and medium Sandstones recovered as gravel and cobbles.

9.5 Visual & olfactory evidence of organic contamination

9.5.1 No significant organic contamination was noted; however the following odours were noted within Area A:

Site area	Hole	Material	Depth (m)	Observation
Centre north	TP327	Ash & Clinker	1.4 – 2.6m	Strong bituminous odour
Centre	TP322	Ash and Clinker	0.6	Slight hydrocarbon odour
Centre	TP336	Relict Topsoil	1.5 – 1.8m	Natural organic odour

9.5.2 No visual or olfactory evidence of hydrocarbon contamination was recorded in Area B.

9.6 Groundwater

9.6.1 No significant inflows of groundwater were encountered during the investigation.

9.6.2 Groundwater levels recorded in the monitoring wells (2 visits undertaken to date) are summarised below.

Hole	Response zone (depth range & strata)	Groundwater body	Typical standing water level	
			m bgl	m AoD#
PH101	3.0-6.0m (Rough Rock Sandstone)	Perched (drift)	3.58	213.9
PH102	3.0-6.0m (Quarry Backfill)	Perched (made ground)	5.25	211.2
PH105	3.0-6.0m (Rough Rock Sandstone)	Perched (drift)	4.65	204.6
PH107	3.0-6.0m (Rough Rock Sandstone)		3.03	216.2
PH111	2.5-5.5m (Quarry Backfill)	Perched (made ground)	5.13	223.0
PH115	3.0-6.0m (Rough Rock Sandstone)	Perched (drift)	5.48	231.2
PH117	3.0-6.0m (Rough Rock Sandstone)		4.99	223.6
PH123	3.0-6.0m (Rough Rock Sandstone)		2.75	213.5
PH124	3.0-6.0m (Rough Rock Sandstone)		3.49	222.5
PH126	3.0-6.0m (Rough Rock Sandstone)		4.85	230.7
PH128	3.0-6.0m (Rough Rock Sandstone)		5.44	223.2
PH129	3.0-6.0m (Rough Rock Sandstone)		5.55	218.1
PH130	3.0-6.0m (Rough Rock Sandstone)		5.52	216.8

levelled-in by survey to enable groundwater assessment

9.6.3 Dip data to date suggests there is some isolated **perched water** within Granular Residual Soils and Quarry Backfill material.

9.6.4 Based on the findings of the intrusive investigation and monitoring undertaken to date. The groundwater table is anticipated to lie at depth within bedrock.

9.6.5 Across Area B, groundwater was encountered in TPs 515, 538 & 539 between 0.5 and 2.2m as seepages and inflows.

9.7 Stability

9.7.1 Stability of excavations within natural strata was good (beyond areas of quarrying).

9.7.2 However, excavations within the footprints of quarries and/or deep made ground (c. >2.0m depth) were unstable, with significant spalling and collapse.

9.7.3 Exploratory holes within the quarry backfill were often abandoned at c. 3m depth due to continual collapse of sidewalls creating circular shaped pits and health and safety concerns.

9.8 Quarrying investigation

9.8.1 As outlined in Section 3, the centre of the site (c. 20% of total site area), has been subject to quarrying of Rough Rock Sandstone.

9.8.2 Historical mapping, available photographs (obtained for an adjacent site in the surrounding area) and an inspection of the adjacent active Johnson Wellfield quarries, suggest that quarrying comprised open excavations of c. 20m depth, with near vertical highwalls.

9.8.3 A total 116 probeholes have been drilled to investigate the quarry depths and highwalls with the locations of the probeholes shown on Drawing 4486/6C.

9.8.4 A total of 20 trial trenches were excavated to investigate the quarry highwall with the locations of the trenches shown on Drawing 4486/6B.

9.8.5 A full summary of the quarry investigation probeholes is provided in the Table 1 in Annex I. Each probehole was drilled **5m** into bedrock at the base of the quarry/highwall to confirm depth to bedrock and ensure that the probeholes were not terminated on bounders present within the quarry backfill or on the quarry floor.

9.8.6 A further 30 probeholes were taken to shallow depth to enable the installation of gas monitoring wells and the locations are shown on Drawing 4486/6D. These probehole logs are provided in Appendix N.

Quarry depths (deep rotary probeholes)

9.8.7 A total of 33 'deep' rotary probeholes were advanced across Area A through deep quarry backfill to record the depth to the base of the quarries. These probehole logs are provided in Appendix L.

9.8.8 Additionally, 43 deep probeholes were advanced through deep quarry backfill as part of the stitch probeholes to investigate highwalls. These probehole logs are provided in Appendix M.

9.8.9 Six of the 76 'deep' probeholes (PHs 3, 11E, 36, 38, 39 & 47) were terminated at shallow depth (5.5m to 8.5m) as they encountered shallow natural soils/bedrock within 3m of surface and it became apparent they were drilled beyond the footprint of the quarries.

9.8.10 Five of the 76 probeholes (PHs 21D, 24A, 30C, 40 & 42B) encountered made ground (quarry backfill) overlying bedrock between 3.0m and 4.5m and are considered likely to be drilled through the **highwall**, or possibly intersected a sandstone **'bench'** within the quarry highwall.

9.8.11 The depth to base of the sandstone quarries varied between 6.0m (PH28A) and 24.3m (PH25) in the remaining 65 probeholes.

9.8.12 Variable depths to the base of quarries were recorded across Area A suggesting the presence of benches of unworked material. It appears that 4 distinct areas of quarrying have been identified with a central main quarry and 3 smaller quarries in the east, west and south.

Quarry highwalls (trial trenching)

9.8.13 A total of 20 trial trenches were excavated to determine the line of buried highwalls at shallow depth. Trenches were typically excavated to between 1.5m and 4m depth where excavation stability allowed.

9.8.14 The quarry highwall was successfully identified in 18 of 20 trenches excavated (all except TTs 302 & 311). Additionally, evidence of the highwall, or 'benches' adjacent to the highwall, was recorded in TPs 352N, S & C & 391E & W.

9.8.15 Highwalls were typically located when deeper made ground (c. >2.5m depth) was identified by colour, composition and stability of excavations (Granular Made Ground and Ash & Clinker).

9.8.16 Where Quarry Backfill was encountered adjacent to the highwall (similar in colour and composition to natural ground), this was typically identified by stability of excavation sidewalls and the proportion of oversize (large diameter cobbles and boulders).

Quarry highwalls (rotary stitch probeholes)

9.8.17 A total of 18 lines of stitch probeholes were advanced to determine the line and profile of buried highwalls. Stitch probeholes were typically drilled at 1.5m to 3m horizontal spacing.

9.8.18 The lines of stitch probeholes were initially determined based on anticipated highwall positions indicated on historical OS maps, and located during the trial pitting. The highwall was successfully located in 17 of the 18 stitch lines undertaken (all except PH37-37B).

9.8.19 The extent of quarrying proven by drilling and trial trenching to date appears to **contradict** the historical OS mapping (see Drawing 4486/3B). Areas of the site that were not anticipated to be quarried, were found to contain deep quarry backfill and it appears that much of the centre of Area A is merged into a single quarry, with varying base depths.

9.8.20 Given the spacing between probeholes, the majority of the highwalls appear to be **vertical/near vertical**. Furthermore, benching of the highwall was potentially discovered in PH32-32C and PH25-25C.

9.8.21 Additionally, **unworked** sandstone 'land bridges/pillars/roads' with two highwalls in immediate proximity laterally were recorded in 5 stitch lines (PH09-9B, PH10-10A, PH11-11F, PH20-20E & PH21-21H).

9.8.22 The approximate outline of the quarry and approximate depths of fill are shown on Isopachyte Drawing 4486/11.

9.8.23 Given findings, and access constraints (ecology) at the time of investigation, it is considered **likely** that further unworked sandstone 'land bridges/pillars/roads' are present within the footprint of the quarries, some of which may be **buried** beyond 3m to 4m depth.

9.8.24 Furthermore, it should be noted that there is a possibility that the sandstone quarries identified are connected by relatively narrow '**roadways**' along the floor of the sandstone quarries. This type of feature was successfully identified in PH48-48G, PH118 & PH25-25C which links the central quarry with a 'spur/bay' off to the south.

9.8.25 Highwall lines appear to be highly irregular with 'bays' and 'spurs' along the crest and at depth. Due to the highly irregular nature of the highwall alignment, some variation from that shown on Drawing 4486/11 is likely.

9.8.26 In total, deep quarry backfill appears to be present beneath about 20% (**c. 6.1 ha**) of the total site area. Considering the Fireworks Factory (Area A) only, deep quarry backfill is present beneath c. 35%.

9.8.27 The remaining c. 80% likely to be underlain by shallow made ground deposits, natural soils and bedrock.

9.8.28 Using all the above data, cross sections have been drawn which are presented on Drawings 4486/12, 13 & 14.

9.9 Revised conceptual ground model (ground conditions)

9.9.1 The Preliminary Conceptual Site Model has been revised in light of data obtained during the ground investigation, most notably with respect to:

- The nature and distribution of made ground, including the presence of significant buried obstructions (relict foundations & boulders within the quarry backfill)
- The strength, nature and depth of underlying natural strata
- The presence of backfilled sandstone quarries
- The nature and distribution of contamination (based on visual/olfactory evidence only)

9.9.2 Further refinement of the Conceptual Site Model is presented in Sections 12.4, where the results of laboratory testing for contaminants have been considered.

10 SOAKAWAY TEST RESULTS

10.1 UK guidance

10.1.1 General notes about soakaways, including their location, design, and Lithos' test methodology are presented in Appendix A.

10.1.2 UK guidance does not explicitly state that soakaways cannot be constructed in made ground, but such construction is not generally considered good practice. There may be a risk of settlement caused by wash out of fine soil particles if soakaway waters are allowed to infiltrate into made ground. Furthermore, UK guidance does state that the soakaways should not be built where the presence of contamination could result in pollution of groundwater.

10.1.3 CIRIA C753[2] recommends that soakaways should not be constructed 'in ground where the water table reaches a level within 1m below the base of the soakaway at any time of the year'.

10.1.4 BRE Digest 365[3] "Soakaway Design" advises that each soakaway pit should be filled and allowed to drain three times to near empty on the same or consecutive days.

10.2 Field tests

10.2.1 Given the presence of made ground, including deep quarry backfill, no testing has been undertaken in **Area A**.

10.2.2 Soakaway testing was carried out in 8 pits across **Area B**, in general accordance with BRE Digest 365 "Soakaway Design". Five tests were undertaken in south and west, and 3 tests in the north-east. The locations of the soakaways are shown on Drawings 4486/6E & 4486/6F presented in Appendix B to this report.

10.2.3 Infiltration rates for each soakaway test have been calculated (where possible) in accordance with BRE Digest 365. This design takes into account time for the water level to fall from 75% to 25% of its effective depth. The effective depth is the difference between the starting water level and the soakaway pit base depth.

10.2.4 Where the water level did not fall to 25% effective depth within 3.5 hours, the test was not considered suitable for calculation of an infiltration rate; this was the case for unsuccessful tests in TPs 518 & 611.

10.2.5 Three filling cycles were undertaken in TPs 513, 514, 612 & 613.

10.2.6 Two filling cycles were undertaken in TPs 516 & 519, but relatively slow drainage and time constraints meant that only one fill was undertaken in TPs 518 & 611.

[2] *CIRIA C753. The SuDS Manual (2015).*
[3] *BRE Digest 365. Soakaway Design (1991).*

10.2.7 Calculated infiltration rates for each successful test are summarised in the table below, and copies of the associated calculations are presented in Appendix R to this report.

Soakaway	Stratum	Infiltration rate (m/s)	Remarks
TP513	0.3m to 1.4m – Granular Residual Soil 1.4m to 1.6m – Rough Rock Sandstone	Test 1 – 7.98x10^{-3}m/s Test 2 – 6.01x10^{-5}m/s Test 3 – 5.90x10^{-5}m/s	-
TP514	0.3m to 2.0m – Granular Residual Soil 2.0m to 2.1m – Rough Rock Sandstone	Test 1 – 2.06x10^{-4}m/s Test 2 – 2.02x10^{-4}m/s Test 3 – 1.03x10^{-4}m/s	-
TP516	0.3m to 1.4m – Granular Residual Soil 1.4m to 1.9m – Rough Rock Sandstone	Test 1 – 4.14x10^{-5}m/s Test 2 – 3.59x10^{-5}m/s	-
TP518	0.4m to 1.3m – Cohesive Residual Soil 1.3m to 2.1m – Granular Residual Soil	Test 1 – N/A	Test still c. 50% full after 4 hours
TP519	0.3m to 1.5m – Granular Residual Soil 1.5m to 1.7m – Rough Rock Sandstone	Test 1 – 4.17x10^{-5}m/s Test 2 – 4.71 x10^{-5}m/s	-
TP611	0.3m to 1.4m – Granular Residual Soil 1.4m to 1.6m – Rough Rock Sandstone	Test 1 – N/A	Test still c. 50% full after 3.5 hours
TP612	0.3m to 1.5m – Granular Residual Soil 1.5m to 2.0m – Rough Rock Sandstone	Test 1 – 1.69x10^{-4}m/s Test 2 – 8.14x10^{-5}m/s Test 3 – 7.91x10^{-5}m/s	-
TP613	0.4m to 1.6m – Granular Residual Soil 1.6m to 2.2m – Rough Rock Sandstone	Test 1 – 8.79x10^{-5}m/s Test 2 – 1.62x10^{-4}m/s Test 3 – 7.94x10^{-5}m/s	-

10.3 Discussion & conclusions

10.3.1 Drainage Engineers could use the infiltration rates reported above to determine the feasibility of soakaways as a solution for the discharge of surface water run-off.

10.3.2 Drainage solutions are discussed further in Section 15.11.

11 CONTAMINATION (ANALYSIS)

11.1 General

11.1.1 Historical mapping suggests the Firework Factory site was occupied by multiple sandstone **quarries** from prior to the 1850s until the 1960s. In addition, **fireworks** were manufactured on site between 1910 and 1998. Subsequently, the site was operated by Black Cat Fireworks for the distribution and selling of fireworks.

11.1.2 Records held by the Environment Agency indicate the presence of a **historic landfill** in the south east of the Firework Factory site. The licence holder is recorded as being Standard Fireworks, with the acceptance of inert and commercial waste permitted.

11.1.3 Lithos understands a previous investigation undertaken by a third party (Gaia) noted the loss of 3,000 litres of **diesel** from an above ground fuel tank on site in 2006. However, subsequent investigation and monitoring did not identify any evidence of diesel contamination in the vicinity of the tank. A copy of this report has been requested but has never been provided, as such the location of the spillage is currently not known.

11.1.4 E3P considered this spillage in their 2018 report suggesting the fuel may have been stolen rather than lost due to spillage.

11.1.5 As detailed in Section 2.3 a variety of chemicals associated with the manufacture of fireworks have been stored and used on site.

11.1.6 Former usages in **Area A** are likely to have given rise to some ground contamination. Furthermore, significant thicknesses of made ground (up to 24m within quarry areas) were encountered in many of the exploratory locations during the ground investigation.

11.1.7 **Area B** has not been the subject of a past potentially contaminative industrial land use. However, historical mapping suggests arable farming has been carried out in Area B. Sampling of the topsoil has been undertaken to confirm its suitability for re-use.

11.1.8 An assessment of potential contaminants associated with the former uses has been undertaken; see Section 6.

11.1.9 In the context of risks to human health associated with the proposed residential redevelopment, the Tier 1 Soil Screening Values referenced in this report have been derived via the CLEA default conceptual site model (CSM) used for generating SGVs, but amended, where appropriate, to be more specific to redevelopment within the planning process.

11.1.10 Where available, Category 4 Screening Levels (C4SL) have also been referenced.

11.1.11 Generic Note 04 in Appendix A provides further details with respect to current guidance and the interpretation of analytical data.

11.2 Testing scheduled

11.2.1 Based on the above assessment, Lithos submitted a number of samples for analysis to a UKAS accredited laboratory. Account has also been taken of visual and olfactory evidence recorded during the ground investigation. Testing across **Area A** comprised:

Type of sample	No. of samples analysed	Determinands
Standard suite		
Made ground	95	pH, water soluble boron, and total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc) Calorific Value (CV) Water soluble sulphate, chloride, nitrate and magnesium TOC, Speciated Polycyclic Aromatic Hydrocarbons (PAH), Banded Total Petroleum Hydrocarbons (TPH)
Fireworks and Explosives Suite		
Made ground	37	Sulphur and sulphide
	10	Phenol, antimony, potassium
	6	2,4,6-trinitrophenyl-N-methylnitramine (tetryl) 2,4,6-trinitrotoluene (2,4,6-TNT), 2,4-dinitrotoluene (2,4-DNT) 2,6-dinitrotoluene (2,6-DNT) Cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX) Cyclotetramethylenetetranitramine (HMX) Hexanitrostilbene (HNS) Pentaerythritol tetranitrate (PETN) 2,4,6-trinitrophenol (picric acid) Picrite (nitroguanidine) Ethylene glycol dinitrate (EGDN) Nitroglycerine (NG) Nitrocellulose (NC) Chlorate Perchlorate
Asbestos		
Made Ground	102	Asbestos ID (fibres within made ground)
ACM spot samples	6	Asbestos ID (ACM fragments)

11.2.2 Selected samples were also scheduled for:

- Speciated Total Petroleum Hydrocarbons
- Volatile Organic Compounds
- Site specific Fireworks and Explosives Suite

11.2.3 The Fireworks and Explosives Suite was based on review of the firework "recipes" obtained from the Black Cats archives (Section 2.3) and assessment of the chemical and toxicological properties of the ingredients. The individual contaminants for which analysis was carried out was limited to those for which analysis was commercially available.

11.2.4 In determining which samples would be scheduled for further analysis account was taken of previous land uses associated with specific areas of the site.

11.2.5 Asbestos quantification was carried out on all samples which returned a positive ID.

11.2.6 Testing across **Area B** (fields) comprised the below:

Type of sample	No. of samples analysed	Determinands
Topsoil	26	pH, water soluble boron, and total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc) & asbestos ID TOC, Speciated Polycyclic Aromatic Hydrocarbons (PAH)
	10	Clay/sand/silt content and visible contaminants, sharps (glass etc) to check compliance with BS3882:2015
Granular Made Ground	3	pH, water soluble boron, and total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc) & asbestos ID Water soluble sulphate, chloride, nitrate and magnesium TOC, Speciated Polycyclic Aromatic Hydrocarbons (PAH), Banded Total Petroleum Hydrocarbons (TPH)

11.3 Soil contamination results

11.3.1 Soil contamination test results are summarised in the tables in Annex II.

11.3.2 Laboratory test certificates as received from the laboratory are presented in Appendix O to this report.

Inorganic determinands

11.3.3 Given the proposed residential development these samples have been classified by comparison with Tier 1 Soil Screening Values for an end use including domestic gardens and any area where plants are to be grown (the most sensitive of proposed end-uses).

11.3.4 Of the 95 samples of **made ground** recovered from **Area A** analysed for inorganic parameters, the majority can be classified as uncontaminated. A third of the samples recorded elevated concentrations, classifying them as potentially contaminated.

11.3.5 The most common contaminants are arsenic, copper, lead, nickel and zinc.

11.3.6 Of the 29 samples of **topsoil** (26) and granular made ground (3) analysed for inorganic parameters from **Area B**, all 29 can be classified as uncontaminated.

11.3.7 Current UK guidance regarding the statistical analysis of soil contamination data obtained during a site investigation is provided by CL:AIRE[4], and uses two-way confidence intervals and graphical summaries, to assist assessors when determining whether or not a dataset is adequate to answer the question posed; e.g. "is existing site topsoil suitable for retention & re-use?". To answer such a question, it is necessary to recover and test a large number of samples (a minimum of 10; ideally 20+) in order to undertake meaningful statistical analysis.

11.3.8 However, in the context of site investigation to assess the significance of contamination on brownfield sites which are typically underlain by heterogenous made ground, some remediation is almost always required (placement of soil cover, excavation of gross contamination etc). Consequently, in such circumstances, it is not usually necessary to demonstrate that made ground soils are "clean" and therefore there is no need to test large numbers of samples and undertake statistical analysis. Heterogenous made ground sample results can simply be compared directly with appropriate screening values (e.g. Lithos Tier 1 values).

11.3.9 The difference between the old and new approaches, including how Lithos apply the statistical assessment is detailed in Generic Note 04, included as Appendix A to this report.

[4] *CL:AIRE, 2020.Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration.*

11.3.10 Lithos can confirm that statistical assessment of the strata encountered on the Black Cats factory site is not appropriate because:

- Made Ground is considered too heterogenous
- Some sampling locations are targeted

11.3.11 Lithos can confirm that statistical assessment of arsenic, lead, zinc and B[a]Pin topsoil across Area B is appropriate because:

- There is a well understood, robust CSM which identifies possible source areas
- Sampling locations are relatively evenly spread across Area B and only random sample data has been included in the assessment
- Samples are considered by strata type
- A minimum of 10 samples have been taken from each strata

11.3.12 Statistical analysis assumes that a given stratum is reasonably homogenous in terms of composition, the distribution of contaminants and the degree of contamination; the CSM indicates that this is a reasonable assumption for Topsoil in Area B.

11.3.13 The Dot and Box Plots are presented in Appendix H and the results are summarised below.

Natural Ground – Topsoil (Area B)

Contaminant	Critical concentration	Mean	Upper confidence level (95%)	Lower confidence level (5%)	Range of 'true' mean	Mean lies above critical concentration (Y/N)
Arsenic	37	16.4	18.0	14.9	14.9 to 18.0	No
Lead	200	68.3	77.3	59.8	59.8 to 77.3	No
Zinc	200	67.7	75.8	59.9	59.9 to 75.8	No
B[a]P	5	0.16	0.21	0.11	0.11 to 0.21	No

All concentrations are in mg/kg
Notes: Values in **bold** indicate that the true mean range exceeds the relevant Tier 1 value.

11.3.14 Statistical analysis indicates that the true mean for arsenic, lead, zinc and B[a]P in topsoil from Area B is below the relevant Lithos tier 1 screening values.

Calorific value

11.3.15 The calorific value of 12 samples of Ash & Clinker, have yielded an average CV of 3.1 MJ/kg (maximum of 8.3MJ/kg with 4 samples recorded as <1.0MJ/kg).

11.3.16 Materials whose CVs exceed 10MJ/kg are almost certainly combustible, while those with values below 2MJ/kg are unlikely to burn.

11.3.17 No calorific value testing was undertaken in Area B as no potentially combustible materials were identified.

Asbestos

11.3.18 Potential asbestos-containing materials (ACMs), such as broken fragments of asbestos-cement sheeting, were noted during the excavation of 11 of the 136 trial pits. Where possible, a sample was taken.

11.3.19 Six samples of suspected **ACMs** were sent for analysis, with the presence of asbestos (Chrysotile) confirmed in all 6 of the samples.

11.3.20 A total of 102 samples of **soil**, recovered from Area A, were screened for the presence of asbestos, fibres were positively identified in 11 samples.

11.3.21 Further analysis (asbestos quantification) was instructed on all samples where asbestos was positively identified. Quantification revealed concentrations ranging between <0.001% to 0.288% (see Annex II).

11.3.22 No visual evidence of asbestos-containing materials (ACMs), such as broken fragments of asbestos-cement sheeting, was noted during the excavation of trial pits across Area B.

11.3.23 No asbestos fibres were identified in any of the 29 topsoil and made ground samples screened from Area B.

Organic determinands (Area B)

11.3.24 Area B is essentially greenfield and therefore for organic compounds, the Tier 1 Values used in this report have been derived with reference to a CSM that assumes a residential with gardens end use, with no clean soil cover will be placed in gardens/landscaped areas (Lithos Scenario A).

11.3.25 Lithos have used the CLEA model to derive risk-based screening values for hydrocarbons, in accordance with the methodology detailed by the TPHCWG, and reviewed by a UK workshop of experts with respect to UK adoption of the method.

11.3.26 However, these screening values assume a Soil Organic Matter (SOM) of 6% (equivalent to a TOC of 3.5%). Many organic contaminants are more mobile when the SOM is lower, and consequently comparison of soil results with lower screening values may be required.

11.3.27 In order to check the validity of Lithos' Tier 1 Soil Screening Values, the average TOC for each common fill type (beyond any areas of obvious hydrocarbon impact) have been determined.

Fill type	Typical TOC (%)	Comparison of soil results with revised screening value necessary?
Topsoil	3.9%	No
Granular Made Ground	1.8%	Yes, revised screening values adopted for SOM of 2.6% but all organic determinands tested for were below the limit of detection;

Polycyclic Aromatic Hydrocarbons (PAH)

11.3.28 There are numerous PAH compounds. The USEPA identified 16 PAHs that are considered to represent the most problematic in terms of toxicology, fate and behaviour. The UK have also focused on these 16 and these are included in the laboratory report where speciated PAH analysis has been scheduled.

11.3.29 Speciated PAH analysis has been undertaken in order to determine concentrations of the key "marker" compounds: benzo(a)pyrene (considered the most toxic of the PAHs); and naphthalene (the most mobile and volatile of the PAHs).

11.3.30 Speciated analysis has confirmed the absence of significant concentrations of both benzo(a)pyrene and naphthalene in the soils beneath Area B.

Organic determinands (Area A)

11.3.31 Area A (fireworks factory) is brownfield and underlain by significant depths of made ground which has yielded elevated concentrations of a number of inorganic determinands. Consequently, for organic compounds, the Tier 1 Soil Screening Values used in this report have been derived with reference to a CSM that assumes a minimum 600mm of clean soil cover will be placed in gardens/landscaped areas (Lithos Scenario B).

11.3.32 In order to be sufficiently conservative an initial screen has been undertaken using Tier 1 values assuming 1% Soil Organic Matter (SOM) rather than 6% SOM.

Hydrocarbons (TPH & PAH)

11.3.33 Given the absence of visual/olfactory evidence of any hydrocarbon contamination, only a simple banded TPH (cf full speciation) was undertaken on the majority of samples.

11.3.34 TPH can be associated with a variety of sources and elevated TPH concentrations do not automatically infer a petroleum product is present; indeed the absence of petroleum products across a large proportion of this site can be seen on Drawing 4486/3A presented in Appendix B. TPH analysis will detect most hydrocarbons and is not restricted to those detailed within the TPHCWG reports.

11.3.35 Whilst not necessarily associated with a petroleum product, the significance of these hydrocarbons, with respect to health, should still be assessed. Providing no other sources are present on site (solvents, degreasers etc), it can be assumed that the most problematic compounds detected within the banded TPH screen are polycyclic aromatic hydrocarbons (PAHs).

11.3.36 The significance of PAHs can be determined by considering indicator compounds. In most cases, benzo(a)pyrene (BaP) is adopted as an indicator (due to the wealth of toxicological data available) and has been used by various authoritative bodies to assess the carcinogenic risk of PAHs in food.

11.3.37 A C4SL toxicity assessment using the surrogate marker approach can be used to estimate the significance of a mixture of PAHs in soil, using toxicity data for indicator compounds within that mixture. Exposure to the indicator (or surrogate marker) is assumed to represent exposure to all PAHs in that matrix.

11.3.38 The sample profiles here are sufficiently similar to the toxicity study adopted for the C4SL assessment, and BaP concentrations are below Lithos' Tier 1 Value. Consequently, in the locations where no petroleum products have been identified the hydrocarbons detected are unlikely to pose any unacceptable risk to end users, and no remediation is required.

11.3.39 Whilst classed as a PAH, naphthalene is more volatile and mobile in the environment than other PAHs. As such the significance of naphthalene cannot be considered within the surrogate marker approach. Consequently, naphthalene has been considered individually against Lithos' Tier 1 Value.

11.3.40 Concentrations of naphthalene are typically below their respective Tier 1 Values, however isolated exceedances (max. 4.5mg/kg) were recorded at 6 locations across Area A. Given the marginal and sporadic nature of these exceedances they are not considered to be of significance.

11.3.41 Consequently, the elevated concentrations of DRO and LRO hydrocarbons detected are unlikely to pose any unacceptable risk to end users.

11.3.42 A number of petroleum sources were identified on Area A (Section 2.2.25 and Drawing 4486/3A) in the form of isolated fuel storage tanks. Furthermore, olfactory evidence of hydrocarbon contamination was noted within a single trial pit (TP322 at 0.6m) within a band of Ash and Clinker, no obvious source for this has been identified.

11.3.43 Any hydrocarbon contamination encountered at these locations is potentially due to leakage or spillage of fuel. Such contamination can be mobile and as such may pose a risk to the environment and human health.

11.3.44 Due to significant site constraints, intrusive investigation in the vicinity of all but one of the fuel tanks was **not** possible. Investigation (TP 306) was carried out in the vicinity of the tank located in the north of Building 37 (on the east of the Firework Factory site).

11.3.45 The locations which were inaccessible will require investigation as part of the post demolition site investigation.

11.3.46 Given the presence of plausible petroleum sources and/or evidence of petroleum contamination speciated analysis was scheduled on two samples (TP306 (0.5m), TP322 (0.6m)).

11.3.47 Assessment of TPH has been undertaken in accordance with a 3-step approach, (outlined in Generic Note 04 in Appendix A). The first two steps involve review of speciated results. The third step assesses cumulative effects.

11.3.48 **Step 1** – Consideration of indicator compounds, (BTEX, naphthalene & BaP). Naphthalene in **TP306** (0.5m) exceeds the respective Tier 1 criteria in, therefore further investigation/remediation is required at this location, and no further assessment of fractions is considered necessary.

11.3.49 None of the Indicator Compounds exceed their respective Tier 1 criteria in **TP322** (0.6m), therefore the more toxic / prevalent compounds are below their representative screening value and the next step can be undertaken to consider mixtures within the fractions.

Expl Hole	Depth (m)	Material	Concentrations in mg/kg. Results are quoted to 1 decimal place if <10, and whole numbers if >10. Trigger Level Concentrations are shown in BLUE and assume a residential with gardens and 600mm cover end use with 1% SOM.					
			GRO				DRO	LRO
			Benzene	Toluene	Ethyl Benzene	Xylenes	Naphthalene	Benzo(a)pyrene
			0.13	287	76	27	0.7	25
TP306	0.5	Ash & Clinker	< 0.1	< 0.1	< 0.1	< 0.1	**1.2**	4.1
TP322	0.6	Ash & Clinker	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	23

11.3.50 **Step 2** – TPH fractions, does any individual fraction exceed Tier 1 for the sample from TP322?. None of the fractions exceed their respective Tier 1 criteria, therefore the anticipated mixture of hydrocarbons within each fraction is not considered to pose a risk at the site.

11.3.51 **Step 3** – Assessing cumulative effects (for the sample from TP322). The third step of the assessment assesses the cumulative risk from all of the fractions identified. This is because each TPH fraction comprises a range of different substances, and a number of these can affect the same 'target organ' (i.e. cause skin irritation or affect the liver), resulting in cumulative effects.

11.3.52 The cumulative effect, associated with the source material in TP322, has been assessed via calculation of a Hazard Index (HI): HI < 1 indicates no cumulative effects; HI > 1, cumulative risk requires further consideration. The HI for TP322 (0.6m) sample(s) is < 1, therefore cumulative risks need not be considered further.

Sample	Made ground type	Initial TPH result	1 BTEX, etc	2 individual fraction	3 Cumulative effects	Remarks
TP306, 0.5m	Ash & Clinker	Elevated DRO	Yes	n/a	n/a	Further assessment or remediation required.
TP322, 0.6m	Ash & Clinker	Elevated DRO & LRO	No	No	HI=0.04	Currently not considered significant. Merits further assessment post-demolition due to visual/olfactory evidence.

Volatile Organic Compounds

11.3.53 Volatile Organic Compound analysis was scheduled on two samples (TP306 at 0.5m and TP322 at 0.6m). All results were recorded below the limit of detection.

Fireworks and Explosives Suite

11.3.54 Based on the past use of Area A and review of both the fireworks "recipes" obtained from Black Cats archives and the DETR Industry Profile: *Chemical Works; explosives, propellants, pyrotechnics manufacturing works*, a site specific analytical suite was created to assess the potential risk associated with residual "fireworks" contamination. The extent of the suite was dictated by the commercial availability of the required analysis. This suite included:

- Sulphur
- Phenols
- Potassium
- Antimony
- Explosives

11.3.55 **Sulphur** was identified as potential contaminant of concern due to its use as a fireworks ingredient. Whilst being of low toxicity it can present an explosive risk if powdered and able to form a fine dust within the atmosphere. A total of 37 samples were analysed for total sulphur. Concentrations of sulphur recorded ranged between <0.01mg/kg and 0.14mg/kg.

11.3.56 A total of 10 samples were analysed for **phenols**. No recorded concentrations were in excess of the relevant Tier 1 screening value of 389mg/kg, based on SOM of 1%.

11.3.57 **Potassium** was noted to form a part of a number of compounds recorded as having been used on the Fireworks Factory site. At high doses potassium can cause muscle weakness and slow the heart rate. Whilst not toxic at low doses in isolation, the compounds it forms part of are potentially toxic. A total of 10 samples were analysed for potassium with recorded concentrations ranging between 430mg/kg and 4,000mg/kg.

11.3.58 **Antimony** was identified as having been used on the Fireworks Factory site. It can be toxic at low concentrations affecting the lungs, heart and stomach and can be harmful to the eyes and skin. A total of 10 samples were analysed for antimony, with recorded concentrations ranging between <1mg/kg and 70mg/kg.

11.3.59 A total of 6 samples were analysed for an **explosives** suite comprising:

- 2,4,6-trinitrophenyl-N-methylnitramine (tetryl)
- 2,4,6-trinitrotoluene (2,4,6-TNT)
- 2,4-dinitrotoluene (2,4-DNT)
- 2,6-dinitrotoluene (2,6-DNT)
- Cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)
- Cyclotetramethylenetetranitramine (HMX)
- Hexanitrostilbene (HNS)
- Pentaerythritol tetranitrate (PETN)
- 2,4,6-trinitrophenol (picric acid)
- Picrite (nitroguanidine)
- Ethylene glycol dinitrate (EGDN)
- Nitroglycerine (NG)
- Nitrocellulose (NC)
- Chlorate
- Perchlorate

11.3.60 All determinants were recorded below the laboratory limit of detection.

12 CONTAMINATION (QUALITATIVE RISK ASSESSMENT & REMEDIATION)

12.1 Topsoil (Area A)

12.1.1 Topsoil, typically 300mm thick is sporadically present across the Fireworks Factory site (Area A). Whilst testing has not identified elevated concentrations of contaminants within this topsoil, given the significant historical potentially contaminative uses within Area A, this topsoil is **not** considered suitable for re-use.

12.1.2 Given the compressible nature and gas-generating potential of this material if buried at depth, it is recommended that it is placed in garden areas and/or POS, immediately beneath the proposed 750mm cover, and that it is overlain by no more than 1m of soil.

12.2 Topsoil (Area B)

12.2.1 Topsoil (and made ground topsoil), typically 300mm thick is present across most of Area B. Testing suggests this material is chemically suitable for re-use.

12.2.2 Given the nature of the topsoil present on this site it would be expected to be suitable to support plant growth.

BS3882 Topsoil testing (Area B)

12.2.3 The presence of visible contaminants, sharps (glass etc) was assessed by the Engineer in the field (inspection of initial trial pit arisings); none were identified. BS3882 considers visual contaminants to comprise 'undesirable potentially injurious foreign object(s) visible to the naked eye'.

12.2.4 The clay/sand/silt content of 10 topsoil samples have been determined to check compliance with BS3882[5] requirements.

12.2.5 It should be noted that this is a reduced suite of analysis, and no N-P-K etc. testing has been undertaken.

[5] *BS3882:2015. Specification for topsoil. Published by BSI Standards Limited.*

12.2.6 The results are summarised below:

Parameter	BS3882 Specification	TP504 0.2m	TP513 0.2m	TP514 0.2m	TP515 0.2m	TP516 0.2m	TP528 0.2m	TP538 0.2m	TP611 0.2m	TP612 0.2m	TP613 0.2m
Retained on 2mm sieve	< 30%	20	11	20	11	14	19	5	17	20	27
Retained on 20mm sieve	< 10%	8	2	8	4	2	4	1	8	**13**	**19**
Retained on 50mm sieve	0%	0	0	0	0	0	0	0	0	0	0
Clay content	5 to 35%	11	11	14	11	12	11	10	13	12	10
Silt content	0 to 65%	18	19	23	16	20	17	17	20	19	15
Sand content	0 to 90%	71	70	64	73	69	72	73	66	69	75
Visible contaminants	< 0.5%	None	None	None	None	None	None	None	None	None	None

Note: Values in **bold** type fail the required specification for multipurpose topsoil

12.2.7 The results indicate that the topsoil complies with the requirements for multipurpose topsoil, with the following exceptions:

- The gravel content of 2 of the 10 samples tested slightly exceeded the maximum permissible level (13% & 19% *cf* upper threshold of 10%). However, the average gravel content from the 10 samples is within the specified range.
- 12 of the 26 samples tested as part of the contamination suite recorded a pH value below the specified range (5.5 to 8.5).

12.2.8 In terms of textural classification, the topsoil falls into the 'Sandy loam' class.

12.3 Summary of significant contamination

12.3.1 No contamination has been identified in **Area B**.

12.3.2 Beyond former quarries, a veneer of made ground, typically less c. 1m thick, underlies the majority of the Fireworks Factory site (**Area A**). Within areas of former quarry, made ground extends to depths ranging between 6m and 24m.

12.3.3 This made ground generally comprises Made Ground Topsoil or macadam/concrete hardstand, overlying Ash & Clinker, Granular Made Ground, Quarry Backfill & Reworked Natural Ground.

12.3.4 The made ground types within Area A contain elevated concentrations of a number of inorganic determinands and asbestos (ACMs & free fibres). Furthermore, made ground contains materials (e.g., brick, concrete tarmac, coal, clinker, glass etc), which would generally be considered undesirable as a near-surface material in garden areas.

12.3.5 Within two sampling locations organic (hydrocarbon) contamination was identified as summarised in the table below.

Hole	Material	Depth (m bgl)	Observations & typical composition
TP306	Ash & Clinker	0.5	Location adjacent to fuel tank. Elevated naphthalene and DRO concentrations.
TP322	Ash & Clinker	0.6	Slight hydrocarbon odour noted, elevated DRO and LRO concentrations.

12.3.6 These areas are based on:

- Observations made during Lithos' ground investigation
- Lithos' laboratory test results

12.4 Revised conceptual ground model (contamination)

12.4.1 The Preliminary Conceptual Site Model has been amended in light of data obtained during the ground investigation, most notably with respect to the distribution of made ground and contaminants.

12.4.2 A revised Conceptual Site Model is presented as Drawing 4486/7 in Appendix B. The Model includes the contaminants described in Section 12.3 above, and potential contaminant linkages (summarised below in Section 12.6) to receptors.

12.5 Environmental setting & end use

12.5.1 As discussed in Section 12.3 above, contamination exists in the soil beneath **Area A**. In order to assess the significance of this contamination, consideration must be given to the site's environmental setting and the proposed end use.

12.5.2 The underlying Rough Rock Sandstone is classified as a Secondary A aquifer. The nearest surface watercourse is the River Colne, which flows in an eastern direction, approximately 1km beyond the site's northern boundary. Therefore, the site's environmental setting is considered to be **moderate sensitivity**.

12.5.3 With respect to human health, the proposed end use (residential) is considered sensitive.

12.5.4 Transient risks to construction workers can be addressed by the adoption of appropriate health and safety measures, see Section 16.6.

12.6 Contaminant linkages

12.6.1 In terms of a proposed redevelopment of this site, plausible contaminant linkages can be summarised as follows.

Contaminants

12.6.2 Contaminants have been summarised in Section 12.3 above.

Pathways

12.6.3 Potential contaminant pathways include:

- Ingestion
- Dermal contact
- Inhalation of contaminated particulates and vapours
- Surface water run-off, including existing drainage infrastructure
- Downward infiltration of leachable/mobile contaminants to groundwater

Receptors

12.6.4 Potential contaminant receptors include:

- The environment – Secondary A aquifer
- End users of the site (residents)

12.6.5 It can be concluded that there are plausible pathways between the soil contaminants summarised in Section 12.3 above and potential receptors (i.e. end users etc). Consequently, some remediation will be required; either treatment/removal of the contaminant, or "breakage" of the pathway.

12.7 Potential remediation options

General

12.7.1 Approval of the recommendations given below should be sought from the appropriate regulatory authorities prior to commencement of site redevelopment.

12.7.2 Given the constraints discussed in Section 8.2 (existing buildings across the majority of **Area A** and ecology), a post-demolition trial pit investigation will be required before definitive recommendations are provided. However, at this stage it is considered unlikely that anything more than placement of soil cover underlain by hard to dig layer in garden and landscaped areas, and removal of a relatively small volume of fuel contaminated soils will be required within Area A.

Asbestos

12.7.3 CL:AIRE has published a Joint Industry Working Group (JIWG) guidance[6] document with the support of the Health & Safety Executive which provides an explanation of how legal requirements of the Control of Asbestos Regulations 2012 have been interpreted to be more directly applicable to the risks associated with asbestos contaminated soil and construction & demolition materials.

12.7.4 As discussed in Section 11.3, an asbestos ID (screen) was scheduled on samples of made ground, with asbestos positively identified in 11 samples. Supplementary analysis (asbestos quantification) of the 11 samples yielded concentrations of between <0.001% to 0.288%.

12.7.5 Made ground soils with only a trace of asbestos still have the potential to be hazardous to human health. This is because soil with a low asbestos content of say 0.001% may contain thousands, possibly hundreds of thousands, of potentially respirable asbestos fibres per gram of soil. However, asbestos fibres only pose a risk if they are allowed to become airborne, and release from soil to air can only occur if the soil is dry and then agitated (e.g. by vehicle movement, excavation, wind etc).

12.7.6 Provided soils are kept damp the risk of airborne fibre release, even during disturbance associated with excavation, should be negligible, and certainly below the control limit (as set by the Control of Asbestos Regulations 2012) of 0.1 f/cm3 airborne fibres averaged over a 4-hour period.

12.7.7 In our experience, damp soils do not allow the release of asbestos fibres, even from soils that contain concentrations in excess of the hazardous waste threshold (0.1%).

12.7.8 There may be transient risks during the excavation of made ground soils. Exposure to asbestos of personnel involved in these excavation works is considered likely to be sporadic and of low intensity (provided soils are kept damp). Therefore in accordance with Regulation 3(2) of the Control of Asbestos Regulations (2012), exemption from Regulations: 9 (notification of work with asbestos); 18(1)(a) (asbestos areas); and 22 (health records and medical surveillance) should apply, provided it is 'clear from a suitable and sufficient risk assessment that the control limit of 0.1 f/cm3 airborne fibres averaged over a 4-hour period will not be exceeded'.

12.7.9 Nonetheless, risks must be mitigated by appropriate measures (principally damping down), working procedures, and PPE. Method Statements and Risk Assessments should be prepared by the Contractor, and then be reviewed by the Client and Lithos.

[6] *Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance. CL:AIRE, 2016.*

12.7.10 Any fragments of asbestos cement sheeting encountered during the excavation works, should be gathered by hand and placed in double sealed bags. Personnel involved in this activity must be equipped with an appropriate respirator (i.e. a FFP3 or better), in addition to their "standard" PPE. The bags of asbestos waste should be placed in a sealed skip for off-site disposal at a suitably licensed landfill site; such material will be classified as hazardous waste.

12.7.11 It should be noted that ACMs were commonly used as shuttering beneath concrete slabs, and to form ducts, and it is important that this is kept in mind when breaking through concrete slabs.

12.7.12 Made ground where asbestos has been positively identified and considered representative of near-surface soils, should ultimately be isolated beneath a minimum **600mm** thick surface cover of "clean" soil underlain by a **hard dig** layer (garden/landscaped areas), or hardstand (parking areas), or floor slabs (buildings) and therefore there will be no risk of release of asbestos fibres from the ground.

12.7.13 New utilities should be laid in trenches reinstated with 'clean' backfill in order to prevent exposure to maintenance workers in the future.

12.7.14 See also comments in the 'Waste Classification' Section below.

Inorganic contamination

12.7.15 The made ground within **Area A** has yielded elevated concentrations of a number of metals; most notably arsenic, copper, lead, nickel and zinc. Therefore, where residual made ground remains beneath garden and landscaped areas (i.e. not beneath hardstanding) a minimum **600mm** thick surface cover of "clean" soil underlain by a 150mm thick **hard dig** layer (garden/landscaped areas) is recommended. This cover will break potential contaminant linkages between the contaminated made ground and future end-users.

12.7.16 Alternatively, the made ground types are considered suitable for redistribution beneath concrete oversite or areas of hardstanding, where they would be satisfactorily isolated from end users.

Combustibility

12.7.17 The Ash & Clinker at this site yielded an average CV of 3.1 MJ/kg. This is at the lower end of the range where the potential for combustion exists, and it is not considered a significant hazard and Ash & Clinker will be isolated beneath the proposed 600mm 'clean' soil cover and a 150mm 'hard dig' layer.

Organic contamination

12.7.18 No areas of significant gross organic contamination were encountered during the site works. However, two localised areas (TP306, TP322) were identified, furthermore more onerous contamination than that identified to date may well be present. Further post demolition site investigation should target areas close to the disused fuel storage tanks which are located in Area A.

12.7.19 It would be prudent to allow for the off-site disposal of some grossly contaminated soil. Further advice should be sought from a specialist contractor, with experience of brownfield remediation, regarding an appropriate contingency.

12.7.20 Lithos understands a previous investigation undertaken by a third party (Gaia) noted the loss of 3,000 litres of **diesel** from an above ground fuel tank on site in 2006. A copy of this report has been requested but has never been provided, as such the location of the spillage is currently not known.

Groundwater & surface water

12.7.21 No significant surface or ground water contamination has been encountered.

12.7.22 Groundworkers should make all necessary arrangements to prevent off-site migration of contaminants via surface water runoff, inadvertent groundwater disturbance and airborne dust.

12.8 Summary of potential contaminant linkages & mitigation

12.8.1 In terms of the proposed redevelopment in **Area A** plausible contaminant linkages, and feasible remediation options, can be summarised as follows:

Receptors	**Pathways**	**Contaminants**	**Plausible contaminant linkage? (and remediation options where required)**
Human health (Future residents) ◊	Consumption of contaminated vegetables	Metals, asbestos and hydrocarbons in the made ground	Yes. Isolation beneath a minimum 600mm clean soil cover underlain by 150mm hard to dig layer in garden and landscaped areas.
	Ingestion		
	Dermal contact		
	Inhalation (dust and/or vapours)		
	Infiltration of water supply pipes	Hydrocarbons (in the made ground)	To be assessed on completion of remediation. Treatment or removal of hydrocarbons. Water company may still insist of barrier pipes
Buildings	Migration & accumulation of explosive gas	Methane in the made ground	To be assessed on completion of monitoring and gas risk assessment.

◊ transient risks to construction workers will be addressed by the adoption of appropriate health and safety measures in accordance with the Health and Safety at Work Act 1974 and regulations made under the Act including for example the COSHH Regulations.

12.9 Waste classification

Area A (Factory)

12.9.1 Disposal of the made ground off site is generally not considered appropriate, economically viable, nor in line with current Government philosophy regarding sustainable development. However, some excess arisings may be generated by excavations for foundations, sewers etc.

12.9.2 Following excavation and stockpiling, sampling will be required prior to disposal.

12.9.3 As there is no WRAP protocol for soils, the characterisation, sampling and classification of soils arising from brownfield sites has been incorporated within the Environment Agency's Technical Guidance WM3[7]. Classification of soils as non-hazardous or hazardous in accordance with WM3 is quite a complex process, although it ultimately results in a simple classification as hazardous or non-hazardous. Note: inert is not a class under WM3; WAC testing is required to determine whether a waste soil can be considered inert.

12.9.4 If waste soil is classed as hazardous following classification under WM3, and destined for landfill, waste acceptance criteria (WAC) leachate testing will need to be undertaken. Similarly, if waste soil destined for landfill is classed as non-hazardous under WM3, and suspected to be inert, WAC leachate testing will need to be undertaken. However, non-hazardous soil waste can go to a non-hazardous landfill facility; no further testing (e.g. WAC) is required.

12.9.5 WAC analysis is different to the 'routine' laboratory testing (such as that included earlier in this Section) undertaken in order to determine hazardous properties. Lithos typically only include WAC analysis if significant off-site disposal (of soil classified as hazardous waste) is anticipated.

12.9.6 It is critical if material is to be exported from site that this is allocated an appropriate waste code, following the steps within WM3. Waste carriers transporting, and sites accepting, this material should have a corresponding code within their permits. It is the responsibility of those generating the waste (i.e. the Developer), to ensure that the waste is handled and disposed of appropriately.

12.9.7 Soil treatment facilities (STFs) provide an alternative to landfill. STFs are regulated by the Environment Agency and allow soils to be treated and screened (effectively recycled to be used at other sites). Export to an STF does not require WAC testing and suitability of various soil types will be dependent on material waste codes, which may be allocated after consideration of the data in Section 0 but will often need supplementing with further testing after soils have been stockpiled (see also advice in Section 16.3).

12.9.8 Most STFs are permitted to accept soils with waste code 17 05 04 (i.e. soils which do not exhibit hazardous properties). Lithos has a list of permitted STFs and can help identify one local to this development site.

[7] *Technical Guidance WM3 – Guidance on the classification and assessment of waste. Environment Agency 2015*

12.9.9 With respect to **asbestos**, waste soils will be classed hazardous if the soil mass contains more than 0.1% asbestos fibres that are free and dispersed. However, WM3 states that where the waste contains identifiable pieces of asbestos (i.e. any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye), then the waste is hazardous if the concentration of asbestos in the pieces alone is 0.1%. If a stockpile of soil contained rare fragments of broken asbestos-cement sheeting, the whole stockpile would be classed as hazardous unless all the fragments could be picked-out (even though the concentration of asbestos in the soil mass might be orders of magnitude less than 0.1%).

12.9.10 As discussed in Section 9.2, tarmac hardstand is present.

12.9.11 This **tarmac** could be recycled and crushed to yield a 6F3 selected granular material, provided the recovered bitumen content is less than 10% (determined in accordance with BS598-1[8]). Crushed tarmac could also be blended with crushed concrete etc to generate 6F2 graded material. 6F2 can contain up to 50% recycled tarmac/asphalt (provided it does not pose a contamination risk to controlled waters and, if the proportion of asphalt is greater than 20%, the recovered bitumen content is less than 2%).

12.9.12 However, if off-site disposal is anticipated, tarmac assessment is based on the amount of coal tar present, this will vary depending on the age of the tarmac. The assessment is based on the amount of benzo(a)pyrene and has a concentration limit of 50mg/kg.

12.9.13 Speciated PAH analysis has been undertaken on 18 samples of tarmac and BaP concentrations in all were < 50mg/kg. Consequently, tarmac is likely to fall within waste code 17 03 02:

- 17 - Construction and Demolition wastes
- 03 – bituminous mixtures, coal tar and tarred products
- 02 – bituminous mixtures other than those mentioned in 17 03 01

12.9.14 17 03 02 is a mirror non-hazardous entry (17 03 01 is the corresponding mirror hazardous entry). This code along with this supporting report, in particular the laboratory results, should be used to complete a paper trail documenting disposal routes for tarmac.

12.9.15 Contractors exporting waste from the site should review the site investigation data and make their own assessment. Alternatively, Lithos could undertake this assessment once exported waste streams have been identified.

Area B (Fields)

12.9.16 Some excess arisings (topsoil & subsoil) may be generated by excavations for foundations, sewers etc. If these are intended for retention and reuse on the site, they would be classed as clean naturally occurring soils and would not be considered waste, under the Waste Framework Directive.

12.9.17 Off-site disposal of surplus clean naturally occurring soils to landfill is not recommended. In accordance with the CL:AIRE Code of Practice[9] any excess natural soil arisings should be suitable for Direct Transfer to another development site, for use either as clean cover material, or bulk fill, without the need for waste legislation to be applied.

[8] *BS598 (2003) Sampling and examination of bituminous mixtures for roads and other paved areas.*

[9] *The Definition of Waste: Development Industry Code of Practice. CL:AIRE, 2011.*

13 HAZARDOUS GAS

13.1 General

13.1.1 Consideration of the conceptual site model and potential linkages has enabled a preliminary qualitative assessment of risks associated with gas:

Source	Receptors	Hazard	Pathway	Initial risk
Historic landfill (on site in the south)	Human health	Asphyxiation & explosion	Vertical migration, ingress & accumulation	**Low**: landfill footprint smaller than EA records and material appears to be essentially inert (uppermost 4m)
	Buildings	Explosion		
Off-site historic & active landfill (30m to northeast and 20m south respectively)	Human health	Asphyxiation & explosion	Lateral migration, ingress & accumulation	**Low**: hazardous gas could be migrating through residual soils and sandstone bedrock beneath the site. However hard cover across the surface of the landfills is typically absent, and gas is more likely to vent to the surface rather than migrate laterally.
	Buildings	Explosion		
Deep quarry backfill	Human health	Asphyxiation & explosion	Vertical migration, ingress & accumulation	**Low**: quarry backfill appears to be essentially inert in uppermost 5m (however only limited inspection has been undertaken below 5m depth)
	Buildings	Explosion		

13.1.2 Given the above gas monitoring wells have been installed in 30 boreholes across the site. Details of the installations are given on the borehole logs presented in Appendix N to this the report.

13.1.3 Shallow gas monitoring installations, comprising a 19mm galvanised steel pipe; 1m in length with a lower 500mm slotted section and an upper 500mm solid section, were driven into the ground at three locations on the eastern boundary of the southern field. These were installed to assess potential migration of gas from the landfill sites located to the south of Blackmoorfoot Road.

13.1.4 The generation potential of the gas source was initially considered to be Low. Consequently, in accordance with CIRIA Report C665[10], given the proposed residential end use, 9 visits have been scheduled over a 6-month period.

13.2 Scope of works

13.2.1 To date, the wells have been monitored on 3 occasions for groundwater levels and soils-gases, and the results are presented in Appendix Q.

13.2.2 A standard procedure was followed, in accordance with CIRIA guidance:

- Ambient oxygen concentration
- Atmospheric temperature & pressure
- Methane, oxygen and carbon dioxide concentrations and flow rates using a Gas Data GFM436 infra-red gas analyser
- Standing water level using a dipmeter
- Ambient oxygen concentration (check for instrument drift)

[10] *CIRIA C665: Assessing risks posed by hazardous ground gases to buildings (2007).*

13.3 Monitoring results

13.3.1 The results of the monitoring completed to date are summarised below.

Well	Response zone	Range of methane concentrations (% v/v)	Range of carbon dioxide concentrations (% v/v)	Range of steady flow rates (litre/hour)
PH101	3.0-6.0m (Rough Rock Sandstone)	ND	1.7 to 4.6	ND
PH102	3.0-6.0m (Quarry Backfill)	ND	1.3 to 1.9	ND
PH103	3.0-6.0m (Rough Rock Sandstone)	ND	0.1 to 0.3	ND
PH104	3.0-6.0m (Rough Rock Sandstone)	ND	ND	ND
PH105	3.0-6.0m (Rough Rock Sandstone)	ND	ND to 0.2	ND
PH106	3.0-6.0m (Rough Rock Sandstone)	ND	3.4 to 4.6	ND
PH107	3.0-6.0m (Rough Rock Sandstone)	ND	ND	ND
PH108	3.0-6.0m (Quarry Backfill)	ND	0.1 to 0.3	ND
PH109	3.0-6.0m (Quarry Backfill)	ND	0.5	ND
PH110	2.0-5.0m (Quarry Backfill)	ND	0.1 to 0.3	ND
PH111	2.5-5.5m (Quarry Backfill)	ND	0.4 to 0.6	ND
PH112	1.0-2.0m (Quarry Backfill)	ND	0.2 to 0.3	ND
PH113	3.0-6.0m (Rough Rock Sandstone)	ND	ND	ND
PH114	3.0-6.0m (Rough Rock Sandstone)	ND	0.6 to 0.7	ND
PH115	3.0-6.0m (Rough Rock Sandstone)	ND	ND to 0.5	ND
PH116	3.0-6.0m (Quarry Backfill)	ND	0.3 to 0.4	ND
PH117	3.0-6.0m (Rough Rock Sandstone)	ND	1.2 to 1.3	ND
PH118	3.0-6.0m (Rough Rock Sandstone)	ND	0.3 to 0.4	ND
PH119	1.5-4.5m (Quarry Backfill)	ND	0.3 to 0.4	0.1
PH120	3.0-6.0m (Quarry Backfill)	ND	0.4 to 0.5	ND
PH121	3.0-6.0m (Rough Rock Sandstone)	ND	ND to 0.1	ND
PH122	1.5-4.5m (Quarry Backfill)	ND	0.2	0.2
PH123	3.0-6.0m (Rough Rock Sandstone)	ND	0.2 to 3.0	0.1
PH124	3.0-6.0m (Rough Rock Sandstone)	ND	0.8 to 1.5	ND

Well	Response zone	Range of methane concentrations (% v/v)	Range of carbon dioxide concentrations (% v/v)	Range of steady flow rates (litre/hour)
PH125	3.0-6.0m (Rough Rock Sandstone)	ND	0.6 to 2.1	ND
PH126	3.0-6.0m (Rough Rock Sandstone)	ND	0.6 to 1.7	ND
PH127	3.0-6.0m (Rough Rock Sandstone)	Not recorded (well damaged)		
PH128	3.0-6.0m (Rough Rock Sandstone)	ND	ND to 0.7	ND
PH129	3.0-6.0m (Rough Rock Sandstone)	ND	0.3 to 0.8	ND
PH130	3.0-6.0m (Rough Rock Sandstone)	ND	ND to 2.3	ND

ND = Not detected

13.4 Discussion (methane & carbon dioxide)

13.4.1 Generic Note 05 in Appendix A outlines how monitoring results are interpreted.

13.4.2 On the 3 visits to date, no concentrations of methane have been identified and carbon dioxide concentrations are all below 5%.

13.4.3 A hazardous gas risk assessment incorporating all of the results will be issued on completion of monitoring in April 2024.

13.5 Radon

13.5.1 Requirements with respect radon measures are set out in Building Regulations Approved Document C. Probability bandings (based on the proportion of properties in a given area that exceed the Action Level; currently 200 $Bq.m^{-3}$) are used to determine whether a property requires no, basic or full measures.

13.5.2 At present Approved Document C advocates basic measures for the probability banding 3% to 10% (full measures if >10%). However, the UK Health Security Agency (HSA) would like to see all new build include basic measures.

13.5.3 In December 2022, the British Geological Survey (BGS), deployed a revised dataset which increased accuracy and also the number of properties falling within radon affected areas. This revised dataset is now referenced by maps on the HSA website.

13.5.4 The HSA website radon map indicates that the site is in an area where **5% to 10%** of homes are estimated to be above the action level, and **basic** radon protection measures are required in new dwellings.

13.5.5 In accordance with BR211:2023[11], basic radon measures simply comprise a barrier (membrane) laid within the floor construction, which is linked to a damp-proof course (DPC) within the walls of the building. The DPC to cavity walls should be in the form of a cavity tray to prevent radon entering the building through the cavity. Sealing of joints in the barrier and sealing around service penetrations are also required. A 1200-gauge polythene membrane should suffice, and sub-floor ventilation is not essential.

[11] *BRE Report BR211, 2023: "Radon: Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects"*

13.5.6 However, a building site is a harsh environment and barriers can easily become damaged during construction by operatives or equipment moving across or working over a completed section of barrier. As a consequence, where there is a risk of puncturing the membrane, stronger materials such as thicker or reinforced polyethylene sheet should be considered, and it should be ensured that the membrane is well protected with sand or lean mix concrete before advancing construction.

13.5.7 BRE211:2023 highlights the importance of good practice and workmanship to ensure radon membranes are installed to a high standard and suggests regular supervision and inspection. Whilst there are no specific statutory requirements to inspect radon barriers, BRE and Lithos strongly recommend a programme of inspections.

13.5.8 It is not deemed necessary to inspect each barrier before it is covered but Lithos would suggest the first plot is inspected and 1 in 20 plots thereafter.

14 GEOTECHNICAL TESTING

14.1 General

14.1.1 A total of 136 samples of natural soil and made ground were delivered to a suitably accredited laboratory with a schedule of geotechnical testing drawn up by Lithos.

14.1.2 The geotechnical laboratory test results are presented in Appendix P to this report.

14.2 Atterberg limits

14.2.1 The plasticity indices of 5 samples of cohesive soil have been determined; results are summarised below.

Soil type	No. samples tested	Moisture content range % (average)	Range of Plasticity Indices % * (average)	Shrinkability
Cohesive Residual Soil	10	16 to 39 (23)	16 to 42 (26)	Medium
Granular Residual Soil (very clayey)	3	15 to 21 (17)	Non plastic	Non-shrinkable
Quarry Backfill	3	20, 28 & 31 (28)	6, 8 & 23 (13)	Non shrinkable to Medium

* Modified where appropriate in accordance with Chapter 4.2 of the NHBC Standards

Note. The term Shrinkability is equivalent to the term Volume Change Potential used in Chapter 4.2.

14.2.2 The Quarry Backfill and Residual Soils at this site are of predominantly granular nature.

14.2.3 A single sample of Quarry Backfill (from TP385) recorded a modified plasticity index of 23% and 3 samples of Granular Residual Soils with a significant proportion of fines were recorded as non-plastic.

14.2.4 Ten samples of Cohesive Residual Soils were samples and tested where encountered across the site. Given the size of the site Cohesive Residual Soils are typically localised and are not anticipated to be encountered widespread across the site.

14.2.5 For the purposes of foundation design, it is recommended that all cohesive soils be regarded as being of **medium** shrinkability.

14.3 Soluble sulphate and pH

14.3.1 In accordance with BRE SD1[12], this site has been classified as brownfield with a mobile groundwater regime.

14.3.2 It is envisaged foundations will extend to depths of about 1m through made ground and natural strata beyond the quarries, and samples taken from this depth range have been submitted for pH and water-soluble sulphate (2:1 soil/water extract). Within the quarries, samples have been taken from between c. 0.5m and 4m depth, which covers the likely range of turnover earthworks.

14.3.3 The concentrations of sulphate in the aqueous natural soil extracts of 18 samples were determined. In addition, 57 samples of made ground were tested as part of the contamination suite. The pH value of each sample has also been determined.

14.3.4 The highest water-soluble sulphate concentration and the lowest pH value for each soil type analysed are shown in the table below.

Soil type	No. samples tested	Lowest pH values	Highest soluble sulphate concentration (mg/l)
Ash & Clinker	10	6.6	490
Quarry Backfill	22	5.1	160
Granular Made Ground	18	7.1	310
Reworked Natural Ground	3	6.1	< 10
Sub-Base	2	7.9	11
Relict Topsoil	2	6.3	29
Granular Residual Soil	15	6.1	43
Cohesive Residual Soil	7	5.5	61
Rough Rock Sandstone	1	7.4	< 10

14.3.5 One pH value of Quarry Backfill recorded a pH of 5.1 with the next lowest recorded at 5.8.

14.3.6 All other pH values were all above 5.5, therefore concentrations of chloride and nitrate are considered insignificant.

14.3.7 In accordance with Tables C1 and C2 of SD1, sub-surface concrete should be Design Sulphate Class **DS-1**, with the site allocated an ACEC Classification of **AC-2z**.

14.4 Particle size distribution

14.4.1 The grading of 18 samples of Ash & Clinker (A&C), Quarry Backfill (QB) and Reworked Natural Ground (RNG) has been determined by wet sieving and the results are summarised in the table below:

Sample & depth	Field description	% passing 37.5mm sieve	% passing 20mm sieve	% passing 2mm sieve	% fines	Material description (based on grading & plasticity)
TP341, 2.0m to 2.5m	Very sandy GRAVEL. (A&C)	88	74	26	6	Very sandy silty GRAVEL
TP345, 3.5m to 4.0m	Very gravelly very silty SAND with a low cobble content. (A&C)	100	93	58	6	Very gravelly silty SAND
TP352C, 1.2m	Sandy GRAVEL. (A&C)	100	83	50	11	Very sandy silty GRAVEL

[12] *BRE Special Digest 1 (2005) – Concrete in aggressive ground.*

Sample & depth	Field description	% passing 37.5mm sieve	% passing 20mm sieve	% passing 2mm sieve	% fines	Material description (based on grading & plasticity)
TP311, 2.5m	Slightly gravelly Clay with a low cobble content. (QB)	100	100	96	77	Slightly gravelly, slightly sandy CLAY
TP313, 2.0m to 2.5m	Very clayey, sandy Gravel with a medium cobble content. (QB)	20	16	10	6	COBBLES with much sandy clayey Gravel
TP326, 0.7m to 1.2m	Slightly silty very sandy Gravel with a medium cobble content (QB)	100	34	22	9	Silty sandy GRAVEL
TP332, 1.6m	Slightly sandy slightly clayey GRAVEL with a medium cobble content. (QB)	46	31	18	8	Sandy clayey GRAVEL with a high cobble content
TP357, 0.8m	Sandy slightly clayey GRAVEL with a medium cobble content. (QB)	42	29	19	8	Sandy, silty GRAVEL with a high cobble content
TP380 2.2m to 2.7m	Very sandy, slightly gravelly CLAY with a low cobble content. (QB)	54	48	44	23	COBBLES with much clayey, gravelly Sand
TP382, 2.0m to 2.5m	COBBLES & BOULDERS with some clayey gravelly Sand. * (QB)	62	46	33	11	COBBLES & BOULDERS with silty, sandy Gravel
TP385, 1.5m to 1.7m	Slightly gravelly sandy CLAY. (QB)	100	96	86	68	Slightly gravelly, slightly sandy CLAY
TP388, 2.5m to 3.0m	COBBLES & BOULDERS with much clayey sandy Gravel. * (QB)	47	43	33	23	COBBLES & BOULDERS with much silty sandy Gravel
TP389, 2.2m to 2.4m	Very silty, gravelly SAND. (QB)	80	64	43	14	Very sandy, silty GRAVEL
TP401, 2.0m to 2.5m	Very gravelly SAND with a medium cobble content.* (QB)	73	70	55	11	Silty SAND & GRAVEL
TP402, 1.5m to 1.8m	Very clayey gravelly SAND with a medium cobble/ boulder content. (QB)	53	46	38	22	Very silty, sandy GRAVEL with a high cobble content
TP408, 0.8m	Very sandy silty GRAVEL with a medium cobble/boulder content. (QB)	55	40	21	8	Very sandy, silty GRAVEL with a high cobble content
TP398, 0.8m	Sandy GRAVEL with a medium cobble content. (RNG)	55	49	40	19	COBBLES with much silty sandy Gravel
TP399, 1.0m	COBBLES with much sandy Gravel. * (RNG)	65	48	34	13	Silty, very sandy Gravel with a medium cobble content

*cobbles and/or boulders not included in sample

14.4.2 NHBC Chapter 4.2 considers shrinkable soils to be those containing more than 35% fines and having a Modified Plasticity Index greater than 10%.

14.4.3 Fines (silt and clay) were found to comprise between 6% and 11% (average 16%) within the **Reworked Natural** Ground sampled. Fines (silt and clay) were found to comprise between 13% and 19% (average 8%) within the **Ash & Clinker** sampled.

14.4.4 Therefore, the Reworked Natural Ground and Ash & Clinker encountered on this site can therefore be regarded as non-shrinkable.

14.4.5 Fines (silt and clay) were found to comprise between 6% and 77% (average 22%) within the **Quarry Backfill** sampled although only two samples (TPs 311& 385) recorded a fines content of greater than 35%.

14.4.6 The above gradings generally support the soil descriptions shown on the exploratory hole logs; Quarry Backfill is generally made up of coarse (gravel, cobbles and boulders) granular materials, with smaller proportions of sand and cohesive fines.

14.4.7 The majority of the Quarry Backfill encountered on this site can therefore be regarded as non-shrinkable. However, localised areas of shrinkable soils within the Quarry Backfill are considered likely to be present.

14.4.8 It should be noted that significant oversize (cobbles and boulders) was recorded within the Quarry Backfill. However, these fragments often were not included in the sample due to practicality size (>200mm).

14.5 Compaction tests

14.5.1 Laboratory compaction tests are useful wherever ground improvement is anticipated, for example to provide a satisfactory CBR beneath proposed highways.

14.5.2 In accordance with BS5930[13] engineered fill is defined as material which is selected, placed and compacted to an appropriate specification so that it will exhibit the required engineering behaviour.

14.5.3 Grading and moisture content control the degree to which materials can be effectively compacted. If the grading or moisture content of an in-situ material is not suitable to facilitate its compaction then screening, wetting, or lime addition may be required.

14.5.4 Laboratory compaction testing was scheduled on 18 samples of Ash & Clinker, Quarry Backfill & Reworked Natural Ground (using a 4.5kg rammer) to determine their suitability for re-engineering.

14.5.5 Laboratory compaction tests are only appropriate if:

- At least 90% of the material passes the 37.5mm sieve; and/or
- At least 70% of the material passes the 20mm sieve

14.5.6 It is apparent from the gradings tabulated in Section 14.4, that the **Ash & Clinker** samples scheduled for compaction tests are suitable (i.e. at least 70% of the material is finer than 20mm).

14.5.7 However, it is apparent from the gradings tabulated in Section 14.4, that the **Quarry Backfill** & **Reworked Natural** Ground scheduled for compaction tests are generally too 'coarse' (i.e., the fraction of coarse gravel, cobbles and boulders) is too great. Boulders are present within the Quarry Backfill, although for the purpose of practicality these are not included within the bulk samples recovered.

[13] *BS5930 (2015) - Code of practice for ground investigations.*

14.5.8 If particle sizes are only slightly in excess of the above limits, compaction tests can be useful in order to indicate target densities, but the results should be treated with caution and used for guidance only.

14.5.9 The material particle density (Gs) is required in order to plot the 0, 5 and 10% air voids lines on the compaction graph for each material type.

14.5.10 The results are summarised in the tables below:

Sample location & depth	Material description	Gs (Mg/m³)	MDD (Mg/m³)	OMC (%)	Allowable mc range for 95% MDD & <5% air voids	Initial in-situ MC (%) [typical average MC value from strata type]
TP341, 2.0m to 2.5m	Very sandy GRAVEL. (A&C)	2.59	1.61	22	21 to 26.5	26 [15]
TP345, 3.5m to 4.0m	Very gravelly very silty SAND with a low cobble content. (A&C)	2.57	1.85	13	12.5 to 17.5	15 [15]
TP352C, 1.2m	Sandy GRAVEL. (A&C)	2.54	1.61	20	20 to 24.5	24 [15]
TP311, 2.5m	Slightly gravelly Clay with a low cobble content. (QB)	2.67	1.62	24	22 to 27	**36** [17]
TP313, 2.0m to 2.5m	Very clayey, sandy Gravel with a medium cobble content. (QB)	2.69	1.96	12	11.5 to 16	**21** [17]
TP326, 0.7m to 1.2m	Slightly silty very sandy Gravel with a medium cobble content (QB)	2.66	1.96	11	11 to 15.5	14 [17]
TP332, 1.6m	Slightly sandy slightly clayey GRAVEL with a medium cobble content. (QB)	2.69	1.99	12	10.5 to 15.5	15 [17]
TP357, 0.8m	Sandy slightly clayey GRAVEL with a medium cobble content. (QB)	2.69	2.00	11	10.5 to 15	**17** [17]
TP380 2.2m to 2.7m	Very sandy, slightly gravelly CLAY with a low cobble content. (QB)	2.68	1.91	14	13 to 17	**20** [17]
TP382, 2.0m to 2.5m	COBBLES & BOULDERS with some clayey gravelly Sand. * (QB)	2.66	2.01	11	10.5 to 14.5	**15** [17]
TP385, 1.5m to 1.7m	Slightly gravelly sandy CLAY. (QB)	2.69	1.61	22	22 to 26	**31** [17]
TP388, 2.5m to 3.0m	COBBLES & BOULDERS with much clayey sandy Gravel. * (QB)	2.70	1.98	12	11 to 15.5	**21** [17]
TP389, 2.2m to 2.4m	Very silty, gravelly SAND. (QB)	2.66	1.91	13	12.5 to 17	**19** [17]
TP401, 2.0m to 2.5m	Very gravelly SAND with a medium cobble content.* (QB)	2.44	1.82	11	11 to 16	13 [17]

Sample location & depth	Material description	Gs (Mg/ m³)	MDD (Mg/m³)	OMC (%)	Allowable mc range for 95% MDD & <5% air voids	Initial in-situ MC (%) [typical average MC value from strata type]
TP402, 1.5m to 1.8m	Very clayey gravelly SAND with a medium cobble/ boulder content. (QB)	2.65	1.79	16	15.5 to 20	**28** [17]
TP408, 0.8m	Very sandy silty GRAVEL with a medium cobble/boulder content. (QB)	2.68	1.91	13	12 to 17	**19** [17]
TP398, 0.8m	Sandy GRAVEL with a medium cobble content. (RNG)	2.67	1.96	12	11 to 16	**21** [12]
TP399, 1.0m	COBBLES with much sandy Gravel. *(RNG)	2.63	1.92	12	11.5 to 16	15 [12]

Results in **red** and **blue** indicate the material is too wet and dry respectively

14.5.11 It is apparent that the in-situ moisture content of the **Ash & Clinker** and **Reworked Natural** Ground is generally within the allowable moisture content range to achieve 95% MDD. On this basis it is considered that the Ash & Clinker and Reworked Natural Ground are suitable for re-engineering.

14.5.12 The in-situ moisture content of the **Quarry Backfill** is highly variable, with the strata typically too wet to achieve 95% MDD. Therefore, the Quarry Backfill is likely to require some drying out before they can be utilised for engineered fill.

14.5.13 Drying out of these soils will require careful management on site. They should be placed in sealed stockpiles during periods of wet weather, or while the site is unattended. During periods of favourable weather (ideally warm & windy) the soils should be spread in thin layers over as wide an area as possible and aerated by turning with an excavator.

14.5.14 The made ground is expected to require screening and /or crushing in order to remove any unsuitable and oversize materials and to meet a suitable grading profile for compaction to be achieved.

14.5.15 Acceptability of the made ground soils for use in the proposed controlled earthworks will need detailed appraisal by the Earthworks Designer in light of the required performance characteristics.

14.6 In-situ density

14.6.1 Due to the large proportion of cobbles and boulders within the Quarry Backfill, assessment of the in-situ density via SPTs was not deemed practical. Any in-situ testing would have resulted in a large number of refusals, with the validity of any test data cast into doubt, not knowing if the N values reflected the true in-situ density, or were a result of resistance caused by cobbles/boulders.

14.6.2 Based on the observations during trial pitting, and the resistance during rotary drilling, the in-situ density of the Quarry Backfill is likely to range from loose to dense.

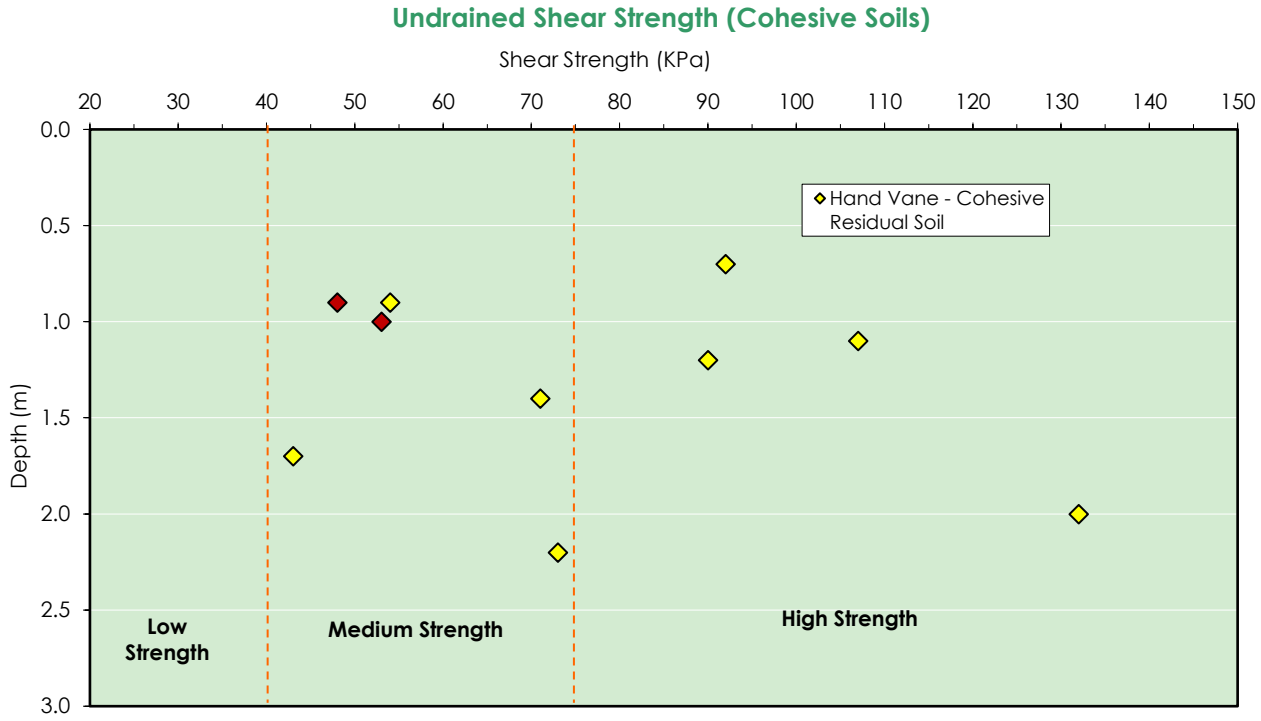
14.7 Undrained shear strength testing

Hand shear vane testing

14.7.1 Hand shear vane testing was undertaken within trial pits in-situ to around 1m depth and from larger blocks of excavated clay below that depth. The majority of ground at this site is granular therefore, only a limited amount of data has been obtained.

14.7.2 The results are summarised within the plot below and show that Cohesive Residual Soil is typically medium strength (c. 55kPa) and above.

14.7.3 The plot below provides a summary of undrained shear strengths.



15 GEOTECHNICAL ISSUES

15.1 Conceptual site model

15.1.1 Historical sandstone quarrying has taken place across about 6.1 ha (c. 20%) of the total site area.

15.1.2 Ground conditions at the site can be divided into areas within and beyond the former sandstone quarries.

15.1.3 **Within** the quarries, ground conditions comprise a veneer of hardstand & Made Ground Topsoil overlying Ash & Clinker, Granular Made Ground & Quarry Backfill to depths >4m (trial pits) and between 6.0m and c. 24m (rotary probeholes).

15.1.4 **Highwalls** have been located at 37 locations (trenches and stitch probeholes) which have a highly variable alignment and appear to be near vertical/vertical with the occasional 'bench' at depth. Additionally, unworked sandstone 'pillars/roads', with two highwalls in immediate proximity laterally have also been recorded.

15.1.5 **Beyond** the quarries (but within **Area A**), ground conditions generally comprise a veneer of Hardstand (tarmac or concrete), Made Ground Topsoil or Topsoil overlying Reworked Natural, Ash & Clinker & Cohesive & Granular Made Ground to depths between 0.1m and 3.7m (average c. 1.0m).

15.1.6 Underlying natural ground generally comprises Granular Residual Soils overlying Rough Rock Sandstone bedrock encountered from depths of between 1m and 3m.

15.1.7 Within **Area B**, natural ground predominantly comprised Granular Residual Soils to between 0.6m and 2.2m over Rough Rock Sandstone bedrock.

15.1.8 Rough Rock Sandstone comprised weak to moderately strong, light yellowish brown, fine and medium Sandstones recovered as gravel and cobbles.

15.1.9 Given the findings and access constraints (ecology) at the time of investigation, it is considered likely that further unworked sandstone 'land bridges/pillars/roads' are present within the footprint of the quarries, some of which may be buried beyond 3m to 4m depth.

15.1.10 Currently land typically falls to the east with several terraces, ramps, steep slopes and retaining walls. Significant ground improvement is anticipated to remove shallow obstructions (building foundations) and enable highway construction. In addition, site regrade is anticipated to create development plateaux.

15.2 Mining & quarrying

15.2.1 This site is located beyond the CA's defined coalfields.

15.2.2 No evidence of underground workings (sandstone) was encountered during Lithos' investigation. However, there is the remote possibility that adits were driven from the base of the quarries.

15.2.3 The site was occupied by sandstone quarries (Matlock House, Crosland Hill & Waterhouse Quarries) from pre-1850 to 1995. The quarries targeted Rough Rock Sandstone which was used as a construction material. The majority of the quarries were backfilled by the 1960s as the Fireworks Factory expanded, with only an area in the far northeast (Crosland Hill) and far south (Matlock House) shown as partially backfilled by 1990s.

15.2.4 Backfilled quarries occupy about 20% of the total site area and reach depths of between c. 6m and 24m. Highwalls have been found at 37 locations and are very steep (vertical) and in excess of 20m high.

15.2.5 The extent of quarrying proven by drilling and trial trenching to date appears to contradict the historical OS mapping (see Drawing 4486/3B). Areas of the site that were not anticipated to be quarried were found to contain deep quarry backfill, and it appears that much of the centre of the site is merged into a single quarry.

15.2.6 It appears the quarry floors and highwalls were benched with 'pillars' of unquarried sandstone identified within the quarries during the site investigation. Areas of shallow unworked sandstone are likely to create '**hard spots**' which will require careful consideration and will likely need removing to a set depth prior to development avoid differential settlement.

15.2.7 The approximate outline of the quarry and approximate depths of fill are shown on Drawing 4486/11.

15.3 Potential issues associated with deep backfill

15.3.1 It is considered likely that during backfilling of the sandstone quarries the Ash & Clinker, Quarry Backfill and Granular Made Ground was placed without mechanical compaction in irregular and thick layers, and without any screening to remove oversized materials, degradable waste etc. Such backfill poses a risk to any proposed development due to the potential for differential settlement, long term 'creep' settlement and inundation settlement (or collapse settlement).

15.3.2 Settlement of deep made ground is initially (first 5 years or so) predominantly associated with **inundation** (caused by changes in the water table depth and/or surface water infiltration). Given the time since quarrying ceased, groundwater rebound is expected to have reached equilibrium with pre-quarrying levels.

15.3.3 Although groundwater rebound is expected to have reached equilibrium, the possibility of surface water percolation and or leaking drains (post construction) resulting in inundation settlement cannot be ruled out. The recommended earthworks and ground improvement will reduce the overall mass permeability of the Quarry Backfill, which will lessen the risk, but not remove it entirely. An inundation trial, in conjunction with some load tests are recommended to formally assess the risk.

15.3.4 **Consolidation** settlement is associated with a reduction in volume caused by expulsion of water from soil pores and transfer of load from excess porewater pressure to soil particles. The Quarry Backfill and Ash & Clinker here is predominantly **granular** and consequently significant consolidation settlement is not anticipated.

15.3.5 **Creep** compression occurs as the particles of fill become more closely packed, under conditions of constant effective stress (arising from self-weight of the fill). Although the movements caused by creep are relatively small, often it is these long-term movements that are of most interest to foundation performance. Many coarse fills show a linear relationship between settlement and the logarithm of the time that has elapsed since the fill was placed (i.e. settlement that occurs during the first 10 years is similar to that from years 10 to 100).

15.3.6 Where development on deep fill takes place, in addition to any ongoing creep associated with self-weight, settlement is caused by the imposed foundation loads. This leads to some immediate compression and consolidation within stressed zones.

15.3.7 Due to the problems in assessing the in-situ density of the Quarry Backfill (see Section 14.6), assessing the likely long-term settlement is difficult. To quantify the risk and provide realistic settlement estimates, some **load testing** (embankment or zone load tests) with an inundation phase is recommended. The results of which will help inform the final depth of turnover and type of ground improvement required (see Section 15.4).

15.3.8 The strength/density of the backfill materials is likely to vary over relatively short distances, especially across the line of any **buried** highwalls, roads, land bridges and even 'benches' at depth within the quarry, which could lead to significant differential settlements across small areas.

15.3.9 At this stage, it is considered that the presence of deep backfill will have implications for:

- Foundations – piled adjacent to and over highwalls; but possibly rafts/heavily reinforced strips within the footprint of the quarries following ground improvement.
- Drainage – likely need for placement at maximum possible gradients using flexible connections to prevent any backfalls should differential settlement of the fill occur. Potential need for piling of manholes.
- New utilities – should be constructed of flexible materials. Electricity and communications cabling should also be laid with sufficient 'slack' to accommodate a degree of movement. The use of flexible joints is recommended where possible, particularly where service connections extend across a rigid/flexible structure interface (e.g. from a piled foundation into a garden area)
- Highways - a specification will need to be agreed with the adopting authority, but reinforcement of the road construction will probably be required.

15.4 Site regrade and ground improvement

General

15.4.1 Made ground currently underlies the majority of Area A, to depths of between c. 6m and 24m (within quarries) and <4m depth, average c. 1.0m (beyond quarries). This made ground is of variable and poor strength, includes significant oversize materials and is likely to have been placed without any formal compaction. Therefore, made ground is not considered a suitable foundation material.

15.4.2 The made ground has also yielded elevated concentrations of a number of inorganic determinands, asbestos and contains materials (e.g. brick, concrete, clinker, coal, etc), which would generally be considered undesirable as a near-surface material in garden areas.

15.4.3 Given the substantial volume of made ground present, export to landfill is not considered economically viable.

Turnover of made ground

15.4.4 The extent of turnover (excavation, screening and replacement in engineered layers) required will depend on the likely long-term settlement predictions and therefore the ground improvement technique used. However, at this stage, it is likely that turnover of at least the **uppermost 4m** of made ground will be required.

15.4.5 If shallow 'islands' of rock are encountered within quarry footprint during the 4m turnover, consideration should be given to over digging the natural strata to sub-formation level to remove visible 'hard spots' within the engineered fill.

15.4.6 Screened and engineered fill should yield CBR values in excess of 5%, thereby reducing abnormals associated with the construction of estate roads and car parking areas. Excavations through the engineered fill, for drainage etc and foundations will not encounter significant obstructions or grossly contaminated ground and should be stable with little overbreak.

15.4.7 Wherever possible, Lithos recommend that excavated soils are retained on site. However, if this is not possible the comments in Section 12.9 should apply.

15.4.8 Assessing the suitability of soil/fill materials for use as engineered fill requires consideration of:

- Organic and biodegradable matter content
- Particle size, shape and grading, for example single size or tabular gravels cannot be properly and effectively compacted
- Dry density/moisture content relationships

15.4.9 At this stage, it appears that the majority of the made ground types at this site (including quarry backfill) will be appropriate for re-use as engineered fill, following screening and crushing to meet a suitable material grading profile.

15.4.10 However, it is possible that some made ground in the far south (EA recorded landfill) may include a significant proportion of degradable materials which have not been encountered to date. Soils with proportions of degradable materials (e.g. wood, paper, 'black bag waste' etc) will not be geotechnically suitable for use as an engineered fill. See also comments in Section 4.3 regarding implications associated with the fact that the quarry in the south (Matlock House) is a recorded historic landfill.

15.4.11 Prior to placement of any fill, the excavation base and any exposed quarry highwalls should be **surveyed**, in order that fill thicknesses can be plotted and appropriate foundation solutions determined.

15.4.12 The above solution is considered to be in line with current government philosophy regarding sustainable development. Turnover works should be undertaken in accordance with the CL:AIRE Code of Practice (v2, March 2011), and a Materials Management Plan (MMP) should be prepared prior to commencement.

Ground Improvement

15.4.13 Following excavation of made ground during turnover works, some ground improvement of deeper, residual quarry backfill (below 4m) within the sandstone quarries will likely also be required.

15.4.14 Ground improvement techniques are likely to comprise:

- In combination with re-engineering the upper 4m of backfill, ground improvement such as high energy impact compaction (**HEIC**) could be undertaken. This would improve the load settlement performance of the backfill in-situ beneath the engineered fill to c. **1m to 2m** depth and create a thicker stiffened crust. HEIC imparts energy to the ground using an asymmetrical roller either square or triangular in shape. Repeated passes occur until the target grounds stiffness or settlement criteria have been achieved.
- Rapid impact compaction (**RIC**) could be undertaken at sub-formation level in conjunction with the re-engineering of the uppermost 4m of backfill. This would improve the load settlement performance of the backfill in-situ beneath the engineered fill to c. **3m to 4m** and create a thicker stiffened crust. With RIC, energy is applied to the ground with repeated blows of 40 to 60 times per minute, by a hammer typically 7 tonnes dropping 1.2m.
- Deep dynamic compaction (**DDC**) can be used to densify the fill in-situ; in conjunction with excavation and replacement of the upper 4m of backfill, from the base of the excavation prior to replacement of engineered fill. With DDC the ground is subjected to repeated surface tamping using a heavy weight of c. 10 tonnes. This weight is dropped by up to 20m a set number of times on a grid pattern over the site to form a pass. The imprints formed at each drop position are infilled with granular material after each pass. A blanket of imported stone is required where in-situ near surface materials are unsuitable. Dependant on soil types and condition, two to five passes can be required, and treatment depth would likely be in the order of **7m to 10m**.

15.4.15 Following ground improvements, some further ground investigation and/or settlement monitoring might then include some/all of:

- Installation of extensometers.
- Installation of a grid of survey stations, and subsequent surveying to determine whether ground levels are changing.
- Zone tests via construction of a shallow test pad or a test embankment.
- Inundation testing.
- Installation of rod & plate in conjunction with zone load tests.

Topography

15.4.16 Given existing topography (much of the site is terraced/sloping with retaining structures/steep slopes in Area A), some earthworks regrade is anticipated, with the need for underbuild and retaining walls.

15.4.17 Careful consideration will need to be given to earthworks design, and implications for slope stability, retaining walls, foundations, highway gradients and drainage.

15.4.18 Any digital terrain modelling undertaken, or commissioned, by the Developers or the Vendor should consider implications for the foundation recommendations outlined below.

15.4.19 Wherever possible, Lithos recommend that excavated soils are retained on site. However, if this is not possible the comments in Section 12.9 should apply.

15.5 Management of unknowns/uncertainties

15.5.1 Whilst extensive ground investigation has been undertaken across the site some uncertainties remain. It is highly unlikely, even with further intensive phases of ground investigation, that these uncertainties would be addressed.

15.5.2 Key uncertainties include:

- The line of the quarry highwalls. The known alignment varies significantly, with undiscovered variation in alignment likely. Risk = **Differential settlement risk.**
- Unidentified buried benches. Risk = **Differential settlement risk.**
- 'Islands' of rock within the Quarry Backfill consisting of former roadways, crane platforms or areas of rock that were did not meet the quality requirements. Risk = **Differential settlement risk.**
- Very large boulders at depth, which could give the false impression of bedrock being reached. Risk = **False pile refusal.**
- Variation in backfill depth and density. Risk = **Total & differential settlement risk.**
- Localised voids within the Quarry Backfill as a result of boulders 'bridging'. Risk = **Total & differential settlement risk.**
- Localised pockets of degrading/corroding materials within the Quarry Backfill. Risk = **Gas & settlement risk.**
- Adits driven form the base of the quarries for further local extraction. This risk is more likely in Elland Flag workings, and much less unlikely in Rough Rock (this site), although cannot be entirely discounted.

15.5.3 The potential mitigation for many of the above risks would be to advance rotary probeholes on a **tight** grid pattern across the quarries during the preparatory earthworks.

15.6 Foundation recommendations

General

15.6.1 Foundation recommendations assume that development will be two or three storey construction and that line loads will not exceed 90kN/m run. If this is not the case significant alteration to these recommendations will be required.

15.6.2 We have assumed that final development levels will not differ significantly from ground levels existing at the time of investigation. Any digital terrain modelling undertaken, or commissioned, by the Developers should consider implications for the foundation recommendations outlined below.

15.6.3 Foundation depths (and types) will depend on thicknesses of fill following the anticipated earthworks regrade & ground improvement.

15.6.4 Following the anticipated turnover earthworks, replaced fill materials will not contain obstructions and should be relatively stable with little overbreak.

15.6.5 Sub-surface concrete in contact with the made ground and natural ground should be Design Sulphate Class DS-1, with the site allocated an ACEC Classification of AC-2z.

15.6.6 There are a number of foundation solution options for two or three storey residential properties constructed on this site. In essence, these are:

- Strip/trench fill footings for plots located beyond deep quarry backfill
- Shallow foundations (on engineered fill) for plots located over deep quarry backfill
- Pre-bored piled foundations for plots located over/adjacent to quarry highwalls

15.6.7 Each of the above is discussed in more detail below.

Plots beyond quarry footprints - Strip/trench fill footings

15.6.8 It is considered that shallow strip or deepened trench fill footings will be the most suitable foundation solution for two or three storey houses constructed beyond the footprints of the former quarries. Footings will be founded in gravelly Sands/sandy Gravels or competent rock. This solution is viable where the made ground is less than about 2.5m thick, and Granular Residual Soil or competent rock is the founding material.

15.6.9 Made ground (in its current state) is not considered a suitable foundation material and foundations should therefore be taken through these materials into underlying natural strata of adequate bearing capacity.

15.6.10 Reinforcement, as a precaution against differential settlement, is recommended only where foundation excavations encounter significant lateral and vertical variations in strata. One layer of B385 mesh placed 75mm above the base of the footing is likely to provide suitable reinforcement, but further advice should be sought from the Structural Engineer.

15.6.11 Where existing buildings are to be demolished, all concrete slabs and service ducts will require breaking out prior to re-development. However, relict foundations could probably be left in-situ and an allowance made for local breaking out, or (probably better) chased-out and removed during the necessary site preparatory works; see Section 15.4.

15.6.12 Foundations of plots placed over relict foundations should be taken to greater depth than the relict foundations and into natural ground of adequate bearing capacity.

15.6.13 Foundations will be required to be placed below a line drawn up at 45° from the base of any service or similar excavation.

15.6.14 Deepened foundations should be stepped in accordance with NHBC Standards, Chapter 4.3.

15.6.15 In order to minimise softening and swelling of cohesive soils or loosening of granular soils, it is recommended that footings are cast as soon as formation level is reached (or alternatively formation could be blinded using concrete with as low a water:cement ratio as possible).

15.6.16 the Developers should review proposed plot designs and layouts, since deeper excavations for trench fill are likely to be unstable where the centre-lines of parallel trenches are closer than about 2m (assuming 600mm widths). the Developers should supervise their groundworker to ensure footings are excavated in a controlled and safe manner.

15.6.17 The **Granular Residual Soil** (sand, gravel and cobbles) is assumed to have a relative density of at least medium dense (in accordance with BS5930).

15.6.18 A safe bearing capacity of at least 150kPa, allowing a maximum foundation line load of 90kN/m run, can be assumed if the following are true:

- A foundation length of 10m
- A foundation breadth of 0.6m
- A foundation thickness of 225mm
- A foundation depth of 0.6m depth
- An angle of shearing resistance of ϕ=34° for the granular deposits

15.6.19 Assuming the foundation geometry detailed above, settlements of less than 25mm would be anticipated. This is considered likely to be acceptable. However, further advice should be sought from the Structural Engineer responsible for foundation design.

15.6.20 In accordance with NHBC Standards, a minimum founding depth of 450mm (due to potential frost susceptibility) is required in granular soils. This depth should be taken from finished ground level to the underside of the footing. If finished ground level is to be above existing ground level, then the foundation excavation simply needs to ensure that there is sufficient depth of excavation to allow casting of the footing entirely within natural ground (not made ground or topsoil).

15.6.21 However, if the excavation is dug from original ground level in cold conditions when freezing is expected, then foundation depth should be taken from the existing, not finished, ground level.

15.6.22 Where ground level is being raised, it would be prudent to proof roll the exposed granular soils after stripping topsoil (to mitigate any near-surface disturbance), and ideally fill should be placed prior to construction (otherwise the Developer will need to consider the potential for movement associated with placement of the fill).

15.6.23 It should also be noted that the footing may require deepening or stepping in order to allow plot drainage to exit the plot footprint (either over or under the footing).

15.6.24 Only a very limited amount of **Cohesive Residual Soil** has been encountered in the investigation to date within TPs 336, 350, 433, 437, 503, 508, 515, 518, 525, 526, 528 & 604. Therefore, the majority of plots footings are considered likely to encounter granular soils and following paragraphs are provided for guidance.

15.6.25 Atterberg tests suggest that natural cohesive soils at the site are of **medium** shrinkability. A minimum founding depth of 900mm (not accounting for any existing or proposed vegetation) is therefore required for all cohesive soils on the site where strip footings are proposed.

15.6.26 In accordance with NHBC Standards, founding depths in cohesive soils should be taken from original or finished ground level, whichever is the lower, to the underside of the footing.

15.6.27 Foundations should be deepened near trees in accordance with NHBC Standards Chapter 4.2.

15.6.28 Any trench fill foundation deeper than 2.5m will need to be designed by a Chartered Engineer, whose status is accepted by NHBC (NHBC Standards, Technical Requirement R5); However, it is likely that the presence of bedrock will result in few, if any, foundations being deeper than 2.5m.

15.6.29 A safe bearing capacity of at least 150kPa, allowing a maximum foundation line load of 90kN/m run, can be assumed if the following are true

- A foundation length of 10m
- A foundation breadth of 0.6m
- A foundation thickness of 225mm
- A foundation depth of 0.9m depth
- An undrained shear strength of 55kPa for the firm clay (typical minimum recorded on site)

15.6.30 Assuming the foundation geometry detailed above, settlements of less than 25mm would be anticipated. This is considered likely to be acceptable. However, further advice should be sought from the Structural Engineer responsible for foundation design.

15.6.31 The sandstone **bedrock** is generally considered to have a safe bearing capacity of at least 300kPa and minimal settlements would be anticipated.

15.6.32 Where rock is encountered at shallow depth foundations should be placed entirely on rock and not partially on rock and partially on soil. This may, depending on surface gradient, necessitate significant deepening of foundations.

Plots within quarry footprints – Shallow foundations (on engineered fill)

15.6.33 Raft foundations (or reinforced strips) may provide a suitable foundation solution if the uppermost 4.0m of made ground is subject to turnover (excavation, screening/sorting and replacement in engineered layers, with compaction) in conjunction with ground improvements (note comments made in Section 15.4). Fill would need to be compacted to an End Product Specification to achieve >95% of the maximum dry density (4.5kg rammer or vibrating hammer) and less than 5% air voids, although the air voids criteria may need to be flexed due to the coarse granular content of the fill.

15.6.34 If it is intended to construct low-rise buildings which derive direct support from engineered fill, an Earthworks Specification document will be required and this would include definition of fill types and requirements for acceptability & testing, compaction trials, control testing and monitoring of fill performance.

15.6.35 In areas where raft foundations are proposed, excavations should extend at least 4.0m beyond the footprint of structures. Excavation and screening will enable the removal of all relict foundations, oversize material and any grossly contaminated soil/fill.

15.6.36 The suitability of made ground for placement as engineered fill should be confirmed by field trials and laboratory testing.

15.6.37 The field trials should be carried out in accordance with Lithos' Specification for Engineered Fill. The field trial will enable estimation of tolerable settlement characteristics and an achievable safe bearing capacity, with a view to establishing new dwellings on raft foundations. It will also yield the following information:

- Number of passes with the compaction plant (to be used during subsequent earthworks)
- Maximum and minimum layer thickness (plant dependent)
- Acceptance criteria; minimum dry density and moisture content range

15.6.38 Raft or beam-grillage design should be in accordance with NHBC Standards, Chapter 4.4. Granular sub-base product should be placed in accordance with Table 8/1 of the Highways Agency Specification for Highway Works (1998).

15.6.39 NHBC generally require any spread foundation on engineered fill to be capable of achieving a minimum spanning capability of 3m and a minimum cantilever capability of 1.5m. For reinforced strip foundations, NHBC also require continuity of reinforcement across orthogonal beams, ensuring a "grillage type" (not a true grillage) arrangement with cross wall / stiffening beams.

15.6.40 For reinforced strip foundations, NHBC typically require the aspect ratios (in plan) of all 'cells' of the 'grillage' to be no greater than 2:1, to ensure there is sufficient rigidity to the foundation. The maximum permissible angular distortion (tilt) is typically 1:400.

15.6.41 Should any long terraces/blocks be proposed they should incorporate structural movement joints to mitigate the risk of differential settlement across the block/terrace.

15.6.42 NHBC generally recommend that rafts be founded on a minimum 150mm thickness of DoT granular sub-base product. Granular sub-base should extend laterally for at least 0.5m beyond the raft. The base of the granular sub-base must be at least 600mm below original or finished level, whichever is the lower. At most reclaimed brownfield sites, original level is generally equivalent to the top of engineered fill.

15.6.43 Where rafts are within the influence of mature trees, the depth of crushed stone placed should be equal to 50% of the trench fill foundation depth determined in accordance with NHBC Chapter 4.2.

15.6.44 Placement of blankets of a granular sub-base, directly on top of engineered fill would normally be acceptable immediately after placement of the final layer of fill. However, if placement is delayed, climatic factors can lead to a deterioration of the near surface fill.

15.6.45 Where the engineered fill is cohesive, rainfall, (softening) or sunshine (desiccation) may cause deterioration. Cohesive fill should therefore be "blinded" with granular sub-base within 48 hours of placement of the final layer of fill. Wherever this is not possible, it is recommended that a minimum 300mm depth of fill is excavated from beneath the plot footprint, prior to placement of the granular sub-base. Furthermore, it may be necessary to remove any desiccated material if the engineered fill is left exposed during a prolonged spell of dry weather.

15.6.46 Where the engineered fill is granular, deterioration may be caused by frost (unless the fill contains less than 10% fines). Granular fill should therefore be "blinded" with granular sub-base prior to frosty weather.

Plots over/adjacent to quarry highwalls - Piled foundations

15.6.47 Piled foundations will be required for dwellings constructed on top of or adjacent to quarry highwalls.

15.6.48 At this stage, based on the likely vertical/ semi-vertical highwalls, it should be assumed that plots will require piling when they are within 10m either side of the highwall. This width will increase where benches are encountered, or where the slope angle of the highwall is found to be less steep.

15.6.49 The following general comments relating to piling are provided for guidance, and further advice should be sought from a specialist-piling contractor.

15.6.50 Piles are likely to be end bearing in bedrock, therefore in accordance with BS 8004[14] and EC7[15], piling contractors may require further boreholes extended a minimum 5m into competent bedrock using rotary coring techniques.

15.6.51 Given the presence of **large sandstone boulders** throughout the Quarry Backfill, **pre-boring** of piles is likely to be required.

15.6.52 The made ground contains significant sandstone boulders (up to 2.5m diameter), and the depths to competent bedrock vary significantly over relatively short distances. Consequently, in order to ensure that piles are founded within natural bedrock (and not any overlying quarry backfill), it may be prudent to advance piles to greater depth, so that they are embedded at least **3m** into bedrock.

15.6.53 Steep highwalls have been identified where depths to bedrock vary significantly over very short distances. Development of plots which span highwalls will require careful consideration and early liaison with a specialist piling contractor and the warranty provider is strongly recommended.

15.6.54 Given the variable depths to bedrock adjacent to quarry highwalls, care should be taken to ensure that piles are not allowed to deflect off any steep under-ground gradients within the rock. This could be achieved by socketing and may require pre-drilling and casing of piles. An allowance should also be made for changing piling locations and ground beam design to account for any difficulties encountered with steep rock gradients associated with the former quarry.

15.6.55 Warranty providers generally require pile lengths to be at least 3m (measured from pile cut off level to pile toe level). Short piles are likely to become dislodged during pile trimming operations, creating additional costs associated with remedial works. Where depths to bedrock vary significantly beneath a plot, pre-boring of piles may be necessary to reach required depths.

15.6.56 The safe working load that may be supported on a pile is dependent on the pile diameter, its founding depth and the method of installation.

15.6.57 There is the potential for settlement of the ground in external areas around piled plots, and mitigation should be considered:

- Extend facing brickwork so that ground settlement does not result in exposing the underground portions of walls and foundations. Two additional courses should be more than adequate.
- Flexible connections in drainage and service pipes passing through the buildings. and,
- Ensure drainage is laid with generous falls to account for any settlement.

[14] *BS 8004 (2015) - Code of practice for foundations.*
[15] *BS EN 1997-1:2007. Eurocode 7: Geotechnical design – Part 2: Ground investigation & testing*

15.6.58 Boreholes indicate that competent sandstone bedrock lies at depths of between 6m and 24m, below current ground levels within the quarries.

15.6.59 As piles would be founded in bedrock, they will be essentially end bearing. Given the presence of deep Backfill, it is essential that pile design allows for down-drag (negative skin friction).

15.6.60 It is recommended that flexible service connections are used on this site, especially where they enter the buildings, in order to avoid any possible damage due to self-settlement of the weak strata once the site is developed.

15.6.61 New houses can be built off ring beams designed to span the piles. In order to bond them to the piles, the tops of the piles must be broken out to expose the reinforcement, which can then be tied to that of the beams.

15.6.62 Ground conditions are considered likely to require provision of a piling mat (working platform) and further advice should be sought from the appointed specialist-piling contractor regarding the proposed plant loadings and resulting pressures. This data, together with a knowledge of the strength and variability of the near-surface ground conditions is required in order that design of a mat can be undertaken in accordance with guidance provided in the 2004 BRE document, "BR 470: Working platforms for tracked plant".

15.6.63 The design of working platforms for tracked plant is a geotechnical design process and should be carried out by a competent person. The following parties should have input into the design:

- Permanent works designer, to consider additional uses for platform material as part of the overall development
- Principal contractor, to define any other purposes for which the platform might be used
- Contractor or subcontractor, to specify requirements for the platform, including gradients, ramps and edges

15.6.64 Piles can provide an enhanced pathway for the vertical migration of mobile contaminants. The Environment Agency may therefore object to the adoption of piles as a foundation solution. However, objection is considered unlikely given the nature of the contamination encountered, and the fact that quarry backfill is currently resting directly on the underlying mudstone bedrock.

Summary of foundation recommendations

15.6.65 In summary, the following foundation solutions are likely to be most appropriate (subject to the Developers preferences regarding site preparatory works, final levels & costs associated with each foundation option).

Foundation solution(s)	Remarks (influencing factors)
Strips from a minimum 0.6m depth	Within Area B and parts of Area A (beyond former sandstone quarries and where made ground is <2.5m thick following turnover earthworks). Where cohesive soils are encountered the minimum depth will require increasing to 0.9m.
Raft or heavily reinforced strips foundations on engineered fill (Area A)	Within the footprint of former quarries and beyond influencing distance of quarry highwall following turnover earthworks and ground improvement techniques.
Piles (Area A)	Plots over/or adjacent to the quarry highwalls where significant differential settlement and thickness of fill anticipated (i.e., highwalls). Due to significant obstructions (boulders) throughout the quarry backfill, piles will require pre-boring, casing and socketing into competent sandstone bedrock.

15.6.66 The foundation solutions outlined in the above table assume that ground levels will not change significantly from those existing at present. If this is not to be the case, further advice should be sought from Lithos.

15.7 Floor slabs

15.7.1 Floors for low rise housing (2-3 storeys) constructed on piled foundations typically utilise reinforced concrete ground beams which rest on pre-cast or in-situ pile caps. A suspended 'Beam and Block' ground floor is then usually constructed using concrete or polystyrene blocks placed between further concrete beams suspended across the ring beams.

15.7.2 Suspended floor slabs should be utilised where the depth of made ground or engineered stone exceeds 600mm in accordance with NHBC Standards Chapter 5.1 (to negate potential settlement problems). The majority of made ground on this site is non-shrinkable, therefore the slabs could be cast in-situ.

15.7.3 If cohesive soils are encountered, in accordance with NHBC Standards Chapter 4.2, a minimum void height of 250mm should be adopted for a precast block and beam (or suspended timber) floor; this includes a 150mm ventilation allowance. If a suspended, cast in-situ slab (on a void former) is proposed, a minimum clear void height of 100mm should be adopted; of course, the actual thickness of the void former will be significantly greater.

15.7.4 Beyond the influence of existing or proposed trees, it is considered that the natural ground is generally suitable for the use of ground bearing floors. However, ground bearing slabs should not be cast on topsoil. Where plots are elevated for design reasons, the depth of engineered stone below a ground bearing slab should not exceed 600mm, in accordance with NHBC guidance.

15.7.5 It should be noted that NHBC have suffered a significant number of claims resulting from the use of ground bearing floor slabs. Consequently, if ground bearing slabs are proposed, care should be taken to ensure correct and careful construction. For example, if fill to the internal face of the foundation excavation is not properly compacted, subsequent settlement can result in cracking of the slab.

15.7.6 Floor slab design should be finalised/take account of the results of the gas monitoring and protection measures required, which will be detailed in Lithos' gas risk assessment, to be issued on completion of monitoring in April 2024.

15.8 Designated concrete mixes

15.8.1 Designated mixes are considered in BRE SD1[16] and BS 8500[17]. However, in addition to soil chemistry (sulphate class), there are a number of other considerations relating to structural design that need to be taken into account when determining an appropriate concrete mix.

15.8.2 Consequently, the Developers should seek advice from their appointed Structural Engineer.

15.9 Excavations

15.9.1 Based on the results of the investigation it is considered unlikely that major groundwater flows will be encountered in shallow excavations.

15.9.2 Groundwater should be controlled in accordance with CIRIA Report R113[18].

15.9.3 The stability of even shallow excavations is likely to be poor, most notably in loose made ground, and allowance should be made for shoring and overbreak of excavation walls.

15.9.4 Re-engineering & processing of made ground is likely to improve stability of excavations for foundations and deep drainage.

15.9.5 Bedrock was encountered in several exploratory holes, especially beyond the former sandstone quarries. Based on the exploratory hole logs, excavation greater than 2.5m is likely to prove difficult beyond the former quarries. It would therefore be prudent to allow for excavation of hard rock in any deep excavations such as those that may be required for drainage etc.

15.10 Highways

15.10.1 Made ground is present across Area A and consultation with the adopting authority, regarding the specification of the highways, is strongly recommended.

15.10.2 The made ground present beneath this site is highly variable in terms of both composition, and strength/density. Furthermore, it often contains a significant amount of oversize (boulders etc) and obstructions (old foundations etc), which represent potential 'hard-spots'.

15.10.3 Consequently, where made ground is present its full thickness (up to a maximum of 2m - from existing ground level or proposed highway formation, whichever is the lower) should be excavated and either:

- Replaced with suitable aggregate in accordance with Series 600 (Earthworks) of The Highways Agency (HA) "Specification for Highway Works" 1998; or
- screened, to allow selection of suitable material, before being replaced in engineered layers (in accordance with Series 600). Unsuitable materials include any soft or wet materials, biodegradables including topsoil, wood, scrap metal, frozen material and oversize.

[16] *BRE Special Digest 1 (2005) – Concrete in aggressive ground.*

[17] *BS 8500-1&2:2015+A2:2019. Concrete. Complementary British Standard to BS EN 206. Method of specifying and guidance for the specifier (1) & Specification for constituent materials and concrete (2).*

[18] *CIRIA Report R113 (1986) - Control of Groundwater for Temporary Works.*

15.10.4 If any new highways span a quarry '**highwall**', the following precautions are recommended to protect highway and drainage infrastructure from damage due to differential settlement.

- The made ground should be excavated over the full width of the adoptable highway to at least 1.0m below deepest sewer invert level
- The base of excavation (1.5m below sewer invert) should be reinforced with two layers of Tensar Triax TX160 (or equivalent) geogrid sandwiched within at least 300mm of suitable aggregate

15.10.5 A minimum length of 5m either side of any highwalls associated with the former quarry should be treated to the above specification, although the final specification should be agreed with the adopting authority.

15.10.6 Some refinement of the above advice might be possible after highways design (with consideration of the proposed formation level cf existing ground level), and via inspection (and usually CBR testing) of the proposed formation during site preparatory groundworks. In addition, the chosen method of ground improvement (if any) may enable significant refinement of the above advice.

15.10.7 Any residual made ground materials in the base of the excavation should be inspected and (where necessary) any soft spots removed and replaced with suitable engineered fill.

15.10.8 Where the made ground is re-engineered it is considered that a CBR value of at least 5% should be achievable. However, this should be verified by field trials.

15.10.9 Crushing of demolition/hardstand/foundation/oversize arisings will generate aggregate, which (subject to confirmatory testing) should be suitable for use as unbound pavement materials within the highways.

15.10.10 The natural soils (beyond former quarries) present at shallow depth (anticipated formation) are predominantly granular. Based on visual inspection of the natural materials, published guidance[19] and tables[20] indicate that the Granular Residual Soil would be expected to provide a CBR value of at least 5%. This value should be verified prior to or during construction.

15.10.11 Whilst the CBRs estimated above should be achievable, significant deterioration during/after periods of significant rainfall and/or site trafficking is likely. Consequently, it would be prudent to consider flexibility in the groundworks programme to enable highway construction during prolonged dry/warm weather (typically between May and September) when formation will be least vulnerable to deterioration. Alternatively, a minimum 200mm thickness of suitable granular fill (i.e. a "blanket" of 6F2) could be placed along the line of proposed highways to protect formation during the construction phase.

[19] *CD225 Design for new pavement foundations Revision 1 (Design Manual for Roads and Bridges)*
[20] *The Structural Design of Bituminous Road, TRRL Laboratory Report 1132 (Table C1, page 36)*

15.11 Drainage

15.11.1 Given the significant thicknesses of made ground encountered across **Area A** (Fireworks Factory) on-site soakaway construction will be highly problematic. It should be noted that soakaways cannot be allowed to infiltrate into made ground due to the risk of settlement caused by wash out of fine soil particles.

15.11.2 Drainage Engineers could use the infiltration rates for testing undertaken in **Area B** (see Section 10) to determine the feasibility of soakaways as a solution for the discharge of surface water run-off.

15.11.3 Alternative SuDS options (see CIRIA C753[21] for further details) include:

- Pervious Pavements – provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate into subsurface storage, with subsequent infiltration or controlled discharge. Pavement could be porous (water able to infiltrate across entire surface material; e.g. reinforced grass), or permeable (water infiltrates via joints between concrete blocks).
- Swales – linear grassed features in which surface water can be stored or conveyed. Where suitable, swales can be designed to allow infiltration.
- Basins - a ground depression designed to store surface water that is normally dry, except during and immediately following a rainfall event. There are two types:
  - Infiltration – basin designed to store runoff and infiltrate it gradually into the ground.
  - Detention – an outlet restricts flows, so that the basin fills and provides attenuation.
- Ponds – designed to have permanent pool of water, but with capacity to provide temporary storage-controlled discharge.

15.11.4 Yorkshire Water have published a guide[22] for developers and designers outlining their design requirements for surface water attenuation assets.

15.11.5 With respect to detention basins, which should normally be dry, water table levels should be taken from borehole monitoring wells over 4 consecutive seasons, for at least 3 points in the basin area. The detention basin should be designed to ensure that there is a minimum of 1m of unsaturated soil between the maximum groundwater level and the lowest part of the structure.

15.11.6 Ground conditions must be suitable to allow free drainage from the detention basin all year round by having regard to groundwater levels, and impermeable liners are not to be used.

15.11.7 It is Lithos' understanding that ground does not have to be free-draining (i.e. sands/gravels), but where clay is present the basin needs to be designed to prevent waterlogging - because this renders maintenance (grass cutting) difficult. It would be prudent to seek confirmation of this from Yorkshire Water and/or the appointed drainage designer.

15.11.8 Appropriate design usually comprises a fall across the short axis (to centre of basin), and then along the long axis (possibly inclusive of a pipe in gravel trench) to the outfall.

15.11.9 The guide also discusses required access to flow control chambers, large diameter (i.e. >900mm) surface water storage pipes, and surface water storage tanks.

15.11.10 It is recommended that the developer contact Yorkshire Water Services with respect to capacity in existing foul and surface water sewers in the vicinity of the development area.

[21] *CIRIA C753 (2015) – The SuDS Manual.*

[22] *Design Requirements for Surface Water Attenuation Assets, February 2017.*

15.12 External works

15.12.1 Any digital terrain modelling undertaken, or commissioned, by the Developers should be made available to their Engineering Designer prior to issue of an External Works Drawing.

15.12.2 When designing retaining walls, consideration should be given to Clause 10.2.3 of NHBC standards which states that flexible retaining walls such as gabion and timber structures should not be used to provide support to homes, garages, roads, drives, car parking areas or drainage systems.

15.12.3 Modelling should take account of the presence of highwalls and deep made ground (former quarries) as these may have an impact on proposed layout and earthworks design.

16 REDEVELOPMENT ISSUES

16.1 General

16.1.1 This report has presented options with respect to foundation solutions, treatment of contamination etc that are considered technically feasible and in line with current good practice. Consequently, we would expect to obtain regulatory approval for whichever option is adopted, although this cannot be guaranteed. Copies of this report should be forwarded to the relevant regulatory authorities (Warranty Provider & Local Authority) for their comment/approval.

16.1.2 Even after an appropriate preliminary investigation and ground investigation, with exploratory holes on a closely spaced grid (say trial pits at 30m centres), a geoenvironmental appraisal is typically based on inspection of the ground underlying less than 0.5% of the total site area (and much less at depths in excess of about 3.5m). Consequently, there is always a possibility that unanticipated ground conditions will be encountered during the construction phase.

16.1.3 If unexpected ground is encountered during the construction phase, the Contractor should immediately seek further advice from the Engineer.

16.2 Remediation strategy

16.2.1 Given the absence of any significant contamination in **Area B**, a remediation strategy is not considered necessary. Nonetheless, some preparatory works will be required, most notably:

- Site clearance of surface materials & vegetation
- Topsoil strip & stockpile

16.2.2 However, redevelopment of **Area A** will almost certainly be subject to planning conditions relating to remediation and validation. Once a specific, preferred development strategy has been decided, Lithos could liaise with local Planning Authority and Warranty Provider and prepare a detailed Remediation Strategy document for approval.

16.2.3 The Remediation Strategy document would include:

- General background information, including site location, site description and a summary of ground investigation data
- An overview of existing constraints on development and the aims of the proposed remediation works
- Specific details of the anticipated site remediation/preparatory works
- Details of site supervision and verification
- A summary of implications for redevelopment

16.2.4 The Remediation Strategy will describe what is required, but not how it is achieved; the appointed Contractor would normally be expected to undertake an Options Appraisal, and then prepare a Method Statement.

16.2.5 The anticipated remediation works are summarised below:

- Treatment of Japanese Knotweed and other invasive weeds
- General site clearance of surface materials and vegetation
- Demolition of buildings (after asbestos removal)
- Break-up of slabs and hardstand
- Post demolition investigation of the ground beneath the former buildings and slabs, which were inaccessible during the earlier investigations.
- Removal of fuel tanks with a post-removal trial pitting investigation beneath each tank.
- Crushing of all suitable artificial hard material (i.e. concrete/brick etc)
- Turnover (excavation, screening and replacement in engineered layers (End Product compaction) of the uppermost 4m of made ground to enable:
    - Inspection of the made ground
    - Surveying of highwalls and areas of deeper made ground associated with former quarries.
    - Picking of fragments of asbestos cement sheeting and placement in double sealed bags prior to off-site disposal
    - Removal of below ground obstructions
    - Removal of any localised fuel/oil contamination; with subsequent treatment and/or off-site disposal
    - Preparation of the ground for highway construction
- Advance rotary probeholes on a tight grid pattern across the quarries during the preparatory earthworks to remove below ground uncertainty.
- Ground improvement of areas of deeper made ground (former quarries) at reduced dig level during turnover earthworks.
- Backfill of all resultant excavations, with appropriate compaction
- Re-grade of site to levels.
- Excavation of up to a maximum depth of 2m (beyond former quarries) beneath proposed adoptable road footprints and controlled re-engineering of selected materials in layers to approximately 650mm below final road levels.
- Provision of a minimum 600mm thick cover layer of 'clean' soils in all garden and landscaped areas underlain by a 150mm thick 'hard dig layer of crushed demolition arisings.

16.2.6 The remediation contractor should survey reduced levels during the proposed turnover, prior to the placement of any fill.

16.2.7 Subsoil (from beyond the former quarries) excavated during the site preparatory works for subsequent use as cover in gardens and landscaped areas, would be best placed during the construction phase; i.e. it should be left in stockpile(s) on completion of the site preparatory works.

16.2.8 A minimum 200mm thickness of suitable granular fill (i.e. a "blanket" of 6F2) could be placed along the line of proposed haul roads to provide a firm and stable running layer for the subsequent construction works.

16.2.9 It is strongly recommended that the demolition contractor should chase-out all significant buried structures, and survey-in the resultant excavations before making them safe by backfilling. At the very least, relevant features should be surveyed-in before "hiding" them beneath a veneer of rubble. Similarly, it would be prudent to complete a drainage survey prior to blading rubble across Area A to leave it safe and secure.

16.3 Control of excavation arisings

16.3.1 Excavations into made ground are likely to yield contaminated arisings. The groundworker should carefully segregate (and stockpile separately) made ground arisings from arisings of "clean" natural soils, in order that an excessive volume of unsuitable material is not generated.

16.3.2 The groundworker should appreciate the need for good materials management. Most notably the importance of not mixing different materials within a given stockpile; i.e. there should be separate stockpiles of: topsoil; grubbed-up concrete hardstand; tarmac; Ash & Clinker; excess clean, natural soil arisings; general construction waste etc.

16.3.3 Further characterisation of stockpiled materials is likely to be required if off-site disposal is proposed. See also comments in Section 12.9 regarding asbestos.

16.3.4 Made ground arisings could be:

- Placed in area deliberately left low on completion of the remediation works in order to accommodate construction arisings
- redistributed beneath concrete oversite, or areas of hardstanding, where they would be satisfactorily isolated from end users;
- Isolated beneath the 750mm thick (600mm 'clean' soil, 150mm 'hard dig') cover layer in garden or landscaped areas
- Exported from site to a suitably licensed landfill facility

16.3.5 Natural ground arisings should be suitable for use as subsoil in the proposed soil cover.

16.4 Good practice guidance

16.4.1 The construction phase groundworker should follow good environmental practice to minimise the risks of spillage, leakage etc with reference, but not limited, to the following documents:

- CIRIA C741[23]
- EA Pollution Prevention Guidelines[24]:
  - PPG6 - Working at construction and demolition sites
  - PPG2 - Above ground oil storage tank
  - PPG7 – The safe operation of refuelling facilities
  - PPG21 – Incident Response Planning

16.4.2 Site preparatory works associated with this project are likely to involve the re-use of both natural and made ground soils on site. Therefore, the Contractor should prepare a Materials Management Plan (MMP) in accordance with the CL:AIRE Code of Practice (v2, March 2011) [25]. However, see also comments in Section 4.3 regarding implications associated with the fact that the quarry in the south (Matlock House) is a recorded historic landfill.

16.4.3 The MMP will document how all of the materials to be excavated during the proposed site preparatory and remediation earthworks are to be dealt with.

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[23] *CIRIA C741 (2015) - Environmental Good Practice on Site*

[24] *Whilst this has formally been withdrawn it can still be accessed via the EA archives and provides useful information on managing risks.*

[25] *The Definition of Waste: Development Industry Code of Practice. CL:AIRE, 2011.*

16.5 New utilities

16.5.1 It is strongly recommended that all statutory service bodies are consulted at an early stage with respect to the ground conditions within which they will lay services in order to enable them to assess at an early stage any potential abnormal costs.

16.5.2 It is recommended that trenches for services including site drainage and water supply in **Area A** are cut over size in order to isolate pipe materials from potential contaminants and to enable maintenance to be conducted in "clean" material.

16.5.3 Water Companies have a statutory duty to supply wholesome water, which could be compromised by the selection of an inappropriate pipe material. For example, compounds such as petroleum hydrocarbons and solvents can permeate commonly used plastics pipes, and/or corrosive chemicals can reduce the service life of metallic pipes. Guidance has been developed for the selection of pipes in brownfield sites and is contained in a UKWIR Report[26].

16.5.4 Area A is brownfield, and therefore consideration of soil contaminant concentrations is required. Samples taken must be representative of the soil conditions in which the water pipes are proposed to be laid; normally water pipes are laid 0.7m to 1.3m below finished ground level.

16.5.5 At the time of writing, significant remediation earthworks are anticipated, and ground currently present along proposed supply pipe routes will almost certainly be redistributed. Consequently, to date laboratory testing of soil samples in line with UKWIR guidance has not been undertaken.

16.5.6 However, given the proposed remediation works, the Verification Report should include the results of further testing within 15m of the proposed route(s) of water supply pipes. In the meantime, it is considered likely that Yorkshire Water will request the use of barrier pipe mains, with plastic coated copper house connections, in Area A given that residual organic contaminants will still be present post-remediation, albeit at acceptable concentrations.

16.6 Health & safety issues - construction workers

16.6.1 Access into excavations etc. must be controlled and undertaken in accordance with the CDM Regulations 2015, most notably Regulation 22, to mitigate risk of collapse or asphyxiation.

16.6.2 Before site operations are started, the necessary COSHH statements and Health & Safety Plan should be drafted in accordance with the CDM regulations.

16.6.3 The bulk of the made ground will be retained on site. This made ground contains contaminants at concentrations above the guidance threshold values for an end use that includes domestic gardens. Workers involved in excavations for foundations, drainage, utilities etc are likely to come into direct contact with the made ground.

16.6.4 Although workers will only be exposed to the contaminated soil for a relatively short time, the contaminants represent a risk, and simple precautionary measures are required, i.e. good personal hygiene and basic personal protective equipment. See also comments in Section 12.7 regarding asbestos.

[26] *UKWIR Report 10/WM/03/21 – 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites'.*

16.6.5 Consequently, during the remediation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with protective clothing, footwear and gloves. Personnel should be instructed in why and how they are to be used.
- Hand-washing and boot-washing facilities.
- Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor should satisfy the Health & Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

16.7 Potential development constraints

16.7.1 **Topography** will require significant regrade earthworks across the entire site.

16.7.2 Deep quarry **backfill** (see Drawing 4486/11) and high walls present a potential development constraint.

16.7.3 In addition, quarry **highwalls** are visible in the south (within the 'UN testing area') and in the northwest of the site (within the 'burn ground') due to historical quarries only being partially backfilled. These will need to be accounted for when designing the site layout and determining platform levels.

16.7.4 Steep 'buried' highwalls have been identified where depths to bedrock vary significantly over very short distances. Development of plots which span highwalls will require careful consideration and early liaison with a specialist piling contractor and the warranty provider is strongly recommended.

16.7.5 Furthermore, it appears the quarry floors and highwalls were benched with '**pillars**' of unquarried sandstone identified within the quarries during the site investigation. Areas of shallow unworked sandstone are likely to create 'hard spots' which will require careful consideration and will likely need removing to a set depth prior to development reduce differential settlement (see comments made in 14.5).

16.7.6 **Badger** setts and **invasive plants** have been identified by a specialist ecologist (ECUS) Further advice should be sought from ECUS to allow for redevelopment following relocation of the badgers and specialist removal of the invasive plants.

16.7.7 Some deterioration of the surface is likely to be caused by trafficking, especially after topsoil has been stripped and during/after periods of significant rainfall. Consequently, it would be prudent to consider placement of a minimum 200mm thickness of suitable granular fill (i.e. a "blanket" of 6F2) along the line of proposed highways and any temporary haul roads to protect formation during the construction phase.

16.7.8 Enquiries should be made with existing utility providers with regards to their assets in the vicinity of the site and the appropriate easement or diversion works that may be required.

17 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

17.1 General

17.1.1 The site is located off Standard Drive and Blackmoorfoot Road about 3.5km southwest of Huddersfield town centre and occupies an area 29.3 ha.

17.1.2 The site can be divided into two:-

- **Area A:** Fireworks Factory – located in the centre of site and comprising a range of buildings, roadways and storage yards. Total area of 17.8 ha (60% of the total red line area).
- **Area B:** Agricultural land – located in the east, west and south. Total area of 11.5ha (c.40% of the total red line area)

17.1.3 Land generally falls to the east with several terraces, ramps, steep slopes and retaining walls across Area A and relatively gentle slopes across Area B. Significant quarry highwalls are visible in the south and in the northwest of the site.

17.1.4 It is understood that consideration is being given to redevelopment of the site with 770 domestic dwellings, local centre, extra care facility, associated gardens, POS, adoptable roads and sewers. An area of POS in the form of two linear parks, a village green, a natural play area and a community parkland within the far north of the site.

17.1.5 Within the quarries (**Area A**), ground conditions comprise a veneer of hardstand & Made Ground Topsoil overlying Ash & Clinker, Granular Made Ground & Quarry Backfill to depths between 6.m and 24m.

17.1.6 Quarry highwalls have been located at 37 locations (trenching and stitch probeholes) and appear to be very steep/vertical. Additionally, unworked sandstone 'pillars/roads' were recorded in 5 locations.

17.1.7 Within **Area A,** beyond the quarries, ground conditions generally comprise a veneer of Hardstand (tarmac or concrete), Made Ground Topsoil or Topsoil overlying Reworked Natural, Ash & Clinker & Cohesive & Granular Made Ground to depths between 0.1m and 3.7m (average c. 1.0m).

17.1.8 Underlying natural ground generally comprises Granular Residual Soils overlying Rough Rock Sandstone bedrock encountered from depths of between 1m and 3m.

17.1.9 Within **Area B**, natural ground predominantly comprised Granular Residual Soils to between 0.6m and 2.2m over Rough Rock Sandstone bedrock.

17.1.10 Rough Rock Sandstone comprised weak to moderately strong, light yellowish brown, fine and medium Sandstones recovered as gravel and cobbles.

17.2 Mining & quarrying

17.2.1 This site is located beyond the CA's defined coalfields.

17.2.2 No evidence of underground workings in the sandstone have been encountered. However, the presence of adits driven from the base of the quarries cannot be entirely ruled out.

17.2.3 The site was occupied by sandstone quarries (Matlock House, Crosland Hill & Waterhouse Quarries) from pre-1850 until 1995. The quarries targeted Rough Rock Sandstone which was used as a construction material. The majority of the quarries were backfilled in 1960s with an area in the far northeast and far south shown as partially backfilled by 1990s.

17.2.4 Backfilled quarries occupy c. 35% of the Firework Factory (Area A) and c. 20% of the total site area and reach depths of between 6m and 24m depth. The approximate outline and depth of quarry backfill is shown on Drawing 4486/11.

17.3 Potential issues associated with deep backfill

17.3.1 It is considered likely that during backfilling of the sandstone quarries the made ground was placed without mechanical compaction in irregular and thick layers, and without any screening to remove oversized materials, degradable waste etc. Such backfill poses a risk to any proposed development due to the potential for differential settlement, long term 'creep' settlement and inundation settlement.

17.3.2 At this stage, it is considered that the presence of deep backfill will have implications for foundations, drainage, new utilities and highways.

17.4 Foundations

17.4.1 Within **Area B** and **Area A** (beyond former sandstone quarries and where made ground is <2.5m thick on completion of turnover earthworks), the natural ground is suitable for strip/trench fill footings from a minimum depth of 0.6m. Where localised cohesive soils are encountered, the footing depth will require increasing to 0.9m depth.

17.4.2 Within the footprint of former quarries and beyond influencing distance of quarry highwalls, following turnover earthworks and ground improvement techniques, the re-engineered fill should be suitable for rafts or heavily reinforced strip foundations providing the fill is placed to an end product specification.

17.4.3 Due to issues associated with thickness of fill and differential settlement, plots over or adjacent to quarry highwalls will require piled (bored) foundations.

17.4.4 Significant obstructions are present throughout the quarry backfill and highwalls are anticipated to be near vertical. Therefore, piles will require pre-boring, casing and socketing into competent sandstone bedrock.

17.5 Hazardous gas

17.5.1 The site is in an area where **5% to 10%** of homes are estimated to be above the action level, and **basic** radon protection measures are required in new dwellings.

17.5.2 There are known areas of landfill and historical quarrying both within and beyond the site's boundary. Consequently, there is a plausible risk of hazardous gas generation and monitoring wells have been installed in 30 shallow rotary probeholes. A further 3 shallow gas monitoring installations, comprising a 19mm galvanised steel pipe; 1m in length with a lower 500mm slotted section and an upper 500mm solid section have been installed on the eastern boundary of the southern field.

17.5.3 Monitoring is underway and a hazardous gas risk assessment will be issued on completion in April 2024.

17.6 Contamination & remediation

17.6.1 As summarised in Section 16.2, remediation is required across the Firework Factory site due to the presence of elevated concentrations of inorganic contaminants and asbestos. Furthermore, remediation of isolated pockets of organic contamination is also required.

17.6.2 The Quarry Backfill requires turnover earthworks with further ground improvement required in areas of deep made ground (former quarries).

17.6.3 Where made ground remains beneath gardens and landscaped areas following earthworks turnover and regrade, it should be isolated beneath a minimum of 600mm thick, clean soil cover layer underlain by 150mm 'hard dig' layer.

17.6.4 Topsoil typically 300mm thick is present across most of Area B. Testing suggests this material is chemically suitable for re-use. However, Topsoil, sporadically present across Area A is not considered suitable for re-use.

17.7 Flooding

17.7.1 The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low.

17.8 Drainage

17.8.1 Due to the presence of very deep made ground, soakaways will not provide a suitable drainage solution for surface water run-off across **Area A**. Consequently, it will be necessary to consider alternative sustainable drainage systems (SuDS), and there may be a need for surface water balancing.

17.8.2 Drainage Engineers could use the infiltration rates for testing undertaken in **Area B** (see Section 10) to determine the feasibility of soakaways as a solution for the discharge of surface water run-off.

17.9 Highways

17.9.1 Made ground is present across the majority of Area A, typically to depths of between 6.0m and 24m within former quarries and <4m depth (average c. 1.0m) beyond former quarries , and consultation with the adopting authority, regarding the specification of the highways, is strongly recommended.

17.9.2 Where made ground is present it should be excavated and either replaced with suitable aggregate, or screened, to allow selection of suitable material, before being replaced in engineered layers. Where the made ground is re-engineered it is considered that a CBR value of at least 3% should be achievable. However, this should be verified by field trials.

17.9.3 Beyond areas of deep made ground (in Area A), based on visual inspection of the shallow natural materials and published guidance, the Granular Residual Soil should provide a CBR value of at least 3%. This value should be verified prior to or during construction.

17.10 Uncertainties

17.10.1 Whilst extensive ground investigation has been undertaken across the site some uncertainties remain. It is highly unlikely, even with further intensive phases of ground investigation, that these uncertainties would be addressed.

17.10.2 Key uncertainties include:

- The line of the quarry highwalls.
- Unidentified buried benches.
- 'Islands' of rock within the Quarry Backfill consisting of former roadways, crane platforms or areas of rock that were did not meet the quality requirements.
- Very large boulders at depth, which could give the false impression of bedrock being reached.
- Variation in backfill depth and density.
- Localised voids within the Quarry Backfill as a result of boulders 'bridging'.
- Localised pockets of degrading/corroding materials within the Quarry Backfill.

17.10.3 The potential mitigation for many of the above risks would be to advance rotary probeholes on a tight grid pattern across the quarries during the preparatory earthworks.

17.11 Further works

17.11.1 Given the constraints discussed in Section 8.2 (existing buildings across the majority of Area A) a minimum of a post-demolition trial pit investigation will be required in order to remove residual uncertainties with respect to ground, and provide final definitive recommendations with respect to contamination and foundations.

17.11.2 In accordance with BS 8004 and EC7, piling contractors may require rotary cored boreholes extended a minimum 5m into competent bedrock using rotary coring techniques.

17.11.3 Due to the problems in assessing the in-situ density of the Quarry Backfill, assessing the likely long-term settlement is difficult. To quantify the risk and provide realistic settlement estimates, some load testing (embankment or zone load tests) with an inundation phase is recommended. The results of which will help inform the final depth of turnover and type of ground improvement required.

17.11.4 Beyond the former quarries, if deep infrastructure is proposed (and pitting encounters hard rock at shallow depth), rotary cored boreholes may be required to provide further information (spacing of bedding, fractures, strength etc).

17.11.5 If a detention basin is proposed, water table levels should be taken from borehole monitoring wells over 4 consecutive seasons, for at least 3 points in the basin area.

17.11.6 Preparation of a Remediation Strategy.

Appendix A

General Notes

01 - Environmental setting
Generic notes – geoenvironmental investigations

General

Third party information obtained from the British Geological Survey (BGS), the Coal Authority, the Local Authority etc is presented in the "Search Responses" Appendix of this Geoenvironmental Report.

Geology, mining & quarrying

In order to establish the geological setting of a site, Lithos refer to BGS maps for the area, and the relevant geological memoir. Further information is sourced by reference to current and historical OS plans.

In July 2011, the Coal Authority (CA) formalised their requirements in relation to planning applications and introduced some new terminology. The CA, using its extensive records has prepared plans for all coalfield Local Planning Authorities, which effectively refines the defined coalfield areas into High Risk and Low Risk areas. **High Risk** areas are likely to be affected by a range of legacy issues that pose a risk to surface stability, including: mine entries; shallow coal workings; workable coal seam outcrops; mines gas; and previous surface mining sites. **Low Risk** areas comprise the remainder of the defined coalfield, and are areas where no known defined risks have been recorded; although there may still be unrecorded issues. Where a site lies within either a High or Low Risk area, a mining report is obtained from the CA.

Landfills

Reference is made to publicly available Government held digital data via **QGIS** (an Open Source Geographic Information System), data from Landmark or Groundsure, and sometimes the Environment Agency and the Local Authority with respect to known areas of landfilling within 250m of the proposed development site.

Historical OS plans are also inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips etc.

Radon

Radon is a colourless, odourless gas, which is radioactive. It is formed in strata that contain uranium and radium (most notably granite), and can move though fissures eventually discharging to atmosphere, or the spaces under and within buildings. Where radon occurs in high concentrations, it can pose a risk to health.

In order to assess potential risks associated with radon gas, Lithos refer to BRE Report BR211[1], and the Public Health England website. Advice on the limitation of exposure of the population to radon in buildings was originally published in 1990 by the National Radiological Protection Board (NRPB), which joined the Health Protection Agency (HPA) in 2005; the HPA updated NRPB advice in July 2010[2]. The HPA became part of Public Health England in 2013.

The HPA recommended that the NRPB radon Action Level for homes be retained, and a new Target Level for radon in homes be introduced. The values of the Action Level and Target Level, expressed as the annual average radon concentration in the home, are 200 Bqm^{-3} and 100 Bqm^{-3} respectively. The Target Level was to provide an objective for remedial action in existing homes and preventive action in new homes.

The term 'radon Affected Area' is defined as those parts of the country with >1% of homes estimated to be above the Action Levels. The NRPB first indicated which parts of the country should be regarded as radon Affected Areas in 1990. A more detailed mapping method was developed by the HPA in conjunction with the British Geological Survey in 2007[3]. The level of protection needed is site-specific and can be determined by reference to this mapping on the Public Health England website, which indicates the highest radon potential within each 1km grid square. Each 1km grid square is classified on the basis of the percentage of existing homes within that grid square estimated to have radon concentrations above the Action Level. There are 6 'bands': <1%; 1 to 3%; 3 to 5%; 5 to 10%; 10 to 30%; and >30%.

The NRPB advised that action should be taken to reduce radon concentrations in existing homes if the radon concentration exceeded the Action Level of 200 Bqm^{-3} in room air averaged over a year; ten times the average UK domestic radon concentration. NRPB advice informed changes in the requirements for radon protection in new buildings.

- **Basic** preventive measures are required in new buildings, extensions, conversions and refurbishments if the probability of exceeding the Action Level is **>3%** in England and Wales, and >1% in Scotland and Northern Ireland.
- Provision for further preventive (**Full**) measures is required in new buildings if the probability of exceeding the Action Level is **>10%**.

At present Building Regulations Approved Document C advocates basic measures for the probability banding 3% to 10%, and full measures if >10%. However, Public Health England would like to see all new build include basic measures.

Action & Target Levels should also be applied to non-domestic buildings with public occupancy exceeding 2,000 hrs/yr and to all schools.

Hydrogeology

Reference is made to publicly available Government held digital data via QGIS, and Landmark or Groundsure with respect to:

- Groundwater quality
- Recorded pollution incidents
- Licensed groundwater abstractions

From April 2010 the EA's Groundwater Protection Policy uses aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply), but also their role in supporting surface water flows and wetland ecosystems. The aquifer designation data is based on geological mapping provided by the British Geological Survey. The maps are split into two different types of aquifer designation:

- Superficial (Drift) - permeable unconsolidated (loose) deposits. For example, sands and gravels
- Bedrock - solid permeable formations e.g. sandstone, chalk and limestone

The maps display the following aquifer designations:

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

Secondary aquifers: These include a wide range of rock layers or superficial deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into three types:

- **Secondary A** - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
- **Secondary B** - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
- Secondary undifferentiated - In most cases, this is because the rock type in question has previously been designated as both a minor and non-aquifer in different locations due to the variable characteristics.

[1] BRE Report BR211, 2015: "Radon: guidance on protective measures for new buildings.

[2] Limitation of Human Exposure to Radon, Documents of the Health Protection Agency - Radiation, Chemical and Environmental Hazards, RCE-15. July 2010.

[3] Miles JCH, Appleton JD, Rees DM, Green BMR, Adlam KAM and Myers AH (2007). Indicative Atlas of Radon in England and Wales. Chilton, HPA-RPD-033.

Unproductive strata: These are rock layers or superficial deposits with low permeability that have negligible significance for water supply or river base flow.

The EA maps only display the principal and secondary aquifers as coloured areas. All uncoloured areas on the map will be unproductive strata. However, for uncoloured areas on the superficial (drift) designation map it is not possible to distinguish between areas of unproductive strata and areas where no superficial deposits are present; to do this, it is necessary to consult the published geological survey maps.

For the purposes of the EA's Groundwater Protection Policy the following default position applies, unless there is site specific information to the contrary:

- If no superficial (drift) aquifers are shown, the bedrock designation is adopted
- In areas where the bedrock designation shows unproductive strata (the uncoloured areas) the superficial designation is adopted
- In all other areas, the more sensitive of the two designations is used (e.g. If secondary superficial overlies principal bedrock, an overall designation of principal is assumed)

The EA have also designated groundwater Source Protection Zones, which are based on proximity to a groundwater source (springs, wells and abstraction boreholes). The size of a Source Protection Zone is a function of the aquifer, volume of groundwater abstracted and the effective rainfall, and may vary from tens to several thousand hectares.

Hydrology

Reference is made to publicly available Government held digital data via QGIS, and Landmark or Groundsure with respect to:

- Surface water quality
- Recorded pollution incidents
- Licensed abstractions (groundwater & surface waters)
- Licensed discharge consents
- Site susceptibility to flooding

The EA have set **water quality** targets for all rivers. These targets are known as River Quality Objectives (RQOs). The water quality classification scheme used to set RQO planning targets is known as the River Ecosystem scheme. The scheme comprises five classes (RE1 to RE5) which reflect the chemical quality requirements of communities of plants and animals occurring in our rivers.

General Quality Assessment (GQA) grades reflect actual water quality. They are based on the most recent analytical testing undertaken by the EA. There are 6 GQA grades (denoted A to F) defined by the concentrations of biochemical oxygen demand, total ammonia and dissolved oxygen.

The susceptibility of a site to **flooding** is assessed by reference to a Flood Map on the Environment Agency's website. These maps show natural floodplains - areas potentially at risk of flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas. There are two different kinds of area shown on the Flood Map:

1. Dark blue areas (Flood Zone 3) could be flooded by the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year, or by a river by a flood that has a 1% (1 in 100) or greater chance of happening each year
2. Light blue areas (Flood Zone 2) show the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Where there is no blue shading (Flood Zone 1), there is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

The maps also show all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods.

The Agency's assessment of the likelihood of flooding from rivers and the sea at any location is based on the presence and effect of all flood defences, predicted flood levels, and ground levels.

It should also be noted that as the floodplain shown is the 1 in 100 year, areas outside this may be flooded by more extreme floods (e.g. the 1 in 1000 year flood). Also, parts of the areas shown at risk of flooding will be flooded by lesser floods (e.g. the 1 in 5 year flood). In some places due to the shape of the river valley, the smaller floods will flood a very similar extent to larger floods but to a lesser depth.

If a site falls within a floodplain, it is recommended that a flood survey be undertaken by a specialist who can advise on appropriate mitigating measures; i.e. raising slab levels, provision of storage etc. In accordance with Chapter 10 of the National Planning Policy Framework, a site-specific flood risk assessment is required for: proposals of 1 hectare or greater in Flood Zone 1, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and any new development in Flood Zones 2 and 3.

COMAH & explosive sites

Lithos obtain information from Landmark or Groundsure with respect to Control of Major Accident Hazards (COMAH) or explosive sites within 1km of the proposed development site. Lithos' report refers to any that are present, and recommends that the Client seeks further advice from the HSE.

Areas around COMAH sites (chemical plants etc) are zoned with respect to the implementation of emergency plans. The HSE are a statutory consultee to the local planning authority for all COMAH sites. The COMAH site may have to revise its emergency action plan if development occurs. This might be quite straightforward or could entail significant expenditure. Consequently, the COMAH site may object to a proposed development (although it is the Local Authority who have final say, and they are likely to place more weight on advice from the HSE).

Preliminary conceptual site model

The site's environmental setting (and proposed end use) is used by Lithos to assess the significance of any contamination encountered during the subsequent ground investigation.

Assessment of contaminated land is based on an evaluation of pollutant linkages (source-pathway-receptor). Contaminants within the near surface strata represent a potential source of pollution. The environment (most notably groundwater), site workers and end users are potential receptors.

Potential pollutant linkages are shown on a preliminary conceptual site model (pCSM). A CSM is essentially a cross-section through a site that reflects both the surface topography and underlying geology, and shows surface features of interest. The most significant sources of contamination are then superimposed onto this cross-section together with potential receptors (human health & controlled waters), and plausible pathways between the two. In addition to environmental issues, the CSM should also highlight geotechnical issues.

A pCSM is prepared after consideration of all available "desk study" data, and before design of the ground investigation. Data reviewed should include historical plans (with superimposition on a current-day plan), previous SI reports, geological maps etc. The pCSM, in conjunction with knowledge of site constraints (buildings, services, slopes etc) is used to design the ground investigation.

The revised CSM takes account of data obtained during the ground investigation, including the distribution of made ground, the nature and distribution of contamination etc.

02 - Ground investigation fieldwork
Generic notes – geoenvironmental investigations

General

Lithos Ground Investigations are undertaken in accordance with current UK guidance including:

- BS5930:2015 "Code of practice for site investigation"
- Eurocode 7: BS EN 1997-1:2004. Geotechnical design - Part 1: General rules
- Eurocode 7: BS EN 1997-2:2007. Geotechnical design - Part 2: Ground investigation and testing
- BS10175:2013 "Code of practice for the identification of potentially contaminated sites"
- "Technical Aspects of Site Investigation" – EA R&D Technical Report P5-065/TR (2000)
- "Development of appropriate soil sampling strategies for land contamination" – EA R&D Technical Report P5-066/TR (2001)
- Contaminated Land Reports 1 to 6, most notably CLR Report No. 4 "Sampling strategies for contaminated land"
- "Guidance on the protection of housing on contaminated land" – NHBC & EA R&D Publication 66 (2000)
- AGS: 1996 "Guide to the selection of Geotechnical Soil Laboratory Testing"

Exploratory hole locations

Exploratory hole locations are selected by Lithos, prior to commencement of fieldwork, to provide a representative view of the strata beneath the site and to target potential contaminant sources identified during the preliminary investigation (desk study). Additional exploratory locations are often determined by the site engineer in light of the ground conditions actually encountered; this enables better delineation of the depth and lateral extent of organic contamination, poor ground, relict structures etc.

Investigation techniques

Ground conditions can be investigated by a number of techniques; the procedures used are in general accordance with BS5930: 2015 and BS1377: 1990. Techniques most commonly used by Lithos include:

- Machine excavated **trial pits**, usually equipped with a backactor and a 0.6m wide bucket. Allows a thorough inspection of the ground; especially the uppermost 1m or so (but able to reach depths of up to c. 4m), with the recovery of representative, disturbed samples. Also used to conduct soakaway testing.
- **Window or windowless** sampling boreholes (**dynamic sampling**). Constraints associated with existing buildings, operations and underground service runs can render some sites partly or wholly inaccessible to a mechanical excavator. In such circumstances, window sampling is often the most appropriate technique. A window sampling drilling rig can be manoeuvred in areas of restricted access and results in minimal disturbance of the ground (a 150mm diameter tarmac/concrete core can be lifted and put to one side). However, it should be noted that window sampling allows only a limited inspection of the ground (especially made ground with a significant proportion of coarse material).
- **Cable percussive** (Shell & Auger) boreholes, typically using 150mm diameter tools and casing. Enables the recovery of soil samples and data from greater depth than is possible via trial pitting or a mini-percussive drill rig. Also enables the installation of better/deeper monitoring wells (cf use of a mini-percussive drill rig) due to the utilisation of temporary steel casing during drilling.
- **Rotary percussive** open-hole probeholes are typically drilled using a tri-cone rock roller or polycrystalline diamond compact (PDC) bit with air as the flushing medium. Probeholes are generally lined through made ground with temporary steel casing to prevent hole collapse. Often used to penetrate bedrock to investigate abandoned shallow mineworkings
- **Rotary cored** boreholes. A rock core is cut by a bit, passes up into the inner barrel and, at the end of the coring run, the core barrel assembly is lifted to the surface. Core drilling is relatively expensive, but essential if quality data is required to assess issues associated with deep excavation, rock slope stability etc.

Where installed, gas\groundwater monitoring **wells** typically comprise a lower slotted section, surrounded by a filter pack of 10 mm non-calcareous gravel and an upper plain section surrounded in part by a bentonite seal and in part by gravel or arisings. The top of the plain pipe is cut off below ground level and the monitoring well protected by a square, stopcock type manhole cover set in concrete, or the plain pipe is cut off just above ground level and the well protected by 100mm diameter steel borehole helmet set in concrete. Monitoring well details, including the location of the response zone and bentonite seal are presented on the relevant exploratory hole logs.

In-situ testing

Relative densities of granular materials given on the trial pit logs are based on visual inspection only, they do not relate to any specific bearing capacities.

The relative densities of granular materials encountered in cable percussive boreholes are based on Standard Penetration Test (SPT) results. SPTs are carried out boreholes, in accordance with BS 1377 1990, Part 9 Section 3.3. Where full penetration (600mm) is not possible, N values are calculated by linear extrapolation and are shown on the logs as N* = x. The strength of cohesive deposits is determined using a hand shear vane.

Shear strength test results (hand vane readings) reported on trial pit logs are considered to be more reliable than those reported on window sample logs. Significant sample disturbance occurs during window sampling and consequently shear strength results on disturbed window samples are generally lower than results obtained during trial pitting, in-situ or in large excavated blocks.

Sampling

Typically Lithos collect at least three soil samples from each exploratory hole, although in practice a greater number are often taken. The collection of a sufficient number of samples provides a sound basis upon which to schedule laboratory analysis, ensuring:

- A sufficient number of samples from each (common) site material are tested
- Horizontal and vertical coverage of the site is adequate, thereby providing a robust data set for use in the conceptual ground model
- Any localised, significant, but non-pervasive conditions are considered

Made ground and natural soils encountered in the field during a ground investigation often contain a significant proportion of coarse grained material (e.g. brick etc). Soil samples obtained during most investigations are often only truly representative of the in-situ soil mass where there is an absence of particles coarser than medium gravel; i.e the entire soil mass would pass a 20mm sieve.

Representative bulk samples of the **soil mass** are retrieved from coarse soils for specific geotechnical tests (most notably grading and compaction); this typically requires the collection of at least 10kg of soil, and occasionally >50kg. However, in the context of assessing land contamination, it is generally accepted that samples should be representative of the **soil matrix** of the stratum from which they are taken. Consequently, truly representative samples of coarse soils for subsequent contaminant analysis are not obtained - only the finer fraction is placed in sample containers. Coarse constituents not sampled would typically comprise any 'particles' with an average diameter greater than about 20mm (i.e. coarse gravel, cobble and boulder).

At present, neither ISO/IEC 17025 nor MCERTS specify sample pre-treatment with respect to stone removal. Unsurprisingly therefore UKAS accredited testing laboratories do not adopt the same approach to stones[1] – some crush and test the "as received" soil, whilst others sieve out stones and analyse only the residual soil (the sieve size used varies depending on the laboratory).

In essence, samples taken from coarser soils for contaminant analysis are "screened" by the geoenvironmental engineer in the field, and often sieved again by the laboratory during sample preparation. Geoenvironmental engineers do not typically re-calculate soil mass contaminant concentrations by taking account of the unsampled coarse fraction. Likewise, laboratories that remove stones typically report contaminant concentrations based on the dry weight of soil passing the sieve. In the context of land contamination and human health risk assessment, this is considered reasonable, because it is the soil matrix which is of greatest concern. Stones are unlikely to:

- Provide a significant source for plant uptake (consumption of vegetables)
- Remain on vegetables after washing (consumption of vegetables)
- Be eaten (accidentally by an adult, or deliberately by a child)
- Be whipped-up by the wind for dust generation (inhalation)
- Stick to the skin for any length of time (dermal contact)
- Yield toxic vapour (inhalation)

Consequently, Lithos instruct labs to remove all stones >10mm, and to report the results as dry-weight based on the mass of matrix tested. However, the laboratory are given site-specific instruction where coarse stones are coated in say oil, or impregnated with mobile contaminants such as diesel. Where the stones are predominantly natural, or inert (e.g. brick, concrete etc), removal will clearly result in higher reported concentrations, than if the stones were crushed and added to the matrix.

Where the stones include a significant proportion of contaminant-rich material (e.g. slag, fragments of galvanised metal etc) an argument could be made for crushing and analysing. However, provided the stones are stable (i.e. unlikely to disintegrate or degrade) they should not pose a significant risk to human health for the reasons stated above.

Sometimes it is necessary to obtain samples that are not representative of the wider soil matrix, for example when investigating localised, significant, but non-pervasive conditions. Any such unrepresentative samples are annotated with the suffix '*' (eg 2D*, or 4G*). Lithos' site engineer describes both the unrepresentative sample, and the soil mass from which it was been taken.

Sample Containers (for contaminant analysis). Samples of soil for contaminant testing are placed into appropriate containers (see below). Soil samples for organic analysis are stored in cool boxes, at a temperature of approximately 4°C, until delivery to the selected laboratory.

Anticipated testing	Container(s)
Asbestos identification	1000ml plastic tub
pH & metals	1000ml plastic tub or 250ml glass jars
non-volatile organics	250ml glass jars
Speciated TPH	250ml & 50ml glass jars
VOCs (incl. naphthalene and\or GRO)	50ml glass jar

Sample Containers (for geotechnical analysis). The majority of samples are only scheduled for PI and sulphate testing, for which 500g of sample is required (a full 0.5-litre plastic tub). However, bulk bags are taken where scheduling of compaction or grading tests is proposed.

Groundwater

Where encountered during fieldwork, groundwater is recorded on exploratory hole logs. If monitoring wells are installed, groundwater levels are also recorded on one or more occasions after completion of the fieldwork. Long-term monitoring of standpipes or piezometers is always recommended if water levels are likely to have a significant effect on earthworks or foundation design.

It should be borne in mind that the rapid excavation rates used during a ground investigation may not allow the establishment of equilibrium water levels. Water levels are likely to fluctuate with season/rainfall and could be substantially higher at wetter times of the year than those found during this investigation.

Description of strata

Soils encountered during a Lithos investigation are described (logged) in general accordance with BS 5930:2015. The descriptions and depth of strata encountered are presented on the exploratory hole logs and summarised in the Ground Conditions section within the main body of text. The materials encountered in the trial pits are logged, samples taken, and tests performed on the in-situ materials in the excavation faces, to depths of up to 1.2m; below this depth these operations are conducted at the surface on disturbed samples recovered from the excavation.

[1] *Mark Perrin. Stoned – Sample Preparation for Soils Analysis. Ground Engineering, April 2007.*

03 – Geotechnical laboratory testing
Generic notes – geoenvironmental investigations

General

Soil samples are delivered to the laboratory for testing along with a schedule of testing drawn up by Lithos. All tests are carried out in accordance with BS 1377:1990. The following laboratory testing is routinely carried out on a selection of samples:

- Atterberg limits & moisture contents
- Soluble sulphate & pH

Where soft, cohesive soils are encountered, one-dimensional consolidation tests are scheduled in order to assess settlement characteristics, and unconsolidated undrained triaxial compression tests to assess shear strength.

The additional tests are typically only scheduled where significant earthworks regrade is anticipated:

- Grading
- Compaction tests
- Particle density

Test results are presented as received in an Appendix to the Geoenvironmental Report.

Atterberg limits & moisture content

The Liquid and Plastic Limits of samples of natural in-situ clay are determined using the cone penetrometer method and the rolling thread test. These tests enable determination of an average Plasticity Index (PI) for each "type" of clay, although judgement is applied where variable results are reported.

PI can be related to shrinkability (low, medium or high) and then to minimum founding depth. Lithos typically only consider a soil to be shrinkable if the proportion finer than 63µm is >35%. PI results are compared against guidance given in the NHBC Standards, Chapter 4.2 (revised April 2003), which advocates the use of modified Plasticity Index (I'p), defined as:

I'p = Ip * (%< 425µm/100)

i.e. if PI is 30%, but the soil contains 80% < 425µm, then: I'p = 30 * 80/100 = 24%.

It should be noted that in accordance with the requirements of BS 1377, the % passing the 425µm sieve is routinely reported by testing labs. Lithos apply engineering judgment where PI results are spread over a range of classifications. Consideration is given to:

- The average values for each particular soil type (ie differentiate between residual soil and alluvium)
- The number of results in each class and
- The actual values

Unless the judgment strongly indicates otherwise, Lithos typically adopts a conservative approach and recommends assumption of the higher classification.

Soluble sulphate and pH

Sulphates in soil and groundwater are the chemical agents most likely to attack sub-surface concrete, resulting in expansion and softening of the concrete to a mush. Another common cause of concrete deterioration is groundwater acidity.

The rate of chemical attack depends on the concentration of aggressive ions and their replenishment at the reaction surface. The rate of replenishment is related to the presence and mobility of groundwater.

Lithos refer to BRE Special Digest 1 (SD1) "Concrete in aggressive ground. Part 1: Assessing the aggressive chemical environment" (2005). SD 1 provides definitions of:

- The nature of the site (greenfield, brownfield or pyritic)
- The groundwater regime (static, mobile or highly mobile)
- The design sulphate class (DS class) and
- The aggressive chemical environment for concrete (ACEC class)

Lithos reports clearly state each of the above for the site being considered.

The concentrations of sulphate in aqueous soil/fill extracts are determined in the laboratory using the gravimetric method. The results are expressed in terms of SO_4 for direct comparison with BS 5328:1997. The pH value of each sample was determined by the electrometric method.

SD1 also discusses determination of "representative" sulphate concentration from a number of tests. Essentially if <10 samples of a given soil-type have been tested, the highest measured sulphate concentration should be taken. If >10 samples have been tested, the mean of the highest 20% of the sulphate test results can be taken. With respect to groundwater, the highest sulphate concentration should always be taken.

With respect to pH (soil & groundwater) the value used is the lowest value if <10 samples have been tested and the mean of the lowest 20% if >10 samples have been tested.

Oedometer (Consolidation) tests

Oedometer tests measure a soil's consolidation properties, and are performed by applying different loads to a soil sample and measuring the deformation response. Typically the sample is subject to 5 incremental pressures (4 loading & 1 unloading), and the convention is for each subsequent pressure to be double the previous pressure. BS1377 suggests the **initial** pressure should be:

a) For stiff soils the effective overburden pressure*
b) For firm soils "somewhat less" than the effective overburden pressure
c) For soft soils "appreciably less" than the effective overburden pressure, usually 25 kPa or less
d) For very soft soils very low, typically 5 kPa or 10 kPa

* Effective **overburden pressure** (kNm^{-2}) = depth (m) x soil bulk unit weight (kNm^{-3})

Results from these tests are used to predict how a soil in the field will deform in response to a change in effective stress.

Triaxial tests

This test measures the mechanical properties of a soil by placing the sample between two parallel platens which apply stress in one (usually vertical) direction, with fluid used to apply a confining pressure in the perpendicular directions. During the test, the surrounding fluid is pressurized, and then stress on the platens is increased until the material in the cylinder fails.

From triaxial test data, it is possible to extract fundamental material parameters, including its angle of shearing resistance, apparent cohesion, and dilatancy angle. These parameters are then used in computer models to predict how the material will behave in a larger-scale engineering application.

Quick (single stage, Unconsolidated, Undrained tests) are most appropriate for foundation design. This is because load is applied relatively quickly, and shear strength of the clay will be lowest initially; after the applied load causes some consolidation of the ground (after drainage results in dissipation of short-term excess pore water pressure), the in-situ clays will become progressively stronger and hence the factor of safety will increase. Confining pressure is specified as equivalent to overburden pressure (kNm^{-2}).

Foundations on granular soils would use effective shear strength parameters (c' and phi') to assess safe bearing capacity, as the soil would fully drain quickly. These effective shear strength parameters could be determined from Consolidated Undrained (or sometimes the more expensive Consolidated Drained) triaxial tests, but often correlations to the SPT are used.

Unconsolidated Undrained triaxial tests are most appropriate for assessment of the stability of fill slopes on clays. Similar to foundations, the application of load gradually increases the strength of the clays and hence the critical case is the short term undrained condition.

Consolidated Undrained (or sometimes **Consolidated Drained**) triaxial tests are most appropriate for assessment of the stability of cut slopes in clays. This is because unloading of the ground leads to short term reduction in pore pressures that approximately balance the unloading, hence the soil strength is largely unchanged. Over time the reduced pore pressures suck water in, which leads in to the progressive increase in pore pressure and loss of strength. The fully drained state is critical, which must be modelled using effective strength parameters and a reasonable estimate of the long term water table conditions.

Slopes formed in granular soils would use effective shear strength parameters (c' and phi') to assess safe bearing capacity, as the soil would fully drain quickly. These effective shear strength parameters could be determined from Consolidated Undrained (or sometimes the more expensive Consolidated Drained) triaxial tests, but often correlations to the SPT are used.

Determination of analytical suite

An assessment of potential contaminants associated with the former usages of the site is undertaken with reference to CLR 8 "Potential contaminants for the assessment of land" and the relevant DETR Industry Profile(s).

Common contaminants

Common **Inorganic** Contaminants include:

- Metals, most notably cadmium, copper, chromium, mercury, lead, nickel, and zinc
- Semi-metals, most notably arsenic, selenium, and (water soluble) boron
- Non-metals, most notably sulphur
- Inorganic anions, most notably cyanides (free & complex), sulphates, sulphides, and nitrates

With respect to the terminology used by most analytical laboratories:

Total cyanide = Free cyanide + Complex cyanide

Total cyanide (CN) is determined by acid extraction; whereas free cyanide is the water soluble fraction. Complex cyanide is "bound" in compounds and is hard to breakdown. Laboratory determination of complex CN involves subjecting the sample to UV digestion for determination of both free and total CN.

Thiocyanate (SCN) is a different species combined with sulphur.

Elemental sulphur (S) and free sulphur are the same. Total sulphur is all forms, including that present in sulphates (SO_4), sulphides etc.

There are 2 forms of chromium (Cr), chromium VI and chromium III. Chromium VI is the more toxic of these. In soils, total chromium is determined by a strong aqua regia acid digestion. Chromium VI is an empirical method based on a water extract test.

Common **Organic** Contaminants include hydrocarbons, phenols, and polychlorinated biphenyls.

Petroleum is a mixture of hydrocarbons produced from the distillation of crude oil, and includes aliphatics (alkanes, alkenes and cycloalkanes), aromatics (benzene and derivatives) and hydrocarbon-like compounds containing minor amounts of oxygen, sulphur or nitrogen. Petroleum hydrocarbons can be grouped based on the carbon number range:

- GRO – Gasoline Range Organics (typically C_6 to C_{10}). Also referred to as PRO – Petroleum Range Organics
- DRO – Diesel Range Organics (typically C_{10} to C_{28})
- LRO - Lubricating Oil Range Organics (typically C_{28} to C_{40})
- MRO – Mineral Oil Range Organics (typically C_{18} to C_{44})

However, it should be borne in mind that the terms "GRO" and "DRO" analysis are purely descriptive terms, the exact definition of which varies. Total Petroleum Hydrocarbons (TPH) is also a poorly defined term; some testing laboratories regard TPH as hydrocarbons ranging from C_5-C_{40}, whereas others define TPH as C_{10}-C_{30}.

The composition of a TPH plume migrating through the ground can vary significantly; this is primarily dictated by the nature of the source (e.g. petrol, diesel, engine oil etc). Furthermore, different hydrocarbons are affected differently by weathering processes, and this can result in further variation in the chemical composition of the TPH.

Gasoline contains light aliphatic hydrocarbons (especially within the C_4 to C_5 range) that are volatile. The aromatic hydrocarbons in gasoline are primarily benzene, toluene, ethylbenzene and xylenes, referred to as BTEX. Small amounts of polycyclic aromatic hydrocarbons (PAHs) such as benzo(a)pyrene may also be present. Diesel and light fuel oils have higher molecular weights than gasoline. Consequently, they are less volatile and less water soluble. About 25 to 35% is composed of aromatic hydrocarbons. BTEX concentrations are generally low.

Heavy Fuel Oils are typically dark in colour and considerably more viscous than water. They contain 15 to 40% aromatic hydrocarbons. Polar nitrogen, sulphur and oxygen-containing compounds (NSO) compounds are also present. Lubricating Oils are relatively viscous and insoluble in groundwater. They may contain 10 to 30% aromatics, including the heavier PAHs. NSO compounds are also common.

Polycyclic Aromatic Hydrocarbons (PAHs) have two or more fused benzene rings as a structural characteristic. PAH compounds are present in both petrol and diesel, although in significantly lower concentrations than in coal tars. Certain PAH compounds are carcinogenic (benzo(a)pyrene) and\or mobile in the environment (naphthalene).

Volatile Organic Compounds (VOCs) are organic chemicals, and most are liquids that readily evaporate on exposure to air. Examples include benzene, toluene, xylene, chloroform etc. Semi-Volatile Organic Compounds (sVOCs) include phenol and benzo(a)pyrene, and have relatively low boiling points. Both groups of chemicals are readily absorbed through skin and some, such as benzene, are believed to be linked to tumour growth.

Phenols are compounds that have a hydroxyl group (-OH) attached to an aromatic ring (ie include a benzene ring and an –OH group). Most are colourless solids. A solution of phenol in water is known as carbolic acid, and is a powerful antiseptic. However, phenol vapour is toxic, and skin contact can result in burns.

Polychlorinated Biphenyls (PCBs) were used in pre-1974 transformers as dielectric fluids. PCB's are of increasing toxicity relative to the degree of chlorination. Acute symptoms of PCB poisoning are irritation of the respiratory tract leading to coughing and shortness of breath. Nausea, vomiting and abdominal pain are caused by ingestion of PCB's.

Dioxins and furans (polychlorinated dibenzodioxins and polychlorinated dibenzofurans) are some of the most toxic chemicals known; in the environment, they tend to bio-accumulate in the food chain. Dioxin is a general term that describes a group of hundreds of chemicals that are highly persistent in the environment. The most toxic compound is 2,3,7,8-tetrachlorodibenzo-p-dioxin or TCDD.

Dioxin is formed by burning chlorine-based chemical compounds with hydrocarbons. The major source of dioxin in the environment comes from waste-burning incinerators and also from backyard burn-barrels. Dioxin pollution is also affiliated with paper mills which use chlorine bleaching in their process and with the production of Polyvinyl Chloride (PVC) plastics and with the production of certain chlorinated chemicals (like many pesticides).

Methods of analysis (organic compounds)

TPH by GC-FID is an analytical technique which only detects hydrocarbons (aliphatic and aromatic) in the range C_{10} to C_{40} (volatiles, heavy tars, humic material and sulphur are not detected). The laboratory can provide a broad, 'banded' breakdown of the TPH results into gasoline range organics (GRO), diesel range organics (DRO) and heavier lubricating oil range organics (LRO), or fully speciated results with the reporting of hydrocarbon concentrations in 14 specific carbon bandings based upon behavioural characteristics, e.g. aliphatic C_6 to C_8, aromatic C_{10} to C_{12} etc.

Speciated VOC (by GC-MS) analysis quantifies the concentrations of 30 USA-EPA priority compounds. These include chlorinated alkanes and alkenes (in the molecular weight range chloroethane to tetrachloroethane); trimethylbenzenes; dichlorobenzenes; and the 4 BTEX compounds (benzene, ethyl-benzene, toluene & xylene).

Speciated sVOC by (GC-MS) analysis quantifies the concentrations of a variety of organic compounds, including the 16 USA-EPA priority PAHs, phenols, 7 USA EPA priority PCB congeners, herbicides & pesticides.

Note: PAHs are hydrocarbons and consequently (where present) will be picked-up when scheduling TPH by GC-FID.

Note: Risk assessment models require physiochemical properties (solubilities, toxicities etc) of compounds in order to model their behaviour in the environment. These physiochemical properties cannot be derived from a single "TPH", "GRO" or "DRO" value. However, the carbon banded fractions can be used in risk assessment models.

Current UK guidance

The UK approach to contaminated land is set out in Land Contamination Risk Management (2020). The approach is based upon risk assessment, where risk is defined as the combination of the probability of occurrence of a defined hazard and the magnitude of the consequences of the occurrence.

In the context of land contamination, there are three essential elements to any risk: (1) a contaminant source; (2) a receptor (eg controlled water or people); and (3) a pathway linking (1) and (2). Risk can only exist where all three elements combine to create a pollutant linkage. Risk assessment requires the formulation of a conceptual model which supports the identification and assessment of pollutant linkages.

Lithos adopt a tiered approach to risk assessment, consistent with UK guidance and best practice. The initial step of such a risk assessment (or Tier 1) is the comparison of site data with appropriate UK guidance levels, Lithos risk-derived screening values, or remedial targets. It should be noted that exceedance of Tier 1 does not necessarily mean that remedial action will be required.

Soil screening values used by Lithos

In March 2002 DEFRA and the Environment Agency published a series of technical papers (R&D Publications CLR 7, 8, 9 & 10) outlining the UK approach to the assessment of risk to human health from land contamination. In 2008 CLR 7, 9 & 10 and all corresponding SGV and Tox reports were withdrawn and superseded by new guidance including:

- Guidance on Comparing Soil Contamination Data with a Critical Concentration - CL:AIRE and CIEH, May 2008
- Evaluation of models for predicting plant uptake of chemicals from soil - Science Report – SC050021/SR
- Human health toxicological assessment of contaminants in soil - Science Report: SC050021/SR2
- Updated technical background to the CLEA model - Science Report: SC050021/SR3
- CLEA Software Handbook, Science report: SC050021/SR4
- Compilation of data for priority organic pollutants for derivation of Soil Guideline Values - Science Report: SC050021/SR7

In December 2013 Defra published the results of research project SP1010 – Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination. The objective of this project was to provide technical guidance in support of Defra's revised Statutory Guidance for Part 2A of the Environmental Protection Act 1990 (Part 2A). The revised Statutory Guidance, published in April 2012, introduced a new four-category system for classifying land under Part 2A, where Category 1 includes land where the level of risk is clearly unacceptable, and Category 4 includes land where the level of risk posed is acceptably low. Project SP1010 aimed to deliver:

- A methodology for deriving C4SLs for four generic land-uses comprising residential, commercial, allotments and public open space; and
- Demonstration of the methodology, via derivation of C4SLs for 6 substances – arsenic, cadmium, chromium IV, lead, benzene & benzo(a)pyrene.

The methodology for deriving both the previous Soil Guideline Values and the Category 4 Screening Levels is based on the Environment Agency's Contaminated Land Exposure Assessment (CLEA) methodology. Development of C4SLs has been achieved by modifying the toxicological and\or exposure parameters used within CLEA (while maintaining current exposure parameters).

Part 2A Statutory Guidance was developed on the basis that C4SLs could be used under the planning regime. Defra anticipate that, where they exist, C4SLs will be used as generic screening criteria, and Lithos consider C4SLs to be suitable for use as Tier 1 Screening Values. Lithos have discussed this matter with both NHBC and YALPAG (collection of Yorkshire & Lincolnshire local authorities) and received confirmation that they are satisfied with this approach.

The CLEA conceptual site model assumes a source located in a sandy loam, with 6% soil organic matter (SOM) - equivalent to 3.5% total organic carbon (TOC). However, many organic contaminants are more mobile when the SOM is lower, and consequently comparison of soil results with revised, lower screening values may be required. Other CLEA default characteristics adopted by Lithos are:

Sandy Loam characteristics (source)	Default values adopted
Total porosity (fraction)	0.53
Water filled porosity (fraction)	0.33
Air filled porosity (fraction)	0.2

Lithos have derived Screening Values for five different CSMs (scenarios); these are:

A - Residential with gardens, but no cover (or only up to 300mm)

B - Residential with gardens and 600mm 'clean' cover

C - Residential apartments with landscaping (i.e. no home grown produce)

D - Commercial/industrial with landscaping

E – Importation of soil cover

The **exposure** pathways considered for each scenario are detailed in the table below.

Scenario	Land use	Pathways	Justification
A	Residential with garden, but no cover (or only up to 300mm)	• Direct ingestion of soil • Dermal contact • Consumption of vegetables & soil attached to vegetables • Inhalation of indoor vapours and dust • Inhalation of outdoor vapours and dust	Minimal cover – insufficient to break any pathways therefore all exposure pathways are relevant.
B	Residential with garden minimum 600mm cover	• Inhalation of indoor vapours • Inhalation of outdoor vapours	The 600mm cover removes the risk from all pathways other than inhalation.
C	Residential apartments with landscaped areas and minimum 300mm cover	• Direct ingestion of soil • Dermal contact • Inhalation of indoor vapours and dust • Inhalation of outdoor vapours and dust	All pathways applicable due to possible exposure from landscaped areas. However consumption of home grown produce not included as unlikely to be grown in landscaped areas. Where vegetables are to be grown site specific QRA may be required.

Scenario	Land use	Pathways	Justification
D	Commercial/ industrial with landscaped areas no cover	• Direct ingestion of soil • Dermal contact • Inhalation of indoor vapours and dust • Inhalation of outdoor vapours and dust	All pathways applicable due to possible exposure from landscaped areas. Assumed the commercial development consists of offices to provide a conservative assessment.
E	Importation of soil for cover in garden and landscaped areas	• Direct ingestion of soil • Dermal contact • Consumption of vegetables & soil attached to vegetables • Inhalation of outdoor vapours and dust	Material used as cover to break existing pathways therefore all direct and indirect pathways relevant; however cover is **not** placed below plots therefore indoor inhalation is not relevant.

Lithos have assumed the source of contamination is directly below the building foundation; i.e. a depth to source of 0.15m as opposed to the CLEA default of 0.65m. This assumption provides for a more conservative approach than the UK default.

Lithos have derived Tier 1 values for a number of inorganic and organic determinands in the context of the five Scenarios A to E. The Tier 1 values are **not** intended to be used when considering potential risks associated with:

- Existing land uses in the context of Part 2A of the Environment Protection Act 1990;
- End uses such as allotments, sports fields, children's playgrounds, care homes, hospitals etc; or
- Groundwater and surface water

Inorganic Tier 1 values for scenarios A to E

Inorganic contaminant	Tier 1 assessment criteria (mg/kg) for Scenarios A to E							Comments/notes
	SGV*	C4SL*	A	B	C	D	E	
As	32	37	37	Use (A) in SI Report for initial "screen" If >5 x A, then consider increase of cover to 1,000mm	40	640	37	C4SL adopted
Cd	10	26	26		149	410	26	C4SL adopted
Cr			4,000		4,000	28,767	4,000	Assumes Cr is CrIII
Pb	450	200	200		314	2,330	200	C4SL adopted
Ni	130		109		123	892	109	Assessment of health risk only
Se	350		434		596	13,018	434	
Hg	170		199		244	3,603	199	Assumes in an inorganic compound
Vn			584		586	4,994	584	
B			5		5	5	5	Based on phytotoxic risks as plants are the more sensitive receptor (Cu is pH dependant)
Cu			100		100	100	100	
Zn			200		200	200	200	

Organic Tier 1 values for scenarios A to E

Organic contaminant (all sourced via CLEA)	Tier 1 assessment criteria (mg/kg) for Scenarios A to E							Comments/notes
	SGV*	C4SL*	A	B	C	D	E	
Benzene	0.33	0.87	0.7	<1^	<1^	63	<1	<1 based on professional judgement and lower than calculated value.
Toluene	610		836	2,048	1,912	5,000	<1	Scenario D based on professional judgement and lower than calculated value.
Ethyl Benzene	350		379	592	566	5,000	<10	
Xylenes	240		535	590	585	5,000	<10	Scenario E based on professional judgement and lower than calculated value.
Phenol	420		1,434	3,360	2,264	5,000	<10	
PCBs			2	8	2	38	N/A	Based on toxicity of EC7
Benzo(a)pyrene		5	5	25	5	76	5	C4SL adopted. Scenario B 5 times scenario A
Naphthalene			6	6	6	619	<10	Scenario E based on professional judgement and lower than calculated value
Gasoline Range Organics			22	23	23	2178	626	See 3-step assessment of TPH below ^Based on professional judgement and lower than calculated value
Diesel Range Organics			215	218	215	^5,000	1,429	
Lubricating Range Org			3,299	5,000	3,829	^5,000	3,299	

* *For a residential end use*

The significance of PAHs can be determined by considering indicator compounds. In most cases benzo(a)pyrene (BaP) is adopted as an indicator due to the amount of toxicological data available and has been used by various authoritative bodies to assess the carcinogenic risk of PAHs in food. A surrogate marker approach can be used to estimate the toxicity of a mixture of PAHs in soil using toxicity data for individual indicator compounds within that mixture. Exposure to the surrogate marker is assumed to represent exposure to all PAHs in that matrix. The surrogate marker approach relies on a number of assumptions:

- Surrogate marker (BaP) must be present in all soil samples
- Profile of the different PAH relative to BaP should be similar in all samples
- PAH profile in the soil samples should be similar to that used in the pivotal toxicity study[1]

To assess the PAH profile in a soil sample, the ratio of the seven genotoxic PAHs (benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[g,h,i]perylene, chrysene, dibenz[a,h]anthracene and indeno[1,2,3-c,d]pyrene), relative to BaP, should be calculated. The ratio relative to BaP should lie within an order of magnitude above and below the mean ratio to BaP.

[1] SP1010 Appendix E, Provisional C4SIs for benzo(a)pyrene as a surrogate marker for PAHs, CL:AIRE 2013

Naphthalene should also be considered separately against its generic screen. Whilst classed as a PAH, naphthalene is more volatile and mobile in the environment than most other PAHs. As such the significance of naphthalene cannot be considered within the surrogate marker approach.

Similarly, **TPH** cannot be assessed as a single "total" value, and reference has been made to the Environment Agency's document P5-080/TR3, "The UK approach for evaluating human health risks from petroleum hydrocarbons in soils". This document supports the assumptions and recommendations made by the US Total Petroleum Hydrocarbons Criteria Working Group (TPHCWG). The TPHCWG have broken down "TPH" into representative constituent fractions or "EC Bandings". The TPHCWG have derived a series of physiochemical and toxicological parameters for each of the bandings.

The significance of speciated TPH results can be assessed by following the 3 steps outlined in the tables below.

Step	Result	Action
1. Consider indicator compounds: Are BTEX, naphthalene, benzo(a)pyrene above their respective Tier 1 values?	Yes	Remediation or dQRA required
	No	Proceed to Step 2
2. Consider individual TPH fractions: are they above respective screening values?	Yes	Remediation or dQRA required
	No	Proceed to Step 3
3. Assess Cumulative effects: Is the calculated Hazard Index for each source >1	Yes	Remediation or dQRA required
	No	TPH compounds pose no significant risk

The equation used to assess cumulative effects in step 3 is shown below.

$$HI = \sum_{F_i=1}^{16} HQ\ F_i = \frac{Measured\ concentration\ F_i\ (mg\,kg^{-1})}{SGV\ F_i\ (mg\,kg^{-1})}$$

where HI = Hazard Index
HQ = Hazard Quotient
F_i = Fraction $_i$
SGV = Soil Guideline Value

Statistical Assessment

Current UK guidance is provided by CL:AIRE[2], and uses two-way confidence intervals and graphical summaries, to assist assessors when determining whether or not a dataset is adequate to answer the question posed; e.g. "is existing site topsoil suitable for retention & re-use?". To answer such a question, it is necessary to recover and test a large number of samples (a minimum of 10; ideally 20+) in order to undertake meaningful statistical analysis.

However, in the context of site investigation to assess the significance of contamination on brownfield sites which are typically underlain by **heterogenous made ground**, some remediation is almost always required (placement of soil cover, excavation of gross contamination etc). Consequently, in such circumstances, it is not necessary to demonstrate that made ground soils are "clean" and therefore there is no need to test large numbers of samples and undertake statistical analysis. Sample results can simply be compared directly with appropriate screening values (e.g. Lithos Tier 1 values).

The CL:AIRE (2020) guidance replaces the withdrawn "Guidance on Comparing Soil Contamination Data with a Critical Concentration" (2008).

The old approach to statistical analysis was based on a definitive yes/no answer which required limited consideration of the dataset and Conceptual Site Model. It was widely accepted that this did not allow sites or risk to be adequately assessed. The updated approach requires a comprehensive understanding of the datasets within the context of the Conceptual Site Model.

Current guidance requires that:

- A robust CSM is in place which identifies source areas, averaging areas and averaging zones
- Sampling locations are relatively evenly spread across the site and were selected using simple or stratified random sampling with no targeting being undertaken
- The field data and CSM do not suggest the presence of a hotspot of contamination which should be treated as a separate zone
- The samples are all taken from a similar same depth and within the same material type across the zone being assessed
- A minimum of 10 samples have been taken. It should be appreciated that confidence in a dataset increases as the number of samples obtained and tested from a zone increases.

The statistical analysis assumes a homogenous distribution of strata and contamination and therefore the dataset will be normally distributed (symmetric, log symmetric or fat tailed).

A normally distributed dataset is assessed using a number of statistical tools to generate a Dot and Box Plot which includes summary statistics and confidence intervals. The review of statistical data enables the assessor to make a decision, with an associated level of confidence, where the true mean of the sample population lies in relation to the critical concentration.

It is essential when using statistics to assess sample data that all decisions relate back to the conceptual site model. Statistics cannot indicate if contamination on a site is likely to present a risk to the end user, this is the role of the 'competent person' i.e. Lithos.

However, broadly speaking the following applies:

- Mean and UCL below the critical concentration – no further assessment required.
- Mean below the critical concentration, but UCL above – consider the CSM and likely sources.
- Mean and UCL above the critical concentration – further assessment required, remediation likely depending on the CSM.
- LCL, Mean & UCL above the critical concentration – further assessment required, remediation likely.

[2] *CL:AIRE, 2020.Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration.*

Other screening values used by Lithos

Tier 1 risk assessment of **hazardous gas** is undertaken through reference to the following documents (and further information is presented in Generic Note No. 5 – Hazardous Gas):

- Approved Document C, Building Regulations 2000
- Boyle & Witherington (2007) – Guidance on evaluation on development proposals on sites where methane and carbon dioxide are present, incorporating "traffic lights". Report Ref. 10627-R01-(02), for NHBC
- CIRIA C665 (2007) – Assessing risks posed by hazardous ground gases to buildings
- BS 8485:2015 – Code of Practice for the characterisation & remediation from ground gas in affected developments

With respect to the assessment of potential **phytotoxic effects** of contaminants, Lithos refer to The Sewage Sludge in Agriculture: Code of Practice 2018 for copper and zinc (at pH 5.5 to 6.0). The CLEA derived Tier 1 value is adopted for nickel due to its human health effects.

The potential risk to **building materials** is considered through reference to relevant BRE Digests, with particular emphasis on BRE Special Digest 1, 'Concrete in aggressive ground', 2005.

With respect to the interpretation of the **calorific values**, at present there are no accepted methods to assess whether a sample is combustible and under what circumstances it might smoulder. Some guidance is given in ICRCL Note 61/84 "Notes on the fire hazards of contaminated land" which states that: "*In general … it seems likely that materials whose CV's exceed 10MJ/kg are almost certainly combustible, while those with values below 2MJ/kg are unlikely to burn*".

Tier 1 **groundwater risk assessments** are always site specific and compare leachate or groundwater concentrations with the appropriate water quality standard based on the CSM and consideration of relevant water quality impacts and assessments.

Waste classification & WAC

In the context of waste soils generated by remediation and\or groundworks activities on brownfield sites, the following definitions (from the Landfill Regulations 2002) apply:

- Inert (e.g. uncontaminated 'natural' soil, bricks, concrete, tiles & ceramics)
- Non-Hazardous (e.g. soil excavated from a contaminated site which contains dangerous substances, but at concentrations below prescribed thresholds)
- Hazardous (e.g. soil excavated from a contaminated site which contains dangerous substances at concentrations above prescribed thresholds)

Dangerous substances include compounds containing a variety of determinants commonly found in contaminated soils on brownfield sites, for example arsenic, lead, chromium, benzene etc.

Landfill operators require Waste Acceptance Criteria (WAC) laboratory data, if soil waste is classified as **hazardous**. However, subject to WAC testing it may be possible to classify it as stable, non-reactive hazardous waste, which can be placed within a dedicated cell within the non-hazardous landfill.

Lithos typically only include WAC analysis in site investigation proposals and reports, if significant off-site disposal (of soil classified as hazardous waste) is anticipated, for example where redevelopment proposals include basement construction etc. If off-site disposal of soils classified as hazardous waste during redevelopment is anticipated, then WAC analysis should be scheduled at an early stage in the remediation programme. However, organic compounds (BTEX, TPH, PAH etc) are the most common contaminants that result in soils being classed as hazardous, and these contaminants can often be dealt with by alternative technologies (e.g. by bioremediation or stabilisation) and consequently retention on site is often possible.

It should be noted that **non-hazardous** soil waste can go to a non-hazardous landfill facility; no further testing (e.g. WAC) is required.

Possible action in event of Tier 1 exceedance

Should any of the Tier 1 criteria detailed above be exceeded, then three potential courses of action are available. (The first is only applicable in terms of human health, but the second and third could also be applied to groundwater or landfill gas).

1. Undertake further statistical analysis following the approach set out in Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration, 2020 (see above) in order to determine whether contaminant concentrations of inorganic contaminants within soil\fill actually present a risk (only applicable to assessing the risk to human health).
2. Carry out a more detailed quantitative risk assessment in order to determine whether contamination risks actually exist.
3. Based on a qualitative risk assessment, advocate an appropriate level of remediation to "break" the pollutant linkage - for example the removal of the contaminated materials or the provision of a clean cover.

Prior to undertaking any statistical analysis the issue of the **averaging area** requires further consideration. Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration, 2020 provides some guidance on averaging areas noting that they are the area within which a receptor may be exposed to contamination but leaving the site assessor to determine the appropriate averaging area for their site.

Lithos consider the entire site needs to be characterised by reference to the Conceptual Site Model. Consequently, Lithos gather and analyse sample results by fill type, and\or by former use in a given sub-area of the site, before undertaking statistical analysis; i.e. the averaging area is associated with the extent of a particular fill type, or an area affected by spillage\leakage.

In terms of brownfield redevelopment, this is considered a more appropriate methodology which provides a more representative sample population for statistical analysis. As such the entire site is considered in terms of the proposed end use, be this residential with, or without gardens.

Analysis by soil\fill type is appropriate for essentially immobile contaminants associated with a particular fill type, for example arsenic in colliery spoil, metals in ash & clinker, sulphate in plaster-rich demolition rubble etc.

Analysis by former use is appropriate where more mobile contaminants have entered the ground, for example diesel associated with leakage from a former fuel tank, downward migration of leachable metals through granular materials, various soluble contaminants present in a wastewater leaking into the ground via a fractured sewer etc. In these circumstances, it may be appropriate to undertake statistical analysis of sample results from a variety of different soil\fill types. However, consideration would have to be given to factors such as porosity which might influence impregnation of a mobile contaminant into the soil mass, i.e. contamination would normally be more pervasive and significant in granular soils than cohesive soils

05 – Hazardous gas
Generic notes – geoenvironmental investigations

General

Hazardous gas is considered to be any mixture of potentially explosive, toxic or asphyxiating gases, most notably methane, carbon dioxide and oxygen (deficiency). In addition, radon, a naturally occurring radioactive gas is also considered. Further information about radon is included in Notes 01 – Environmental Setting.

Assessment of potential risks associated with hazardous gas are based on a review of data obtained from the Landmark Information Group, the Environment Agency and the Local Authority and the British Geological Survey. Reference is also made to historical OS plans, which are inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips etc.

Where landfilling has occurred within 250m of the site boundary, the Local Planning Authority may request a landfill gas investigation in accordance with the Town and Country Planning General Development Order, 1988.

Sources

Potential sources of hazardous gas include:

- Landfill sites
- Made ground, especially where significant depths are present
- Shallow mineworkings associated with coal extraction
- Geological strata, including peat, organic silts, coal and limestone (reaction with acidic waters), granite (radon)
- Groundwater can sometimes act as a "carrier" for hazardous gas
- Leakages from pipelines or storage tanks
- Sewers, septic tanks and cess pits

Generation

Wherever biodegradable material is deposited, landfill gas (principally a mixture of methane and carbon dioxide) is likely to be generated by microbial activity. Carbon dioxide is an asphyxiant and toxic; methane is flammable and a mixture containing between 5% and 15% methane by volume in air is explosive. Landfill gas in the ground is unlikely in itself to pose a significant risk, though it may damage vegetation. However, infiltration of landfill gas into confined spaces (e.g. cellars, services, etc) may give rise to considerable risk.

There is no typical figure for the length of time that landfill gas will be evolved, but at many sites significant gas generation continues for at least 15 years after the last deposit of waste.

Migration

Gas migration from a landfill site may occur in several ways. It may migrate through adjacent strata; the distance of migration being dependent on the pressure gradients, volume of gas and permeability of the strata. Where there are faults, cavities and fissures within the strata, gas may move considerable distances. Other migration pathways for gas include man-made features such as mine shafts, roadways and underground services.

Gas migration is influenced by a number of climatic factors, such as atmospheric pressure variations, water table level variations and the influence of a covering of snow or ice over the surface of the site and surrounding area.

Gas monitoring procedure

Lithos adopt a standard gas monitoring procedure, in accordance with CIRIA guidance. This procedure involves the measurement, in the following order of:

- Atmospheric temperature, pressure and ambient oxygen concentration
- Gas emission rate
- Methane, oxygen and carbon dioxide concentrations using an infra-red gas analyser
- Standing water level using a dipmeter.

In addition, ground conditions at each sampling location are recorded together with prevailing weather conditions and any other observations such as any vandalism. Where samples of gas are required for laboratory analysis, Gresham Tubes or multi-layer Tedlar / ALTEF sampling bags are used. Gas concentrations in the well are typically recorded immediately before and after retrieval of a sample.

Current guidance

CIRIA Report 151 (1995)[i] identified that there was inadequate guidance on trigger concentrations for ground gases. CIRIA concluded that the most important aspect of a gas regime below or adjacent to a site was the surface emission rate, i.e. how quickly the gas is coming out of the ground. The lower the surface emission rate the lower the risk. CIRIA Report C665 (2007)[ii] advocates two methodologies for characterising sites:

A – All developments except low rise housing. The advocated methodology is that proposed by Wilson & Card, 1999[iii]

B – Low rise housing. An alternative (traffic light) methodology, derived by Boyle and Witherington, 2006[iv] for NHBC

Both methodologies refer to Gas Screening Values (GSV); previously referred to as limiting borehole gas volume flow.

Other relevant UK guidance includes:

- BS8485:2015+A1:2019 – Code of Practice for the characterisation & remediation from ground gas in affected developments.
- BS8576:2013 Guidance on investigations for ground gas – permanent gases and volatile organic compounds
- Boyle & Witherington (2007) – Guidance on evaluation on development proposals on sites where methane and carbon dioxide are present, incorporating "traffic lights". Report Ref. 10627-R01-(02), for NHBC
- Wilson, Card & Haines (CIEH, 208) The Local Authority Guide to Ground Gas
- CL:AIRE Research Bulletin RB17 (November 2012) A Pragmatic Approach to Ground Gas Risk Assessment
- CL:AIRE Research Bulletin RB13 (February 2011) The Utility of Continuous Monitoring in Detection & Prediction of 'Worst-Case' Ground Gas Concentration
- BRE\Environment Agency Report BR 414 (2001) – "Protective Measures for housing on gas-contaminated land".
- YALPAG (December 2016) - Verification Requirements for Gas Protection Systems - Technical Guidance for Developers, Landowners and Consultants.
- Environment Agency Report LFTGN 03 - Guidance on the management of landfill gas, June 2014

A – All developments except low rise housing

(Wilson & Card, 1999)[v] revised Table 28 of CIRIA 149[v] in terms of borehole gas volume flow rate (now GSV) in order to achieve a more consistent design of protection measures. This was done to reflect the importance of recognising the gas surface emission rate. Wilson & Card then developed a method for classifying gassing sites (Table 1 below), which took into account the combined gas concentration and GSV.

Characteristic Situation	Gas Screening Value, CH_4 or CO_2 (l/hr)	Additional limiting factors	Typical source of generation
1	<0.07	Methane not to exceed 1% v/v and carbon dioxide not to exceed 5% v/v	Natural soils with low organic content
2	<0.7	Borehole air flow rate not to exceed 70 litre/hr otherwise increase to Characteristic Situation 3	Natural soil, high peat/organic content
3	<3.5		Old landfill, inert waste, mineworkings flooded.
4	<15	Quantitative Risk Assessment required to evaluate scope of protection measures.	Mineworkings – susceptible to flooding, completed landfill, inert waste
5	<70		Mineworkings unflooded, inactive
6	>70		Recent landfill site

Notes: Borehole flow rate = volume of gas (regardless of composition) which is escaping from well (l/hr). Gas Screening Value (litre/hour) = gas concentration (%) / 100 x borehole flow rate (l/hr). To facilitate design implementation, the limiting values for both methane and carbon dioxide are identical.

B – Low rise housing.

NHBC have developed a characterisation system similar to that of Wilson & Card above, but specific to low-rise housing development (Boyle and Witherington) (Table 8.7). This approach compares measured gas emission rates with generic "Traffic Lights". The Traffic Lights include "Typical Maximum Concentrations" for initial screening, and risk-based Gas Screening Values (GSVs) for consideration of situations where the Typical Maximum Concentrations are exceeded. Calculations are carried out for both methane and carbon dioxide and the worst case adopted in order to establish the appropriate protection measures.

Table 8.7 NHBC Traffic light system for 150 mm void

Traffic Light Classification	Methane [1]		Carbon Dioxide [1]	
	Typical Maximum Concentration [5] (%v/v)	Gas Screening Value [2,4,6] (l/hr)	Typical Maximum Concentration [5] (%v/v)	Gas Screening Value [2,3,4,6] (l/hr)
Green	1	0.16	5	0.78
Amber 1	5	0.63	10	1.56
Amber 2	20	1.56	30	3.13
Red				

Notes:

1. The worst gas-regime identified at the site, either methane or carbon dioxide, recorded from monitoring in the worst temporal conditions, will be the decider for which Traffic Light and GSV is allocated.
2. Generic GSVs are based on guidance contained within "The Building Regulations: Approved Document C" (2004) and assume a sub-floor void of 150 mm thickness.
3. A leak of gas from the sub-floor void into a small room (e.g. downstairs toilet with soil pipe potentially passing into sub-floor void) of dimensions 1.50m × 1.50m × 2.50m, with a total room volume of 5.63m^3 has been considered.
4. The GSV, in litres per hour, is as defined in Wilson and Card (1999) as the borehole flow rate multiplied by the concentration in the air stream of the particular gas being considered.
5. The Typical Maximum Concentrations can be exceeded in certain circumstances should the conceptual site model indicate it is safe to do so. This is where professional judgment will be required, based on a thorough understanding of the gas regime identified at the site where monitoring in the worst temporal conditions has occurred.
6. The GSV thresholds should not generally be exceeded without completion of a detailed gas risk assessment taking into account site-specific conditions.

---

i *Harries CR, Witherington PJ and McEntee JM (1995). Interpreting measurements of gas in the ground. CIRIA Report 151*

ii *CIRIA (2007) – Assessing risks posed by hazardous ground gases to buildings.*

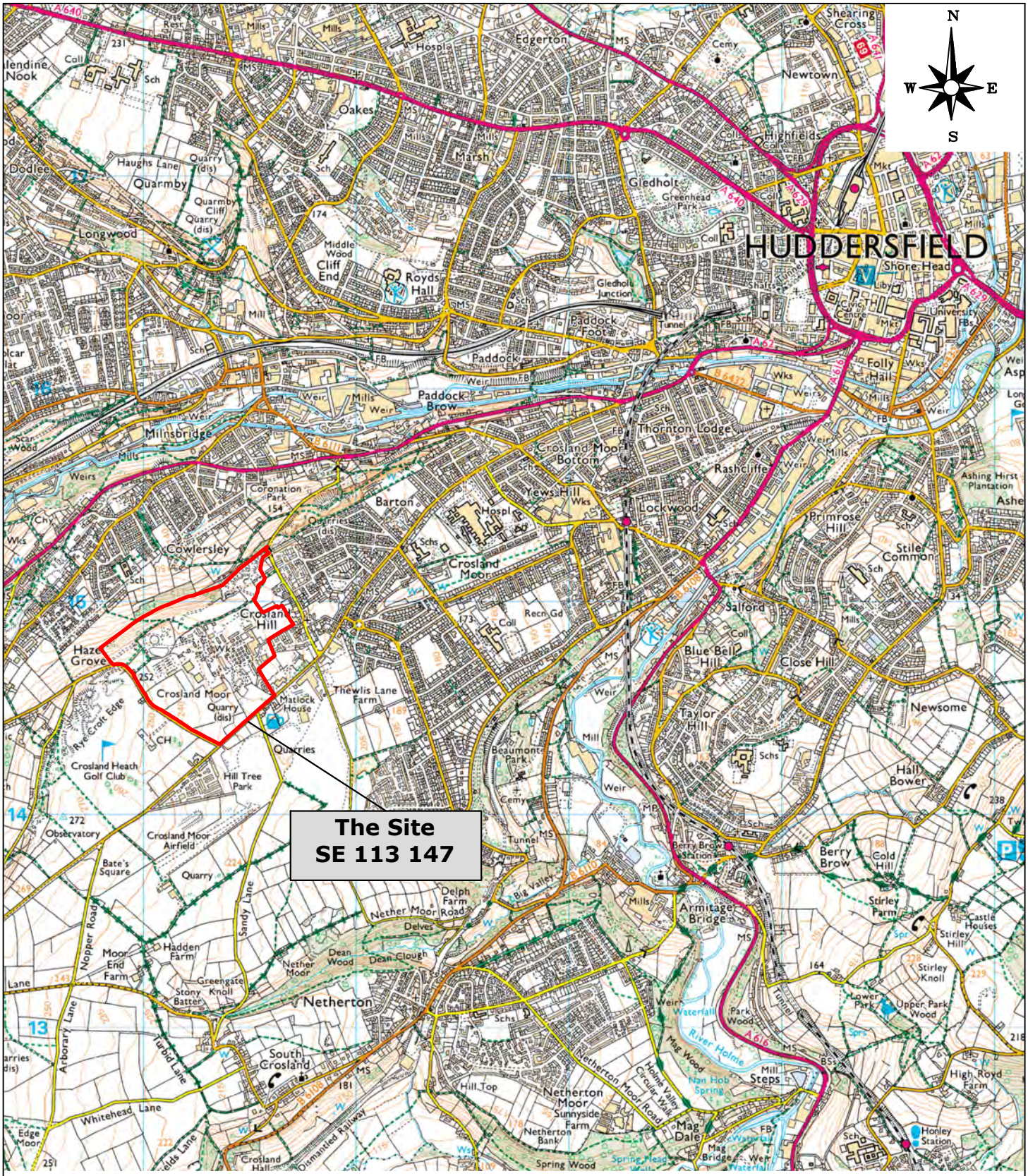
iii *Wilson SA and Card GB (February 1999). Reliability and Risk in Gas Protection Design. Ground Engineering.*

iv *Boyle & Witherington (2006) – Guidance on evaluation on development proposals on sites where methane and carbon dioxide are present, incorporating "traffic lights". Report Ref. 10627-R01-(02), for NHBC*

v *Wilson SA and Card GB (February 1999). Reliability and Risk in Gas Protection Design. Ground Engineering.*

Appendix B

Drawings



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CLIENT: VISTRY HOMES, COUNTRYSIDE PARTNERSHIPS, MILLER HOMES & EMPIRE KNIGHT GROUP

JOB TITLE: LAND OFF BLACKMOORFOOT RD, HUDDERSFIELD (BLACK CATS)

DRAWING TITLE: SITE LOCATION PLAN

DRAWN	CC	DATE	15 11 2023
CHECKED	REG	DATE	15 11 2023

STATUS: FOR COMMENT ☐ DRAFT ☐ FOR APPROVAL ☐ FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:25,000	A4	4486/1	

NOTES

APPROXIMATE SITE BOUNDARY

REPRODUCED FROM MILLER HOMES & VISTRY HOMES DRAWING REFERENCE n1939 005 REV B, DATED 16.02.2023

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

PROPOSED SITE LAYOUT

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	04 04 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2500	A3	4486/2	

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- HISTORICAL RESERVOIR
- FUEL STORAGE TANKS
- APPROXIMATE SITE BOUNDARY

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

SITE FEATURES

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	04 04 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2500	A3	4486/3	

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- HISTORICAL RESERVOIR
- FUEL STORAGE TANKS
- APPROXIMATE SITE BOUNDARY
- 16 EXPLOSIVES STORED WITHIN THE BUILDING, LICENSED BY HSE
- 5 NO EXPLOSIVES STORED WITHIN THE BUILDING, NOT LICENSED WITH HSE

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

SITE FEATURES - NUMBERED PLAN

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	3 04 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
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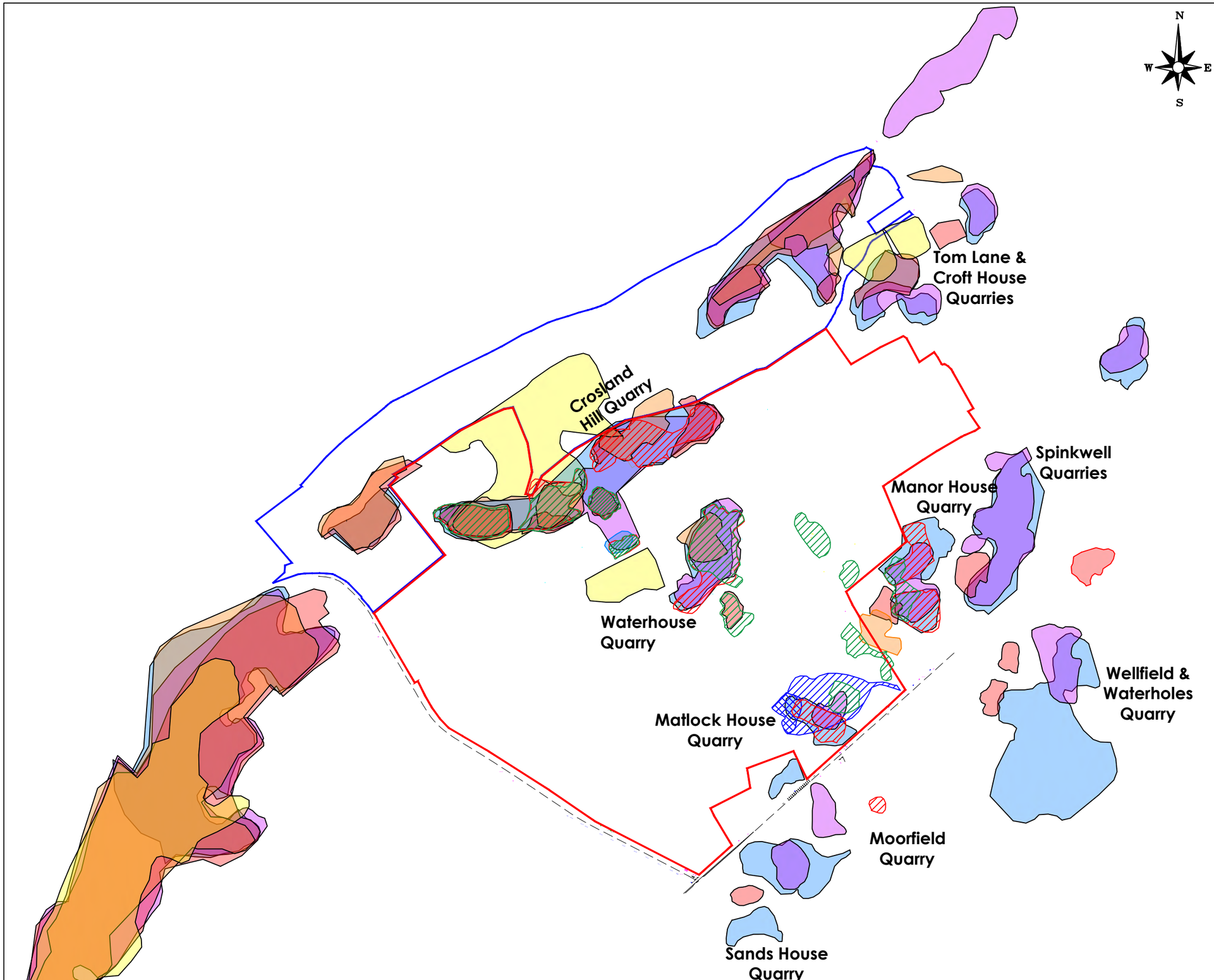

NOTES

FEATURES FROM 1:10,000 HISTORICAL MAPS

- SHOWN ON 1854 MAPPING
- SHOWN ON 1894 MAPPING
- SHOWN ON 1908 MAPPING
- SHOWN ON 1930 MAPPING
- SHOWN ON 1956 MAPPING

FEATURES FROM 1:2,500 HISTORICAL MAPS

- REFUSE TIP SHOWN ON 1984 MAPPING
- QUARRY SHOWN ON 1984 MAPPING
- QUARRY SHOWN ON 1938 MAPPING
- QUARRY SHOWN ON 1916 MAPPING
- APPROXIMATE SITE BOUNDARY

NOTE: COLOURS 'MIX' WHERE QUARRIES OF DIFFERENT AGES OVERLAP

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

HISTORICAL QUARRIES

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
		FOR APPROVAL ☐
CHECKED	DATE	DRAFT ☐
REG	04 04 2023	FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:5000	A3	4486/3B	

NOTES

- MANUFACTURE OF FIREWORKS INCLUDING CHLORATE
- GUNPOWDER STORAGE
- FILLING OF FIREWORKS NOT CONTAINING CHLORATE

REV.	DESCRIPTION	DATE

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JOB TITLE

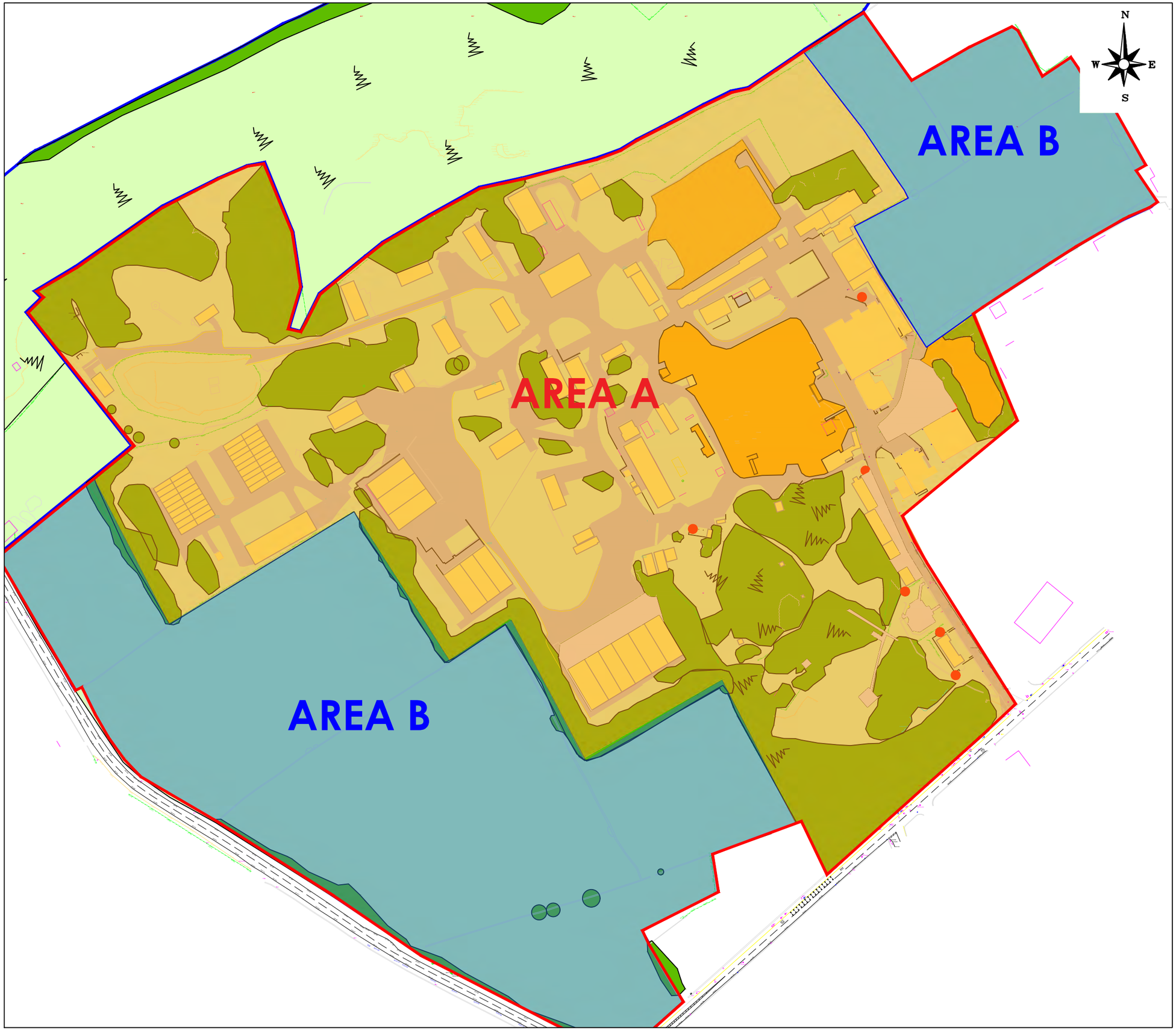
BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

SITE FEATURES - STANDARD
FIREWORKS PLAN

DRAWN	DATE	STATUS
CC	14 07 2023	FOR COMMENT ☐
		FOR APPROVAL ☐
CHECKED	DATE	DRAFT ☐
REG	14 07 2023	FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2000	A3	4486/3C	



NOTES

- AREA A - FIREWORK FACTORY
- AREA B - FIELDS

REV.	DESCRIPTION	DATE

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KNIGHT GROUP

JOB TITLE

BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

SITE AREAS

DRAWN	DATE	STATUS
CC	14 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	14 11 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
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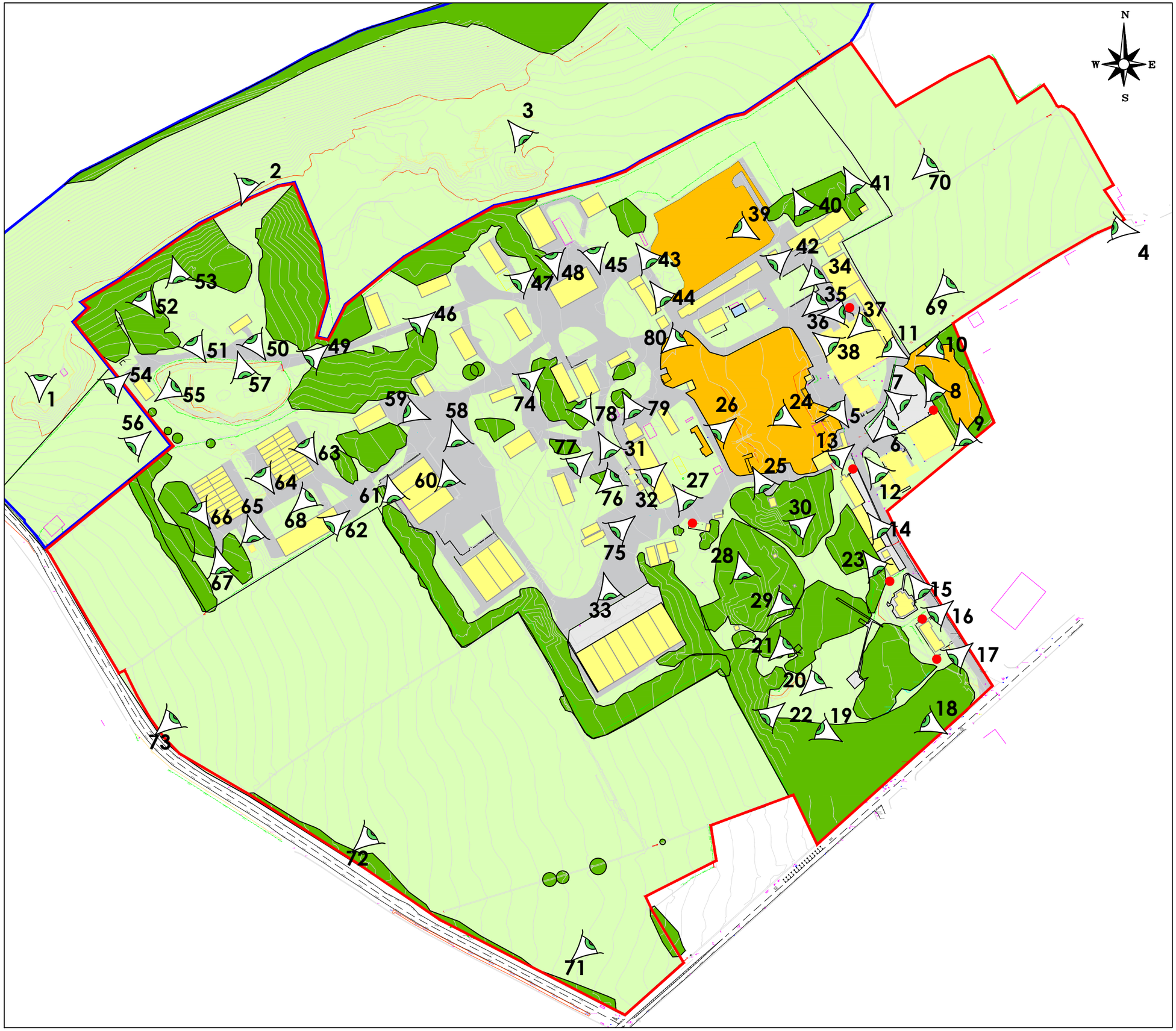

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- HISTORICAL RESERVOIR
- FUEL STORAGE TANKS
- APPROXIMATE SITE BOUNDARY
- LOCATION & ORIENTATION OF PHOTOGRAPH

REV.	DESCRIPTION	DATE

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JOB TITLE

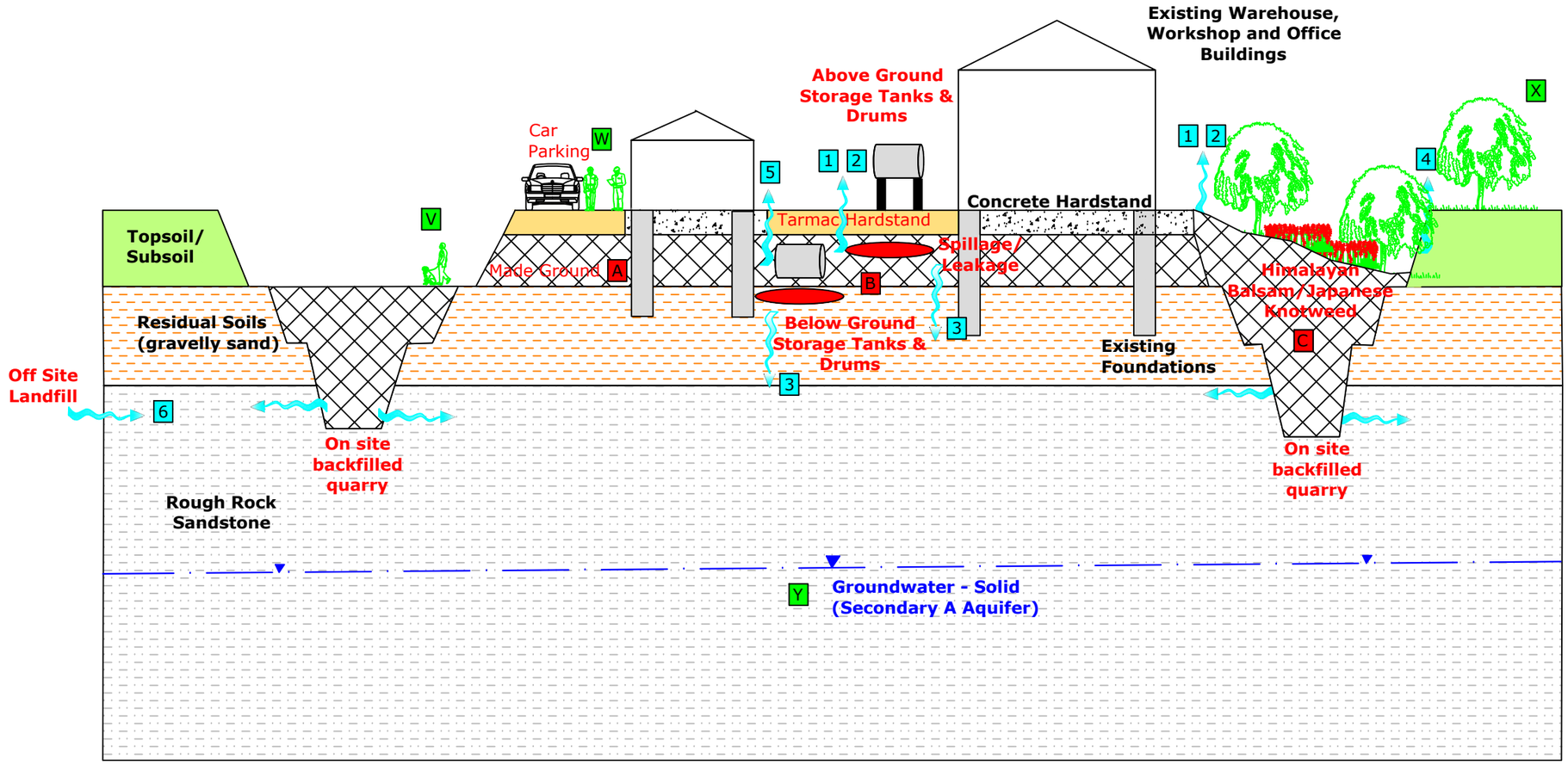
BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

SITE PHOTOGRAPHS

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	31 03 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
NOT TO SCALE	A3	4486/4	



SOURCES	PATHWAYS	RECEPTORS
A MADE GROUND (INORGANICS)	1 DERMAL CONTACT	V END USERS (RESIDENTS)
B LEAKAGE/SPILLAGE (ORGANICS)	2 INGESTION/INHALATION	W SITE WORKERS
C INVASIVE PLANTS	3 LEACHING OF CONTAMINANTS	X VEGETATION
	4 UPTAKE BY PLANTS	Y GROUNDWATER
	5 VOLATILISATION	
	6 MIGRATION OF GAS	

NOTES

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

PRELIMINARY CONCEPTUAL SITE MODEL

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	31 03 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
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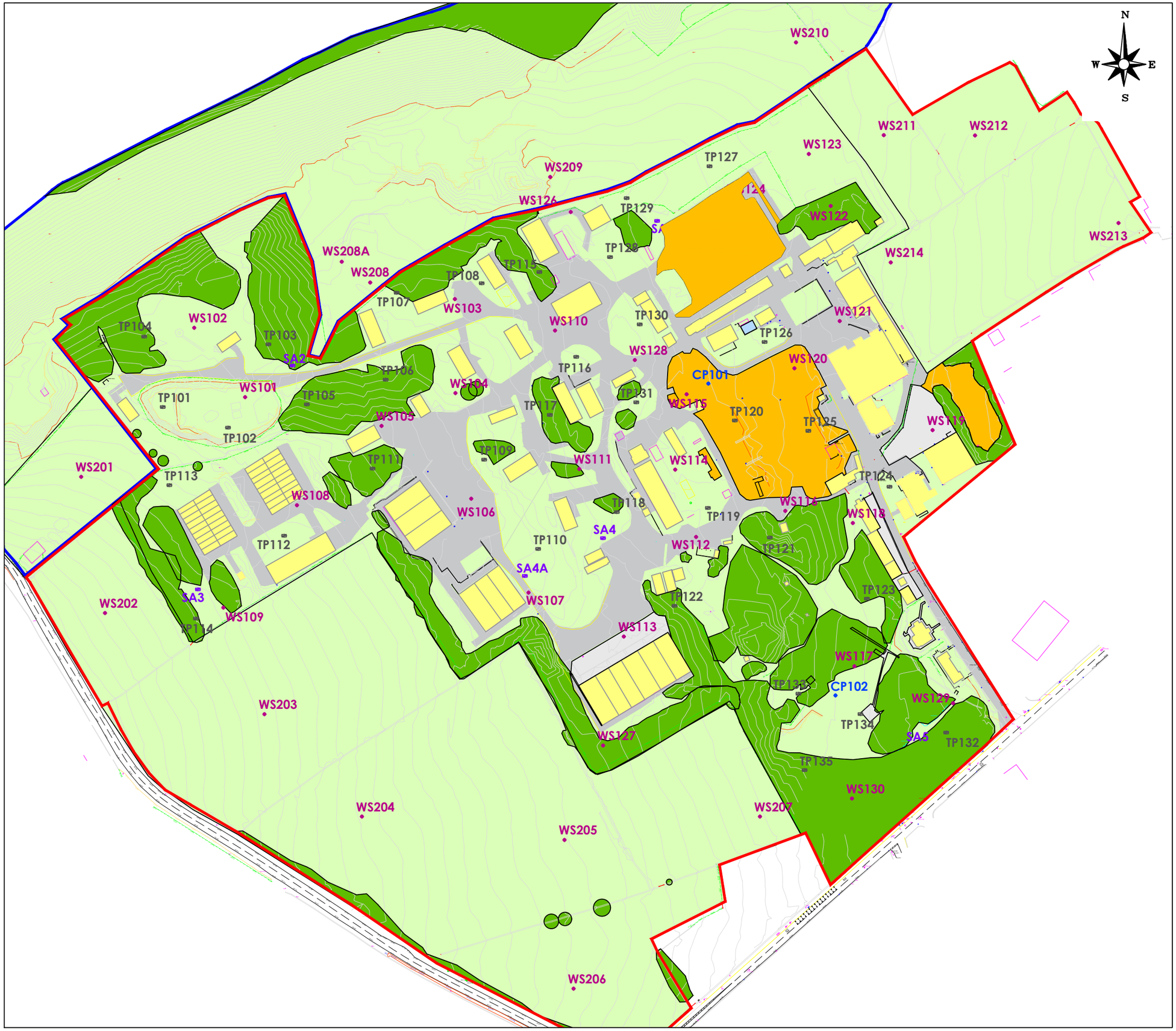

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- GROUNDSOLVE SOAKAWAY PIT
- E3P TRIAL PIT
- E3P CABLE PERCUSSION BOREHOLE
- E3P WINDOW SAMPLE BOREHOLE

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

e3p EXPLORATORY HOLE LOCATIONS

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
		FOR APPROVAL ☐
CHECKED	DATE	DRAFT ☐
REG	31 03 2023	FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2500	A3	4486/6	

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- TRIAL PIT/TRENCH LOCATION
- TRIAL PIT LOCATION (WEST FIELDS)
- TRIAL PIT LOCATION (EAST FIELDS)
- SOAKAWAY PIT LOCATION
- FOUNDATION PIT LOCATION
- PROBEHOLE LOCATION
- MONITORING WELL LOCATION
- WINDOW SAMPLE LOCATION
- APPROXIMATE SITE BOUNDARY

EXPLORATORY HOLE LOCATIONS HAVE BEEN SURVEYED IN (COORDINATES & GROUND LEVEL) ON COMPLETION

REV.	DESCRIPTION	DATE
A	SUPPLEMENTARY INVESTIGATION ACROSS FIELDS	27/11/2023

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JOB TITLE

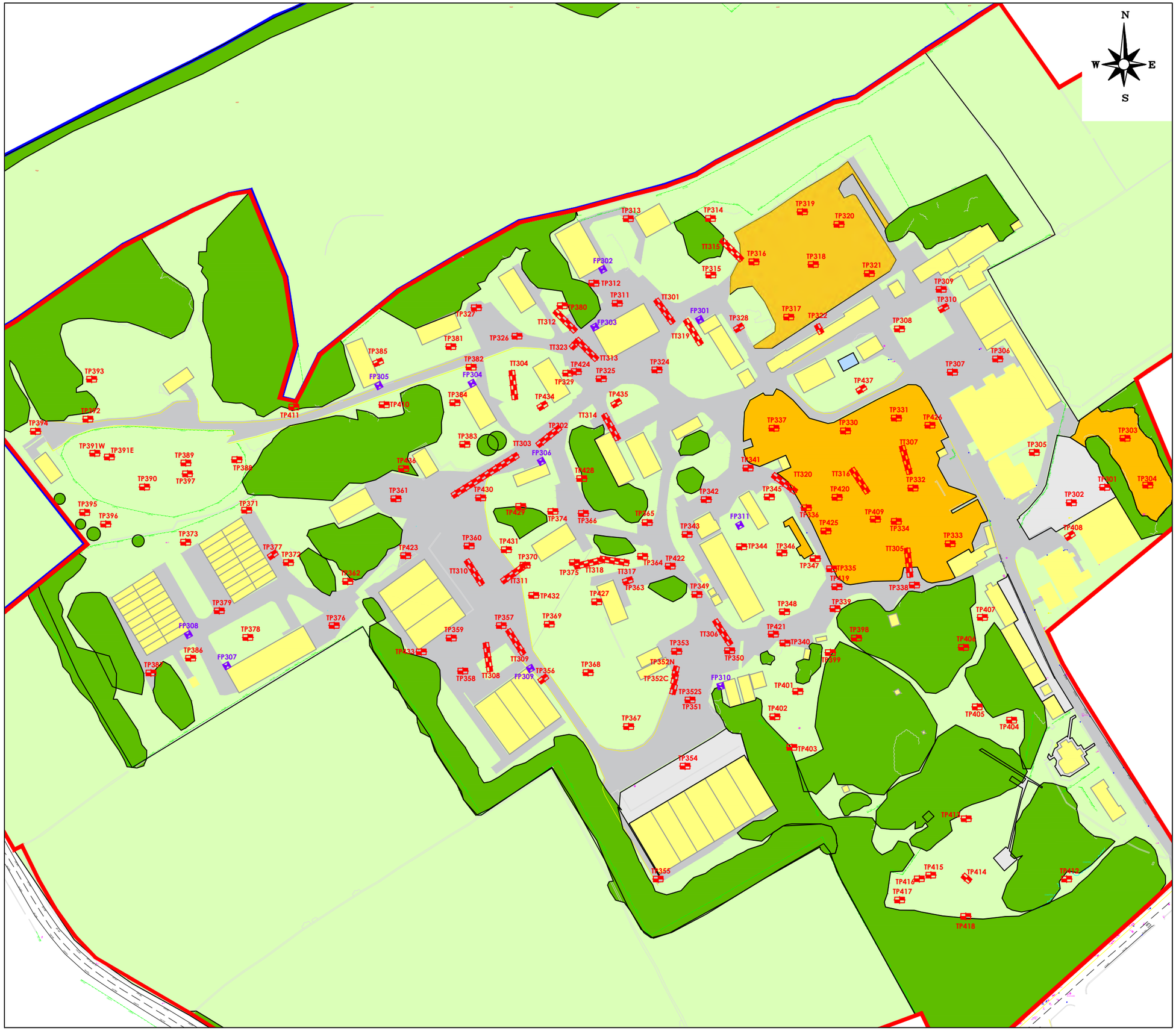
BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

EXPLORATORY HOLE LOCATIONS

DRAWN	DATE	STATUS
CC	27/11/2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	27/11/2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:3000	A3	4486/6A	A



NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- TRIAL PIT/TRENCH LOCATION
- FOUNDATION PIT LOCATION
- APPROXIMATE SITE BOUNDARY

EXPLORATORY HOLE LOCATIONS HAVE BEEN SURVEYED IN (COORDINATES & GROUND LEVEL) ON COMPLETION

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

EXPLORATORY HOLE LOCATIONS - MACHINE DUG EXCAVATIONS (AREA A)

DRAWN	DATE	STATUS
CC	26 09 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	26 09 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
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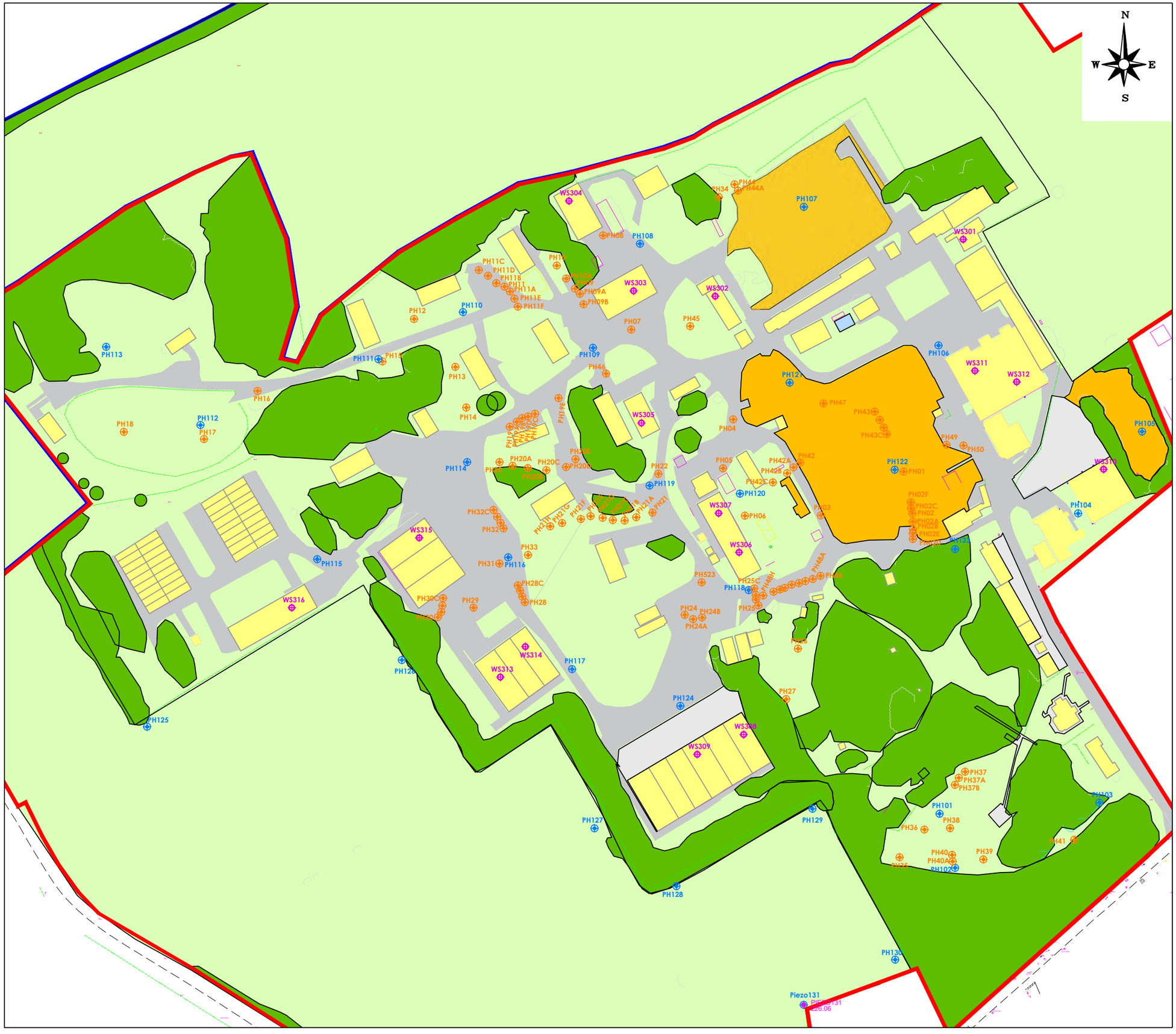

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- PROBEHOLE LOCATION
- MONITORING WELL LOCATION
- WINDOW SAMPLE LOCATION
- APPROXIMATE SITE BOUNDARY

EXPLORATORY HOLE LOCATIONS HAVE BEEN SURVEYED IN (COORDINATES & GROUND LEVEL) ON COMPLETION

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

EXPLORATORY HOLE LOCATIONS - BOREHOLES (AREA A)

DRAWN	DATE	STATUS
CC	26 09 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	26 09 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2000	A3	4486/6C	

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- MONITORING WELL LOCATION
- APPROXIMATE SITE BOUNDARY

EXPLORATORY HOLE LOCATIONS HAVE BEEN SURVEYED IN (COORDINATES & GROUND LEVEL) ON COMPLETION

REV.	DESCRIPTION	DATE

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& EMPIRE
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JOB TITLE

BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

EXPLORATORY HOLE LOCATIONS - MONITORING WELLS (AREAS A & B)

DRAWN	DATE	STATUS
CC	06 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	06 11 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2500	A3	4486/6D	

NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- TRIAL PIT LOCATION
- SOAKAWAY PIT LOCATION
- APPROXIMATE SITE BOUNDARY

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

EXPLORATORY HOLE LOCATIONS - TRIAL PITS (AREA B - WEST FIELDS)

DRAWN	DATE	STATUS
CC	06 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	06 11 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
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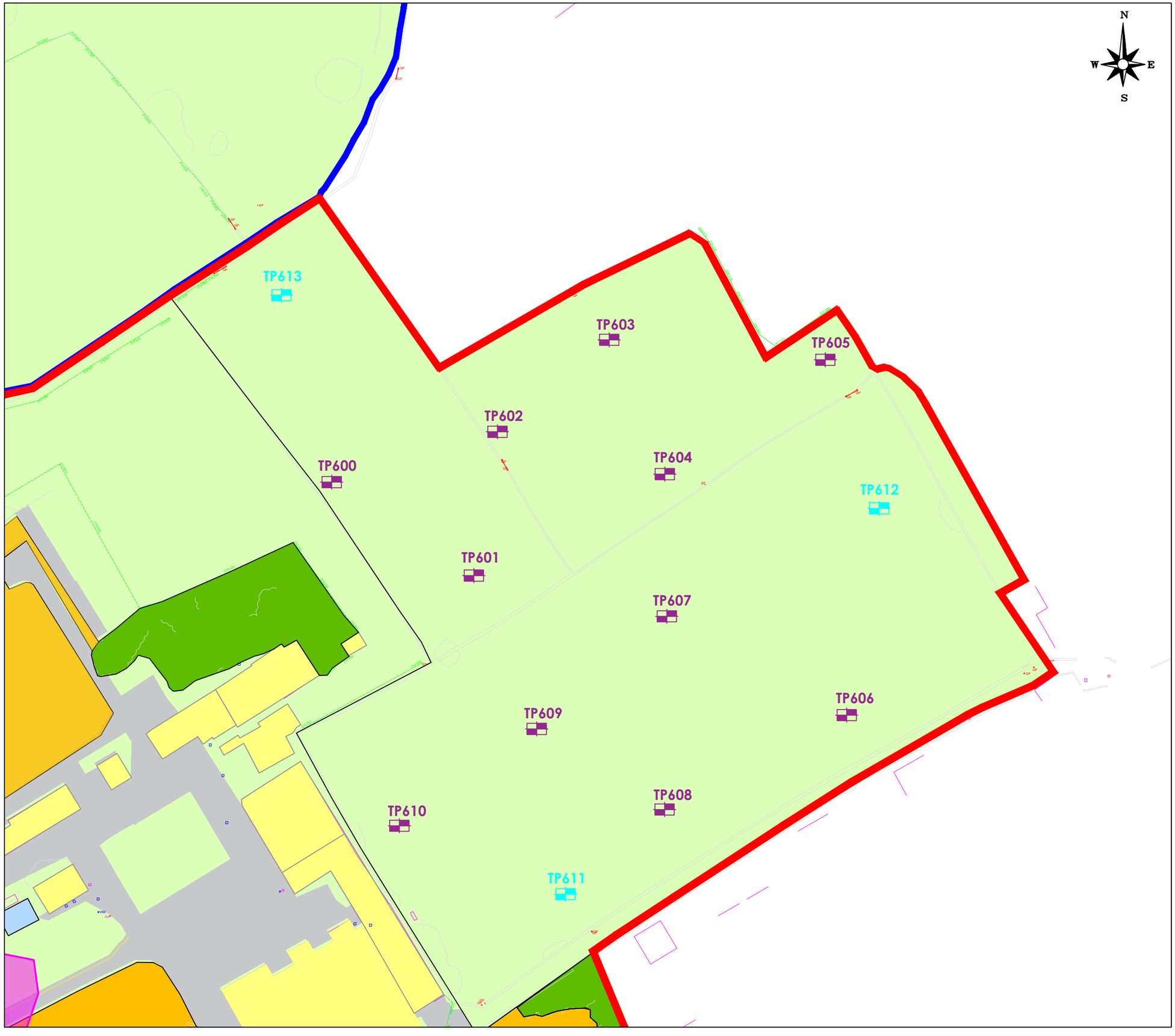

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NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- TRIAL PIT LOCATION
- SOAKAWAY PIT LOCATION
- APPROXIMATE SITE BOUNDARY

REV.	DESCRIPTION	DATE

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JOB TITLE

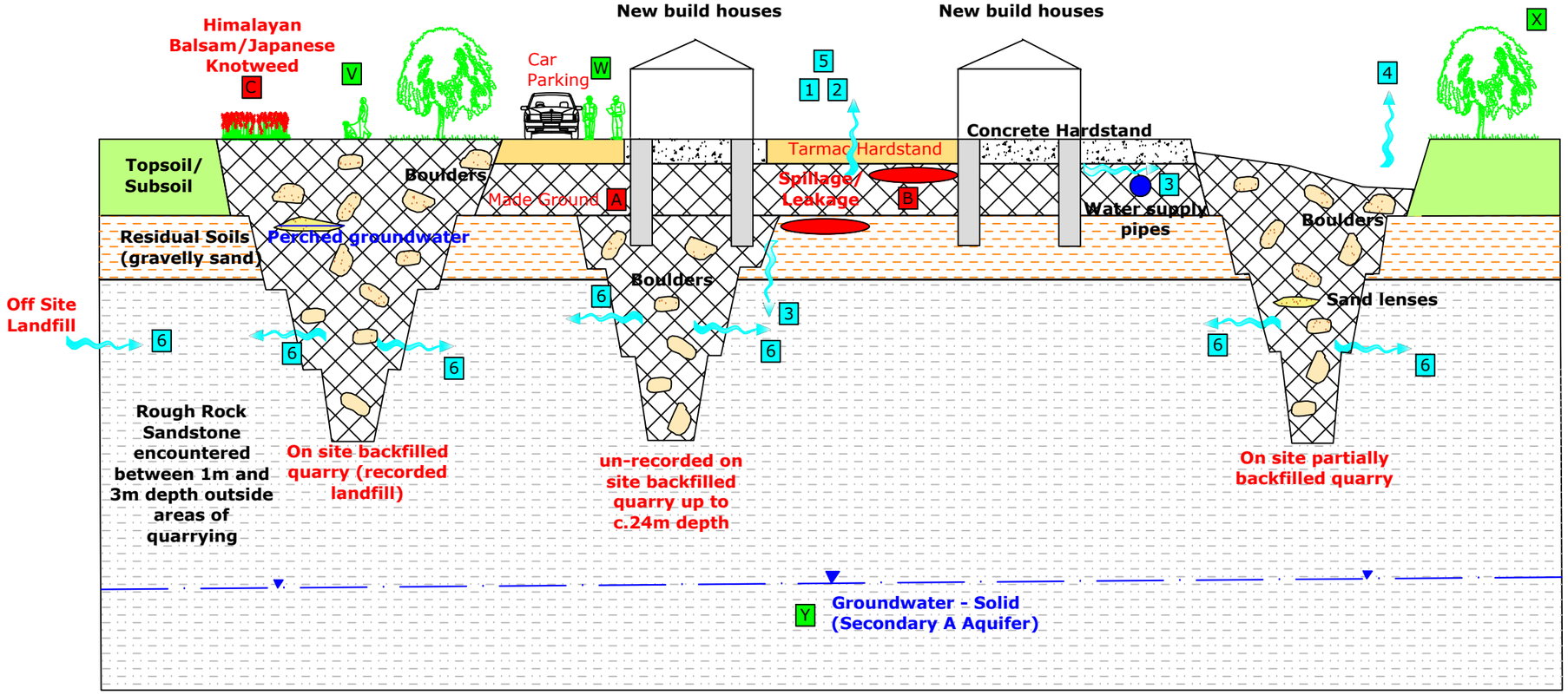
BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

EXPLORATORY HOLE LOCATIONS - TRIAL PITS (AREA B - EAST FIELDS)

DRAWN	DATE	STATUS
CC	06 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	06 11 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:1,000	A3	4486/ 6F	



SOURCES	PATHWAYS	RECEPTORS
A MADE GROUND (INORGANICS)	1 DERMAL CONTACT	V END USERS (RESIDENTS)
B LEAKAGE/SPILLAGE (ORGANICS)	2 INGESTION/INHALATION	W SITE WORKERS
C INVASIVE PLANTS	3 LEACHING OF CONTAMINANTS	X VEGETATION
	4 UPTAKE BY PLANTS	Y GROUNDWATER
	5 VOLATILISATION	
	6 MIGRATION OF GAS	

NOTES

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

REVISED CONCEPTUAL SITE MODEL

DRAWN	DATE	STATUS
CC	14 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	14 11 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
Not to scale	A3	4486/7	

NOTES

- Site Boundary
- High
- Medium
- Low
- Very low
- Badger sett
- 30m Buffer from Badger Sett
- Himalayan balsam
- Hollyberry cotoneaster
- Japanese knotweed
- Rhododendron
- Wall cotoneaster

REV.	DESCRIPTION	DATE
A	ADDITION OF UPDATE ECOLOGICAL CONSTRAINTS PLAN	13/07/2023

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JOB TITLE

BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

ECOLOGY & INVASIVE PLANTS

DRAWN	DATE	STATUS
CC	31 03 2023	FOR COMMENT ☐
		FOR APPROVAL ☐
CHECKED	DATE	DRAFT ☐
REG	31 03 2023	FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2500	A3	4486/8	A

NOTES

- FOUNDATION PIT LOCATION
- TRIAL PIT/TRENCH LOCATION
- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- CONFIRMED ASBESTOS FRAGMENTS
- CONFIRMED ASBESTOS FIBRES

NOTE: ASBESTOS HAS BEEN IDENTIFIED SPORADICALLY ACROSS THE SITE, THEREFORE VISUAL INSPECTION AND FURTHER TESTING SHOULD BE UNDERTAKEN TO CONFIRM THE ABSENCE OF ASBESTOS BEFORE RE-USE

REV.	DESCRIPTION	DATE

LITHOS CONSULTING

info@lithos.co.uk
www.lithos.co.uk

Tel 01937 545330

CLIENT

VISTRY HOMES, COUNTRYSIDE PARTNERSHIP, MILLER HOMES & EMPIRE KNIGHT GROUP

JOB TITLE

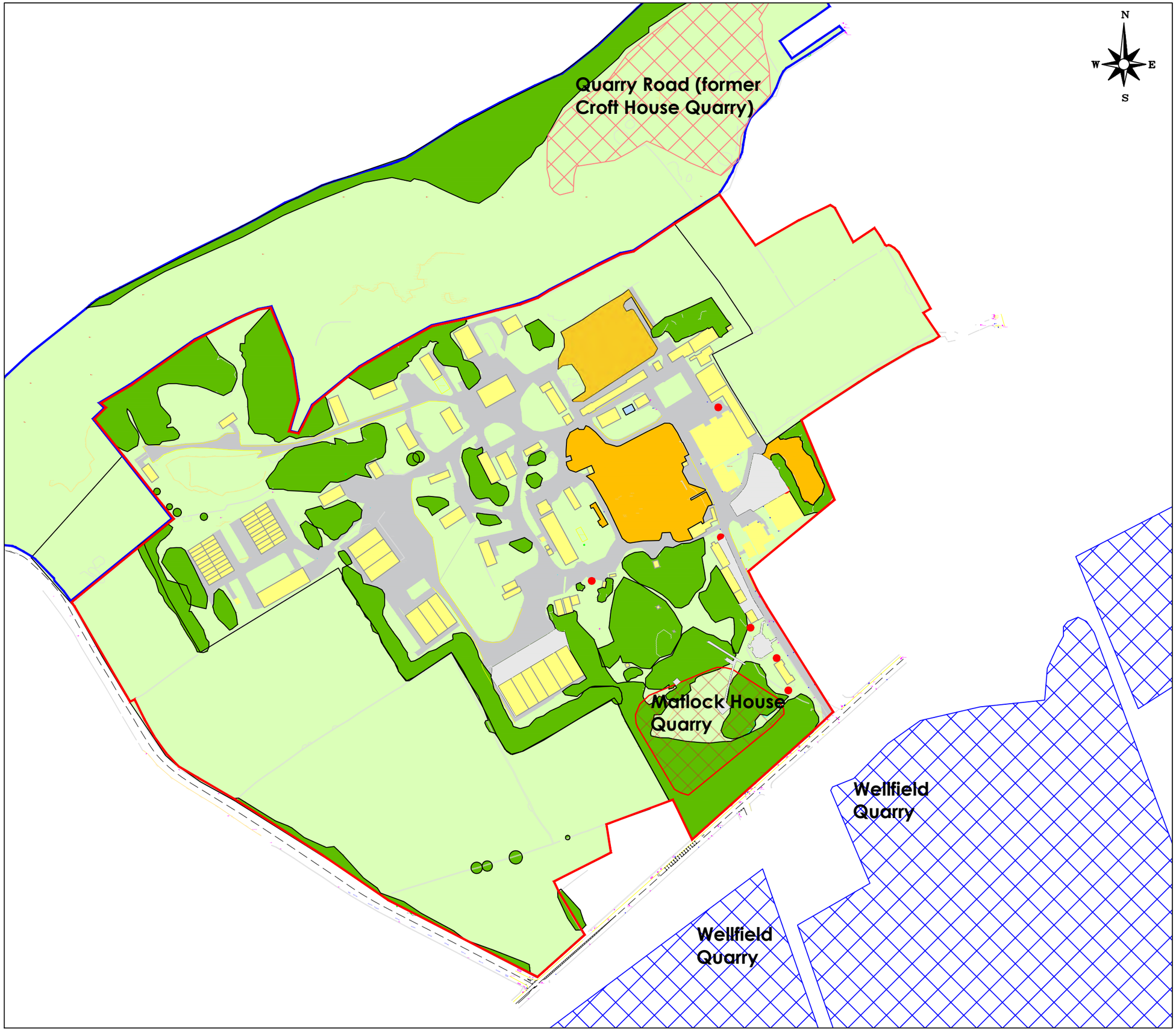
BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

IDENTIFIED ASBESTOS LOCATIONS

DRAWN	DATE	STATUS
CC	17 10 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	17 10 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2000	A3	4486/9	



NOTES

- GRASS AREAS
- TREES & OVERGROWN AREAS
- BUILDING
- GRAVEL OR HARDCORE SURFACING
- TARMAC HARDSTAND
- CONCRETE HARDSTAND
- HISTORICAL LANDFILL
- PERMITTED LANDFILL

REV.	DESCRIPTION	DATE

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& EMPIRE
KNIGHT GROUP

JOB TITLE

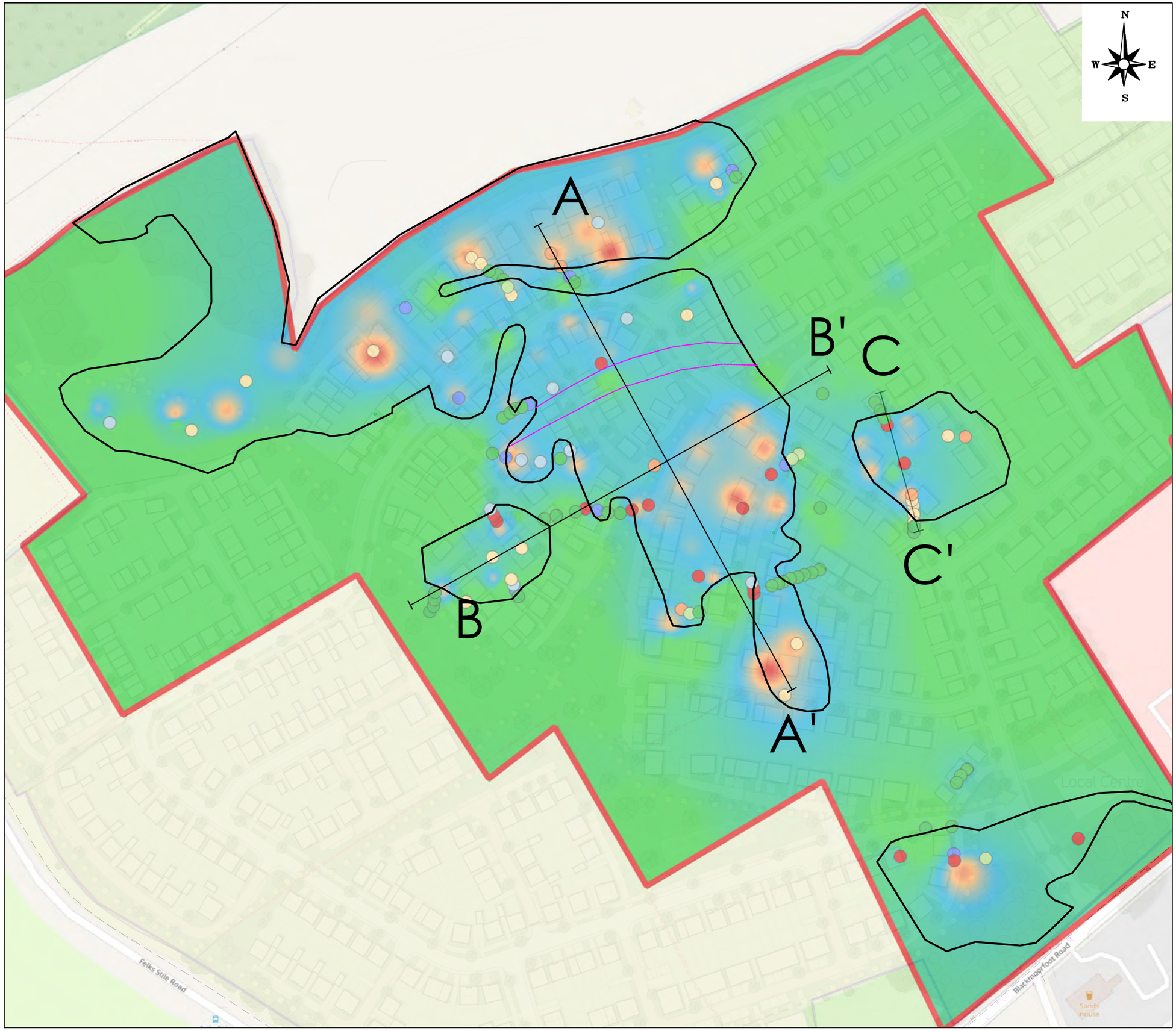
BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

RECORDED LANDFILLS

DRAWN	DATE	STATUS
CC	26 09 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	26 09 2023	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:400	A3	4486/10	



NOTES

MADE GROUND/QUARRY DEPTHS

- 0.0m - 2.0m
- 2.0m - 4.0m
- 4.0m - 8.0m
- 8.0m - 12.0m
- 12.0m - 16.0m
- 16.0m - 20.0m
- 20.0m - 24.0m

APPROXIMATE QUARRY HIGHWALL

A A' LINE OF CROSS SECTION

POSSIBLE 'LAND BRIDGE' - TBC

NOTE: THIS DRAWING IS **SCHEMATIC**. FOR ABSOLUTE DEPTHS, INDIVIDUAL EXPLORATORY HOLE LOGS SHOULD BE CONSULTED.

REV.	DESCRIPTION	DATE

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VISTRY HOMES, COUNTRYSIDE PARTNERSHIP, MILLER HOMES & EMPIRE KNIGHT GROUP

JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

APPROXIMATE QUARRY DEPTHS

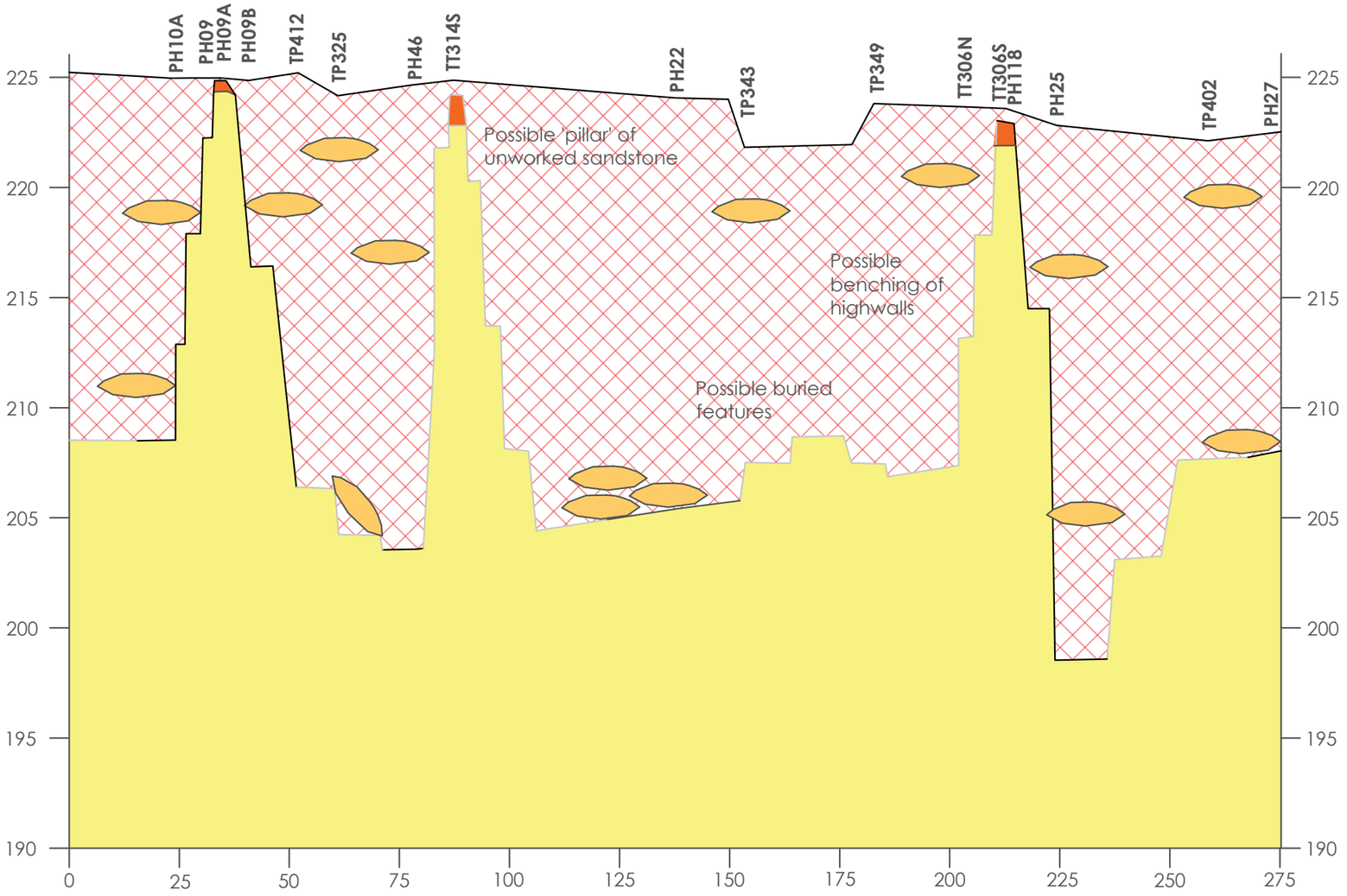
DRAWN	DATE	STATUS
CC	14 11 2023	FOR COMMENT ☐
		FOR APPROVAL ☐
CHECKED	DATE	DRAFT ☑
REG	14 11 2023	FINAL ☐

SCALE	SHEET	DRAWING NO.	REVISION
1:2000	A3	4486/11	

A (NORTH)

Geological Cross Section A-A'
(approx. vertical exaggeration 1 in 5)

A' (SOUTH)



N
W E
S

NOTES

- QUARRY BACKFILL (DEEP MADE GROUND)
- RESIDUAL SOILS
- ROUGH ROCK SANDSTONE BEDROCK
- ROUGH ROCK SANDSTONE BEDROCK (INFERRED)
- BOULDERS (SHOWN INDICATIVELY)
- STRATA BOUNDARY (PROVEN)
- STRATA BOUNDARY (INFERRED)

REV.	DESCRIPTION	DATE

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JOB TITLE

BLACK CAT FIREWORKS, HUDDERSFIELD

DRAWING TITLE

GEOLOGICAL CROSS SECTION LINE A

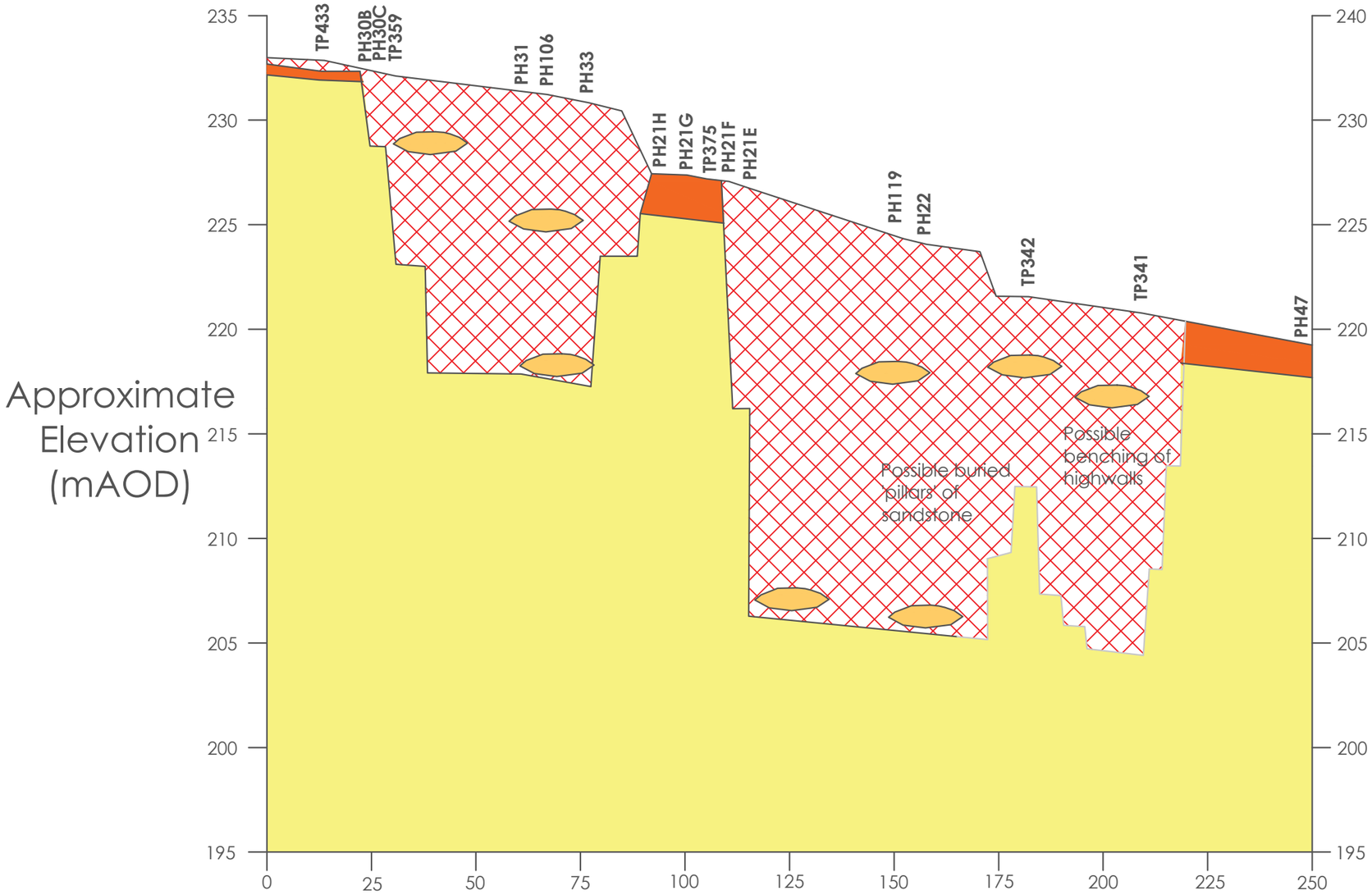
DRAWN	DATE	STATUS
JBR	14 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	14 11 2023	DRAFT ☑
		FINAL ☐

SCALE	SHEET	DRAWING NO.	REVISION
NOT TO SCALE	A3	4486/12	

B
(WEST)

B'
(EAST)

Geological Cross Section B-B'
(approx. vertical exageration 1 in 5)



N
W E
S

NOTES

- QUARRY BACKFILL (DEEP MADE GROUND)
- RESIDUAL SOILS
- ROUGH ROCK SANDSTONE BEDROCK
- ROUGH ROCK SANDSTONE BEDROCK (INFERRED)
- BOULDERS (SHOWN INDICATIVELY)
- STRATA BOUNDARY (PROVEN)
- STRATA BOUNDARY (INFERRED)

REV.	DESCRIPTION	DATE

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KNIGHT GROUP

JOB TITLE

BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

GEOLOGICAL CROSS SECTION
LINE B

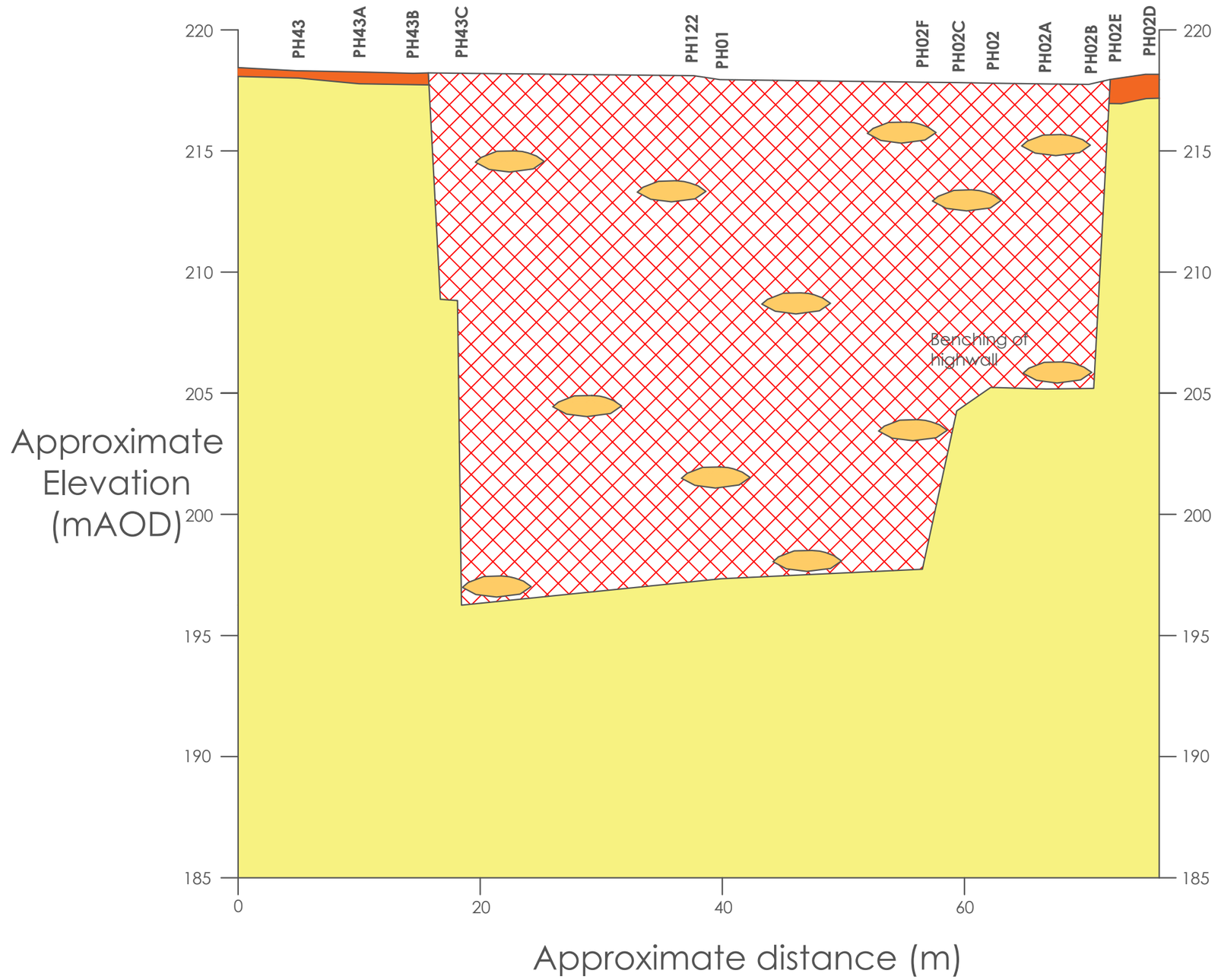
DRAWN	DATE	STATUS
JBR	14 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	14 11 2023	DRAFT ☑
		FINAL ☐

SCALE	SHEET	DRAWING NO.	REVISION
NOT TO SCALE	A3	4486/13	

Geological Cross Section C-C'
(approx. vertical exageration 1 in 2)

C
(NORTH)

C'
(SOUTH)



N
W E
S

NOTES

- QUARRY BACKFILL (DEEP MADE GROUND)
- RESIDUAL SOILS
- ROUGH ROCK SANDSTONE BEDROCK
- ROUGH ROCK SANDSTONE BEDROCK (INFERRED)
- BOULDERS (SHOWN INDICATIVELY)
- STRATA BOUNDARY (PROVEN)

REV.	DESCRIPTION	DATE

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KNIGHT GROUP

JOB TITLE

BLACK CAT
FIREWORKS,
HUDDERSFIELD

DRAWING TITLE

GEOLOGICAL CROSS SECTION
LINE
C

DRAWN	DATE	STATUS
JBR	14 11 2023	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	14 11 2023	DRAFT ☑
		FINAL ☐

SCALE	SHEET	DRAWING NO.	REVISION
NOT TO SCALE	A3	4486/14	

Appendix C

Site Photographs

Photo 1 – northwest of blue line area.	Photo 2 – centre north of blue line area.
Photo 3 – northeast of blue line area.	Photo 4 – access into eastern fields.

Photo 5 – main entrance.	Photo 6 – car park.
Photo 7 – building 15 (shop).	Photo 8 – red diesel tank east of building 15.

Photo 9 – east of building 15 (shop).	Photo 10 – lorry park east of building 15 (shop).
Photo 11 – building 3 (office block & reception).	Photo 12 – building 150 & 5.

Photo 13 – underground white diesel tank pump.	Photo 14 – building 1 (garages & fire station).
Photo 15 – building 240.	Photo 16 – above ground heating oil tank north of building 152.

Photo 17 – above ground heating oil tank south of building 152.	Photo 18 – south of UN testing area.
Photo 19 – centre of UN testing area, looking north.	Photo 20 – centre of UN testing area, looking east.

Photo 21 – concrete structure in UN testing area.	Photo 22 – spill kit bin next to kerosene tank, appears used.
Photo 23 – above ground kerosene tank north of building 240.	Photo 24 – Trailer park C, looking north.

Photo 25 – building 30.	Photo 26 – area of former buildings.
Photo 27 – above ground red diesel tank with spill kits to the right.	Photo 28 – 'badger hill' looking south.

Photo 29 – palisade fencing north of the UN testing area.	Photo 30 – former gunpowder storage safe.
Photo 31 – buildings 144 A-D, looking south.	Photo 32 – boiler rooms, west of buildings 144 A-D

Photo 33 – buildings 166A – F.	Photo 34 – building 8 internal.
Photo 35 – building 4 internal.	Photo 36 – unknown fuel tank north of building 37.

Photo 37 – building 4 external.	Photo 38 – building 37.
Photo 39 – trailer park A.	Photo 40 – 217AB internal.

Photo 41 – building 28 (substation).	Photo 42 – buildings 35A-C, 36 A-L, looking west ('Catherine Wheel Alley').
Photo 43 – building 52A, 53A-D.	Photo 44 – building 41A, not marked on map, located next to building 52A.

Photo 45 –building 115, looking north.	Photo 46 – building 93, looking west.
Photo 47 – building 86 (front) and 93 (back), looking north.	Photo 48 – metal containers east of building 146, looking north.

Photo 49 –burn area, looking west.	Photo 50 –building 90, looking north.
Photo 51 –testing area, looking north.	Photo 52 –concrete building, northeast of testing area.

Photo 53 –testing area, looking south.	Photo 54 – western fields looking west.
Photo 55 –burn area, looking east.	Photo 56 –western fields viewed from firework factory, looking west.

Photo 57 – IBC's used for soaking fireworks in the burn area.	Photo 58 – buildings 167A-C.
Photo 59 –buildings 16 (left) and 88 (right).	Photo 60 – buildings 167A-C.

Photo 61 – back of buildings 167A-C.	Photo 62 –building 111.
Photo 63 – east of buildings 24 looking north.	Photo 64 – west of buildings 24 looking north.

Photo 65 –building 237.	Photo 66 – building 232 looking north
Photo 67 – tarmac track, dead end, looking south.	Photo 68 – west of firework factory, looking east.

Photo 69 – eastern fields, looking east.	Photo 70 – northeastern fields looking east.
Photo 71 – southern fields looking northeast.	Photo 72 – western fields looking east.

Photo 73 –northwestern field looking east.	Photo 74 – buildings 132A-B looking west.
Photo 75 – building 131 & adjacent storage containers.	Photo 76 – back of boiler houses & buildings 144A-D, looking west.

Photo 77 – building 100, looking west.	Photo 78 – building 134, looking northwest.
Photo 79 – unlabelled building, south of building 34, looking south.	Photo 80 – buildings 35A-C, 36A-L & 66, looking east.

Appendix D

Commission

036/4486/REG

8th August 2022

Registered in England 07068066

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LS22 5DZ

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Mr T Pardey
Vistry Yorkshire
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Leeds
LS15 8ZB

Dear Tom

Black Cats, Blackmoorfoot Road, Huddersfield

Further to recent issue of our review of 3rd party reports, please find attached our proposal for undertaking the supplementary site investigation outlined in Section 3.6 of that review. A draft Masterplan suggests that proposed development will include 770 plots, a local centre and an extra care facility. There is POS in the form of two linear parks, a village green, a natural play area, and a community parkland.

Review of the information supplied suggests that the site consists of a single parcel of land (c. 42 ha), although residential development is restricted to c. 29 ha outlined red on Drawing PL1713-AB-005, Rev 02, issued by Planit. The red line area can be divided in two:

- **Agricultural land** to the east, west & south which has remained largely undeveloped; c. 11.5 ha (c. 40% of the total red line area).
- General **fireworks factory** area which comprises a range of buildings roadways and storage yards; c. 17.8 ha (60% of the total red line area).

At this stage, no significant intrusive investigation is proposed within the 12.5 ha of land outlined blue.

The e3p SI Report reviewed is considered very 'thin' in terms of scope; it provides an initial, 'exploratory' phase of investigation only.

Key findings of our Review were:

- The site has formerly been occupied by:
  - Several **quarries** from early 1800s until present, but mostly backfilled by 1960.
  - A fireworks factory since around 1910. Recently, the property has principally been used for the storage and distribution of fireworks.
- There is significant uncertainty regarding the **depth** and lateral **extent** of each quarry.
- The site is located within 250m of known landfill sites, including a recorded **historic landfill** in the south.
- The site is not within a groundwater source protection zone.
- The site is in an area where the risk of encountering **UXO** is considered moderate to high.
- The site is located beyond the Coal Authority's defined coalfields.
- Beyond former quarries, made ground is typically relatively thin; typically <1m across the former factory area.
- Underlying natural strata typically comprise completely weathered bedrock (sands/gravels), with sandstone bedrock typically from depths of <2m.

- To date no significant gross contamination has been encountered, but e3p only tested 11 samples of made ground.

Ground investigation is generally best undertaken once site operations have ceased and preferably post-demolition; access constraints associated with existing buildings, operations and underground service runs, can prevent thorough inspection of the ground via extensive trial pitting/trenching. Consequently, some uncertainties may remain and a supplementary, post-demolition ground investigation may be required by the relevant regulatory authorities. Nonetheless, useful data can be obtained at this time and we will certainly aim to resolve as much uncertainty relating to ground as possible, in order to enable you to make an unconditional offer for the site.

Our site investigation will be undertaken in accordance with UK good practice (as outlined in BS5930, BS10175, LCRM etc). Our Report may not be fully compliant with Eurocode 7 (EC7) and will not purport to be a Ground Investigation Report, nor a Geotechnical Design Report as defined by EC7. Our ground appraisal is intended to assist others as they proceed with design of the proposed development.

This proposal allows for the following works:

Desk study: We will (if/where possible):

- Obtain and review a 'fresh' Landmark report (including 2500 scale historic maps). The e3p search data is already over 4 years old.
- Obtain and review a copy of the Gaia Environmental Report (Ref. 151862.610.00, dated September 2013).
- Obtain and review a Detailed Unexploded Ordnance Risk Assessment, prepared in accordance with CIRIA C681, from a UXO specialist.
- Interview Black Cats employees regarding recent & former activities etc.
- Obtain copies of any site plans showing the location of: known tanks (AST & UST); known basements, air raid shelters etc; burial pits; drainage runs etc.

We will also visit site to review current operations and undertake a walkover survey.

Given the site's history / location, we will obtain a Detailed Unexploded Ordnance Risk Assessment, prepared in accordance with CIRIA C681, comprising a thorough investigation of historical archives by an unexploded ordnance (**UXO**) specialist.

Should significant risks be identified (or if a detailed assessment is recommended and cannot be completed in time), ground investigation activities may need to be supervised by a UXO specialist in addition to the geoenvironmental engineer (Lithos). This would add £ per day to the cost of the ground investigation.

Fieldwork: We have allowed for the excavation of c. 200 trial pits and the drilling of c. 25 rotary probeholes to confirm quarry depths, and c. 25 'stitch lines', comprising 4 to 8 probeholes, to confirm highwall location and determine approximate steepness. All trial pits and probeholes will be supervised and logged by an experienced geoenvironmental engineer.

At this stage, no **cable percussion boreholes** are proposed. Such boreholes would allow the recovery of soil samples from greater depths than are possible via trial pitting (probeholes do not allow the recovery of any soil samples), but only if the quarry backfill does not contain significant boulders (because these cause premature termination). Based on information reviewed to date, it seems unlikely that boreholes will yield any useful data.

Trial pitting / trenching will enable us to determine the:

- Nature of made ground, including:
  - visual/olfactory evidence of potential contamination and the proportion of undesirable elements e.g. biodegradable matter, relict foundations etc
  - the proportion of "oversize", boulder-sized material
  - the location and extent of the quarries, with some trenching to locate the quarry high wall
  - the nature of existing internal floor slabs (where access, and possibly thickness / reinforcement allows)
  - the nature of existing foundations (pits excavated adjacent to external walls)
- Nature, distribution and thickness of shallow soils beyond the former quarries
- Suitability of the ground, beyond the former quarries, for soakaways
- Suitability of the ground for founding structures and highways

Given the site's history and anticipated ground we have allowed for pits to be dug using a tracked 360° excavator. Trial pitting will be undertaken using a tracked 360° excavator (better able to deal with obstructions in made ground), with a 2nd wheeled excavator to breakout surface hardstand.

Representative soil samples of natural and man-made ground, including any contaminated samples, will be taken during the works. In-situ shear strengths of any cohesive soils encountered will be determined by the use of a hand-held shear vane.

We will make every effort to compact arisings and 'sweep' them over each trial pit. However, you should be aware that on completion of the investigation, "graves" of spoil (each about 3m long by 1m wide) unsuitable for trafficking, will be left up to 400mm proud at each trial pit location. At this stage, no allowance has been made for any further reinstatement such as removal of excess arisings, reinstatement of the hardstanding etc.

Soakaway testing will also be carried out in at least 8 pits in order to assess suitability of the ground for plot and highway surface water drainage. This will provide an 'initial sweep' at relatively wide spacings and often with only 1 or 2 fills.

It should be noted that if the initial soakaway tests yield satisfactory results, in order to obtain approvals from the LLFA, Highways etc, the drainage designer is likely to require further testing: (a) within 25m of proposed chamber locations; and (b) to include 3 fills.

This investigation should yield sufficient data to enable a foundation zoning plan, and possibly a detailed Foundation Schedule. However, if ground conditions are found to be more variable than anticipated, a 'tighter' grid of pits will be necessary prior to preparation of a detailed Foundation Schedule. This proposal does not allow for the preparation of a detailed Foundation Schedule, but we will provide a quote on completion of the site investigation if requested.

The site is underlain by c. 4 areas of deep quarry backfill (including boulders), and therefore we have allowed for the drilling of c. 150 **rotary probeholes** to confirm quarry depths, and highwall location.

We have also assumed that it will be possible to park plant overnight within the factory, where it will be more secure and therefore we have assumed that overnight security will not be required.

We have allowed for all exploratory holes to be picked-up by a **surveyor** (co-ordinates/ground levels will be included on the logs).

Given the presence of backfilled quarries and areas of landfill within 250m of the site, we have allowed for the installation of wells in 30 probeholes and monitoring for hazardous **gas** (and any shallow groundwater).

The generation potential of this gas source is considered likely to be Low. Therefore, in accordance with CIRIA Report C665, we have initially allowed for 9 visits over a 6-month period. A hazardous gas risk assessment will be issued on completion of monitoring.

We strongly recommend that groundwater / gas wells be decommissioned after monitoring has been completed. Decommissioning involves removal of the metal covers, unscrewing the upper 1m to 2 m of pipework and filling the void / remaining well with bentonite.

Decommissioning of monitoring wells prevents gas migration into sub-floor voids. Subject to your instruction, we will decommission accessible wells after the last monitoring visit for an E\O price of £ +VAT. We will contact you to seek instruction following issue of our gas risk assessment / groundwater dip results.

Testing: This will comprise routine **geotechnical** soils analysis, including 20 moisture content & Atterberg limits, and 50 pH & water-soluble sulphate. We will also schedule compaction tests and gradings on 20 samples of made ground to assess suitability for use in earthworks ground improvement.

This site is underlain by made ground which in turn is likely to be subject to re-engineering prior to the construction of new estate roads. Consequently, there is no merit in obtaining CBR values at this stage.

Appropriate **chemical analyses**, based on our review of the existing e3p report and knowledge of the site's history, have been allowed for; this will comprise 100 samples (made ground, including tarmac, and topsoil) for a suite including heavy metals, sulphur, sulphide, speciated PAH, and banded TPH (with supplementary speciation as/where appropriate). In the event that ground contamination is more significant or different to that anticipated, it might be necessary to carry out additional chemical testing.

Up to 10 samples will also be scheduled for a 'standard' explosives suite.

Within in our proposal we have allowed for the screening (ID) of 100 samples for asbestos. In the event that positive IDs are reported, it is likely that we will need to schedule further analysis (asbestos quantification), in order to determine the significance of the results. Asbestos quantification is currently a relatively expensive test and consequently we have not allowed for it at this stage. We will inform you immediately after receipt of results if we consider asbestos quantification is required.

Visible contaminants, sharps and the clay/sand/silt content of 10 topsoil samples will be determined to check compliance with BS3882 requirements.

Reporting & timescales: In order to provide you with sufficient information to enable assessment of abnormal costs at the earliest opportunity we will issue a concise overview report within 5 days of fieldwork completion.

On completion of the desk study, fieldwork and laboratory testing a comprehensive, factual and interpretative report will be issued. This will contain exploratory hole logs, laboratory test results, copies of all relevant correspondence and drawings of the site. The report will include qualitative risk assessment with respect to both controlled waters and human health. The report will also include consideration of foundation types.

At the time of writing, fieldwork could be commenced within 4 weeks of receipt of your written instruction to proceed. Our comprehensive geoenvironmental appraisal report will be issued within 5 weeks of fieldwork completion. This report will comment on issues associated with hazardous gas, but the gas risk assessment will not be issued until monitoring is completed.

A completed copy of the **YW** Contaminated Land Assessment Form will be included in an Appendix to our Report. However, the proposed route(s), and total length, of water supply pipes are not currently known and no allowance has been made for laboratory testing of soil samples in line with UKWIR guidance.

Given previous usage of this land, it is considered highly likely that a **Remediation Strategy** report will be required by the Local Authority, and our proposal allows for this.

A copy of the final report will be issued to the relevant regulatory authorities on receipt of written instruction from yourselves.

Invoicing: The attached proposal provides a breakdown of the costs associated with this project. This breakdown is for information only and the proposal can be regarded as a lump sum price of **£*** ** plus VAT. Variation will only occur in the event that a given item is not undertaken or that substantial additional works are recommended, in which case we will inform you immediately, provide costs for the required works, and seek your prior consent. Revision of the costings provided may be required if works are not instructed within 6 months of the date this proposal was issued.

Our proposal allows for submission of the report to the Local Authority and NHBC, and for submission of a single piece of subsequent correspondence with each regulator to address any queries they may have. Any further meetings, correspondence etc, would be chargeable.

We will submit invoices for this project on completion of each Item(s) instructed.

Please note if following instruction of the works outlined in this proposal, it is necessary to subsequently **postpone or cancel**, this should be done at least 3 working days before Lithos are due to commence intrusive investigation on site. We reserve the right to charge a cancellation fee in the event of later notification to cover plant / drill rig costs and abortive consultancy time. The cancellation fee will not exceed £ plus VAT.

Health, safety & welfare: The works outlined above will be carried out in accordance with Lithos' task- and site- specific Risk Assessments and Method Statements.

This investigation is expected to last for at least 2 working weeks and details of welfare will be included within the Method Statements. However, However, presumably Black Cat have established welfare facilities on site, and Lithos' Engineer and the drilling operatives will be able to make use of these facilities as and when necessary, after removing PPE and washing hands.

Utility plans are required in order to protect operatives from the hazards associated with striking buried services and avoid potentially substantial disruption\repair costs. We will make every effort not to damage any services (including review of utility plans and use of a CAT detector). However, Lithos cannot accept liability for damage to any underground services that are not accurately marked on plans made available to us prior to commencement of our field investigation, or have not been accurately marked on the ground by a responsible third party (e.g. utility company, site owner).

Most developers have copies of the necessary utility plans (including electricity, gas, water, drainage & telecom), and it would be appreciated if you could forward these prior to the proposed fieldworks. However, if you do not have the necessary plans, Lithos will obtain them direct from each of the utility companies.

It is highly likely that the site is underlain by many "private" services and drains etc which will not be shown on statutory utility plans. Consequently, it would be appreciated if copies of plans showing these services could be made available to our field engineer, and\or someone with site knowledge could advise us with respect to safe locations for our exploratory holes.

Under the **CDM** Regulations 2015, Lithos must be provided with pre-construction information already in your possession, or information that can reasonably be obtained through sensible enquiry. This information must be relevant to the project, have an appropriate level of detail, and be proportionate to the nature of the risks.

If no other designers or contractors have been appointed, Lithos could perform the role of Principal Contractor but only for the duration of the site investigation outlined in this proposal. If you require us to perform the role of Principal Contractor, please make this clear in your instruction. It should be noted that we are not suitably qualified to perform this role where other designers or contractors are also appointed.

It is anticipated that the site investigation outlined in this proposal will be undertaken several months before any construction is commenced on site. Consequently, our works can be considered in isolation and, given the anticipated number of person days on site, this site investigation is not notifiable to the HSE.

Further work: In addition to the investigation outlined above, the following further works may ultimately be required:

- If deep infrastructure (e.g. a wet well) is proposed, **rotary cored boreholes** to provide further information regarding bedrock (spacing of bedding, fractures, strength etc) and groundwater conditions to inform groundworks design for the required enabling works.
- In accordance with BS 8004:2015 and EC7, if piled foundations are anticipated, piling contractors may request that boreholes be extended a minimum 5m into competent bedrock using **rotary coring** techniques. This would add significant cost to the proposed investigation and it would be prudent to liaise with your preferred piling contractor(s) in advance of commissioning this investigation and inform Lithos whether or not rotary coring is required.
- Further pitting and testing within the curtilage of the former factory following demolition of remaining buildings.
- Coring of floor slabs (if pitting is unable to penetrate due to significant thickness)
- If the initial **soakaway** tests yield satisfactory results, it may be necessary to:
    - Undertake further testing in order to obtain approvals from the LLFA etc: (a) within 25m of proposed chamber locations; and (b) to include 3 fills.
    - Install groundwater monitoring wells to depths of around 5m in at least 3 boreholes. Given the anticipated depth to bedrock, these boreholes might need to be advanced by rotary probing.
    - The wells should then be monitored on at least 7 occasions; monthly for 3 months, and then bi-monthly for a further 8 months.

Terms & conditions: Vistry and Lithos have an agreed Appointment document, and this work will be undertaken in accordance with that. However, if the Appointment term expires or remains unsigned, works will be undertaken in accordance with our Standard Terms and Conditions, a copy of which are enclosed.

It is hoped the above is sufficient for your present needs. However, should you require any further information, please contact the undersigned.

Yours sincerely

Mark Perrin
Director
for and on behalf of
LITHOS CONSULTING LIMITED

1 DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, unless the context otherwise requires, the following words and expressions have the following meanings:

"Agreement" means these Terms (entitled "Terms and Conditions for the Appointment of Lithos Consulting"), the Proposal, any document recording your unequivocal acceptance of the Proposal and any other documents or parts of other documents expressly referred to in any of the foregoing;

"Documents" means all documents of any kind and includes plans, drawings, reports, programmes, specifications, Bills of Quantities, calculations, letters, e-mails, faxes, memoranda, films and photographs (including negatives), or any other form of record prepared or provided or received by, or on behalf of us, and whether in paper form or stored electronically or on disk, or otherwise;

"Intellectual Property" includes all rights to, and any interests in, any patents, designs, trade marks, copyright, know-how, trade secrets and any other proprietary rights or forms of intellectual property (protectable by registration or not) in respect of any technology, concept, idea, data, programme or other software (including source and object codes), specification, plan, drawing, schedule, minutes, correspondence, scheme, programme, design, system, process logo, mark, style, or other matter or thing, existing or conceived, used, developed or produced by any person;

"Project" means the project described in the Proposal and any enquiry from you on which we have based our Proposal;

"Proposal" means the offer document prepared by us in response to an enquiry or otherwise, in connection with the proposed provision of the Services;

"Services" means the work and services relating to the Project to be provided by us pursuant to the Agreement and as set out in the Proposal and includes any additions or amendments thereto made in accordance with these Terms;

"Terms" means these terms entitled "Lithos Consulting Terms of Appointment" as amended from time to time.

1.2 Words importing the singular only shall also include the plural and vice versa, where the context requires.

1.3 Words importing persons or parties shall include firms, corporations and any organisation having legal capacity and vice versa, where the context requires; and words importing a particular gender include all genders.

1.4 The sub-headings to the clauses of these Terms are for convenience only and shall not affect the construction of the Agreement.

1.5 A reference to legislation includes that legislation as from time to time amended, re-enacted or substituted and any Orders in Council, orders, rules, regulations, schemes, warrants, by-laws, directives or codes of practice issued under any such legislation.

1.6 In the event of conflict between the documents forming part of the Agreement, the Proposal shall prevail, followed by the Terms.

2 APPOINTMENT

2.1 You agree to engage us and we agree to provide the Services in accordance with the provisions of this Agreement.

3 OUR OBLIGATIONS

3.1 We shall perform the Services using the reasonable standard of skill and care normally exercised by qualified members of our profession, performing similar services under similar conditions.

3.2 We shall use all reasonable endeavours to perform the Services in accordance with relevant environmental and safety legislation.

4 YOUR OBLIGATIONS

4.1 Throughout the period of this Agreement you shall afford to us, or procure for our benefit, access to any site where access is required for the performance of the Services.

4.2 You accept responsibility for ensuring that we are notified in writing of all special site and/or plant conditions, including without prejudice to the generality of the foregoing, the existence and precise location of all underground services, cables, pipes, drains or underground buildings, constructions or any hazards, which you shall clearly mark on the ground or identify on accurate location plans supplied to us prior to the commencement of the Services. You shall also inform us in writing of any relevant operating procedures including any site safe operating procedures and any other regulations relevant to the carrying out of the Services. You shall indemnify us against all costs, losses, claims, demands and expenses arising as a result of any non-disclosure in this respect, including but not limited to indemnification against any action brought by the owner of the land or otherwise.

4.3 If you discover any conflict, defect or other fault in the information or designs provided by us pursuant to the Agreement, you will advise us in writing of such defect, conflict or other fault and we shall have the right to rectify the same or where necessary, to design the solution for rectification of any works carried out by others pursuant the conflicting, defective or in any other way faulty information or designs.

5 COPYRIGHT

5.1 The copyright in all Intellectual Property prepared by or on behalf of us in connection with the Project for delivery to you shall remain vested in us.

5.2 You shall have a non-exclusive licence to copy and use such Intellectual Property for purposes directly related to the Project. Such licence shall enable you to copy and use the Intellectual Property but solely for your own purposes in connection with the Project and such use shall not include any licence to reproduce any conceptual designs or professional opinions contained therein nor shall it include any license to amend any drawing, design or other Intellectual Property produced by us.

5.3 Should you wish to use such Intellectual Property in connection with any other works or for any other purpose not directly related to the Project or wish to pass any Intellectual Property to any third party, you must obtain our prior written consent. The giving of such consent shall be at our absolute discretion and shall be upon such terms as we may require. We shall not be liable to you for the use by any person of such Intellectual Property for any purpose other than that for which the same were prepared by or on our behalf.

5.4 Ownership of any proposals submitted to you that are not subsequently confirmed as part of the Services to be provided for you remain with us and such proposals must not be used as the basis for any future work undertaken by you or a third party and no liability can be accepted howsoever arising from such proposals.

5.5 In the event of you being in default of payment of any fees or other amounts due, we may suspend further use of the licence on giving no less than 2 calendar days' notice of the intention to do so. Use of the licence may be resumed on receipt of the outstanding amounts.

6 CONFIDENTIALITY

6.1 Neither you nor we shall at any time disclose to any person any confidential information concerning the business, affairs, customers, clients or suppliers of the other party or of any member of the group of companies to which the other party belongs, except as permitted by clauses 6.2 and 6.4.

6.2 Each party may disclose the other party's confidential information:

(a) to its employees, officers, representatives, contractors, sub-contractors or advisers who need to know such information for the purposes of exercising the party's rights or carrying out its obligations under or in connection with this Agreement. Each party shall ensure that its employees, officers, representatives, contractors, sub-contractors or advisers to whom it discloses the other party's confidential information comply with this paragraph 6; and

(b) as may be required by law, to a court of competent jurisdiction or any governmental or regulatory authority.

6.3 Neither you nor we shall use any other party's confidential information for any purpose other than to exercise our rights or perform our respective obligations under or in connection with this Agreement.

6.4 Subject to the above and our privacy policy which can be found on www.lithos.co.uk, we shall be permitted to use information related to the Services we provide in connection with the Project for the purposes of marketing its services and in proposals for work of a similar type.

7 ASSIGNMENT

7.1 You may assign the benefit of this Agreement on two occasions with our prior written consent (not to be unreasonably withheld) and any additional assignments shall be with our prior consent.

7.2 We may at any time assign, mortgage, charge, subcontract, delegate, declare a trust over or deal in any other manner with any or all of our rights and obligations under this Agreement.

8 INSURANCE

8.1 We shall maintain a professional indemnity insurance policy covering our liabilities for negligence under this Agreement, with a limit of indemnity of £5,000,000 (FIVE MILLION POUNDS) any one claim, save for pollution and contamination claims and asbestos claims both of which carry £2,000,000 (TWO MILLION POUNDS) in the aggregate cover. This policy is annually renewable and whilst renewal is not automatic, We shall maintain such insurance at all times until six years from the date of the completion (or termination) of the Services under this Agreement, provided such insurance is available at commercially reasonable rates and terms.

8.2 If for any period such insurance is not available at commercially reasonable rates and terms, we shall inform you and shall obtain in respect of such period such reduced level of professional indemnity insurance as is available and as would be fair and reasonable in the circumstances for us to obtain.

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9.1 Invoices for services rendered will be submitted for payment in accordance with the Proposal.

9.2 You shall pay you any VAT properly chargeable on the Services and any amount expressed as payable to us under this Agreement is exclusive of VAT unless stated otherwise.

9.3 The due date for payment is the date of the invoice and the final date for payment is 28 days from the date of the invoice.

9.4 If you dispute the amount included for payment in an invoice then you must serve a written notice on us no later than 14 calendar days before the final date for payment. If no notice is given within the required timeframe the amount due shall be the amount stated in the invoice.

9.5 If you fail to pay any monies in accordance with the foregoing payment provisions, we shall be entitled to charge interest on any monies owed to us, such interest to be at a rate of 4% above the base rate of a clearing bank from time to time calculated from the final date for payment to the date of actual payment on a compound basis. The parties acknowledge that our liability under this clause 10.5 is a substantial remedy for the purposes of section 9(1) of the Late Payment of Commercial Debts (Interest) Act 1998.

10 LIMITATIONS ON LIABILITY

10.1 Unless otherwise agreed in writing, our total liability under or in connection with this Agreement whether in contract, tort, negligence, breach of statutory duty or otherwise (other than in respect of personal injury or death) shall be limited to and shall not exceed the lesser of either the level of insurance cover referred to within clause 8.1 above, or 20 times the total value of invoices issued to you for the Services.

10.2 No action or proceedings under or in respect of the Agreement whether in contract, tort, negligence, under statute or otherwise shall be commenced against us after the expiry of a period of six years from the date of the completion (or termination) of the Services under this Agreement.

10.3 Whilst we usually scan for potential exploratory locations with a Cable Avoidance Tool, we shall not be liable for any damage to underground services, cables, pipes, drains or underground buildings, constructions and the like which were either not marked on site or for which accurate plans were not provided.

10.4 We shall not be liable for the cost of rectifying any defect, conflict or other fault in the information or designs provided by us or for the cost of designing a solution for and rectifying any subsequent works carried out by others pursuant to the conflicting, defective or in any other way faulty information or designs, unless we have been advised in writing of the same by you and have been given the opportunity to rectify the same or where necessary, to design the solution for rectification of any subsequent works carried out by others pursuant to the same.

11 DELAY

We shall comply with any timescale agreed for completion of the Services unless delayed or prevented by circumstances beyond our reasonable control and in the event of any such circumstances arising we undertake to complete the Services within a reasonable period, but will not be liable to you for any delay as a result.

12 TERMINATION

12.1 The Agreement may be terminated by either of us in the event of the other making a composition or arrangement with its creditors, becoming bankrupt, or being a company, making a proposal for a voluntary arrangement for a composition of debts, or has a provisional liquidator appointed, or has a winding-up order made, or passes a resolution for voluntary winding-up (except for the purposes of a bona fide scheme of amalgamation or reconstruction), or has an administrator or an administrative receiver appointed to the whole or any part of its assets. Notice of termination must be given to the party which is insolvent by the other party.

12.2 If for any reason our Services are suspended for a period in excess of three calendar months then we shall be entitled to terminate our appointment under this Agreement in respect of the Services by no less than seven days written notice to you.

12.3 If you fail to pay in full any sum due under the terms of this Agreement by the final date for payment for that sum and no effective pay less notice is issued, we may serve written notice to you demanding payment within 14 days of such notice. If you fail to comply with such notice, we shall be entitled to terminate our employment under this Agreement forthwith.

12.4 Any termination of our appointment howsoever caused shall be without prejudice to our rights to require payment for all Services performed up to the date of such termination including but not limited to payment of a fair and reasonable proportion of any figure identified in the Proposal or otherwise for fees in respect of a particular service which Lithos has started, but not completed.

13 THIRD PARTY RIGHTS

The Agreement shall not confer and shall not purport to confer on any third party any benefit or any right to enforce any term of this Agreement for the purposes of the Contracts (Rights of Third Parties) Act 1999 or otherwise.

14 COLLATERAL WARRANTIES & LETTERS OF RELIANCE

We shall consider and may consent to a request from you for us to enter into a collateral warranty or letter of reliance with a third party with regard to the Services provided under this Agreement. The giving of such consent shall be at our absolute discretion and providing we agree to our standard form of collateral warranty or letter of reliance (subject to any reasonable changes to be approved by us at our absolute discretion) and in return for payment of a fee (to be notified at the time of the request).

15 NOTICES

15.1 Any notice provided for in the Agreement shall be in writing and shall be deemed to be properly given if delivered by hand or sent by pre-paid first class post to the address of the relevant party as may have been notified by each party to the other or, in the absence of notification, to our respective registered office addresses.

15.2 Such notice shall be deemed to have been received on the day of delivery if delivered by hand or on the second working day after the day of posting if sent by pre-paid first class post.

16 ENTIRE AGREEMENT

16.1 The Agreement constitutes the complete and entire agreement between us with respect to the Services and supersedes any prior oral and/or written warranties, terms, conditions, communications and representations, whether express or implied and any claim against us in respect of the Services can only be made in contract under the provisions of this Agreement and not otherwise under the law or tort or otherwise.

16.2 No amendments, modifications or variation of this Agreement shall be valid unless made in writing and agreed to by us; such agreement must be recorded in writing by at least one of us.

16.3 We shall not be bound by any standard or printed terms or conditions furnished by you in any of your documents unless we specifically state in writing separately from such documents that we intend such terms and conditions to apply.

17 DISPUTES, JURISDICTION AND GOVERNING LAW

17.1 This Agreement shall be governed by and construed in accordance with English law and we irrevocably and unconditionally submit to the jurisdiction of the English Courts.

17.2 Where the Housing Grants, Construction and Regeneration Act 1996 applies, any dispute between us may be referred to adjudication in accordance with The Scheme for Construction Contracts Regulations 1998 or any amendment or modification thereof being in force at the time of the dispute, as applicable to England, Wales, Scotland and Northern Ireland.

Charlotte Copley

Subject: FW: 4486, Blackmootfoot Rd

From: Tom Pardey <Tom.Pardey@vistry.co.uk>
Sent: Monday, July 10, 2023 5:08 PM
To: Reg <reg@lithos.co.uk>
Cc: Charlotte Copley <Charlotte.Copley@lithos.co.uk>
Subject: RE: 4486, Blackmootfoot Rd

Hi Reg,

That should be fine, just waiting on the ecology constraints plan and also I have a slight concern about the UXO, as I'm not sure they can survey the fields.

I think the grass is too long. Just waiting for someone to confirm on Wednesday. Otherwise we'll need that cut before we can progress the survey. Not sure how that affects the programme?

Kind Regards

Tom Pardey (CEng MICE)
Head of Technical

Direct: 0113 204 4452
Mobile: 07762892922

Vistry Yorkshire
Suite 2/3 Ground Floor | 1175 Thorpe Park | Century Way
Leeds | LS15 8ZB | 0113 204 4400

Bovis Homes Linden HOMES

Part of the Vistry Group

From: Reg <reg@lithos.co.uk>
Sent: Monday, July 10, 2023 10:50 AM
To: Tom Pardey <Tom.Pardey@vistry.co.uk>
Cc: Charlotte Copley <Charlotte.Copley@lithos.co.uk>
Subject: 4486, Blackmootfoot Rd

NOTE: Email originated outside of Vistry Group.

Morning Tom

Is everything sorted to enable us to place bookings for plant etc?

We're still looking to start GI fieldwork on Mon 31st July (with some breaking-out at the end of the week before).

Regards

Mark Perrin
Director
Lithos Consulting Ltd
M 07703 396 635
DD 01937 545 331

www.lithos.co.uk

From: Tom Pardey <Tom.Pardey@vistry.co.uk>
Sent: Thursday, June 29, 2023 11:58 AM
To: Reg <reg@lithos.co.uk>
Subject: Blackmootfoot Rd

Hi Reg,

We now have the exclusivity agreement over the line and ecology taking place today to define any areas we may need to avoid with the SI.

With that in mind I was wondering if you can confirm lead in time for the UXO and then for yourselves to follow on?

Kind Regards

Tom Pardey (CEng MICE)
Head of Technical

Direct: 0113 204 4452
Mobile: 07762892922

Vistry Yorkshire
Suite 2/3 Ground Floor | 1175 Thorpe Park | Century Way
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064/4486/REG

11th September 2023

Mr T Pardey
Vistry Yorkshire
Suite 2/3 Ground Floor
1175 Thorpe Park
Century Way
Leeds
LS15 8ZB

Registered in England 07068066

Parkhill
Wetherby
West Yorkshire
LS22 5DZ

T 01937 545 330

www.lithos.co.uk

Dear Tom

Black Cats Fireworks, Blackmoorfoot Road, Huddersfield – mini-BHs quote

Further to recent discussion, please find attached our proposal for advancing mini-boreholes within buildings. These boreholes are necessary because following vandalism caused by the travellers, it is no longer possible to open many of the roller shutter doors to allow access for a JCB-type excavator.

The primary purpose of the mini-boreholes is to determine thickness of concrete floor slabs.

Our site investigation will be undertaken in accordance with UK good practice (as outlined in BS5930, BS10175, LCRM etc).

This proposal allows for the following works:

Fieldwork: We have allowed for 2 day's dynamic sampling using a mini percussion drilling rig, plus a separate Hilti bolt down concrete coring rig. All boreholes will be supervised and logged by an experienced geoenvironmental engineer.

Mini-boreholes are proposed here in order to:

- Enable inspection of concrete slabs (thickness & any reinforcement) and underlying sub-base (especially with respect to fragments of ACM). A concrete corer will be used to cut a neat hole (300mm diameter). We should also be able to hand dig within the cored to c. 0.75m to sample shallow strata. The large diameter concrete cores will be replaced on completion. We would expect to complete c. 6 locations per day, probably more if the concrete is unreinforced and only c. 150mm thick.

We have allowed for all exploratory holes to be picked-up by a **surveyor** (co-ordinates/ground levels will be included on the logs).

Reporting & timescales: Assuming these works are instructed by return, findings will be incorporated into the planned SI Report in October 2023.

Invoicing: The proposal can be regarded as a lump sum price of **£** plus VAT. Variation will only occur in the event that a given item is not undertaken or that substantial additional works are recommended, in which case we will inform you immediately, provide costs for the required works, and seek your prior consent. Revision of the costings provided may be required if works are not instructed within **3 months** of the date this proposal was issued.

We will submit invoices for this project on completion of each Item(s) instructed.

Please note if following instruction of the works outlined in this proposal, it is necessary to subsequently **postpone or cancel**, this should be done at least 3 working days before Lithos are due to commence

intrusive investigation on site. We reserve the right to charge a cancellation fee in the event of later notification to cover plant / drill rig costs and abortive consultancy time. The cancellation fee will not exceed £ plus VAT.

Health, safety & welfare: The works outlined above will be carried out in accordance with Lithos' task- and site- specific Risk Assessments and Method Statements.

Terms & conditions: Vistry and Lithos have an agreed Appointment document, and this work will be undertaken in accordance with that. However, if the Appointment term expires or remains unsigned, works will be undertaken in accordance with our Standard Terms and Conditions, a copy of which are enclosed.

It is hoped the above is sufficient for your present needs. However, should you require any further information, please contact the undersigned.

Yours sincerely

Mark Perrin
Director
for and on behalf of
LITHOS CONSULTING LIMITED

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12.2 If for any reason our Services are suspended for a period in excess of three calendar months then we shall be entitled to terminate our appointment under this Agreement in respect of the Services by no less than seven days written notice to you.

12.3 If you fail to pay in full any sum due under the terms of this Agreement by the final date for payment for that sum and no effective pay less notice is issued, we may serve written notice to you demanding payment within 14 days of such notice. If you fail to comply with such notice, we shall be entitled to terminate our employment under this Agreement forthwith.

12.4 Any termination of our appointment howsoever caused shall be without prejudice to our rights to require payment for all Services performed up to the date of such termination including but not limited to payment of a fair and reasonable proportion of any figure identified in the Proposal or otherwise for fees in respect of a particular service which Lithos has started, but not completed.

13 THIRD PARTY RIGHTS

The Agreement shall not confer and shall not purport to confer on any third party any benefit or any right to enforce any term of this Agreement for the purposes of the Contracts (Rights of Third Parties) Act 1999 or otherwise.

14 COLLATERAL WARRANTIES & LETTERS OF RELIANCE

We shall consider and may consent to a request from you for us to enter into a collateral warranty or letter of reliance with a third party with regard to the Services provided under this Agreement. The giving of such consent shall be at our absolute discretion and providing we agree to our standard form of collateral warranty or letter of reliance (subject to any reasonable changes to be approved by us at our absolute discretion) and in return for payment of a fee (to be notified at the time of the request).

15 NOTICES

15.1 Any notice provided for in the Agreement shall be in writing and shall be deemed to be properly given if delivered by hand or sent by pre-paid first class post to the address of the relevant party as may have been notified by each party to the other or, in the absence of notification, to our respective registered office addresses.

15.2 Such notice shall be deemed to have been received on the day of delivery if delivered by hand or on the second working day after the day of posting if sent by pre-paid first class post.

16 ENTIRE AGREEMENT

16.1 The Agreement constitutes the complete and entire agreement between us with respect to the Services and supersedes any prior oral and/or written warranties, terms, conditions, communications and representations, whether express or implied and any claim against us in respect of the Services can only be made in contract under the provisions of this Agreement and not otherwise under the law or tort or otherwise.

16.2 No amendments, modifications or variation of this Agreement shall be valid unless made in writing and agreed to by us; such agreement must be recorded in writing by at least one of us.

16.3 We shall not be bound by any standard or printed terms or conditions furnished by you in any of your documents unless we specifically state in writing separately from such documents that we intend such terms and conditions to apply.

17 DISPUTES, JURISDICTION AND GOVERNING LAW

17.1 This Agreement shall be governed by and construed in accordance with English law and we irrevocably and unconditionally submit to the jurisdiction of the English Courts.

17.2 Where the Housing Grants, Construction and Regeneration Act 1996 applies, any dispute between us may be referred to adjudication in accordance with The Scheme for Construction Contracts Regulations 1998 or any amendment or modification thereof being in force at the time of the dispute, as applicable to England, Wales, Scotland and Northern Ireland.

Charlotte Copley

Subject: FW: Black Cats - mini-BH quote

From: Thomas Dixon <Thomas.Dixon@miller.co.uk>
Sent: Tuesday, September 12, 2023 9:42 AM
To: Tom Pardey <Tom.Pardey@vistry.co.uk>; Reg <reg@lithos.co.uk>
Subject: RE: Black Cats - mini-BH quote

Morning Reg,

This is fine with me.

Thank you.

Regards,

Tom Dixon | Engineering Manager | Miller Homes
T : 0870 336 4628 | M : 07598 602 157 | www.millerhomes.co.uk
Lapwing House, Peel Avenue, Calder Park, Wakefield, WF2 7UA

miller homes
the place to be

From: Tom Pardey <Tom.Pardey@vistry.co.uk>
Sent: Monday, September 11, 2023 4:57 PM
To: Reg <reg@lithos.co.uk>; Thomas Dixon <Thomas.Dixon@miller.co.uk>
Subject: RE: Black Cats - mini-BH quote

Hi Reg,

That's fine by me.

Tom, see attached are you happy with this?

Kind Regards

Tom Pardey **(CEng MICE)**
Head of Technical

Direct: 0113 204 4452
Mobile: 07762892922

Vistry Yorkshire
Suite 2/3 Ground Floor | 1175 Thorpe Park | Century Way
Leeds | LS15 8ZB | 0113 204 4400

From: Reg <reg@lithos.co.uk>
Sent: Monday, September 11, 2023 4:41 PM
To: Tom Pardey <Tom.Pardey@vistry.co.uk>
Subject: Black Cats - mini-BH quote

NOTE: Email originated outside of Vistry Group.

Afternoon Tom

Apologies for delay in issuing this.

It's the quote for mini-BHs\concrete coring inside existing buildings (£).

We've provisionally booked the rig for next Tuesday\Wednesday, so if you could confirm instruction ASAP, that'd be appreciated.

Regards

Mark Perrin
Director
Lithos Consulting Ltd
M 07703 396 635
DD 01937 545 331

www.lithos.co.uk

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Miller Homes Limited Registered in Scotland - SC255429
2 Lochside View, Edinburgh Park, Edinburgh, EH12 9DH

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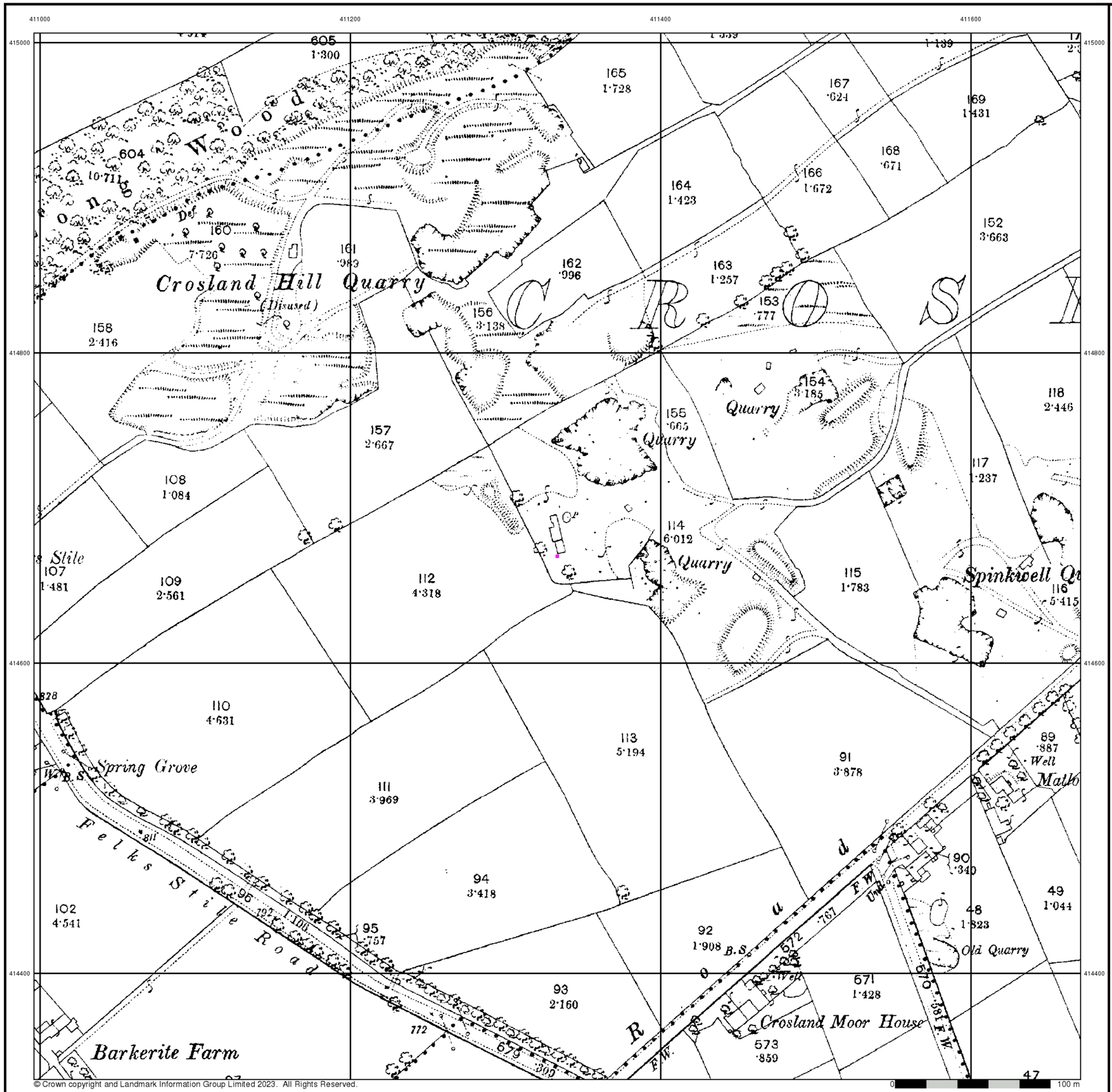
Appendix E

Historical OS Plans



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LITHOS CONSULTING

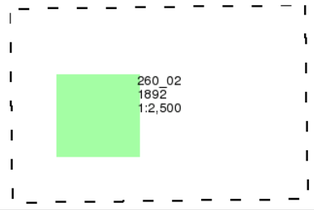
Yorkshire

Published 1892

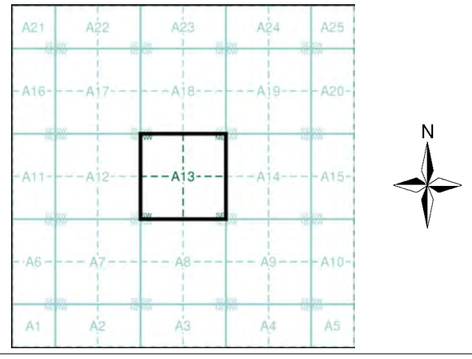
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



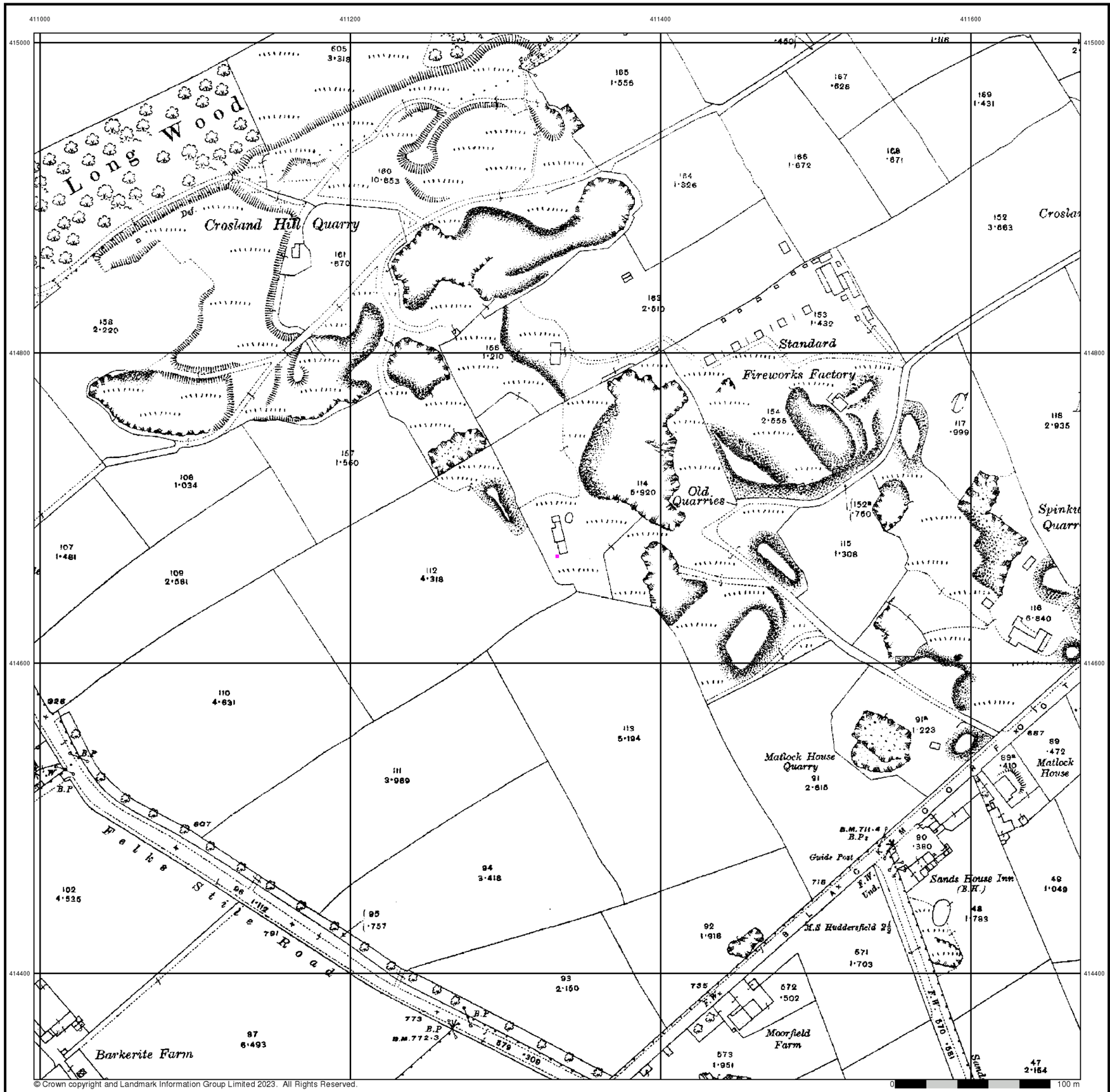
Order Details

Order Number:	308310474_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	0

Site Details

Black Cat Fireworks Ltd, Standard Drive, Crosland Hill, Huddersfield, HD4 7AD

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



LITHOS CONSULTING

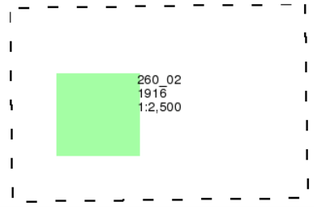
Yorkshire

Published 1916

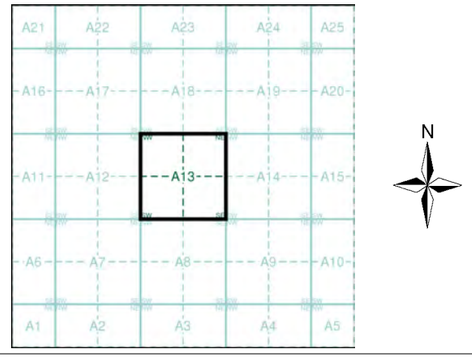
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308310474_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	0

Site Details

Black Cat Fireworks Ltd, Standard Drive, Crosland Hill, Huddersfield, HD4 7AD

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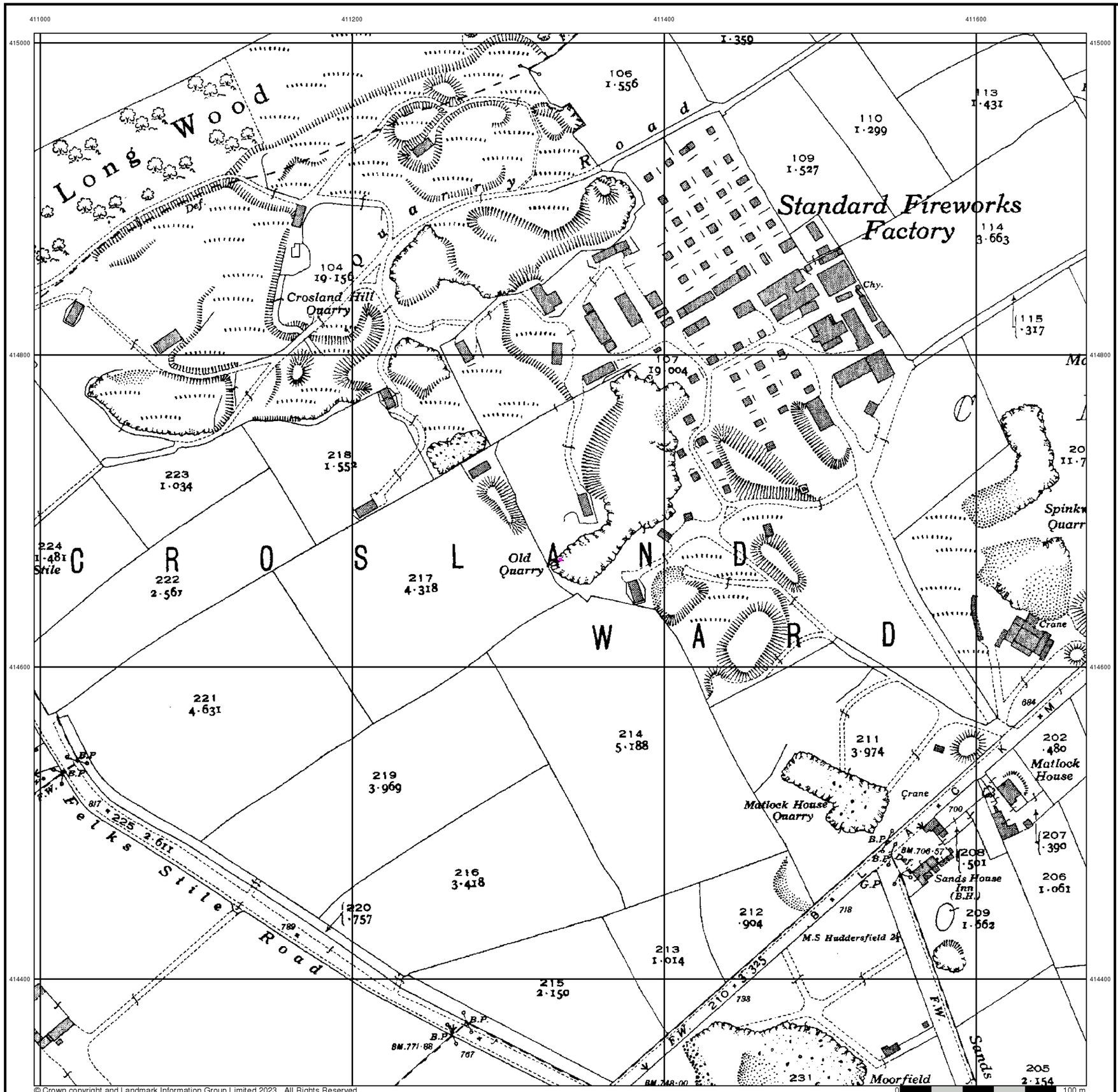
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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LITHOS CONSULTING

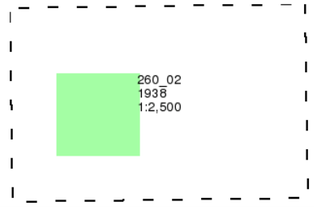
Yorkshire

Published 1938

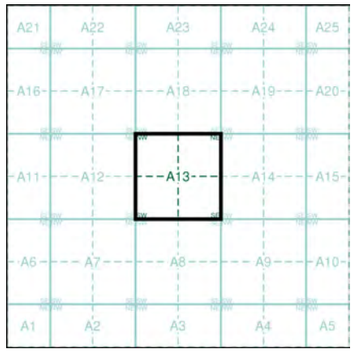
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
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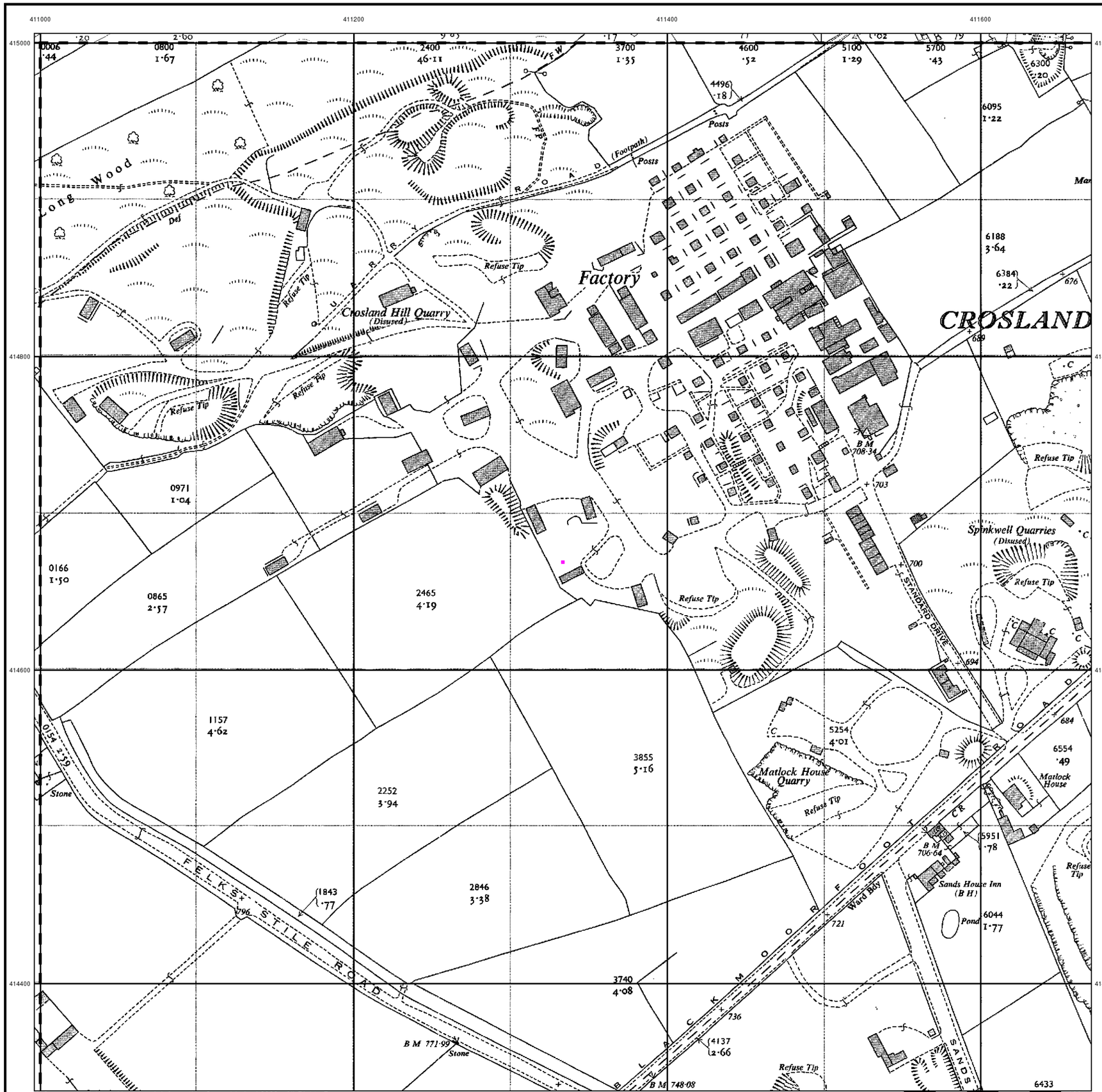


LITHOS CONSULTING

Ordnance Survey Plan

Published 1962 - 1963

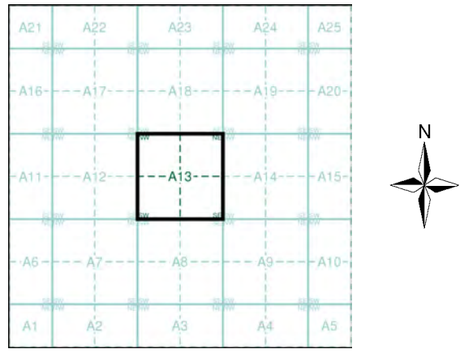
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SE1015 1962 1:2,500	SE1115 1962 1:2,500
SE1014 1963 1:2,500	SE1114 1963 1:2,500

Historical Map - Segment A13



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Order Number:	308310474_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	0

Site Details

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Fax: 0844 844 9951
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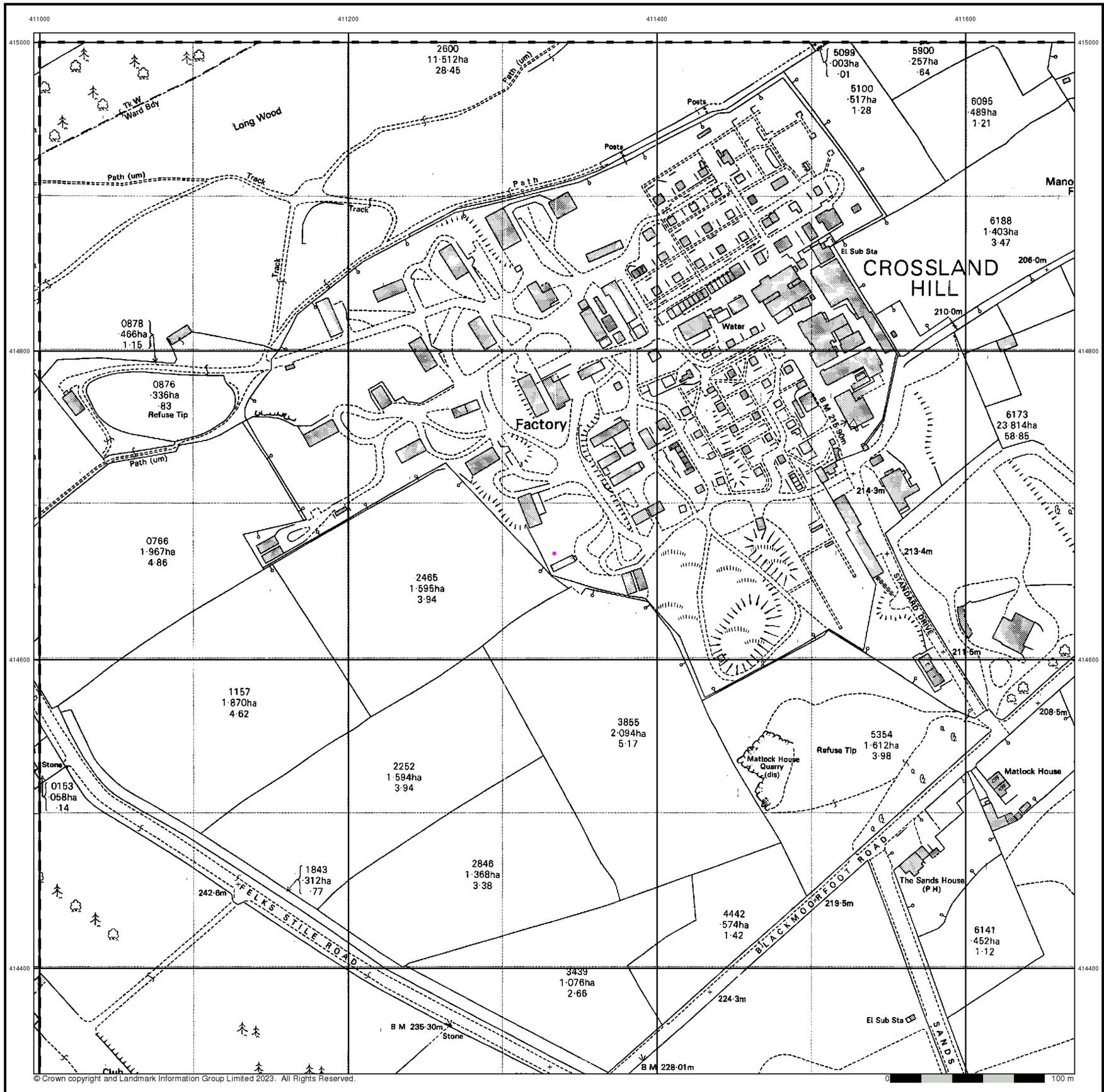

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LITHOS CONSULTING

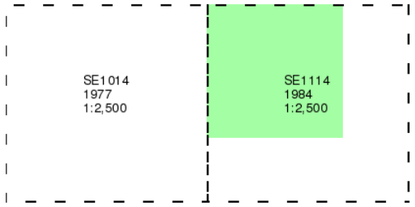
Ordnance Survey Plan

Published 1977 - 1984

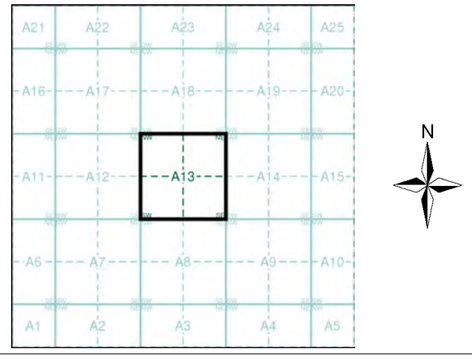
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



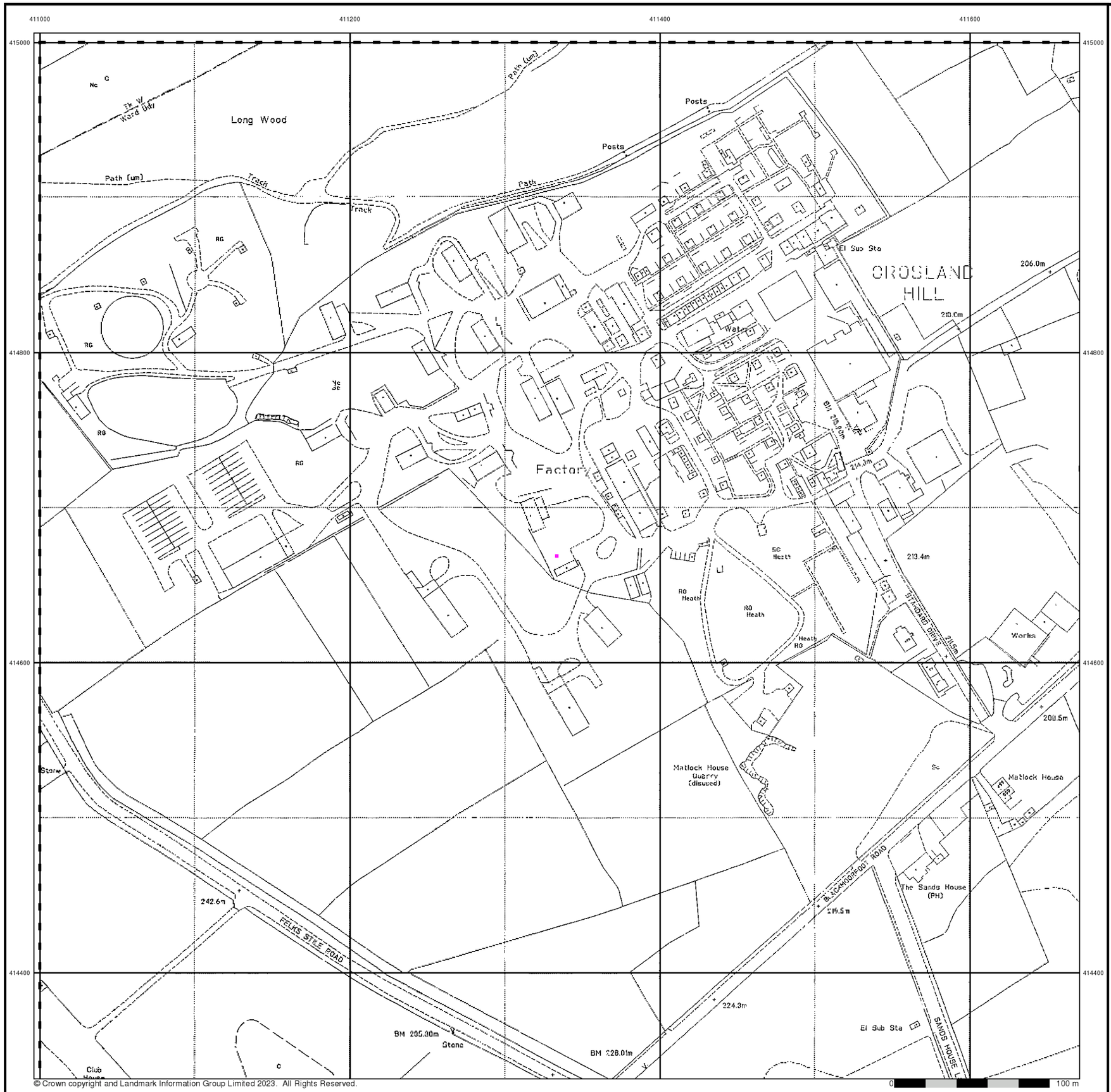
Order Details

Order Number:	308310474_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	0

Site Details

Black Cat Fireworks Ltd, Standard Drive, Crosland Hill, Huddersfield, HD4 7AD

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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LITHOS CONSULTING

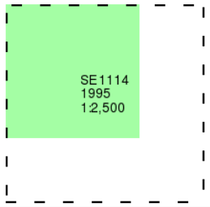
Large-Scale National Grid Data

Published 1995

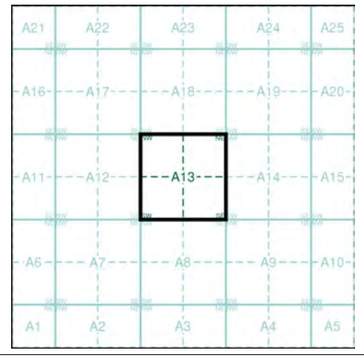
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308310474_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	0

Site Details

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Web: www.envirocheck.co.uk

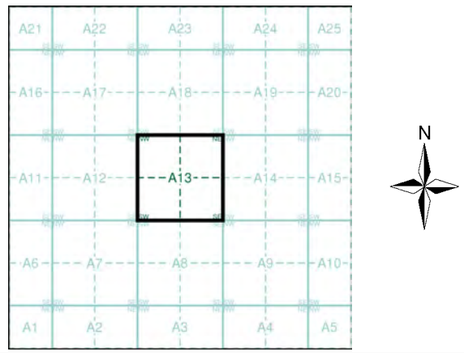
LITHOS CONSULTING

Historical Aerial Photography

Published 2000

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

Order Number:	308310474_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	0

Site Details

Black Cat Fireworks Ltd, Standard Drive, Crosland Hill, Huddersfield, HD4 7AD

Appendix F

Old Photographs of Quarrying

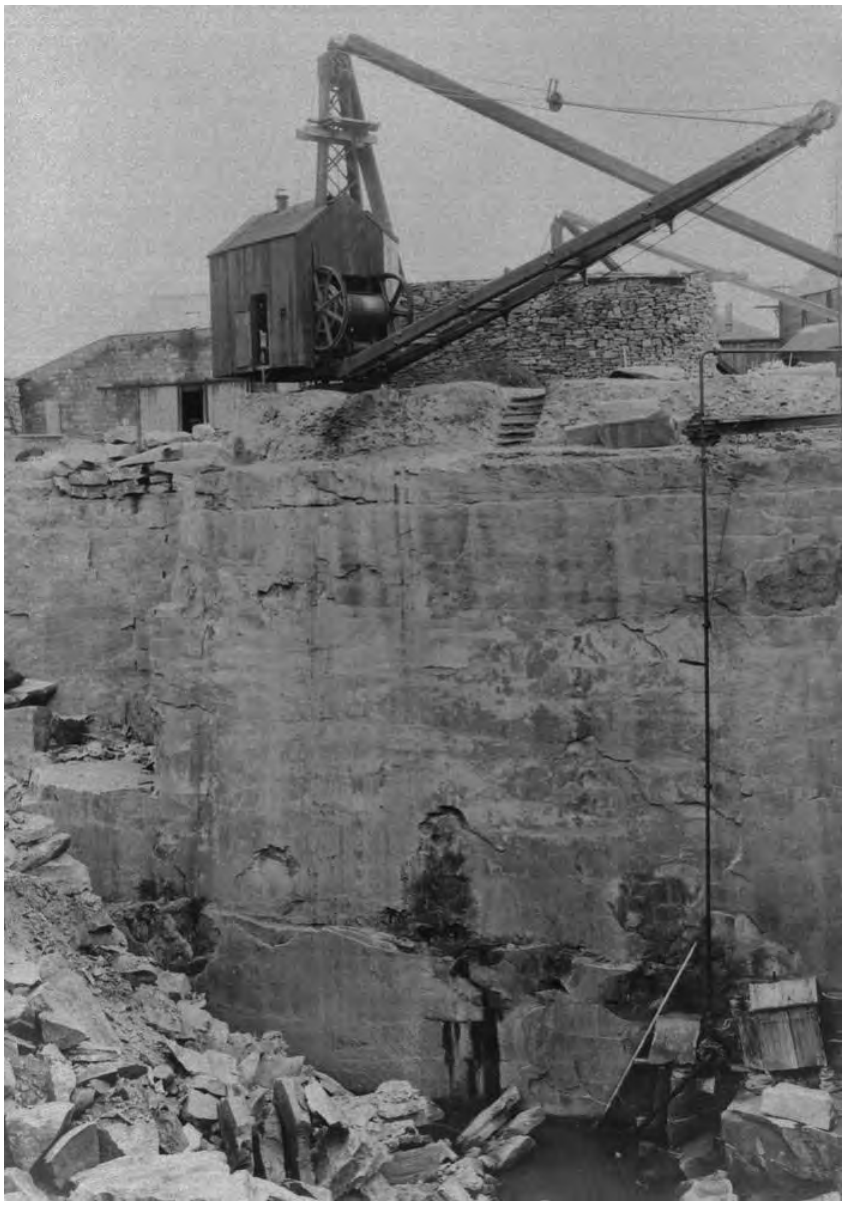
QUARRY PHOTOS

P number:	P203549
Old photograph number:	A03601
Caption:	William Mallinson & Sons Quarry, Crosland Moor, about 2 m. SW of Huddersfield. Looking S.
Description:	William Mallinson & Sons Quarry, Crosland Moor, about 2 m. SW of Huddersfield. Looking S. Mallinson's Quarry, Crosland Hill, Huddersfield. Showing freestone (in Rough Rock) being worked along major joint plan Shows its somewhat variable nature.
Date taken:	01/07/1926
Photographer:	Rhodes, J.
Copyright statement:	Crown
X longitude/easting:	411500
Y latitude/northing:	414500
Coordinate reference system, ESPG code:	27700 (OSGB 1936 / British National Grid)
Orientation:	Portrait
Size:	211.63 KB; 718 x 1001 pixels; 61 x 85 mm (print at 300 DPI); 190 x 265 mm (screen at 96 DPI)
Average Rating:	Not yet rated | Submit review »
Categories:	Unsorted Images, Geoscience subjects/ Economic geology/ Building stones, sandstone
Thumbnail available?:	Yes

Images provided courtesy of "British Geological Survey"

P number:	P203555
Old photograph number:	A03607
Caption:	W. Boothroyd & Sons Quarry, Crosland Moor, about 2 m. SW of Huddersfield. Looking SE.
Description:	W. Boothroyd & Sons Quarry, Crosland Moor, about 2 m. SW of Huddersfield. Looking SE. Boothroyd's Quarry, Crosland Hill, Huddersfield. Large quarry in freestone (Rough Rock). Extensively quarried for building st for local and distant requirements.
Date taken:	01/07/1926
Photographer:	Rhodes, J.
Copyright statement:	Crown
X longitude/easting:	411500
Y latitude/northing:	414500
Coordinate reference system, ESPG code:	27700 (OSGB 1936 / British National Grid)
Orientation:	Landscape
Size:	229.49 KB; 1001 x 721 pixels; 85 x 61 mm (print at 300 DPI); 265 x 191 mm (screen at 96 DPI).
Average Rating:	Not yet rated | Submit review »
Categories:	Unsorted Images
Thumbnail available?:	Yes

Images provided courtesy of "British Geological Survey"



P number:	P203541
Old photograph number:	A03593
Caption:	Spinkwell Quarry, Crosland Moor, about 2 m. SW of Huddersfield. Looking E
Description:	Spinkwell Quarry, Crosland Moor, about 2 m. SW of Huddersfield. Looking E. Spinkwell Quarry, Crosland Hill, Huddersfield. Large quarries in Rough Rock. Extensively worked for building-stone both for local and dist use. Photograph shows large face of freestone capped by thin layer of coarser cross-bedded grit. Large joint face.
Date taken:	01/07/1926
Photographer:	Rhodes, J.
Copyright statement:	Crown
X longitude/easting:	411755
Y latitude/northing:	414779
Coordinate reference system, ESPG code:	27700 (OSGB 1936 / British National Grid)
Orientation:	Portrait
Size:	269.49 KB; 700 x 1001 pixels; 59 x 85 mm (print at 300 DPI); 185 x 265 mm (screen at 96 DPI)
Average Rating:	Not yet rated | Submit review »
Categories:	Unsorted Images
Thumbnail available?:	Yes

Images provided courtesy of "British Geological Survey"

P number:	P203540
Old photograph number:	A03592
Caption:	Spinkwell Quarry, Crosland Moor, about 2 m. south-west of Huddersfield. Looking north-east, Yorkshire.
Description:	Spinkwell Quarry produced high quality yellow-brown, building sandstone (York Stone) from the Millstone Grit Group over a long period of time. The hard, siliceous sandstone was used extensively for building houses churches and industrial mills in Huddersfield and other local towns. The sandstones were also exported to other parts of the United Kingdom. The importance of these building sandstone quarries is clearly evident fro the size of the working faces. The sandstone was worked in benches a few metres in thickness and the stone raised by the many steam driven cranes set above the working face. Large blocks of dressed sandstone c be seen in the cutting sheds. The sandstones of the Rough Rock lie at the top of the Millstone Grit Group and are one of Englands most durable building sandstones. Block stone, paving stones and roofing slates, from the more thinly bedded or flaggy sandstones were all produced in the quarry.
Date taken:	01/07/1920
Photographer:	Rhodes, J.
Copyright statement:	Crown
X longitude/easting:	411755
Y latitude/northing:	414779
Coordinate reference system, ESPG code:	27700 (OSGB 1936 / British National Grid)
Orientation:	Landscape
Size:	243.29 kB; 1000 x 723 pixels; 85 x 61 mm (print at 300 DPI); 265 x 191 mm (screen at 96 DPI);
Average Rating:	Not yet rated | Submit review »
Categories:	Unsorted Images, Geoscience subjects/ Structural features/ Jointing, in sedimentary rocks, Geoscience subjects/ Economic geology/ Building stones

Images provided courtesy of "British Geological Survey"

Appendix G

Search Responses & other Correspondence

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
308310474_1_1

Customer Reference:
19980/JW/4486

National Grid Reference:
411330, 414670

Slice:
A

Site Area (Ha):
0.01

Search Buffer (m):
50

Site Details:

Black Cat Fireworks Ltd, Standard Drive
Crosland Hill
Huddersfield
HD4 7AD

Client Details:

Ms J Wileman
Lithos Consulting Ltd
Parkhill
Walton Road
Wetherby
LS22 5DZ

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	2
Hazardous Substances	-
Geological	3
Industrial Land Use	-
Sensitive Land Use	-
Data Currency	4
Data Suppliers	9
Useful Contacts	10

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v53.0

Summary

Data Type	Page Number	On Site	0 to 50m (*up to 250m)
Agency & Hydrological			
BGS Groundwater Flooding Susceptibility	pg 1	Yes	
Contaminated Land Register Entries and Notices			
Discharge Consents			
Prosecutions Relating to Controlled Waters			n/a
Enforcement and Prohibition Notices			
Integrated Pollution Controls			
Integrated Pollution Prevention And Control			
Local Authority Integrated Pollution Prevention And Control			
Local Authority Pollution Prevention and Controls			
Local Authority Pollution Prevention and Control Enforcements			
Nearest Surface Water Feature			
Pollution Incidents to Controlled Waters			
Prosecutions Relating to Authorised Processes			
Registered Radioactive Substances			
River Quality			
River Quality Biology Sampling Points			
River Quality Chemistry Sampling Points			
Substantiated Pollution Incident Register			
Water Abstractions			
Water Industry Act Referrals			
Groundwater Vulnerability Map	pg 1	Yes	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a
Groundwater Vulnerability - Local Information			n/a
Bedrock Aquifer Designations	pg 1	Yes	n/a
Superficial Aquifer Designations			n/a
Source Protection Zones			
Extreme Flooding from Rivers or Sea without Defences			
Flooding from Rivers or Sea without Defences			
Areas Benefiting from Flood Defences			
Flood Water Storage Areas			
Flood Defences			
OS Water Network Lines			

Summary

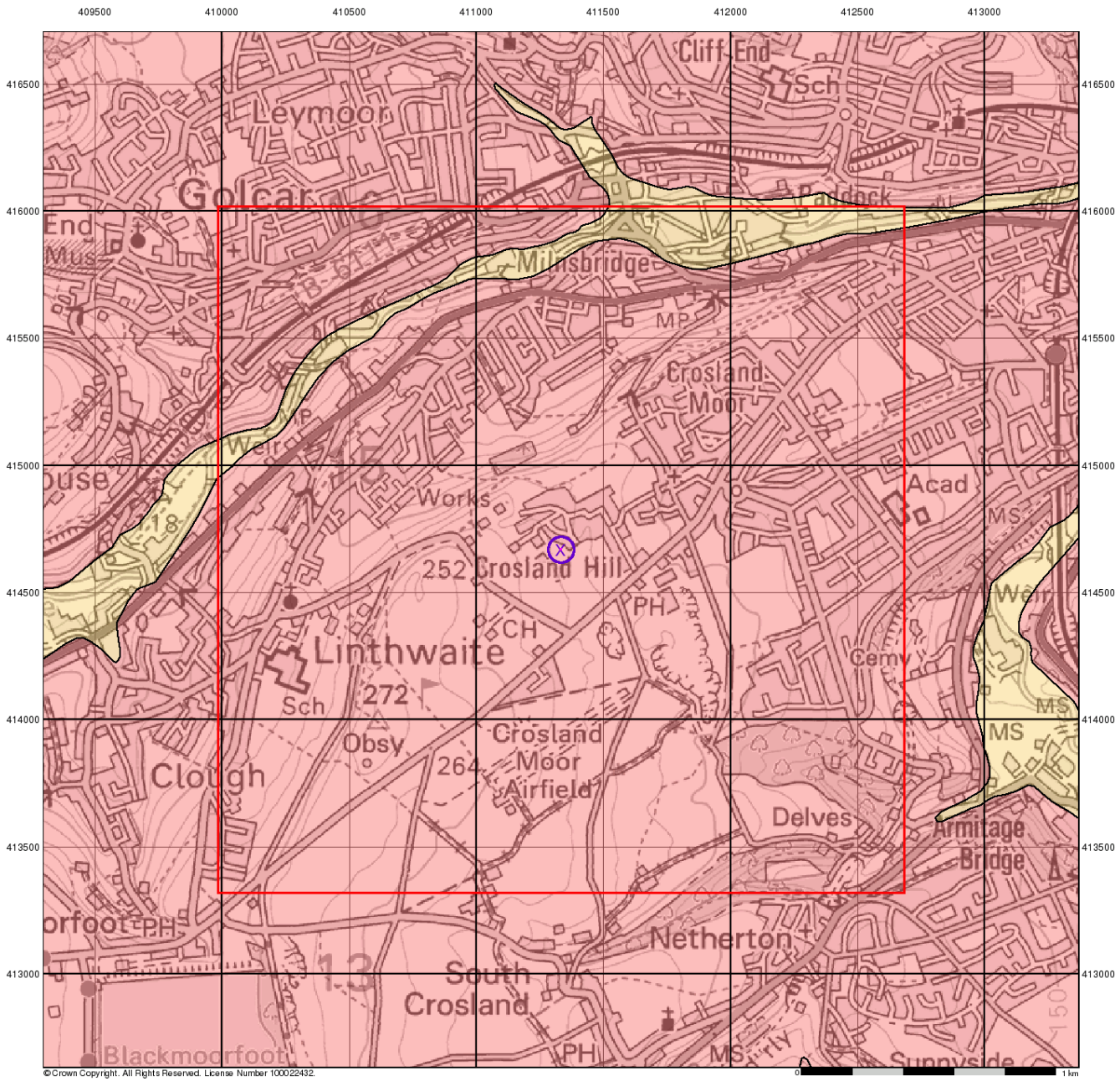
Data Type	Page Number	On Site	0 to 50m (*up to 250m)
Waste			
BGS Recorded Landfill Sites			
Historical Landfill Sites			
Integrated Pollution Control Registered Waste Sites			
Licensed Waste Management Facilities (Landfill Boundaries)			
Licensed Waste Management Facilities (Locations)			
Local Authority Landfill Coverage	pg 2	1	n/a
Local Authority Recorded Landfill Sites			
Potentially Infilled Land (Non-Water)	pg 2		2
Potentially Infilled Land (Water)			
Registered Landfill Sites			
Registered Waste Transfer Sites			
Registered Waste Treatment or Disposal Sites			
Hazardous Substances			
Control of Major Accident Hazards Sites (COMAH)			
Explosive Sites			
Notification of Installations Handling Hazardous Substances (NIHHS)			
Planning Hazardous Substance Consents			
Planning Hazardous Substance Enforcements			

Summary

Data Type	Page Number	On Site	0 to 50m (*up to 250m)
Geological			
BGS 1:625,000 Solid Geology	pg 3	Yes	n/a
BGS Estimated Soil Chemistry	pg 3	Yes	
BGS Recorded Mineral Sites	pg 3		1
BGS Urban Soil Chemistry			
BGS Urban Soil Chemistry Averages			
CBSCB Compensation District			n/a
Coal Mining Affected Areas			n/a
Mining Instability			n/a
Man-Made Mining Cavities			
Natural Cavities			
Non Coal Mining Areas of Great Britain	pg 3	Yes	
Potential for Collapsible Ground Stability Hazards	pg 3	Yes	
Potential for Compressible Ground Stability Hazards			
Potential for Ground Dissolution Stability Hazards			
Potential for Landslide Ground Stability Hazards	pg 3	Yes	
Potential for Running Sand Ground Stability Hazards			
Potential for Shrinking or Swelling Clay Ground Stability Hazards			
Radon Potential - Radon Affected Areas	pg 3	Yes	n/a
Radon Potential - Radon Protection Measures	pg 3	Yes	n/a
Industrial Land Use			
Contemporary Trade Directory Entries			
Fuel Station Entries			
Points of Interest - Commercial Services			
Points of Interest - Education and Health			
Points of Interest - Manufacturing and Production			
Points of Interest - Public Infrastructure			
Points of Interest - Recreational and Environmental			
Gas Pipelines			
Underground Electrical Cables			

Summary

Data Type	Page Number	On Site	0 to 50m (*up to 250m)
Sensitive Land Use			
Ancient Woodland			
Areas of Adopted Green Belt			
Areas of Unadopted Green Belt			
Areas of Outstanding Natural Beauty			
Environmentally Sensitive Areas			
Forest Parks			
Local Nature Reserves			
Marine Nature Reserves			
National Nature Reserves			
National Parks			
Nitrate Sensitive Areas			
Nitrate Vulnerable Zones			
Ramsar Sites			
Sites of Special Scientific Interest			
Special Areas of Conservation			
Special Protection Areas			
World Heritage Sites			



LITHOS CONSULTING

Groundwater Vulnerability

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

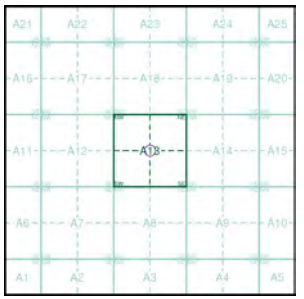
Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer

Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	308310474_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	50

Site Details

Black Cat Fireworks Ltd, Standard Drive, Crosland Hill, Huddersfield, HD4 7AD

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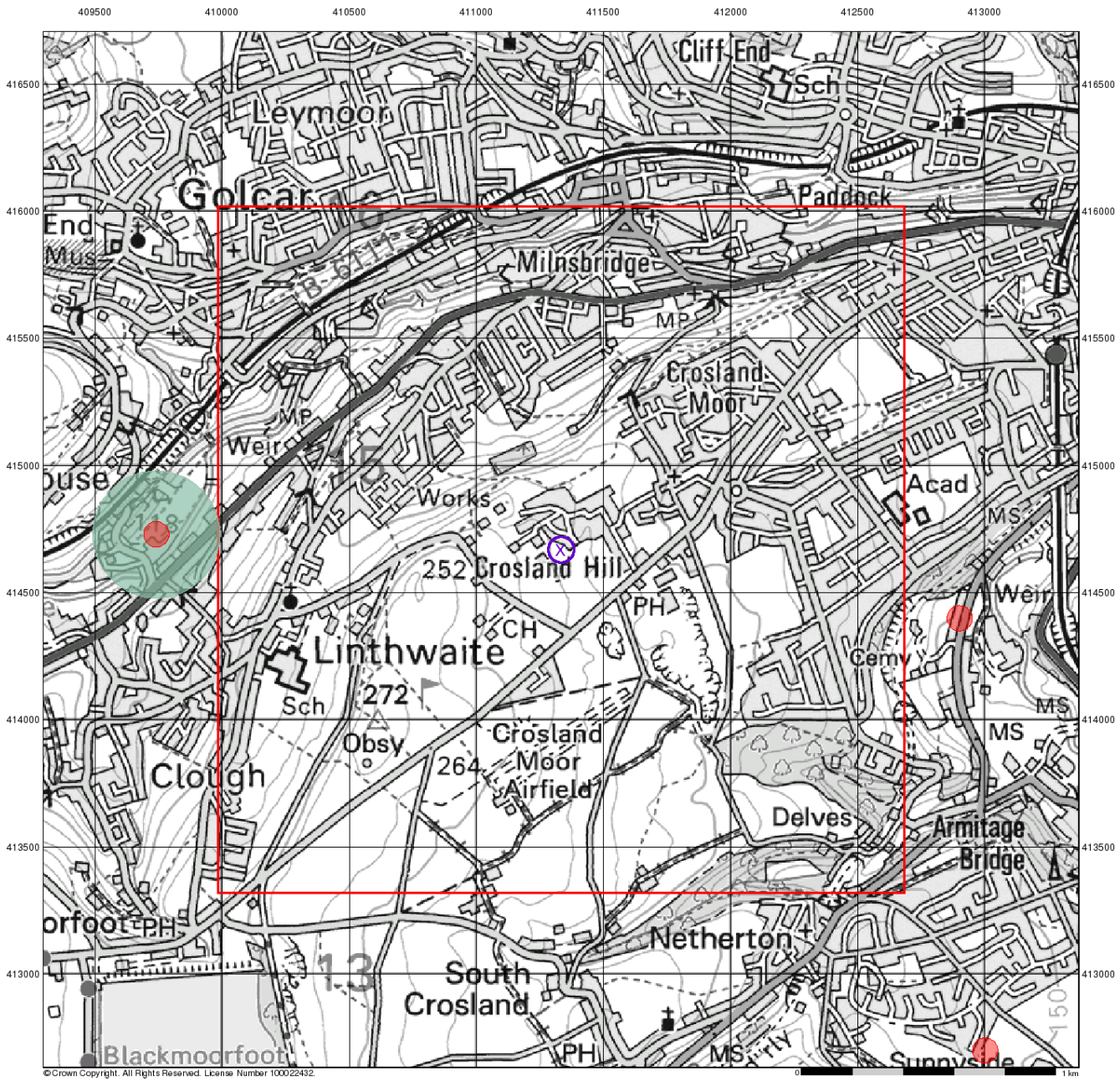


LITHOS CONSULTING

Source Protection Zones

General

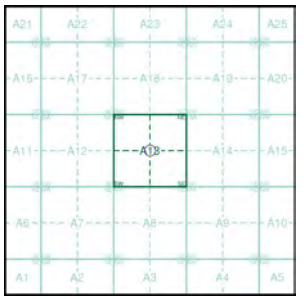
Specified Site | Specified Buffer(s) | Bearing Reference Point

Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



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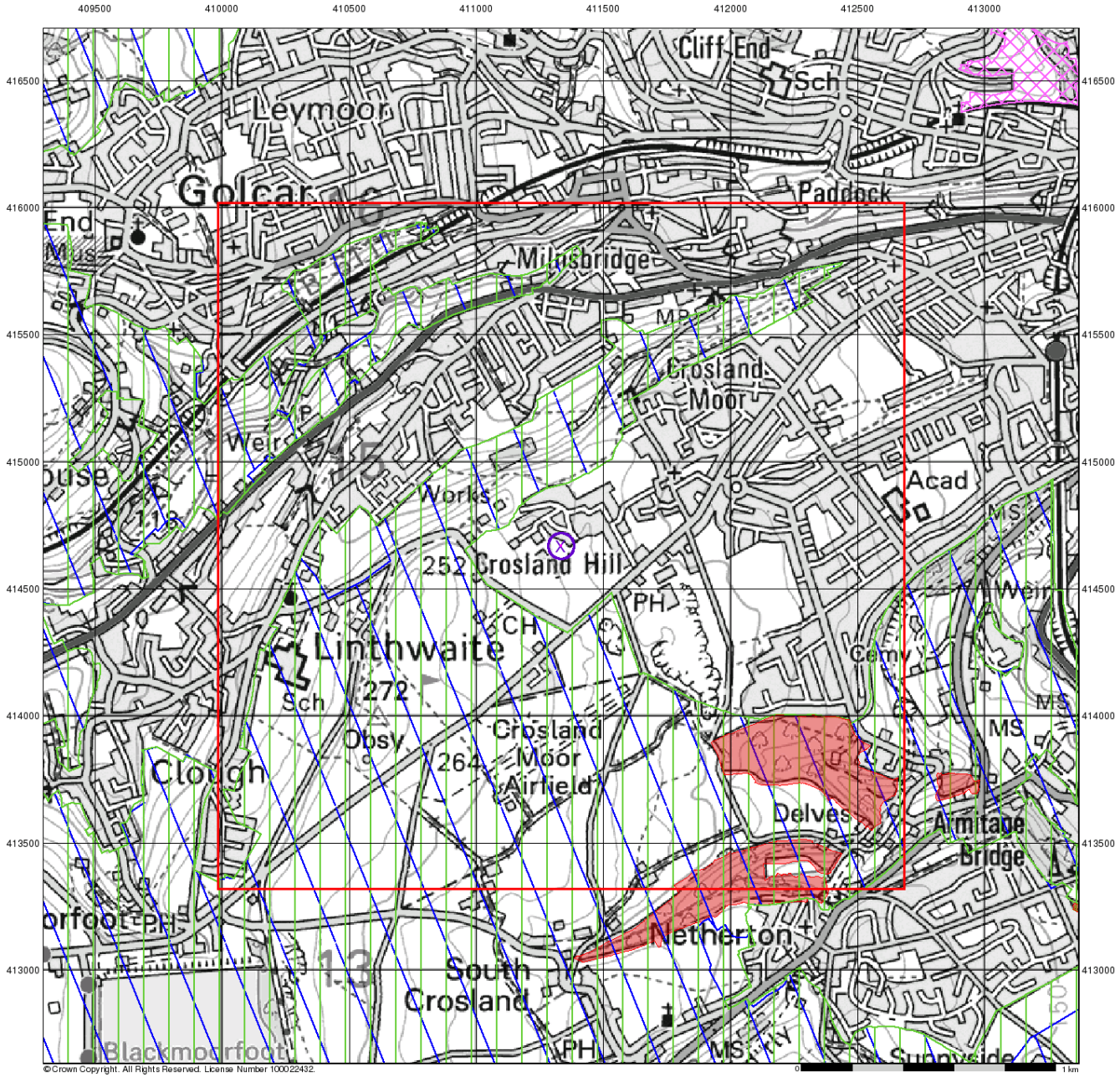


LITHOS CONSULTING

Sensitive Land Uses

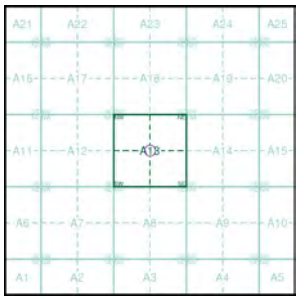
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



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National Grid Reference:	411330, 414670
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	50

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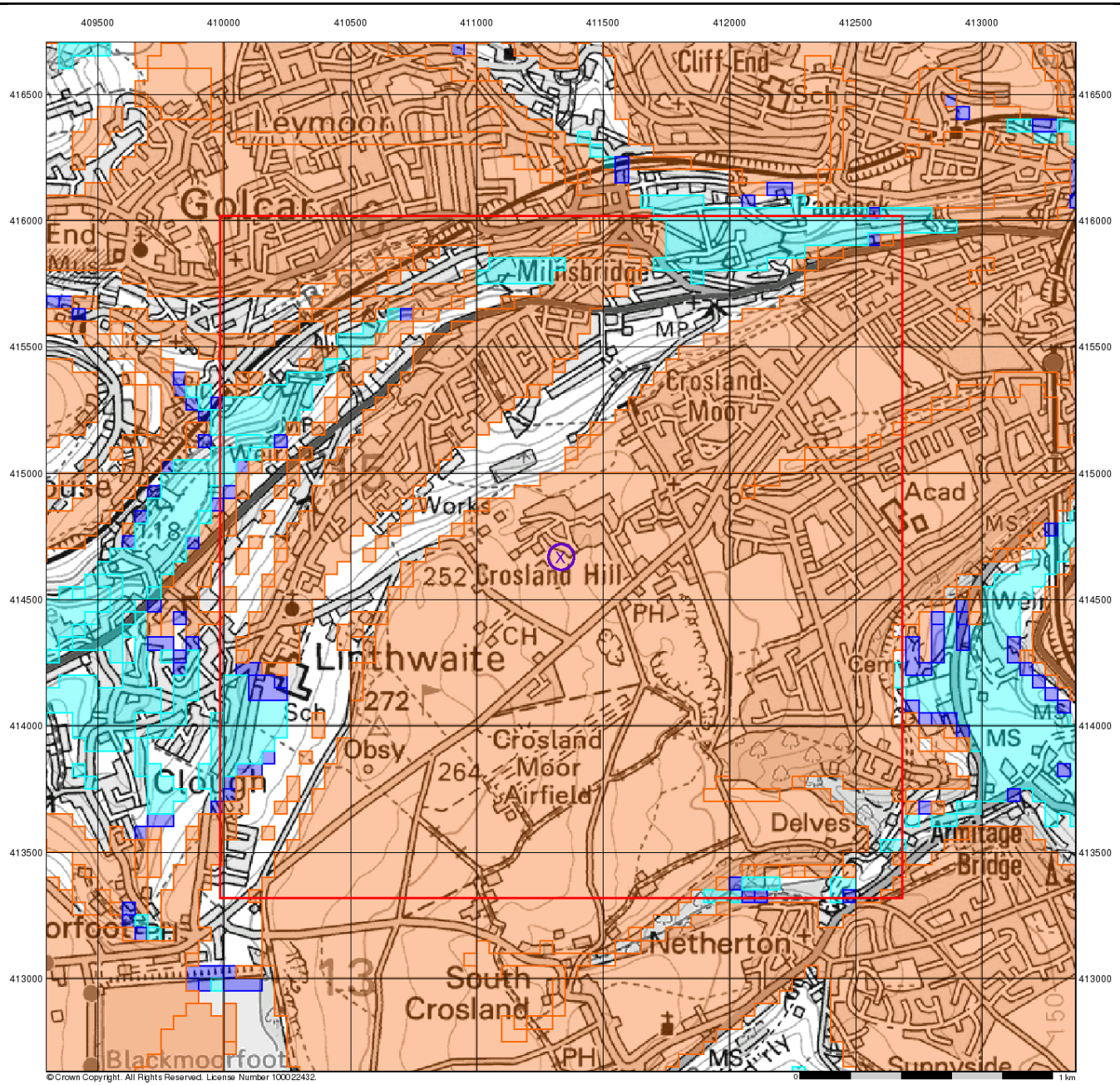


LITHOS CONSULTING

BGS Flood GFS Data

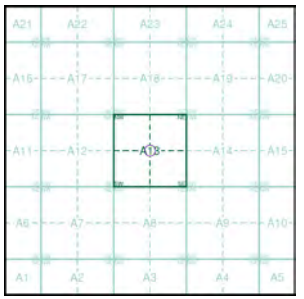
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



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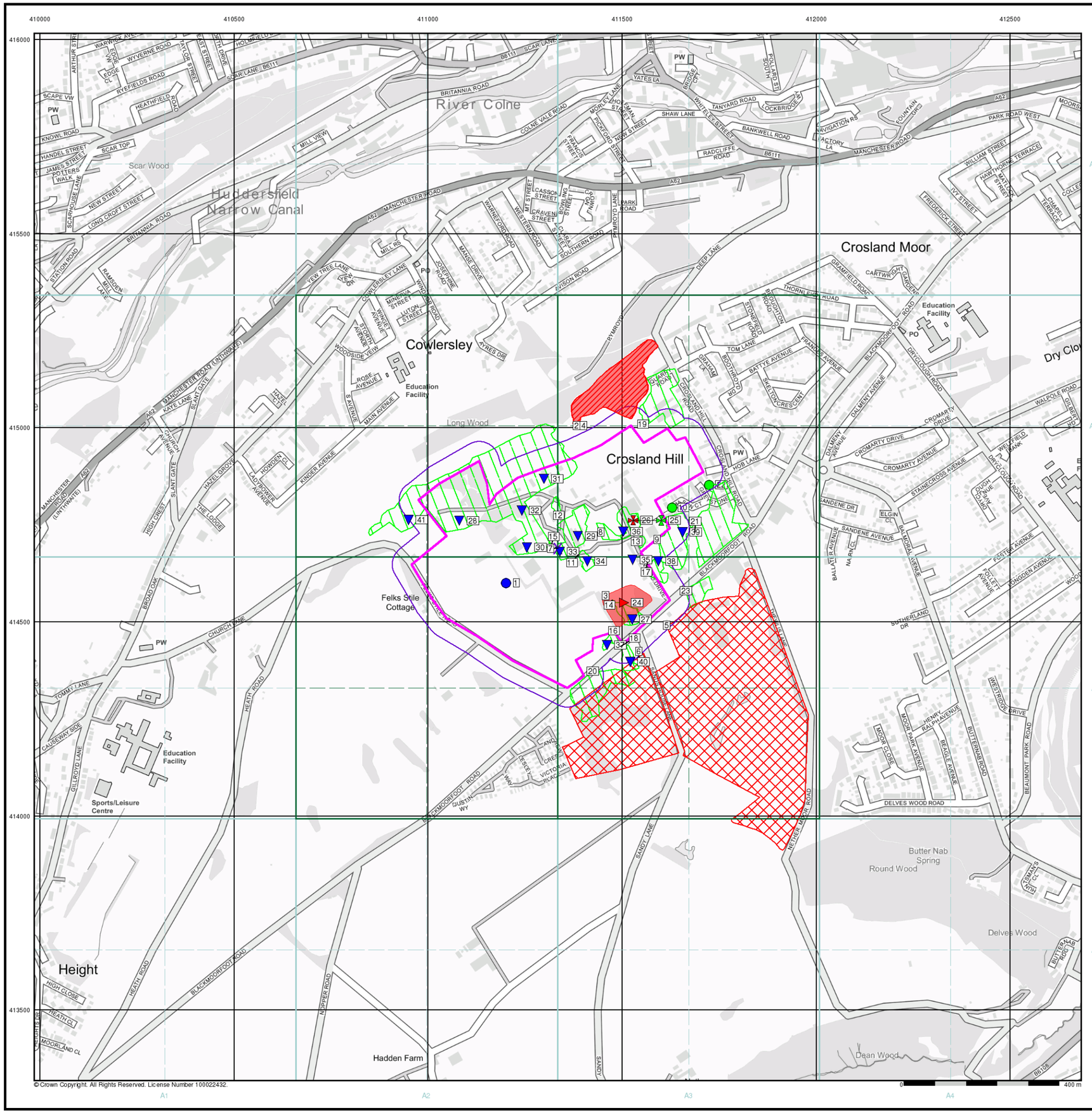

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LITHOS CONSULTING

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

COMAH Site | Explosive Site | NIHHS Site

- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

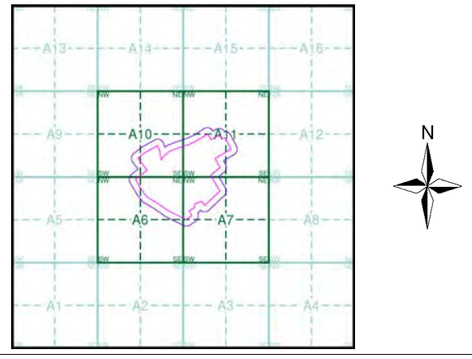
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



Order Details

Order Number:	304510137_1_1
Customer Ref:	19980/JW/4486
National Grid Reference:	411330, 414690
Slice:	A
Site Area (Ha):	29.23
Search Buffer (m):	50

Site Details

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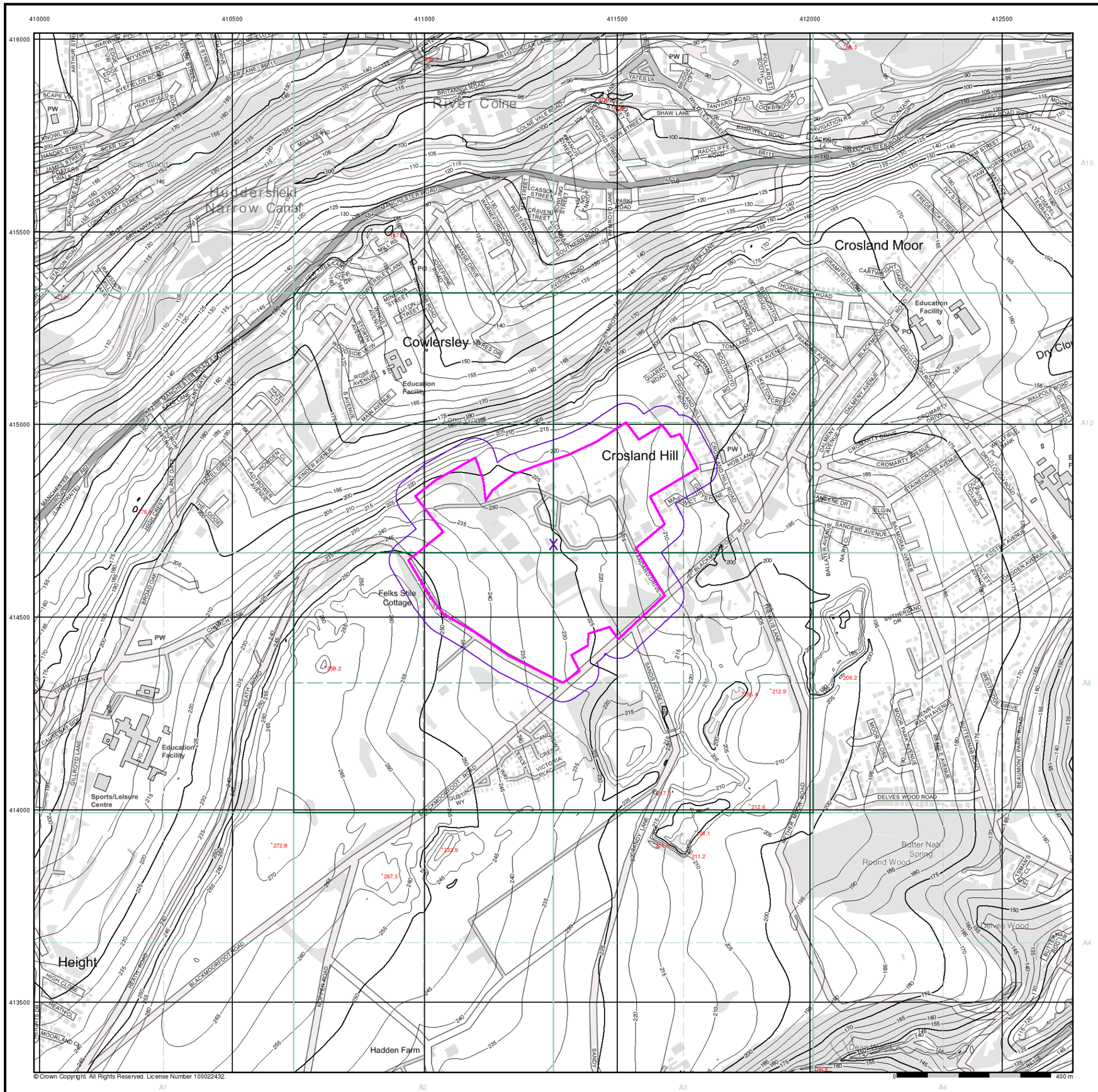

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LITHOS CONSULTING

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

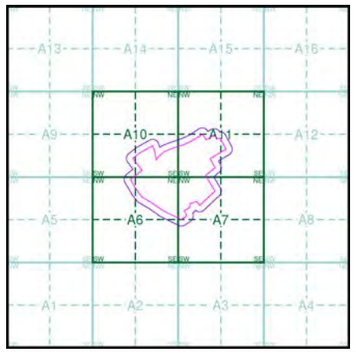
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



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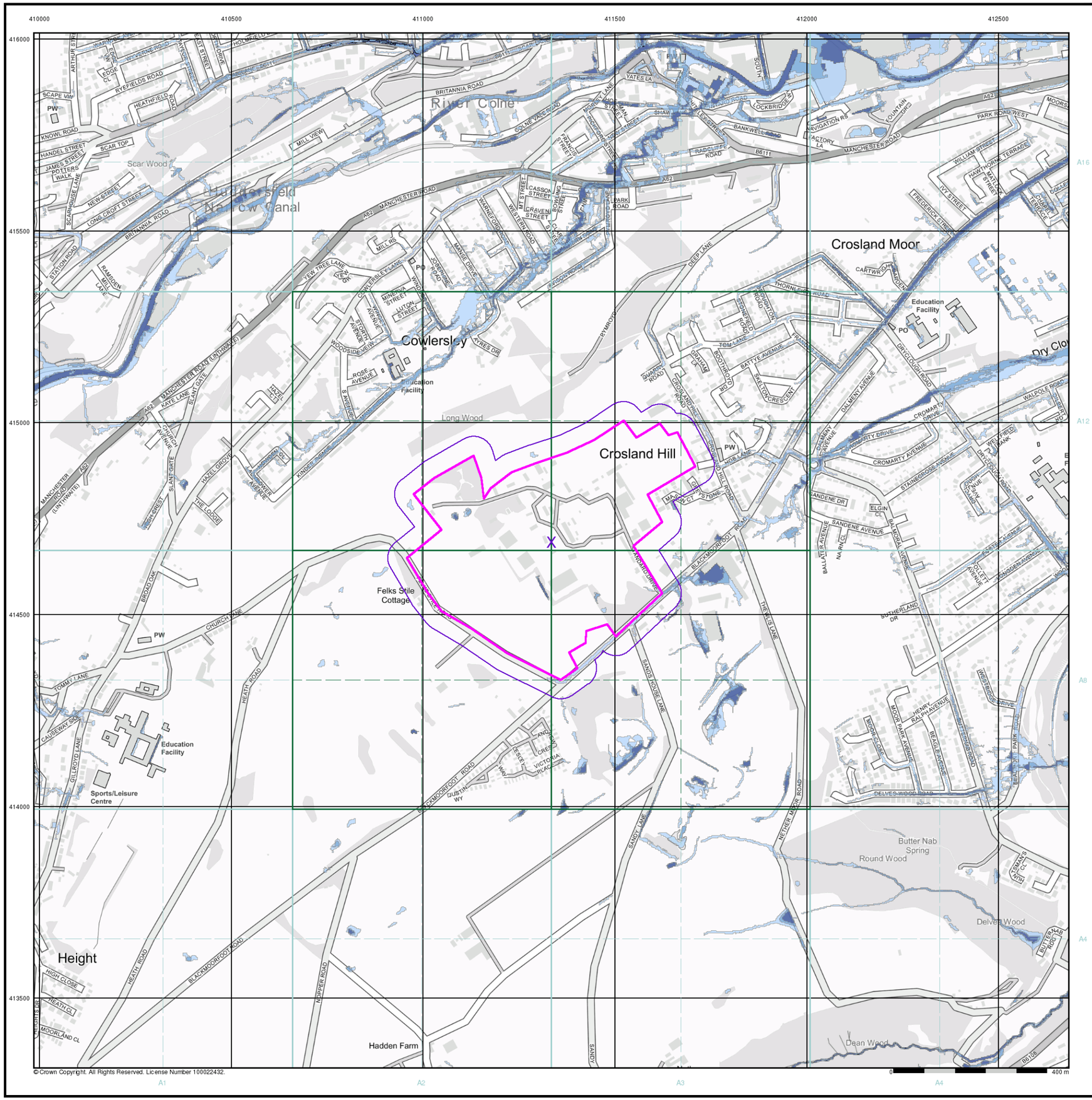


LITHOS CONSULTING

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Risk of Flooding from Surface Water

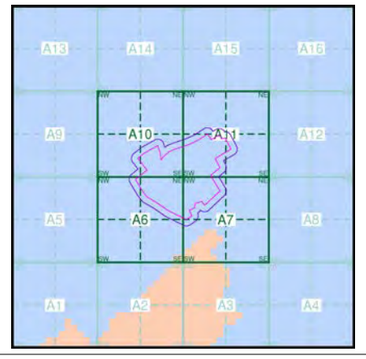
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



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Slice:	A
Site Area (Ha):	29.23
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Appendix H

Trial Pit Logs

Area A

Fireworks Factory

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP301
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411575.56 - 414754.85 Level: 211.95	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.7 × 0.6, Depth 2.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	J		0.05	211.90		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.40	211.55		MADE GROUND: Light brown sand and GRAVEL of sandstone. (SUB-BASE)
	0.60	J,K&T					MADE GROUND: Dark brown sandy angular to subangular fine to coarse GRAVEL of mixed lithologies with a high cobble content. Gravel is of brick, sandstone, clinker and concrete. Cobbles are angular of full bricks and reinforced concrete. (GRANULAR MADE GROUND)
							At 1.2m, concrete boulder circa 1.2m in size.
				1.50	210.45		Dark brown silty SAND with occasional rootlets. (RELICT TOPSOIL)
	1.60	J&T		1.70	210.25		Light brown slightly clayey gravelly SAND. Gravel is angular to subrounded fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
	2.00	D					
				2.60	209.35		*At 2.6m, unable to excavate further due to bedrock.* End of pit at 2.60 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP302
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411558.18 - 414746.80 Level: 212.50	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00, 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	212.45		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	212.30		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
	0.60	J,K&T					MADE GROUND: Dark brown gravelly SAND with a high cobble content. Gravel is angular to subangular fine to coarse of sandstone. Frequent sandstone boulders up to 0.8m in size. (QUARRY BACKFILL)
				0.90	211.60		Dark brown silty SAND with occasional rootlets. (RELICT TOPSOIL)
				1.20	211.30		Light brown gravelly SAND with a low cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				2.00	210.50		*At 2.0m, unable to excavate further due to bedrock.* End of pit at 2.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP303
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411586.18 - 414780.38 Level: 209.55	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.4 × 0.6 Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.20	209.35		MADE GROUND: Light grey sandy angular to subangular fine to coarse GRAVEL of mixed lithologies. (GRANULAR MADE GROUND)
	0.70	D					Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	207.95		*End at 1.6m, unable to excavate further due to bedrock.* End of pit at 1.60 m

1
2
3
4
5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP304
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411598.01 - 414755.95 Level: 209.35	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.7 × 0.6, Depth 1.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.10	209.25		MADE GROUND: Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to medium of sandstone. (MADE GROUND TOPSOIL)
				0.30	209.05		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone (SUB-BASE)
							Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.90	207.45		*At 1.9m, unable to excavate further due to bedrock.* End of pit at 1.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP305
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411538.86 - 414772.99 Level: 212.95	Date 24/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.4 × 0.6 Depth 0.90	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.05	212.90		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	212.65		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
	0.60	D					Light brown gravelly angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				0.90	212.05		*At 0.9m, unable to excavate further due to bedrock.* End of pit at 0.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP306
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411519.79 - 414821.76 Level: 214.25	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.30 — 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	214.20		MADE GROUND: Light brown CONCRETE. 50% gravel, 40% cement, 10% voids. (CONCRETE)
	0.40	J,K&T					MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone and brick fragments. (SUB-BASE)
	0.55	J,K&T		0.50	213.75		*At 0.1m, metal pipe 10cm diameter in west face of pit.*
				0.60	213.65		MADE GROUND: Dark grey sandy ASH and CLINKER with rare fragments of brick. (ASH & CLINKER)
	0.80	D	HVP=48				Firm light brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone. (REWORKED NATURAL GROUND)
				1.20	213.05		Light brown slightly clayey slightly gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.30	212.95		*At 1.3m, unable to excavate further due to bedrock.* End of pit at 1.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No **TP307**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411496.22 - 414814.81 Level: 216.00	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50, 2.1 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	215.95		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	215.70		MADE GROUND: Light brown sandy angular to subangular fine to coarse of sandstone. (SUB-BASE)
	0.60	J,K&T					MADE GROUND: Dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, sandstone and clinker. (COHESIVE MADE GROUND)
							From 0.3m, to 0.85m, Brick wall in northern face of pit.
							At 0.4m, 2 metal pipes 10cm in diameter.
				0.80	215.20		Light brown sandy angular to subangular fine to coarse GRAVEL and COBBLES of sandstone. (GRANULAR RESIDUAL SOIL)
	1.00	D					
				1.50	214.50		*At 1.5m, unable to excavate further due to bedrock.* End of pit at 1.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP308
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411468.58 - 414837.38 Level: 217.40	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2 x 2 Depth 2.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	217.10		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
	0.60	T					MADE GROUND: Dark brown sandy angular gravelly COBBLES of full and half bricks, concrete, metal, plastic clinker and concrete. Rare fragments of cement sheeting. (GRANULAR MADE GROUND)
	1.00	J,K&T					
				2.10	215.30		*End at 2.1m, unable to excavate further due to large amounts of spalling and collapse.* End of pit at 2.10 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability:

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Trial Pit Log

Trialpit No **TP309**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411490.33 - 414857.97 Level: 215.90	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60 — 2.4 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	215.85		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	215.60		MADE GROUND: Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (SUB-BASE)
	0.80	J,K&T					MADE GROUND: Dark brown slightly gravelly clayey SAND. Gravel is angular to subangular fine to medium of sandstone, brick, metal, concrete and tarmac. (GRANULAR MADE GROUND)
				0.90	215.00		Light brown clayey slightly sandy angular fine to coarse GRAVEL of sandstone lithorelicts. (GRANULAR RESIDUAL SOIL)
	1.40	D					
				1.60	214.30		*At 1.6m, unable to excavate further due to bedrock.* End of pit at 1.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

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Trial Pit Log

Trialpit No **TP310**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411491.55 - 414848.23 Level: 215.40	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3 x 2.4 Depth 0.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	215.30		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	215.20		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR MADE GROUND)
				0.50	214.90		MADE GROUND: Dark brown gravelly SAND. Gravel is angular to fine to coarse of sandstone, full and half bricks. (GRANULAR MADE GROUND) *At 0.5m, concrete slab extending from brick wall in west by 2.4m.* End of pit at 0.50 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

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Trial Pit Log

Trialpit No **TP311** Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411321.52 - 414850.71 Level: 223.45	Date 24/08/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 5.00	3.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	223.35		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Brown locally grey and orangish brown slightly gravelly CLAY with a low sandstone cobble content. Gravel is angular to subrounded fine to coarse of sandstone, clinker, tarmac, coal and rare brick. (QUARRY BACKFILL)
							From 0.15m, clay is organic between 0.1m and 4.2m.
	0.80	J,K&T	HVP=53				
	2.50	D&B					
				4.20	219.25		MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of ash, clinker, coal and mudstone. Rare fragments of metal. (ASH & CLINKER)
				4.40	219.05		MADE GROUND: Light yellowish brown sandstone COBBLES and BOULDERS with some dark brown sandy gravel. Boulders up to 0.5m in size. (QUARRY BACKFILL)
							From 4.5 to 5.0m, sandstone boulder (c. 1m diameter) in base of pit.
				5.00	218.45		End of pit at 5.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 4.2m and 5.0m depth during excavation.

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Trial Pit Log

Trialpit No **TP312**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411309.33 - 414861.18 Level: 222.95	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	222.85		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	T					MADE GROUND: Light brown silty very gravelly fine to coarse SAND with a low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, rare brick and clinker. (QUARRY BACKFILL)
	0.50	J,K&T					*At 0.2m, cement sheeting fragments beneath tarmac. Sample taken.*
				0.70	222.25		MADE GROUND: Light yellowish brown very gravelly fine to coarse SAND with a low cobble content. (QUARRY BACKFILL)
							From 1.5m, continual collapse of side walls.
							At 1.7m to 1.75m, dark brown sand.
	3.00 - 3.50	D&B					
				3.80	219.15		End of pit at 3.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 3.8m depth during excavation.

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Trial Pit Log

Trialpit No
TP313
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411327.26 - 414894.82 Level: 222.65	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.80, 3, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	222.45		MADE GROUND: Light grey CONCRETE. (CONCRETE)
	0.30	J,K&T		0.40	222.25		MADE GROUND: Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
	0.70	J,K&T					MADE GROUND: Dark brown very gravelly fine to coarse SAND with a high brick cobble content. Rare fragments of metal sheeting. Gravel is angular to subangular fine to coarse of sandstone, coal and brick. (GRANULAR MADE GROUND)
				1.30	221.35		MADE GROUND: Light brown very clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. (QUARRY BACKFILL)
	2.00 - 2.50	D&B					
				2.80	219.85		End of pit at 2.80 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No **TP314**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411370.18 - 414895.15 Level: 220.15	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 3.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.70	J,K&T					MADE GROUND: Dark brown clayey very gravelly fine to coarse SAND with a high concrete cobble and brick content. Gravel is subangular to subrounded fine to coarse of sandstone, brick and concrete. Rare fragments of metal and wood. (GRANULAR MADE GROUND)
	2.20 - 2.40	D&B		2.20	217.95		MADE GROUND: Dark grey very gravelly slightly clayey fine to coarse SAND. Gravel is angular to subrounded fine to coarse of coal, sandstone , brick, clinker and mudstone. Rare fragments of metal and cement sheeting. (GRANULAR MADE GROUND)
							At 2.7m, sandstone boulder 0.6m diameter.
				3.00	217.15		MADE GROUND: Dark grey gravelly CLAY. Gravel is angular to subangular fine to coarse sandstone, mudstone and shale. (QUARRY BACKFILL)
				3.70	216.45		*At 3.7m, unable to excavate further to due site constraints.* End of pit at 3.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.0m and 3.0m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP315
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411370.31 - 414865.47 Level: 221.20	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	220.90		MADE GROUND: Dark brown silty fine to medium SAND with rare bricks. (MADE GROUND TOPSOIL)
	1.00	D		1.20	220.00		Light brown gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.90	219.30		Light brown very sandy subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				2.20	219.00		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (GRANULAR RESIDUAL SOIL) *At 2.2m, refusal on bedrock.* End of pit at 2.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP316
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411392.75 - 414872.37 Level: 220.35	Date 24/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.6 × 0.6 Depth 2.40	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	220.05		MADE GROUND: Dark grey sandy angular to subrounded fine to coarse GRAVEL of limestone and rare brick. (GRANULAR MADE GROUND)
	0.50	J,K&T					MADE GROUND: Dark grey silty slightly gravelly SAND. Gravel is angular to subangular fine to coarse of brick, sandstone and concrete. (GRANULAR MADE GROUND) *Between 0.3m and 0.9m, 4 metal pipe off cuts 10cm in diameter.*
				0.90	219.45		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
	1.30	D					
				2.40	217.95		*At 2.4m, unable to excavate further due to bedrock.* End of pit at 2.40 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP317
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411410.91 - 414843.54 Level: 220.05	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.8 × 0.6 Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	219.75		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
	0.60	J,K&T		0.80	219.25		MADE GROUND: Dark brown sandy angular to subangular fine to coarse GRAVEL of brick, concrete, sandstone, glass with frequent full and half bricks. (GRANULAR MADE GROUND)
				1.70	218.35		Light brown sandy slightly clayey angular tabular fine to coarse GRAVEL of sandstone with a high cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL) *At 1.7m, unable to excavate further due to bedrock.* End of pit at 1.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No **TP318**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411423.68 - 414870.99 Level: 219.15	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50 — 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	218.85		MADE GROUND: Light grey sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
	0.40	J,K&T		0.60	218.55		MADE GROUND: Dark grey sandy slightly clayey angular to subangular fine to coarse GRAVEL of mixed lithologies including sandstone, brick and concrete. (GRANULAR MADE GROUND) *At 0.6m, blue plastic pipe running north to south through centre of pit.*
	1.20	D		1.50	217.65		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL) *At 1.5m, unable to excavate further due to bedrock.* End of pit at 1.50 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

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Trial Pit Log

Trialpit No
TP319
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411417.95 - 414898.37 Level: 219.15	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00 — 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	219.05		MADE GROUND: Light brown reinforced CONCRETE. 50% gravel, 45% matrix, 5% voids. (CONCRETE)
	0.30	J,K&T		0.50	218.65		MADE GROUND: Dark brown silty slightly gravelly SAND. Gravel is angular to subangular fine to medium of sandstone. (GRANULAR MADE GROUND)
							Light brown gravelly SAND with a medium cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				2.00	217.15		*At 2.0m, unable to excavate further due to bedrock.* End of pit at 2.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP320
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411437.13 - 414892.12 Level: 218.40	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.7 × 0.6, Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	218.30		MADE GROUND: Light grey CONCRETE. 30% gravel, 65% matrix, 5% voids. (CONCRETE)
	0.30	J&T					MADE GROUND: Dark brown clayey slightly gravelly SAND. Gravel is angular to subangular fine to medium of mixed lithologies. (GRANULAR MADE GROUND)
				0.60	217.80		Light brown clayey gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
	1.00	D					
				1.70	216.70		*At 1.7m, unable to excavate further due to bedrock.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP321
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411452.89 - 414866.21 Level: 217.60	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.3 × 0.6, Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark grey gravelly SAND. Gravel is angular to subangular fine to coarse of mixed lithologies including limestone, sandstone, brick and concrete. (GRANULAR MADE GROUND) *From ground level, brick wall to 0.8m depth in northern face of pit with two metal pipes running parallel.*
				0.70	216.90		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	216.00		*At 1.6m, unable to excavate further due to bedrock.* End of pit at 1.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP322
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411426.75 - 414837.32 Level: 219.30	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.3 x 0.6, Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	219.20		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	219.10		MADE GROUND: Light grey sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
				0.30	219.00		MADE GROUND: Reddish brown full bricks in horizontal layer. (BRICKFILL)
	0.60	J,K&T					*At 0.3m, concrete foundation in south face of pit.*
				0.80	218.50		MADE GROUND: Black ashy fine to coarse GRAVEL of clinker, slag and glass. Slight hydrocarbon odour. (ASH & CLINKER)
							Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone and sandstone lithorelicts with a medium cobble content. Cobbles are of sandstone. (GRANULAR RESIDUAL SOIL)
				2.00	217.30		*End at 2.0m, unable to excavate further due to bedrock.* End of pit at 2.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP323
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411299.22 - 414829.21 Level: 225.25	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3 × 0.6, Depth 2.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	225.15		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.40	J,K&T					MADE GROUND: Reddish brown and dark brown very gravelly clayey fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone, brick, red shale and clinker. (GRANULAR MADE GROUND)
				0.80	224.45		Light orangish brown very gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.10	D					
				2.10	223.15		*At 2.1m, refusal on bedrock.* End of pit at 2.10 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP324
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411342.19 - 414816.01 Level: 223.30	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.10, 2.5, 2	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	223.20		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.15	J,K&T		0.20	223.10		MADE GROUND: Dark reddish brown gravelly, ashy SAND. Gravel is angular to subrounded fine to coarse of clinker, brick, concrete and sandstone. (GRANULAR MADE GROUND)
				0.60	222.70		MADE GROUND: Light brown slightly sandy, gravelly angular tabular COBBLES of sandstone. Gravel is angular to subangular fine to coarse of sandstone. (QUARRY BACKFILL)
	0.90	D					MADE GROUND: Light brown sandy gravelly angular tabular COBBLES of sandstone. Gravel is angular fine to coarse of sandstone. (QUARRY BACKFILL) *From 0.6m, large amounts of spalling and collapse.*
				2.10	221.20		*Unable to excavate further beyond 2.1m, due to large amounts of spalling and collapse.* End of pit at 2.10 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.6m and 2.1m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP325
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411313.15 - 414811.42 Level: 224.20	Date 25/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.00 — 2 × 2	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	224.15		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	224.00		MADE GROUND: Light brown sandy subangular to subrounded fine to coarse GRAVEL of sandstone. (SUB-BASE)
							MADE GROUND: Black ashy subangular to subrounded fine to coarse GRAVEL of clinker and burnt shale. (ASH & CLINKER)
							Between 1.0m and 3.0m, large amounts of spalling and collapse.
	1.50	J,K&T					
							At 2.8m, sandstone boulder circa 1.5m in size.
				3.00	221.20		*At 3.0m, trial pit terminated due to large amounts of collapsing.* End of pit at 3.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.0m and 3.0m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP326
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411269.23 - 414833.60 Level: 226.50	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	226.40		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	J,K&T		0.30	226.20		MADE GROUND: Dark reddish brown clayey very sandy angular to subangular fine to coarse GRAVEL of red shale and coal. (GRANULAR MADE GROUND)
	0.50	J,K&T					MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of ash, clinker and coal. (ASH & CLINKER)
	0.70 - 1.20	D&B		0.70	225.80		MADE GROUND: Light brown slightly silty very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble and boulder content. (QUARRY BACKFILL)
				1.20	225.30		MADE GROUND: Light brown sandstone BOULDERS with a little light brown sandy subangular fine to coarse gravel. (QUARRY BACKFILL)
				3.00	223.50		*At 3.0m, continual collapse of sidewalls. Unable to excavate further.* End of pit at 3.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 3.0m depth during excavation.

AGS

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Trial Pit Log

Trialpit No **TP327**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411248.09 - 414848.41 Level: 226.55	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 4.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	226.45		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.30	J,K&T		0.50	226.05		MADE GROUND: Grey slightly silty very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of limestone, coal, mudstone and red shale. (GRANULAR MADE GROUND)
				0.80	225.75		MADE GROUND: Light brown very gravelly fine to coarse SAND with a low cobble content. Gravel is subangular fine to coarse sandstone. (QUARRY BACKFILL)
				1.40	225.15		MADE GROUND: Light grey and dark grey very clayey very gravelly fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of concrete and sandstone. (QUARRY BACKFILL)
	1.50	J,K&T					MADE GROUND: Dark grey gravelly very clayey fine to coarse SAND with a low cobble and boulder content. Gravel is angular to subangular fine to coarse of tarmac, coal and clinker. Strong bituminous odour. (ASH & CLINKER)
				2.60	223.95		MADE GROUND: Brown and light brown clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone, clinker, mudstone, coal and brick with a low cobble content. (ASH & CLINKER)
	3.50 - 4.00	D&B					
				4.00	222.55		*At 4.0m, maximum reach of excavator.* End of pit at 4.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP328
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411384.85 - 414838.07 Level: 220.85	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00, 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	220.80		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.50	J,K&T					MADE GROUND: Dark brown sandy angular tabular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (REWORKED NATURAL GROUND)
				0.80	220.05		Light brown gravelly slightly clayey SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
	1.20	D					*From 1.5m, medium cobble content.*
							At 2.0m, unable to excavate further due to bedrock.
				2.00	218.85		End of pit at 2.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP329
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411295.71 - 414814.29 Level: 226.55	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.00, 2, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	226.35		MADE GROUND: Light grey reinforced CONCRETE. 30% gravel, 60% matrix, 10% voids. (CONCRETE)
							Breeze block wall from surface to 1.0m.
	0.60	J,K&T					MADE GROUND: Light brown angular to subrounded fine to coarse GRAVEL of mixed lithologies including sandstone, brick, concrete and burnt shale. (GRANULAR MADE GROUND)
				1.00	225.55		*At 1.0m, concrete slab. Unable to excavate further.*
							End of pit at 1.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP330
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411440.44 - 414784.25 Level: 218.75	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.9 × 0.6 Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	J,K&T		0.90	217.85		MADE GROUND: Dark grey sandy angular to subrounded fine to coarse GRAVEL of mixed lithologies including brick, sandstone, concrete and clinker. (GRANULAR MADE GROUND)
	1.30	J&T		1.60	217.15		MADE GROUND: Light brown gravelly slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. Pockets of stiff clay with cobbles. (GRANULAR MADE GROUND)
	1.80	D		2.00	216.75		Light brown sandy slightly clayey angular fine to coarse GRAVEL of sandstone and sandstone lithorelicts. (GRANULAR RESIDUAL SOIL) *At 2.0m, unable to excavate further due to bedrock.* End of pit at 2.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP331
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411466.98 - 414790.91 Level: 217.70	Date 25/08/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 2.00	2.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J,K&T		0.50	217.20		MADE GROUND: Dark grey sandy angular to subrounded fine to coarse GRAVEL of mixed lithologies including limestone, sandstone and brick. (GRANULAR MADE GROUND)
				2.00	215.70		Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL) *At 2.0m, unable to excavate further due to bedrock.* End of pit at 2.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP332
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411475.65 - 414754.42 Level: 217.65	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.6 × 0.6 Depth 2.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	J,K&T		0.90	216.75		MADE GROUND: Dark grey gravelly SAND. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete, sandstone and clinker. (COHESIVE MADE GROUND)
	1.40	J&T					MADE GROUND: Light brown slightly sandy slightly clayey angular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (QUARRY BACKFILL)
	1.60	D&B					*From 1.9m, large amounts of spalling and collapse.*
				2.90	214.75		End of pit at 2.90 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.9m and 2.9m depth during excavation.

AGS

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Trial Pit Log

Trialpit No **TP333**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411483.24 - 414724.46 Level: 217.40	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.50, 2.1 × 1.5	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J,K&T		0.50	216.90		MADE GROUND: Dark grey sandy to angular subrounded fine to coarse GRAVEL of brick, sandstone and clinker. (GRANULAR MADE GROUND)
	1.00	J&T					MADE GROUND: Light brown clayey slightly sandy angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
	1.50	D					
				2.50	214.90		*End at 2.5m, due to large amounts of collapse from 1.5m.* End of pit at 2.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.5m and 2.5m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP334
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411466.96 - 414737.05 Level: 217.90	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.4 × 0.6, Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown sandy angular to subrounded fine to coarse GRAVEL of mixed lithologies including sandstone, brick and occasional clinker. (GRANULAR MADE GROUND)
				0.80	217.10		MADE GROUND: Light brown clayey slightly gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (QUARRY BACKFILL)
	1.50	T					*At 1.5m, large amount of cement sheeting tiles. Trial pit abandoned.*
	1.60	D		1.60	216.30		End of pit at 1.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP335**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411433.24 - 414712.37 Level: 221.00	Date 25/08/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 3.40	2.6 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	220.95		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Reddish brown gravelly SAND. Gravel is angular to subangular fine to coarse of brick, mudstone and sandstone. (GRANULAR MADE GROUND)
	0.60	T		0.70	220.30		MADE GROUND: Light bluish grey slightly sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with rare sandstone boulders. (REWORKED NATURAL GROUND)
				1.20	219.80		Light brown sandy slightly clayey angular to subrounded fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
	1.60	D					
	2.00	J&T					
				3.40	217.60		End of pit at 3.40 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP336
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411420.02 - 414744.19 Level: 220.95	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.8 × 0.6 Depth 3.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J,K&T		0.30	220.65		MADE GROUND: Dark grey sandy angular to subangular fine to coarse GRAVEL of sandstone, mudstone, limestone and brick. (SUB-BASE)
				1.10	219.85		MADE GROUND: Light brown cobbly slightly sandy angular fine to coarse GRAVEL of sandstone. Cobbles are angular of sandstone. (REWORKED NATURAL GROUND) *At 0.5m, boulder 0.9m x 0.5m in size excavated.*
				1.50	219.45		MADE GROUND: Light brown gravelly slightly clayey SAND. Gravel is angular to subangular fine to coarse of sandstone. (REWORKED NATURAL GROUND) *At 1.5m, slight water seepage.*
	1.60	J,K&T		1.80	219.15		Light greyish brown sandy SILT with frequent plant matter. (RELICT TOPSOIL) *Between 1.5m and 1.8m, natural organic odour.*
			HVP=73				Firm light orangish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone. (COHESIVE RESIDUAL SOIL)
	2.40	D		2.90	218.05		Light greyish brown clayey slightly sandy angular fine to coarse GRAVEL of sandstone and sandstone lithorelicts. (GRANULAR RESIDUAL SOIL)
				3.30	217.65		*End at 3.3m, unable to excavate further due to bedrock.* End of pit at 3.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP337
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411403.18 - 414785.62 Level: 220.90	Date 25/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.30 — 2.6 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	J,K&T		0.60	220.30		MADE GROUND: Dark grey very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse limestone, tarmac, coal and clinker with rare fragments of wood and metal. (GRANULAR MADE GROUND)
				1.10	219.80		MADE GROUND: Light grey, light brown and brown slightly sandy very clayey angular to subangular fine to coarse GRAVEL of sandstone, concrete, shale and coal. (GRANULAR MADE GROUND)
	1.20	D		1.80	219.10		Light brown clayey very sandy angular subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				2.30	218.60		Weak light yellowish brown SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 2.3m, refusal on bedrock.* End of pit at 2.30 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP338
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411476.43 - 414703.87 Level: 218.10	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.6 x 0.6 Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.05	218.05		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	J&T					MADE GROUND: Reddish brown slightly sandy angular to subrounded fine to coarse GRAVEL of brick and sandstone with frequent full bricks. (GRANULAR MADE GROUND)
				0.40	217.70		MADE GROUND: Light brown slightly gravelly SAND with occasional cobbles. Gravel is angular to subrounded fine to coarse of sandstone. Cobbles are angular to subangular of sandstone. (REWORKED NATURAL GROUND)
				1.30	216.80		Light brown gravelly SAND with a medium cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
	1.50	D					
				2.20	215.90		End of pit at 2.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No **TP339**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411435.03 - 414691.62 Level: 221.05	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.30, 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.05	221.00		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.30	J,K&T					MADE GROUND: Reddish brown sandy angular to subrounded fine to coarse GRAVEL of sandstone, brick and clinker. (GRANULAR MADE GROUND)
				0.50	220.55		MADE GROUND: Light brown gravelly slightly sandy COBBLES of sandstone. Gravel is angular to subangular fine to coarse of sandstone. (REWORKED NATURAL GROUND)
				1.20	219.85		MADE GROUND: Reddish brown slightly clayey slightly gravelly SAND. Gravel is subangular to subrounded fine to coarse of sandstone. (REWORKED NATURAL GROUND)
	1.60	J&T					
				2.00	219.05		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				2.30	218.75		*At 2.3m, unable to excavate further due to bedrock.* End of pit at 2.30 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Trial Pit Log

Trialpit No **TP340** Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411408.93 - 414673.80 Level: 222.30	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.70; 2.6 × 1.5	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J,K&T		0.10	222.20		MADE GROUND: Light grey CONCRETE. 40% gravel, 50% matrix, 10% voids. (CONCRETE)
				0.15	222.15		MADE GROUND: Black gravelly ASH. Gravel is angular to subrounded fine to medium of clinker. (ASH & CLINKER)
							MADE GROUND: Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (QUARRY BACKFILL)
							At 1.6m, sandstone boulder excavated circa 1.0m x 1.0m in size.
				2.70	219.60		*End at 2.7m, due to large amounts of spalling and collapse.* End of pit at 2.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP341
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411389.72 - 414764.87 Level: 220.80	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	220.70		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.30	J,K&T					MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of clinker, coal, shale and rare slag. (ASH & CLINKER)
							At 1.5m, pocket of light brown gravelly clay.
	2.00 - 2.50	D&B					*From 2.0m, frequent fragments of glass.*
				3.70	217.10		End of pit at 3.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 3.7m depth during excavation.

AGS

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Trial Pit Log

Trialpit No **TP342**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411367.86 - 414748.44 Level: 221.60	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 3.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	221.40		MADE GROUND: Light grey CONCRETE. (CONCRETE)
	0.60	J,K&T					MADE GROUND: Light brown and red sandstone and brick COBBLES with some sandy gravel. (GRANULAR MADE GROUND)
							At 0.9m, concrete floor slab (excavated with machine). Brick wall in north face of the pit.
	1.10	T					*At 1.1m, fragments of cement sheeting.*
				1.20	220.40		MADE GROUND: Black gravelly very silty fine SAND. Gravel is angular to subrounded fine to coarse sandstone, brick, coal and clinker. (ASH & CLINKER)
	1.50	J,K&T					
							From 2.5m, frequent sections of metal (up to 1.5m long) and concrete and sandstone boulders. Continual collapse of sidewalls.
				3.30	218.30		*At 3.3m, complete collapse of sidewalls.* End of pit at 3.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 3.3m depth during excavation.

AGS

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Trial Pit Log

Trialpit No **TP343**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411357.96 - 414730.27 Level: 221.85	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	221.75		MADE GROUND: Light grey CONCRETE. (CONCRETE)
	0.50	J,K&T					MADE GROUND: Black very gravelly silty fine to medium SAND with a low brick cobble content. Gravel is subangular to subrounded fine to coarse clinker, coal and sandstone. Rare fragments of metal, wood, cement sheeting and plastic. (ASH & CLINKER)
							From 0.9m, continual collapse of sidewalls.
	1.20 - 1.70	D&B					*At 1.5m, sandstone boulder 2.0m in diameter.*
				1.70	220.15		MADE GROUND: Light brown gravelly CLAY with a medium cobble content. Gravel is angular to subangular fine to medium of sandstone and siltstone. (QUARRY BACKFILL)
	2.00	J,K&T					
				3.30	218.55		*At 3.3m, complete collapse of sidewalls.* End of pit at 3.30 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.9m and 3.3m depth during excavation with complete collapse at 3.3m.

AGS

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Trial Pit Log

Trialpit No **TP344**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411386.35 - 414723.88 Level: 221.25	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 4.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	221.15		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Dark reddish brown very sandy angular to subangular fine to coarse GRAVEL of brick, clinker, sandstone and concrete with a low cobble content. Rare fragments of metal, glass and cement sheeting. (ASH & CLINKER)
							Between 0.1m and 0.6m, brick wall in north face of pit.
							From 0.6m to 0.7m, 100mm thick concrete footing.
	0.80	J,K&T					
	1.30	T					*At 1.3m, sample of cement sheeting.*
							From 1.5m, continual collapse of sidewalls.
				4.60	216.65		End of pit at 4.60 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 4.6m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP345
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411400.75 - 414749.77 Level: 221.00	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 4.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.80	J,K&T		1.20	219.80		MADE GROUND: Dark grey very gravelly fine to coarse SAND with a low concrete and brick cobble content. Gravel is angular to subangular fine to coarse of brick, sandstone, concrete and shale. (GRANULAR MADE GROUND)
	2.50	J,K&T					MADE GROUND: Dark grey very gravelly very silty fine to coarse SAND with a low clinker cobble content. Gravel is subangular to subrounded fine to coarse clinker, coal, shale and sandstone. (ASH & CLINKER)
	3.50 - 4.00	D&B		4.10	216.90		End of pit at 4.10 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between1.2m and 4.1m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP346
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411407.30 - 414720.66 Level: 220.75	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 3.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	220.45		MADE GROUND: Dark brown very clayey gravelly fine to coarse SAND with a medium concrete cobble and boulder content. (GRANULAR MADE GROUND)
	0.50	J,K&T		0.70	220.05		MADE GROUND: Dark brown and reddish brown very gravelly clayey fine to coarse SAND with a medium cobble content. Gravel is angular to subangular fine to coarse of shale, sandstone and concrete. (QUARRY BACKFILL)
							At 0.6m, 50mm blue water pipe. Excavator moved to North.
							MADE GROUND: light brown clayey gravelly fine to coarse SAND. Gravel is subangular fine to coarse sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
							From 1.5m, continual collapse of sidewalls.
	3.00 - 3.50	D&B					
				3.90	216.85		End of pit at 3.90 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 3.9m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP347
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411424.57 - 414717.62 Level: 221.00	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.70, 3.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	220.80		MADE GROUND: Dark brown very gravelly clayey fine to coarse SAND with a low concrete and sandstone cobble content. (GRANULAR MADE GROUND)
							MADE GROUND: Light grey concrete and sandstone BOULDERS with much clayey sandy gravel. (REWORKED NATURAL GROUND)
							At 0.6m, blue water pipe. Pit moved south.
	0.90	J,K&T					
				1.40	219.60		Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.80	D					
				2.40	218.60		Weak light yellowish brown SANDSTONE. Recovered as cobbles and gravel. (ROUGH ROCK SANDSTONE)
				2.70	218.30		*At 2.7m, refusal on bedrock.* End of pit at 2.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.0m and 1.4m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP348
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411408.68 - 414690.01 Level: 221.75	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 2.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J,K&T		0.20	221.55		MADE GROUND: Dark brown clayey gravelly fine to coarse SAND. (GRANULAR MADE GROUND)
							MADE GROUND: Light grey and light brown sandstone COBBLES and BOULDERS with a little sandy gravel. (QUARRY BACKFILL)
							From 0.5m, continual collapse of sidewalls.
							From 2.0m to 2.6m, sandstone boulders up to 1.0m diameter.
				2.60	219.15		*At 2.6m, unable to excavate further due to continual collapse.* End of pit at 2.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 2.6m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP349
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411363.02 - 414699.00 Level: 223.80	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.80, 3.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	223.70		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	223.60		MADE GROUND: Light brown sandy subangular to subrounded fine to coarse GRAVEL of sandstone. (SUB-BASE)
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of clinker, coal, mudstone and brick with a low cobble content. Rare fragments of metal, glass and wood. (ASH & CLINKER)
	1.00	J,K&T					
				2.30	221.50		MADE GROUND: Light brown sandstone BOULDERS with some clayey sandy gravel. (QUARRY BACKFILL)
				2.80	221.00		*At 2.8m, refusal on hard obstructions (likely boulders >1m diameter).* End of pit at 2.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 2.8m depth during excavation.

AGS

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Trial Pit Log

Trialpit No **TP350** Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411380.07 - 414669.68 Level: 223.75	Date 29/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.50, 2.7 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.05	223.70		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.15	J&T		0.10	223.65		
				0.20	223.55		MADE GROUND: Light orangish brown SAND and GRAVEL. Gravel is angular to subangular fine to coarse of sandstone. (SUB-BASE)
							MADE GROUND: Dark grey ashy angular to subangular fine to medium GRAVEL of clinker. (ASH & CLINKER)
				0.70	223.05		Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
	1.30	D					Light brown slightly clayey slightly gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	222.15		Stiff light orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to medium of sandstone. (COHESIVE RESIDUAL SOIL)
	2.00	D	HVP=132				
				2.60	221.15		Light greyish brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone lithorelicts. (GRANULAR RESIDUAL SOIL)
				3.50	220.25		End of pit at 3.50 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP351
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411359.47 - 414643.99 Level: 225.55	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.70 — 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J&T		0.10	225.45		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone and brick. (GRANULAR MADE GROUND)
							At 0.4m, concrete slab 1.6m x 1.6m x 0.2m in size excavated.
				0.70	224.85		*At 0.7m, concrete slab at base of pit. Unable to excavate further. Broke tooth on bucket.*
							End of pit at 0.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP352C
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.8 × 0.6, Depth 3.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30			MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
	0.80	J,K&T					MADE GROUND: Black ashy fine to coarse GRAVEL of brick, wood, sandstone, glass and clinker. (ASH & CLINKER)
	1.20	D&B					
				2.70			Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				3.40			*At 3.4m, refusal on bedrock.* End of pit at 3.40 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP352N
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411351.90 - 414659.06 Level: 225.30	Date 04/09/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 4.30	3.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	225.20		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Black silty very sandy angular to subangular fine to coarse GRAVEL of coal, clinker, brick, shale and sandstone with a medium cobble content. Rare fragments of metal and glass. (ASH & CLINKER)
							From 2.0m, low sandstone boulder content.
				4.30	221.00		*From 4.3m, excavation terminated due to concerns with regard to stability of sidewalls.*
							End of pit at 4.30 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.1m and 4.3m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP352S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411350.83 - 414649.55 Level: 225.50	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.2 x 0.6 Depth 3.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	225.40		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	225.20		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
							MADE GROUND: Black ashy fine to coarse GRAVEL of brick, wood, sandstone, glass and clinker. (ASH & CLINKER)
				1.40	224.10		Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				3.40	222.10		*At 3.4m, refusal on bedrock.* End of pit at 3.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP353
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411352.44 - 414669.37 Level: 224.80	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 4.00, 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	224.75		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.25	224.55		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
	0.40	J,K&T					MADE GROUND: Dark grey sandy ashy angular to subrounded fine to coarse GRAVEL of clinker and rare brick. (ASH & CLINKER)
				0.70	224.10		MADE GROUND: Light brown slightly sandy gravelly angular to subrounded COBBLES of sandstone. Gravel is angular to subrounded fine to coarse of sandstone. 10% cobbles> 150mm. (QUARRY BACKFILL)
				1.50	223.30		MADE GROUND: Dark grey sandy ashy angular to subrounded fine to coarse GRAVEL of clinker and rare brick. (ASH & CLINKER)
				4.00	220.80		*At 4.0m, maximum reach of excavator.* End of pit at 4.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP354
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411356.86 - 414609.51 Level: 226.05	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.5 x 0.6 Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	225.95		MADE GROUND: Light grey reinforced CONCRETE. 40% gravel, 55% matrix, 5% voids. (CONCRETE)
	0.60	J,K&T					MADE GROUND: Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (REWORKED NATURAL GROUND)
				1.80	224.25		*At 1.8m, obstruction at base of pit, unable to see if bedrock.* End of pit at 1.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP355
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411342.81 - 414550.67 Level: 227.20	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.7 × 0.6, Depth 1.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.15	227.05		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	226.90		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
	0.70	D					Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.00	226.20		*At 1.0m, unable to excavate further due to bedrock.* End of pit at 1.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP356
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411283.09 - 414654.77 Level: 230.00	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.90 — 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.05	229.95		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.15	J&T		0.10	229.90		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
				0.20	229.80		Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
	0.70	D					Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone with a medium cobble content. (GRANULAR RESIDUAL SOIL)
				0.90	229.10		*At 0.9m, unable to excavate further due to bedrock.* End of pit at 0.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP357
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411261.06 - 414682.78 Level: 231.20	Date 30/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.6 × 0.6, Depth 3.00	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	231.10		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	231.00		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
				0.30	230.90		MADE GROUND: Dark grey sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
	0.60	J&T					
	0.80	D&B					MADE GROUND: Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. 10% cobbles are >150mm in size. (QUARRY BACKFILL)
							From 0.3m, large amount of spalling and collapse.
							From 1.6m, frequent boulders up to c.50cm in size.
				3.00	228.20		*At 3.0m, trial pit terminated due to pit instability.* End of pit at 3.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable from 0.3m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP358
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411241.04 - 414659.11 Level: 231.75	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.00 — 2.7 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	231.65		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	J&T		0.30	231.45		MADE GROUND: Light grey slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
							Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
							Brick wall in west face of pit to 0.7m.
							Concrete footing 0.7m to 0.8m with 20cm stick out.
				0.90	230.85		
	1.00	D		1.00	230.75		Stiff dark greyish brown mottled orange slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone. (COHESIVE RESIDUAL SOIL)
							At 1.0m, unable to excavate further due to bedrock.
							End of pit at 1.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP359
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411235.14 - 414676.36 Level: 232.10	Date 30/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.30 — 2.6 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	232.00		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	J&T		0.30	231.80		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
							MADE GROUND: Light orangish brown sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. 5% of cobbles >150mm. Rare boulders up to 0.5m in size. (QUARRY BACKFILL)
							From 1.2m, large amounts of spalling and collapse.
	1.40	D					
				3.30	228.80		*At 3.3m, trial pit terminated due to instability* End of pit at 3.30 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable from 1.2m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP360
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411244.28 - 414724.25 Level: 231.30	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.4 × 0.6, Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	231.25		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.35	J&T		0.30	231.00		MADE GROUND: Light greyish brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
				0.40	230.90		MADE GROUND: Dark grey slightly clayey slightly gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone, mudstone and rare brick. (GRANULAR MADE GROUND)
	1.00	D					Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				2.00	229.30		*At 2.0m, unable to excavate further due to bedrock.* End of pit at 2.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP361
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411206.20 - 414748.91 Level: 232.70	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00, 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.05	232.65		MADE GROUND: Black MACADAM hardstand. (MACADAM HARDSTAND)
	0.30	J&T		0.25	232.45		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (REWORKED NATURAL GROUND)
				0.35	232.35		
				0.40	232.30		MADE GROUND: Light orangish red slightly sandy angular to subangular fine to coarse GRAVEL of burnt shale. (ASH & CLINKER)
							MADE GROUND: Black ashy angular to subangular fine to medium GRAVEL of clinker. (ASH & CLINKER)
				0.90	231.80		
				1.00	231.70		MADE GROUND: Light brown sandy angular to subrounded fine to coarse GRAVEL of sandstone. (REWORKED NATURAL GROUND)
							MADE GROUND: Dark brown clayey SAND. (REWORKED NATURAL GROUND)
	1.40	D					Light brown SAND and GRAVEL. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				2.00	230.70		*At 2.0m, unable to excavate further due to bedrock.* End of pit at 2.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP362
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411181.09 - 414705.77 Level: 235.20	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50, 2, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	234.90		Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
	0.60	D					Light brown gravelly SAND with a low cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.50	233.70		*At 1.5m, unable to excavate further due to bedrock.* End of pit at 1.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP363
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411327.04 - 414706.15 Level: 226.35	Date 29/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	226.15		MADE GROUND: Light grey CONCRETE with 5mm steel rebar. (CONCRETE)
	0.40	J,K&T		0.60	225.75		MADE GROUND: Dark brown very clayey very gravelly fine to coarse SAND with a low brick cobble content. Gravel is subangular to subrounded fine to coarse brick, concrete, sandstone and coal. (GRANULAR MADE GROUND)
				2.00	224.35		MADE GROUND: Brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble and boulder content. (REWORKED NATURAL GROUND)
	2.40	D		3.00	223.35		Light yellowish brown SANDSTONE. Recovered as cobbles and gravel. (ROUGH ROCK SANDSTONE)
							At 3.0m, becoming very difficult to excavate (stability between 2.0m and 3.0m suggests bedrock).
							End of pit at 3.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 2.0m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP364
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411334.73 - 414718.84 Level: 224.85	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	224.75		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.40	J,K&T		0.50	224.35		MADE GROUND: Dark grey very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone, clinker, tarmac and shale. (GRANULAR MADE GROUND)
	1.10	T		1.30	223.55		MADE GROUND: Light brown gravelly silty fine to coarse SAND. Gravel is subangular fine to coarse sandstone. (QUARRY BACKFILL)
							MADE GROUND: Light grey sandstone COBBLES and BOULDERS with much clayey sandy gravel. (QUARRY BACKFILL)
							From 1.3m, continual collapse of sidewalls.
				3.60	221.25		*At 3.6m, complete collapse of sidewalls.*
							End of pit at 3.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.3m and 3.6m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP365
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411337.12 - 414736.45 Level: 224.35	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J,K&T		0.30	224.05		MADE GROUND: Dark brown clayey fine to coarse SAND with rare brick, gravel and fragments of glass. (MADE GROUND TOPSOIL)
	0.90	J,K&T		1.20	223.15		MADE GROUND: Light brown gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is subangular fine to coarse sandstone. (QUARRY BACKFILL)
	1.30 - 1.50	B		2.20	222.15		MADE GROUND: Light grey and light brown COBBLES and BOULDERS of sandstone with much clayey sand and gravel. (QUARRY BACKFILL) *At 1.3m, bulk sample of clayey sandy gravel taken.* *At 2.2m, refusal on hard obstruction (boulder >1m diameter).* End of pit at 2.20 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 2.2m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP366
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411303.85 - 414741.22 Level: 227.35	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	227.25		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	J,K&T		0.30	227.05		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone (SUB-BASE)
	0.60	J,K&T					MADE GROUND: Dark brown sandy gravelly CLAY with a medium sandstone cobble and boulder content. Gravel is subangular to subrounded fine to coarse sandstone, brick and coal. (QUARRY BACKFILL)
				1.00	226.35		MADE GROUND: Brownish grey very sandy angular to subangular fine to coarse GRAVEL with a medium brick, concrete cobble and boulder content. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone. (QUARRY BACKFILL)
				1.70	225.65		MADE GROUND: Light yellowish brown sandstone COBBLES and BOULDERS with much silty sandy gravel. (QUARRY BACKFILL) *From 1.7m to 3.5m, continual collapse of sidewalls.*
				3.50	223.85		End of pit at 3.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.0m and 3.5m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP367
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411327.46 - 414630.15 Level: 227.05	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.5 × 0.6 Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	226.75		Dark brown silty slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
	0.70	D					Light brown gravelly SAND with a low cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.40	225.65		*At 1.4m, unable to excavate further due to bedrock.* End of pit at 1.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP368**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411306.31 - 414658.26 Level: 229.15	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90 — 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.20	228.95		MADE GROUND: Dark brown gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (MADE GROUND TOPSOIL)
	0.50	J&T					MADE GROUND: Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with frequent red plastic firework ground spikes. (REWORKED NATURAL GROUND)
	0.80	D		1.00	228.15		Dark brown slightly gravelly SAND. Gravel is angular to subangular fine to medium of sandstone. (RELICT TOPSOIL)
				1.30	227.85		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.90	227.25		*At 3.9m, unable to excavate further due to bedrock.* End of pit at 1.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP369
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411286.08 - 414683.50 Level: 230.75	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.8 × 0.6 Depth 2.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.20	230.55		MADE GROUND: Dark brown clayey slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (MADE GROUND TOPSOIL)
	0.50	J&T					MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone with rare brick. (REWORKED NATURAL GROUND)
	0.70	D					
	1.60	J&T		1.50	229.25		Dark brown sandy CLAY. (RELICT TOPSOIL)
				1.80	228.95		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone with a low cobble content. (GRANULAR RESIDUAL SOIL)
				2.50	228.25		*At 2.5m, unable to excavate further due to bedrock.* End of pit at 2.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP370
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411273.51 - 414714.23 Level: 230.55	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70, 2.9 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	230.45		MADE GROUND: Dark brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (MADE GROUND TOPSOIL)
				0.70	229.85		MADE GROUND: Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. Frequent plastic firework ground spikes. (REWORKED NATURAL GROUND) *At 0.5m, tarmac slabs, 1.0m x 0.8m x 0.05m in size excavated.*
	0.80	J&T					MADE GROUND: Light brown sandy slightly clayey angular to subrounded fine to coarse GRAVEL of sandstone. (REWORKED NATURAL GROUND)
				1.30	229.25		Dark brown slightly clayey SAND. (RELICT TOPSOIL)
				1.60	228.95		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL) *At 1.7m, unable to excavate further due to bedrock.*
				1.70	228.85		End of pit at 1.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP371
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411128.36 - 414742.93 Level: 236.10	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.5 × 0.6 Depth 2.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	235.80		Dark brown gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
	0.60	D		0.80	235.30		Light brown gravelly SAND with a low cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
							Light greyish brown sandy angular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
							From 1.2m, medium cobble content. Cobbles are angular of sandstone.
				2.30	233.80		*At 2.3m, unable to excavate further due to bedrock.* End of pit at 2.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP372
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411150.14 - 414715.64 Level: 237.10	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 1.5 × 0.6 Depth 1.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	236.80		MADE GROUND: Dark brown slightly gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (MADE GROUND TOPSOIL)
	0.60	J&T					MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (REWORKED NATURAL GROUND)
				1.00	236.10		*Trial pit excavated within slope. At 1.0m, trial pit terminated due to instability.* End of pit at 1.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability:

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP373
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411096.55 - 414726.25 Level: 238.35	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.4 × 0.6, Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	238.05		Dark brown gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
	0.90	D					Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone and sandstone lithorelicts. (GRANULAR RESIDUAL SOIL)
				1.40	236.95		*At 1.4m, unable to excavate further due to bedrock.* End of pit at 1.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP374**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411287.98 - 414742.24 Level: 227.80	Date 30/08/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 2.70	2.8 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J,K&T					MADE GROUND: Dark grey ashy angular to subrounded fine to coarse GRAVEL of clinker with occasional gravel of glass, sandstone, burnt shale and concrete. (ASH & CLINKER)
				0.60	227.20		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of predominantly sandstone with occasional gravel of clinker, brick and glass. (GRANULAR MADE GROUND)
				1.10	226.70		MADE GROUND: Dark grey ashy fine to coarse GRAVEL of clinker. (ASH & CLINKER)
	1.40	J,K&T					
				2.60	225.20		Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone with a high cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				2.70	225.10		*At 2.7m, scraping at base. Possible bedrock.* End of pit at 2.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP375
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411299.26 - 414715.63 Level: 227.25	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70; 2; 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	227.15		MADE GROUND: Dark grey angular to subangular fine to coarse GRAVEL of macadam hardstand. (MACADAM HARDSTAND)
	1.00	D					Light brown gravelly SAND with a medium cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.70	225.55		*At 1.7m, unable to excavate further due to bedrock.* End of pit at 1.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP376
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411173.95 - 414682.85 Level: 236.55	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90; 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J,K&T		0.10	236.45		MADE GROUND: Light grey reinforced CONCRETE. 30% gravel, 60% matrix, 10% voids. (CONCRETE)
				0.50	236.05		MADE GROUND: Dark grey slightly clayey, gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone, concrete and brick. (GRANULAR MADE GROUND)
	1.00	D					Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.90	234.65		*At 1.9m, unable to excavate further due to bedrock.* End of pit at 1.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP377
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411142.00 - 414719.67 Level: 236.70	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60; 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	236.65		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	J,K&T		0.10	236.60		MADE GROUND: Light yellowish brown sandy slightly clayey angular fine to medium GRAVEL of limestone. (SUB-BASE)
				0.30	236.40		Light grey sandy CLAY. (RELICT TOPSOIL)
							Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. (GRANULAR RESIDUAL SOIL)
				1.60	235.10		*At 1.6m, unable to excavate further due to bedrock.* End of pit at 1.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP378
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411127.98 - 414676.34 Level: 238.80	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.30 — 2.7 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	238.50		Dark brown slightly clayey slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
	0.90	D					Light brown gravelly SAND with a medium cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.30	237.50		*At 1.3m, unable to excavate further due to bedrock.* End of pit at 1.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP379**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411114.12 - 414690.50 Level: 238.85	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60; 2.3 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	238.75		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	238.55		MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of limestone (SUB-BASE)
	0.40	J,K&T					Dark grey sandy slightly gravelly SILT. Gravel is angular to subangular fine to coarse of sandstone. (RELICT TOPSOIL)
				0.60	238.25		Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	237.25		*At 1.6m, unable to excavate further due to bedrock.* End of pit at 1.60 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP380**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411292.87 - 414849.45 Level: 224.90	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 4.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J,K&T		0.40	224.50		MADE GROUND: Turf over light grey very sandy angular to subangular fine to coarse GRAVEL of limestone and concrete. (GRANULAR MADE GROUND)
	1.10	J,K&T					MADE GROUND: Light brown and dark brown very gravelly fine to coarse SAND with a low sandstone cobble content. (QUARRY BACKFILL) *From 1.0m, continual collapse of sidewalls with complete collapse at 4.0m.*
	2.20 - 2.70	D&B		2.20	222.70		MADE GROUND: Dark grey very sandy slightly gravelly CLAY with a low sandstone cobble content. Gravel is angular to subangular fine to coarse of sandstone and coal. (QUARRY BACKFILL) *From 3.5m, fragments of glass and metal. Medium brick cobble content.*
				4.00	220.90		End of pit at 4.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.0m and 4.0m depth during excavation with complete collapse at 4.0m.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP381**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411234.82 - 414828.14 Level: 227.45	Date 30/08/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 2.40	3 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T					MADE GROUND: Dark brown slightly silty fine to medium SAND with frequent glass and rare brick gravel. (GRANULAR MADE GROUND)
				0.60	226.85		
	0.80	J,K&T					MADE GROUND: Dark grey slightly silty very gravelly fine to coarse SAND with fragments of glass and cement sheeting with a medium cobble and boulder content. (GRANULAR MADE GROUND)
				1.20	226.25		
	1.30	J,K&T					Light brown slightly silty very gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL) *From 1.2m to 1.8m, made ground in east face of pit comprising sandstone cobbles and boulders.*
				1.80	225.65		Weak light yellowish brown SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
	2.30	D					
				2.40	225.05		*At 2.4m, refusal on bedrock.* End of pit at 2.40 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.00m and 1.8m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP382
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411245.37 - 414817.45 Level: 227.65	Date 30/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.10 — 3.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	227.55		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.20	J,K&T		0.30	227.35		MADE GROUND: Dark reddish brown very sandy angular to subangular fine to medium GRAVEL of red shale, sandstone, coal and mudstone. (GRANULAR MADE GROUND)
				0.70	226.95		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some clayey gravelly sand. (QUARRY BACKFILL)
							From 0.7m, continual collapse of the side walls.
	2.00 - 2.50	D&B					
				3.10	224.55		*At 3.1m, complete collapse of the side walls.* End of pit at 3.10 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 3.1m depth during excavation with complete collapse at 3.1m.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP383**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411242.04 - 414777.25 Level: 228.60	Date 30/08/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 3.20	3.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J,K&T					MADE GROUND: Dark brown gravelly clayey fine to coarse SAND. Gravel is angular to subangular fine to coarse of brick, sandstone, concrete and coal. Rare fragments of glass. (GRANULAR MADE GROUND)
				0.30	228.30		
	0.60	J,K&T					MADE GROUND: Dark brown and dark grey very gravelly clayey fine to coarse SAND with a medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, concrete, mudstone and clinker slag. Rare fragments of metal and plastic. (GRANULAR MADE GROUND)
				1.70	226.90		MADE GROUND: Light brown and brown sandstone COBBLES and BOULDERS with much gravelly clayey and sandy gravel. (QUARRY BACKFILL)
							From 1.7m, continual collapse of side walls.
	2.50 - 3.00	B					
				3.20	225.40		*At 3.2m, complete collapse of side walls.* End of pit at 3.20 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.0m and 3.2m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP384
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411236.88 - 414798.91 Level: 227.95	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	227.75		MADE GROUND: Dark brown slightly gravelly silty fine SAND. (GRANULAR MADE GROUND)
	0.70	J,K&T					MADE GROUND: Dark grey locally light to orangish brown very clayey very gravelly fine to coarse SAND with a low brick and sandstone cobble content. (GRANULAR MADE GROUND) *From 0.5m, continual collapse of sidewalls.*
				1.00	226.95		MADE GROUND: Dark grey very sandy silty angular to subangular fine to coarse GRAVEL of sandstone, clinker, coal, concrete, mudstone and brick. Frequent fragments of metal, wood, wire, glass, pottery and plastic buckets. (QUARRY BACKFILL)
	1.50	J,K&T					
				1.90	226.05		MADE GROUND: Dark grey concrete, brick, slag and sandstone COBBLES and BOULDERS with some sand and gravel. Frequent fragments of metal, wood, wire, glass, pottery and plastic buckets. (QUARRY BACKFILL)
				2.90	225.05		*At 2.9m, unable to excavate further due to continual collapse.* End of pit at 2.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 2.9m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP385
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411196.90 - 414820.02 Level: 228.45	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.20 — 3.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	228.30		MADE GROUND: Light grey CONCRETE. (CONCRETE)
	0.50	J,K&T					MADE GROUND: Light brown, dark brown and reddish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone, coal, red shale and brick with a high sandstone brick cobble and boulder content. Rare fragments of metal. (GRANULAR MADE GROUND) *From 0.15m, brick wall in west face to 0.6m depth. No apparent footing.*
				1.20	227.25		MADE GROUND: Dark brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone and coal. (QUARRY BACKFILL)
	1.50 - 1.70	D&B					*From 1.5m, continual collapse of sidewalls.*
				2.00	226.45		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
				3.20	225.25		*At 3.2m, unable to excavate further due to constraints associated with concrete surfacing.* End of pit at 3.20 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 3.2m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP386
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411099.18 - 414665.81 Level: 241.05	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.4 × 0.6 Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J&T		0.40	240.65		Dark brown silty slightly gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
	0.80	D					Light brown gravelly SAND with a low cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.80	239.25		*At 1.8m, unable to excavate further due to bedrock.* End of pit at 1.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP387
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411078.47 - 414658.09 Level: 242.45	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.1 × 0.6, Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	242.35		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							Light brown clayey slightly gravelly SAND with a low cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.70	240.75		*At 1.7m, unable to excavate further due to bedrock.* End of pit at 1.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP388
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411123.29 - 414769.22 Level: 230.60	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	T					MADE GROUND: Dark grey brick COBBLES and concrete sandstone BOULDERS with some dark grey clayey sandy gravel. Frequent fragments of metal, rope, plastic and cement sheeting. (QUARRY BACKFILL) *From 0.10m, continual collapse of side walls.*
	1.30	J,K&T					*At 1.8m, 1.6m long metal trailer bumper.*
				2.20	228.40		MADE GROUND: Light brown sandstone COBBLES and BOULDERS with much clayey sandy gravel. (QUARRY BACKFILL)
	2.50 - 3.00	D&B					*From 2.5m to 3.0m, bulk sample of clayey sandy gravel taken.*
				3.70	226.90		End of pit at 3.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between surface and 3.7m depth during excavation.

AGS

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Trial Pit Log

Trialpit No **TP389**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411096.69 - 414767.58 Level: 231.50
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 3.70	3.5 × 0.6
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		

Date 31/08/2023

Scale 1:25

Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	231.35		MADE GROUND: Light grey CONCRETE. (CONCRETE)
				0.40	231.10		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
	0.60	J,K&T					MADE GROUND: Dark brown silty very sandy angular to subangular fine to coarse GRAVEL of brick, shale, clinker, sandstone, concrete and coal. Rare fragments of metal and glass. (GRANULAR MADE GROUND)
							At 1.6m, sandstone boulder, 2m long.
				1.80	229.70		MADE GROUND: Brown very silty gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is angular to subangular fine to coarse of sandstone and coal. (QUARRY BACKFILL)
	2.20	D&B					
	2.20	J,K&T					
	2.20 - 2.40	D&B					
							From 3.0m, medium cobble content.
				3.70	227.80		End of pit at 3.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.8m and 3.7m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP390
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411075.12 - 414755.00 Level: 231.05	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 4.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50 - 1.00	D&B					MADE GROUND: Dark brown gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is angular to subangular fine to coarse of sandstone, mudstone and coal. (GRANULAR MADE GROUND)
	0.70	J,K&T					
				1.00	230.05		MADE GROUND: Light brown very clayey sandy angular to subrounded fine to coarse GRAVEL of sandstone, brick, concrete, coal and mudstone with a low brick, concrete and sandstone cobble content. (GRANULAR MADE GROUND) *From 1.0m, continual collapse of sidewalls.*
	1.50	J,K&T		1.50	229.55		MADE GROUND: Reddish brown very gravelly fine to coarse SAND with a medium brick cobble content. Gravel is angular to subangular of coal, brick, shale and clinker. (GRANULAR MADE GROUND)
				1.90	229.15		MADE GROUND: Light brown and brown very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
				4.00	227.05		End of pit at 4.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable from 1.3m to 4.0m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP391E
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411056.80 - 414770.64 Level: 232.75	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.80, 3, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark greyish brown silty very gravelly fine to coarse SAND. Frequent fragments of metal, glass and wood. Pieces of metal work (bars, rope) up to 1.5m long. (COHESIVE MADE GROUND)
				1.00	231.75		MADE GROUND: Brown, locally light brown very silty very sandy angular to subangular fine to coarse GRAVEL of sandstone, brick with a low cobble content. (QUARRY BACKFILL)
				2.80	229.95		*At 2.8m, sandstone boulder (2m diameter). Complete collapse of side wall during excavation.* End of pit at 2.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 2.8m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP391W
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411049.23 - 414772.61 Level: 233.20	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80, 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.90	J,K&T					MADE GROUND: Dark greyish brown silty very gravelly fine to coarse SAND. Frequent fragments of metal, glass and wood. Pieces of metal work (bars, rope) up to 1.5m long. (GRANULAR MADE GROUND)
				1.50	231.70		Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL) *At 1.8m, possible highwall step identified between TP391W and TP391E.* *At 1.8m, refusal on bedrock.*
				1.80	231.40		End of pit at 1.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.00m and 1.5m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP392
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411045.66 - 414790.34 Level: 236.30	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.1 × 0.6 Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50	J&T		0.80	235.50		MADE GROUND: Dark brown gravelly SAND with occasional rootlets and a high cobble content. Cobbles are angular of sandstone. (MADE GROUND TOPSOIL)
	1.20	D		2.20	234.10		Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a high cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL) *At 2.2m, unable to excavate further due to bedrock.* End of pit at 2.20 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP393
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411047.96 - 414811.06 Level: 233.95	Date 31/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.20 — 2.1 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	233.65		Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to medium of sandstone. (TOPSOIL)
							Light brown sandy angular fine to coarse GRAVEL of sandstone with a high cobble content. (GRANULAR RESIDUAL SOIL)
				1.20	232.75		*At 1.2m, unable to excavate further due to bedrock.* End of pit at 1.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP394
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411018.35 - 414784.03 Level: 237.20	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.4 x 0.6, Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J,K&T		0.40	236.80		MADE GROUND: Reddish brown sandy, ashy fine to coarse GRAVEL of sandstone, clinker and burnt shale. (GRANULAR MADE GROUND)
	0.90	D					Light brown clayey slightly sandy angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL) *At 0.8m, electric cable running north to south.*
				1.80	235.40		*At 1.8m, unable to excavate further due to bedrock.* End of pit at 1.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP395
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411043.96 - 414741.73 Level: 240.00	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 1.5 x 0.6 Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J,K&T		0.30	239.70		MADE GROUND: Dark brown ashy slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone with occasional brick. (MADE GROUND TOPSOIL)
	0.80	D					Light brown slightly clayey, gravelly angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
				1.50	238.50		*At 1.5m, unable to excavate further due to bedrock.* End of pit at 1.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP396
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411054.92 - 414735.65 Level: 240.10	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.1 × 0.6 Depth 2.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.60	239.50		Dark brown slightly gravelly slightly clayey SAND with occasional rootlets. Gravel is angular to subrounded fine to coarse of sandstone. (TOPSOIL)
				2.80	237.30		Light brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL) *At 2.8m, unable to excavate further due to bedrock.* End of pit at 2.80 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP397
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411097.51 - 414761.85 Level: 231.50	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50, 3.5 x 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	231.35		MADE GROUND: Light grey CONCRETE. (CONCRETE)
	0.50	J,K&T					MADE GROUND: Dark brown very clayey very sandy angular to subangular fine to coarse GRAVEL of concrete, brick, sandstone, coal and clinker with a medium sandstone cobble and boulder content. (GRANULAR MADE GROUND)
				1.10	230.40		MADE GROUND: Light brown sandstone BOULDERS with some dark brown gravelly clayey sand. (QUARRY BACKFILL)
	1.20	J,K&T					
				1.50	230.00		*At 1.5m, unable to continue excavation due to boulders and constraints associated with concrete surfacing.* End of pit at 1.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 1.5m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP398
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411446.16 - 414676.30 Level: 220.75	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.70; 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	220.45		MADE GROUND: Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to medium of sandstone. (MADE GROUND TOPSOIL)
	0.80	D&B					MADE GROUND: Light brown sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. Cobbles are angular of sandstone. (REWORKED NATURAL GROUND)
	1.00	J&T					
				1.90	218.85		Light orangish brown gravelly SAND with a medium cobble content and occasional boulders. Gravel is angular to subangular fine to coarse of sandstone. Cobbles and boulders are angular of sandstone. Boulders up to 0.6m in size. (GRANULAR RESIDUAL SOIL)
				2.70	218.05		*At 2.7m, unable to excavate further due to collapse of trial pit.* End of pit at 2.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP399
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411432.59 - 414668.73 Level: 221.55	Date 31/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00 — 2.5 × 2	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J,K&T		0.20	221.35		MADE GROUND: Dark brown slightly sandy angular to subangular fine to coarse GRAVEL of mixed lithologies including clinker, sandstone and limestone. (GRANULAR MADE GROUND)
							MADE GROUND: Light brown sandy gravelly angular COBBLES of sandstone. Gravel is angular, tabular fine to coarse of sandstone. (REWORKED NATURAL GROUND)
	1.00	D&B					*From 1.2m, large amounts of spalling and collapse.*
				2.00	219.55		*At 2.0m, unable to excavate further due to possible bedrock.* End of pit at 2.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable from 1.2m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP401
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411415.60 - 414648.48 Level: 221.80	Date 01/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.90, 3.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	J,K&T		0.60	221.20		MADE GROUND: Brown and light brown gravelly fine to coarse CLAY with a low brick and sandstone cobble content. (MADE GROUND TOPSOIL)
	1.00	J,K&T		1.30	220.50		MADE GROUND: Dark grey very clayey very gravelly fine to coarse SAND with a low brick and sandstone cobble content. Rare fragments of metal and wood. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone, coal and brick. (QUARRY BACKFILL)
				1.80	220.00		MADE GROUND: Red and light yellowish brown brick and sandstone COBBLES (QUARRY BACKFILL)
	2.00 - 2.50	D&B		3.90	217.90		MADE GROUND: Dark grey very gravelly fine to coarse SAND with a medium sandstone cobble content. Gravel is angular to subangular fine to medium of coal, mudstone and clinker. Frequent fragments of pottery, plastic and metal. (ASH & CLINKER) End of pit at 3.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.3m and 1.8m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP402
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411403.66 - 414635.28 Level: 222.15	Date 01/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 5.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J,K&T		0.50	221.65		MADE GROUND: Dark brown slightly gravelly clayey fine to medium SAND. Gravel is angular to subangular fine to coarse of sandstone, coal and limestone. Rare fragments of glass and metal. (MADE GROUND TOPSOIL)
				0.80	221.35		MADE GROUND: Light brown gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is subangular fine to coarse of sandstone and brick. (QUARRY BACKFILL)
	1.50 - 1.80	D&B					MADE GROUND: Dark grey very clayey gravelly fine to coarse SAND with a medium cobble and boulder content. (QUARRY BACKFILL)
				3.10	219.05		MADE GROUND: Dark grey subangular gravelly CLAY with a low sandstone boulder content. (QUARRY BACKFILL)
	4.50	J,K&T					
				5.00	217.15		End of pit at 5.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 2.5m and 5.0m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP403
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411412.53 - 414619.30 Level: 222.65	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.00 — 2.8 × 2.5	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J,K&T		0.30	222.35		MADE GROUND: Dark brown slightly gravelly slightly clayey SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone, brick and clinker. (MADE GROUND TOPSOIL)
							MADE GROUND: Light brown sandy, gravelly, angular, tabular COBBLES of sandstone with frequent boulders up to 2.5 x 1.5m x 0.3m. (QUARRY BACKFILL)
							From 0.5m, large amount of spalling and collapse.
				3.00	219.65		*At 3.0m, trial pit terminated due to pit instability.* End of pit at 3.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable from 0.5m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP404
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411527.05 - 414633.47 Level: 215.35	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.1 x 0.6 Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.40	214.95		Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subrounded fine to medium of sandstone. (TOPSOIL)
	1.00	D		1.50	213.85		Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL with a low cobble content. Cobbles are angular of sandstone. (GRANULAR RESIDUAL SOIL)
							At 1.5m, unable to excavate further due to bedrock. End of pit at 1.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP405
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411509.12 - 414640.42 Level: 216.30	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.2 × 0.6, Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	216.00		Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
							Light brown gravelly SAND. Gravel is angular to subrounded fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	214.70		*At 1.6m, unable to excavate further due to bedrock.* End of pit at 1.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP406
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411501.97 - 414671.40 Level: 216.00	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70 — 2 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J&T		0.50	215.50		Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to medium of sandstone. (TOPSOIL)
	0.90	D		1.70	214.30		Light brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone with a low cobble content. (GRANULAR RESIDUAL SOIL)
							At 1.7m, unable to excavate further due to bedrock. End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP407
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411511.83 - 414687.06 Level: 215.15	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.1 x 0.6, Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged CC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	215.05		Dark brown slightly gravelly SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL)
							Light brown SAND and GRAVEL. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.40	213.75		*At 1.4m, unable to excavate further due to bedrock.* End of pit at 1.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP408
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411557.41 - 414729.65 Level: 212.85	Date 01/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J,K&T		0.10	212.75		MADE GROUND: Dark brown clayey slightly gravelly fine to medium SAND. (MADE GROUND TOPSOIL)
	0.80 0.80 - 1.20	J,K&T D&B					MADE GROUND: Brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone and coal with a medium sandstone cobble and boulder content. 10 - 20% of cobbles > 0.3m, max 0.6m. (QUARRY BACKFILL)
				1.30	211.55		Light orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
	1.70	D		2.00	210.85		Light yellowish brown SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
				2.80	210.05		*At 2.8m, refusal on bedrock.* End of pit at 2.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 1.3m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP409
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411456.04 - 414738.27 Level: 218.25	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	217.95		MADE GROUND: Dark brown silty very sandy fine to coarse GRAVEL of tarmac, limestone and brick. (GRANULAR MADE GROUND)
	0.50	J,K&T		0.80	217.45		MADE GROUND: Brown very sandy angular to subangular fine to coarse GRAVEL of brick, tarmac, concrete, coal and sandstone. Rare fragments of cement sheeting. (GRANULAR MADE GROUND)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some clayey sandy gravel. (QUARRY BACKFILL) *From 0.8m, continual collapse of side walls.* *At 1.0m, 2.5m diameter sandstone boulder.*
				3.50	214.75		End of pit at 3.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 3.5m depth during excavation.

AGS

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Trial Pit Log

Trialpit No **TP410** Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411200.03 - 414797.91 Level: 228.00	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 4.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J,K&T		0.20	227.80		MADE GROUND: Dark brown slightly gravelly silty fine to medium SAND with rare fragments of glass. Gravel is subangular to subrounded fine to coarse of sandstone and coal. (GRANULAR MADE GROUND)
	0.40	J,K&T		0.50	227.50		MADE GROUND: Black, locally light brown gravelly fine SAND with a low brick cobble content and rare pockets of light brown clay. Gravel is angular to subangular fine to coarse of brick, concrete, sandstone, tarmac and coal. Rare fragments of glass. (GRANULAR MADE GROUND)
							MADE GROUND: Greyish brown sandy gravelly CLAY with a medium brick cobble content. (COHESIVE MADE GROUND)
				2.80	225.20		MADE GROUND: Dark grey silty very sandy angular to subangular fine to coarse GRAVEL of clinker, shale, brick and sandstone with a low clinker cobble content. Frequent fragments of metal and wood. (ASH & CLINKER)
	3.20	J,K&T					
	4.00 - 4.50	D					
				4.90	223.10		End of pit at 4.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP411
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411152.97 - 414796.67 Level: 228.30	Date 31/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 3.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	J,K&T		0.20	228.10		MADE GROUND: Dark brown gravelly silty fine to coarse SAND with fragments of glass and plastic. Gravel is angular to subangular fine to coarse of concrete, brick, coal and clinker. (GRANULAR MADE GROUND)
				0.60	227.70		MADE GROUND: Black and reddish brown very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, coal, mudstone, clinker, brick and red shale. (GRANULAR MADE GROUND)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some silty sandy gravel. (QUARRY BACKFILL)
							From 0.6m, continual collapse of side walls.
	2.00	J,K&T					
				3.00	225.30		*At 3.0m, unable to continue excavation due to side wall instability.* End of pit at 3.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 3.0m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP412
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411300.16 - 414815.00 Level: 225.20	Date 01/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.30, 3.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J,K&T		0.20	225.00		MADE GROUND: Dark brown slightly gravelly clayey fine to medium SAND. Gravel is angular to subrounded fine to coarse sandstone and coal. (MADE GROUND TOPSOIL)
	0.40	J,K&T					MADE GROUND: Light brown very sandy clayey angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (QUARRY BACKFILL)
				0.80	224.40		MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some sand and gravel. More than 50% material > 0.3m, max 1.5m diameter. (QUARRY BACKFILL) *From 0.8m, continual collapse of side walls.*
				3.30	221.90		End of pit at 3.30 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 3.3m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP413
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411503.38 - 414582.12 Level: 216.80	Date 01/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.80, 3.5, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	216.50		MADE GROUND: Brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse sandstone. (COHESIVE MADE GROUND)
	0.50	J&T					MADE GROUND: Dark grey silty very gravel fine to coarse SAND with a medium brick and sandstone cobble content. Gravel is angular to subangular fine to coarse of brick, sandstone, concrete, coal and mudstone. (GRANULAR MADE GROUND)
							From 0.8m, medium sandstone boulder content (up to 0.8m)
	1.00 - 1.50	D&B					
				2.10	214.70		Orangish brown gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				2.70	214.10		Weak light yellowish brown SANDSTONE. (ROUGH ROCK SANDSTONE)
				2.80	214.00		*At 2.8m, refusal on bedrock.*
							End of pit at 2.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 2.1m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP414
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411503.54 - 414551.05 Level: 216.85	Date 01/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.10 — 3.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	1.00	J,K&T					MADE GROUND: Dark brownish grey very sandy angular to subangular fine to coarse GRAVEL of brick, concrete, sandstone, coal and tarmac with a medium cobble and boulder content. (GRANULAR MADE GROUND)
	1.50 - 2.00	D&B					
				2.10	214.75		*At 2.1m, refusal or obstruction (likely sandstone boulder or bedrock across base of pit and >2.5m diameter).* End of pit at 2.10 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 2.1m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP415
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411484.92 - 414552.73 Level: 217.15	Date 01/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 1.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.80	J,K&T					MADE GROUND: Dark brown and brownish grey very clayey very gravelly angular to subangular fine to coarse GRAVEL of sandstone, brick, concrete, coal and tarmac with a medium cobble and boulder content. Rare hessian sacks full of sand. (GRANULAR MADE GROUND)
				1.00	216.15		Medium Strong light yellowish brown SANDSTONE. (ROUGH ROCK SANDSTONE)
				1.10	216.05		*At 1.1m, refusal on obstruction (likely sandstone boulder).* End of pit at 1.10 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP416
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411478.91 - 414550.83 Level: 217.30	Date 01/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.20 — 3.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	217.10		Medium strong yellowish brown SANDSTONE. (ROUGH ROCK SANDSTONE) *At 0.15m, sandstone boulder/outcrop present at surface within quarry (5.3m wide by 7.2m long).* End of pit at 0.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP417
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411468.67 - 414539.79 Level: 217.45	Date 01/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00, 3.5, 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	1.40	J,K&T					MADE GROUND: Dark brown and brownish grey very sandy silty angular to subangular fine to coarse GRAVEL of brick, sandstone, concrete, coal and mudstone with a medium brick and concrete cobble content. (GRANULAR MADE GROUND)
	1.60	T					*From 1.0m, continual collapse of sidewalls.*
				2.00	215.45		*At 1.6m, frequent fragments of cement sheeting and plastic.*
							At 2.0m, hole abandoned due to quantity of cement sheeting and complete collapse of sidewalls.
							End of pit at 2.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between surface and 2m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No **TP418**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411503.11 - 414531.23 Level: 216.80	Date 01/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 4.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.60 0.70 - 1.20	J,K&T D&B					MADE GROUND: Dark brown very gravelly silty fine to coarse SAND with a medium brick, sandstone and concrete cobble and boulder content. (GRANULAR MADE GROUND)
				1.50	215.30		MADE GROUND: Dark brown sandstone COBBLES and BOULDERS with much clayey sandy gravel. (Boulders up to 0.8m diameter) (QUARRY BACKFILL)
				2.40	214.40		MADE GROUND: Dark brown very clayey very gravelly fine to coarse SAND with a low brick and sandstone cobble content. Frequent fragments of metal. Gravel is angular to subangular fine to coarse brick, sandstone, concrete and coal. (QUARRY BACKFILL)
				4.00	212.80		End of pit at 4.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0m and 4.0m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP419
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411436.00 - 414703.01 Level: 220.90	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.70, 3.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	220.80		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.40	220.50		MADE GROUND: Reddish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
				1.40	219.50		MADE GROUND: Brown and light brown very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone, coal and brick. (GRANULAR MADE GROUND)
				2.50	218.40		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				2.70	218.20		Weak light yellowish brown SANDSTONE. (ROUGH ROCK SANDSTONE) *At 2.7m, refusal on bedrock.* End of pit at 2.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP420
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411436.09 - 414749.63 Level: 220.75	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.80, 3.5 × 2.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	220.55		MADE GROUND: Dark brown clayey fine to medium SAND. (MADE GROUND TOPSOIL)
							MADE GROUND: Light brown gravelly fine to medium SAND with a low sandstone cobble content. (QUARRY BACKFILL)
				2.10	218.65		Dark brown slightly sandy silty CLAY. (RELICT TOPSOIL)
				2.30	218.45		*From 2.1m, good stability of sidewalls.* Firm light grey mottled orangish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse lithorelict sandstone. (COHESIVE RESIDUAL SOIL)
				3.20	217.55		Light brown very clayey angular to subangular fine to coarse lithorelict GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				3.80	216.95		End of pit at 3.80 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 2.1m depth during excavation.

AGS

Trial Pit Log

Trialpit No **TP421**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411402.89 - 414678.31 Level: 222.40
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 3.70	3.5 × 2.6
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		

Date 04/09/2023

Scale 1:25

Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	222.30		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Light brown clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble and boulder content. (QUARRY BACKFILL)
							Between 1.0m and 2.0m, sandstone boulder up to 2m diameter.
				2.60	219.80		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble content. (GRANULAR RESIDUAL SOIL)
							From 2.6m, good stability of sidewalls.
				3.00	219.40		Firm light brown slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse sandstone lithorelicts. (COHESIVE RESIDUAL SOIL)
	3.60	D					
				3.70	218.70		End of pit at 3.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between surface and 2.6m depth during excavation.

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP422
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411349.17 - 414713.75 Level: 224.40	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 3.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	224.30		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.60	223.80		MADE GROUND: Reddish brown and black very clayey very sandy angular to subangular fine to coarse GRAVEL of red shale, coal, clinker, brick and sandstone with a low brick and sandstone cobble content. (ASH & CLINKER)
				0.90	223.50		MADE GROUND: Light brown sandy gravelly CLAY with a medium sandstone cobble and boulder content. Gravel is subangular fine to coarse sandstone. (QUARRY BACKFILL)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with much clayey sandy gravel. (QUARRY BACKFILL)
							From 0.9m, continual collapse of sidewalls.
				3.00	221.40		*At 3.0m, complete collapse of sidewalls.* End of pit at 3.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.1m and 3.0m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP423
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411211.23 - 414719.20 Level: 233.25	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80, 3, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	233.15		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.40	232.85		MADE GROUND: Light brown very silty very sandy angular to subangular fine to coarse GRAVEL of sandstone and limestone. (SUB-BASE)
				1.20	232.05		Orangish brown very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.80	231.45		Weak light yellowish brown SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
							At 1.8m, refusal on bedrock.
							End of pit at 1.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP424
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6 Depth 3.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30			MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
							MADE GROUND: Black very sandy silty angular to subangular fine to coarse GRAVEL of coal, clinker, shale, brick and sandstone. (ASH & CLINKER)
				1.20			MADE GROUND: Brown very gravelly fine to coarse SAND with a medium sandstone cobble and boulder content. (QUARRY BACKFILL)
							From 2.0m, large diameters boulders (up to 1.5m) and continual collapse of sidewalls.
							At 2.9m, metal winch rope.
				3.20			*At 3.2m, becoming difficult to excavate due to boulders and complete collapse of sidewalls.* End of pit at 3.20 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 3.2m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP425
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411430.26 - 414732.06 Level: 221.00	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.40, 3.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of sandstone, brick, concrete and limestone. (GRANULAR MADE GROUND)
				0.40	220.60		MADE GROUND: Dark grey very gravelly silty fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, coal, brick and clinker. (GRANULAR MADE GROUND)
				0.80	220.20		*At 0.8m, redundant electric cable.* MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR MADE GROUND)
				1.50	219.50		Dark brown sandy silty CLAY. (RELICT TOPSOIL)
				1.70	219.30		Light brown clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				2.40	218.60		*At 2.4m, becoming difficult to excavate.* End of pit at 2.40 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.8m and 1.5m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP426
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411484.46 - 414787.20 Level: 217.30	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark grey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone, brick, limestone and concrete. (GRANULAR MADE GROUND)
				0.50	216.80		MADE GROUND: Light brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
				1.10	216.20		Dark brown very silty fine to medium SAND. (RELICT TOPSOIL)
				1.30	216.00		Orangish brown silty very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
							At 2.3m, refusal on bedrock.
				2.40	214.90		End of pit at 2.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP427
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411310.84 - 414695.19 Level: 226.90	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6 Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown very sandy subangular to subrounded fine to coarse GRAVEL of sandstone and rare brick with a low sandstone cobble content. (GRANULAR MADE GROUND)
				0.50	226.40		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.70	225.20		Weak light yellowish brown SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				2.20	224.70		*At 2.2m, refusal on bedrock.* End of pit at 2.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP428
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411302.99 - 414759.40 Level: 226.90	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	226.60		MADE GROUND: Dark brown very gravelly fine to coarse SAND with a medium sandstone boulder content. (GRANULAR MADE GROUND)
				0.90	226.00		MADE GROUND: Orangish brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone. (REWORKED NATURAL GROUND)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS of sandstone with some silty sandy gravel. (QUARRY BACKFILL)
							From 0.9m, continual collapse of sidewalls.
				2.90	224.00		*At 2.9m, trial pit terminated due to instability.*
							End of pit at 2.90 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability:

AGS

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Trial Pit Log

Trialpit No
TP429
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411271.17 - 414744.82 Level: 229.05	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 3.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	228.95		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of coal, clinker, sandstone, tarmac and mudstone with a low sandstone cobble content. Rare fragments of glass and metal. (ASH & CLINKER)
							From 2.0m, continual collapse of sidewalls.
							From 3.0m, low sandstone boulder content (up to 0.6m).
				3.90	225.15		End of pit at 3.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 2.0m and 3.9m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP430
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411250.33 - 414749.34 Level: 230.70	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	230.60		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	230.50		MADE GROUND: Brown sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
				0.50	230.20		MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of clinker, coal and mudstone. Rare fragments of glass and metal. (ASH & CLINKER)
				0.80	229.90		Dark brown very clayey fine to medium SAND. (RELICT TOPSOIL)
							Light yellowish brown very silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	229.10		Weak light yellowish brown SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	229.00		*At 1.7m, refusal on bedrock.*
							End of pit at 1.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP431
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411263.69 - 414722.31 Level: 230.95	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6 Depth 3.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown very gravelly fine to coarse SAND with a low brick and sandstone cobble content. (MADE GROUND TOPSOIL)
				0.70	230.25		MADE GROUND: Light brown very clayey angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
							At 1.1m, frequent fragments of wire fencing.
							At 1.2m, dark brown.
				1.30	229.65		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				3.00	227.95		*At 3.0m, becoming difficult to excavate.* End of pit at 3.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP432
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411278.01 - 414698.56 Level: 230.80	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 3.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown silty gravelly fine to coarse SAND with a medium concrete cobble content. (MADE GROUND TOPSOIL)
				1.20	229.60		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
							From 3.4m, sandstone boulders randomly orientated.
				3.70	227.10		End of pit at 3.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 2.0m and 3.7m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP433
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411219.37 - 414669.11 Level: 232.85	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6, Depth 1.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	232.70		MADE GROUND: Light grey CONCRETE. (CONCRETE)
							MADE GROUND: Brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
				0.50	232.35		*At 0.5m, concrete foundation of building identified (150mm thick) protruding 1000mm from building wall.*
			HVP=92				Firm brown silty CLAY. (COHESIVE RESIDUAL SOIL)
				0.90	231.95		Weak light yellowish brown SANDSTONE. Recovered as cobbles and boulders. (ROUGH ROCK SANDSTONE)
				1.30	231.55		*At 1.3m, refusal on bedrock.* End of pit at 1.30 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP434
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411283.28 - 414797.47 Level: 226.60	Date 07/09/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 2.80	3.5 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	226.30		MADE GROUND: Dark brown silty gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse sandstone and coal. (MADE GROUND TOPSOIL)
							MADE GROUND: Light brown very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble and boulder content. (QUARRY BACKFILL)
				2.80	223.80		*Refusal on hard obstruction (likely boulder > 1.5m diameter).* End of pit at 2.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 2.8m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP435
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411321.02 - 414798.69 Level: 224.20	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	223.90		MADE GROUND: Dark brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone, mudstone and coal. (MADE GROUND TOPSOIL)
				1.70	222.50		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone and rare bricks with a high sandstone cobble content. (QUARRY BACKFILL)
				2.90	221.30		MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some silty sandy gravel. (QUARRY BACKFILL) *From 1.7m to 2.9m, boulders up to 1.5m in diameter.* *From 1.7m, continual collapse of side walls.* End of pit at 2.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 2.9m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP436
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411210.16 - 414764.57 Level: 232.30	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 x 0.6 Depth 3.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown silty fine to medium SAND. (GRANULAR MADE GROUND)
				1.40	230.90		Orangish brown gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				2.10	230.20		Light brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
							At 3.1m, becoming difficult to excavate.
				3.30	229.00		End of pit at 3.30 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP437
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411448.77 - 414805.95 Level: 218.15	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 1.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00	218.15		MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of tarmac, limestone and brick. (GRANULAR MADE GROUND)
				0.40	217.75		MADE GROUND: Dark grey very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone, coal, brick, concrete and tarmac. (GRANULAR MADE GROUND)
				0.80	217.35		Firm light brown slightly sandy silty CLAY. (COHESIVE RESIDUAL SOIL)
	1.30	D	HVP=71				
				1.50	216.65		Firm brown mottled grey slightly gravelly silty CLAY. Gravel is angular to subangular fine to medium lithorelict of sandstone. (COHESIVE RESIDUAL SOIL)
				1.90	216.25		*At 1.9m, refusal on strong sandstone bedrock.* End of pit at 1.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Area B

Fields

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP500
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411005.56 - 414675.83 Level: 246.35	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Dark brown silty clayey fine to coarse SAND. (TOPSOIL)
				0.30	246.05		Light brown silty very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.10	T					*From 1.2m, low sandstone cobble content.*
				1.40	244.95		Light brown very silty very sandy angular to subrounded fine to coarse GRAVEL and COBBLES of sandstone. (GRANULAR RESIDUAL SOIL)
				2.20	244.15		*At 2.2m, refusal on bedrock.* End of pit at 2.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP501
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 410970.39 - 414634.45 Level: 251.40	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	251.10		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				1.20	250.20		Light orangish brown silty very gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.40	250.00		Weak yellowish brown fine to medium SANDSTONE. Recovered as cobbles. (ROUGH ROCK SANDSTONE) *At 1.4m, refusal on bedrock.* End of pit at 1.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP502
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411043.41 - 414638.53 Level: 246.10	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	245.80		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	0.90	T					Light yellowish brown very silty subangular to subrounded fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL) *From 1.0m, medium sandstone cobble content.*
				1.70	244.40		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE)
				2.00	244.10		*At 2.0m, refusal on bedrock.* End of pit at 2.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP503
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 410999.59 - 414593.29 Level: 251.05	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.30	250.75		Dark brown silty clayey fine to coarse SAND. Frequent rootlets. (TOPSOIL)
	0.80	T		0.90	250.15		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.30	249.75		Light brown very silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.60	D		1.80	249.25		Stiff light brown slightly sandy slightly gravelly CLAY (COHESIVE RESIDUAL SOIL)
							At 1.8m, refusal on bedrock. End of pit at 1.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP504
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411031.11 - 414545.07 Level: 250.35	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	B		0.20	250.15		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.60	249.75		Orangish brown silty very sandy subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
	0.80	T		0.90	249.45		Strong light yellowish brown fine to coarse SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 0.9m, refusal on bedrock.* End of pit at 0.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP505
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411046.79 - 414583.53 Level: 247.95	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.20	247.75		Dark brown clayey silty fine to coarse SAND. (TOPSOIL)
				0.90	247.05		Light brown very silty very gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is angular to subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.40	T		1.60	246.35		Brown very sandy subangular to subrounded fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.80	246.15		Weak to medium strong light yellowish brown fine to medium SANDSTONE. Recovered as cobbles. (ROUGH ROCK SANDSTONE) *At 1.8m, refusal on bedrock.* End of pit at 1.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP506
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411091.39 - 414592.66 Level: 244.65	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	244.45		Dark brown clayey silty fine to coarse SAND. (TOPSOIL)
	0.50	T		0.70	243.95		Orangish brown silty gravelly fine to coarse SAND. Gravel is subangular fine to medium sandstone. (GRANULAR RESIDUAL SOIL)
				0.90	243.75		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE) *At 0.9m, refusal on bedrock.* End of pit at 0.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP507
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411128.58 - 414636.69 Level: 240.60	Date 30/10/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	240.30		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				1.20	239.40		Light yellowish brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.70	T		1.80	238.80		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.8m, refusal on bedrock.* End of pit at 1.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP508
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411179.51 - 414668.30 Level: 236.35	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	236.05		Dark brown clayey silty fine to coarse SAND. (TOPSOIL)
							Firm to stiff light brown slightly gravelly slightly sandy CLAY. (COHESIVE RESIDUAL SOIL)
	1.00	D		1.00	235.35		Light brown very clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.60	234.75		Weak light brown fine to medium SANDSTONE. Recovered as sandy gravel and cobble. (ROUGH ROCK SANDSTONE)
				1.90	234.45		*At 1.9m, refusal on bedrock.* End of pit at 1.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Trial Pit Log

Trialpit No **TP509**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411201.63 - 414640.52 Level: 236.05	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND. (TOPSOIL)
				0.30	235.75		Light orangish brown very gravelly slightly silty fine to coarse SAND with a low sandstone cobble content. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
				1.50	234.55		*At 1.5m, refusal on bedrock.* End of pit at 1.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP510
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411162.55 - 414622.25 Level: 239.10	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	238.80		Dark brown slightly silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	0.80	T		0.90	238.20		Orangish brown sandy subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.50	T		1.30	237.80		Light yellowish brown very sandy subangular to subrounded fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	237.50		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *From 1.35m, sandstone locally fine to coarse grained* *At 1.6m, refusal on bedrock.* End of pit at 1.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP511
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411133.07 - 414582.19 Level: 242.10	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	241.80		Dark brown silty clayey fine to coarse SAND. (TOPSOIL)
				1.10	241.00		Light brown very silty gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.30	240.80		Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.40	240.70		Medium strong light yellowish brown fine to medium SANDSTONE. (ROUGH ROCK SANDSTONE) *At 1.4m, refusal on bedrock.* End of pit at 1.40 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP512
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411117.69 - 414551.68 Level: 243.70	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	243.40		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	1.00	T		1.10	242.60		Light yellowish brown very sandy subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.20	242.50		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.2m, refusal on bedrock.* End of pit at 1.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP513
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411193.74 - 414602.45 Level: 237.90	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10 0.20	J&T B					Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.30	237.60		Light yellowish brown silty very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
	1.10	T					
				1.40	236.50		Medium strong light yellowish brown fine to coarse SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.60	236.30		*At 1.6m, soakaway undertaken.* *At 1.5m, refusal on bedrock.* *At 1.6m, hydraulic breaker used to advance the hole for soakaway test. However, only limited penetration was achieved to 1.6m depth.* End of pit at 1.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP514
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411299.48 - 414549.14 Level: 230.75	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	B		0.30	230.45		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	0.90	T		1.00	229.75		Light brown very silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.70	T		2.00	228.75		Light brown silty very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				2.10	228.65		Weak light brown fine to medium SANDSOTNE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 2.1m, soakaway undertaken.* *At 2.1m, refusal on bedrock.* End of pit at 2.10 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP515
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411199.09 - 414440.17 Level: 238.80	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	0.20	B		0.20	238.60		Light brown very silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
▼							*At 0.5m groundwater seepage.*
				0.80	238.00		Stiff light brown mottled grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse sandstone. (COHESIVE RESIDUAL SOIL)
	1.10	D	HVP=90				
				1.60	237.20		Brown very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
▼				2.10	236.70		Weak light brown fine to medium SANDSTONE. Recovered as gravel. (ROUGH ROCK SANDSTONE)
▽				2.30	236.50		*At 2.2m, groundwater inflow.*
							End of pit at 2.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater encountered at 0.5m and 2.2m during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit were unstable at 0.5m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP516
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411406.14 - 414494.95 Level: 226.20	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	B		0.30	225.90		Dark brown slightly gravelly clayey silty fine to coarse SAND. Gravel is subangular fine to coarse sandstone. (TOPSOIL)
	1.30	T		1.40	224.80		Light brown silty sandy subangular fine to coarse GRAVEL with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.90	224.30		Weak light yellowish brown fine to medium sandstone. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.9m, soakaway undertaken.* *At 1.9m, refusal on bedrock.* End of pit at 1.90 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP517
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411078.99 - 414531.01 Level: 246.95	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	246.65		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.80	246.15		Light orangish brown silty sandy subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL) *At 0.8m, refusal on bedrock.* End of pit at 0.80 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP518
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411184.76 - 414474.10 Level: 239.00	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.40	238.60		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	1.00	D	HVP=107				Stiff light brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to medium siltstone. (COHESIVE RESIDUAL SOIL)
				1.30	237.70		Brown very sandy angular to subangular fine to medium GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
	1.50	T					*From 1.9m, gravel becoming coarse.*
				2.10	236.90		*At 2.1m, soakaway undertaken.* End of pit at 2.10 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP519
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411334.34 - 414406.69 Level: 231.80	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.30	231.50		Light brown very clayey fine to medium SAND. (GRANULAR RESIDUAL SOIL)
				0.50	231.30		Light greyish brown fine to medium SAND. (GRANULAR RESIDUAL SOIL)
	0.70	T					
				0.80	231.00		Light orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.50	230.30		Medium strong yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	230.10		*At 1.7m, soakaway undertaken.* *At 1.7m, refusal on bedrock.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP520
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411097.79 - 414489.87 Level: 245.45	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	245.25		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
							Light orangish brown silty very sandy subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	0.90	T		0.80	244.65		Weak light yellowish brown fine to coarse SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.30	244.15		*At 1.3m, refusal on bedrock.* End of pit at 1.30 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP521
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411160.47 - 414532.44 Level: 240.50	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown silty clayey fine to coarse SAND with rare sandstone gravely. Frequent rootlets. (TOPSOIL)
				0.30	240.20		Light orangish brown very silty very gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	0.70	T					
				0.80	239.70		Strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.00	239.50		*At 1.0m, refusal on bedrock.*
							End of pit at 1.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP522
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411190.47 - 414558.34 Level: 238.50	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	238.20		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
	1.20	T					Orangish brown very sandy silty subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.60	T		1.40	237.10		Light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	236.80		*At 1.7m, refusal on bedrock.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP523
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411229.61 - 414573.28 Level: 235.30	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND. Frequent rootlets. (TOPSOIL)
				0.30	235.00		Brown silty fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
				0.70	234.60		Light orangish brown very silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.10	T					*From 1.2m, low sandstone cobble content.*
				1.50	233.80		Medium strong light yellow brown fine to medium SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	233.60		End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP524
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411142.01 - 414501.37 Level: 241.85	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	241.65		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
	0.60	T					Light brown gravelly silty fine to coarse SAND. Gravel is subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL) *From 0.7m, low sandstone cobble content.*
	1.10	T		1.00	240.85		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.30	240.55		End of pit at 1.30 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP525
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411147.13 - 414461.11 Level: 241.50	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	241.20		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.80	240.70		Light orangish brown very silty fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
	1.20	D		1.60	239.90		Stiff light brown gravelly slightly sandy CLAY. Gravel is angular to subangular fine to medium siltstone. (COHESIVE RESIDUAL SOIL)
	1.80	D		2.00	239.50		Light brown very clayey slightly sandy angular to subangular fine to coarse GRAVEL of siltstone. (GRANULAR RESIDUAL SOIL)
	2.20	T		2.40	239.10		Very weak light brown SILTSTONE. Recovered as gravel. (ROUGH ROCK SANDSTONE)
							End of pit at 2.40 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP526
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411217.37 - 414513.42 Level: 236.45	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	236.15		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	1.00	D	HVP=54	1.30	235.15		Firm light brown slightly sandy silty CLAY. (COHESIVE RESIDUAL SOIL)
	2.10	T		1.90	234.55		Light brown slightly clayey very gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium sandstone and siltstone. (GRANULAR RESIDUAL SOIL)
				2.30	234.15		very weak light brown fine to medium SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
							At 2.3m, refusal on bedrock.
							End of pit at 2.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP527
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411253.36 - 414531.15 Level: 233.65	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	233.35		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
	1.20	T		1.30	232.35		Light yellowish brown silty very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.50	232.15		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.5m, refusal on bedrock.* End of pit at 1.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP528
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411262.47 - 414563.79 Level: 232.15	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	B		0.30	231.85		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	0.70	D		1.10	231.05		Light brown slightly gravelly very silty fine to medium SAND. Gravel is a subangular fine sandstone. (GRANULAR RESIDUAL SOIL)
	1.30	D		1.40	230.75		Firm to stiff light brown sandy gravelly CLAY. Gravel is subangular fine to coarse sandstone and siltstone. (COHESIVE RESIDUAL SOIL)
				2.00	230.15		Light brown silty very sandy angular to subangular sine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				2.10	230.05		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel. (ROUGH ROCK SANDSTONE) *At 2.1m, refusal on bedrock.* End of pit at 2.10 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP529
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411281.93 - 414590.12 Level: 230.70	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	230.40		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
	0.80	T		1.20	229.50		Light brown very silty gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.60	229.10		Light brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.80	228.90		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.8m, refusal on bedrock.* End of pit at 1.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP530
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411319.63 - 414508.55 Level: 230.75	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	230.55		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.90	229.85		Light brown very gravelly silty fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.00	D		1.30	229.45		Light brown very sandy silty fine to coarse GRAVEL of sandstone with a medium cobble content. (GRANULAR RESIDUAL SOIL)
	1.60	T		1.80	228.95		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles (ROUGH ROCK SANDSTONE) *At 1.8m, refusal on bedrock.* End of pit at 1.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP531
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411268.47 - 414490.11 Level: 233.90	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.20	233.70		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
	0.90	T		1.30	232.60		Light brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.50	232.40		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE) *At 1.5m, refusal on bedrock.* End of pit at 1.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP532
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411233.96 - 414460.49 Level: 236.45	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	236.15		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
	0.80	D		1.00	235.45		Light brown very clayey fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
				1.70	234.75		Brown silty very sandy angular to subangular fine to medium GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				2.20	234.25		Weak light brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 2.2m, refusal on bedrock.* End of pit at 2.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP533
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411309.27 - 414458.35 Level: 232.00	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10 0.20	J&T T		0.30	231.70		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.70	231.30		Light orangish brown gravelly silty fine to coarse SAND. Gravel is subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
				1.50	230.50		Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.60	230.40		Weak to medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.6m, refusal on bedrock.* End of pit at 1.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP534
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411265.32 - 414429.03 Level: 234.65	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	234.35		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.80	233.85		Light brown silty gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.10	T		1.40	233.25		Light brown silty very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.50	T		1.70	232.95		Light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.7m, refusal on bedrock.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP535
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411224.55 - 414408.98 Level: 237.10	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	236.80		Dark brown clayey silty fine to coarse SAND. Frequent roots and rootlets. (TOPSOIL)
	0.60	T		1.20	235.90		Light brown very gravelly fine to coarse SAND. Gravel is subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
				1.90	235.20		Light yellowish brown fine to medium SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.9m, refusal on bedrock.* End of pit at 1.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP536
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411282.86 - 414396.47 Level: 234.00	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	233.70		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.70	233.30		Light brown silty gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	0.80	T		1.20	232.80		Light brown slightly silty very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.40	T		1.50	232.50		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.5m, refusal on bedrock.* End of pit at 1.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP537
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411310.53 - 414361.63 Level: 232.40	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.20	232.20		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.60	231.80		Light brown very gravelly silty fine to coarse SAND with a low cobble content. (GRANULAR RESIDUAL SOIL)
				1.10	231.30		Light brown very sandy subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	230.80		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
							At 1.6m, refusal on bedrock.
							End of pit at 1.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP538
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411367.38 - 414345.95 Level: 228.45	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B					MADE GROUND: Dark brown clayey silty fine to coarse SAND. Frequent rootlets. (MADE GROUND TOPSOIL)
				0.30	228.15		MADE GROUND: Dark greyish brown very silty fine to medium SAND. (GRANULAR MADE GROUND)
▼	0.70	J&T					*At 0.8m, groundwater seepage.*
▼				1.30	227.15		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE)
							At 1.3m, groundwater inflow.
	1.80	T					
				2.00	226.45		*At 2.0m, refusal on bedrock.* End of pit at 2.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit were unstable between 0.8m and 1.3m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP539
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411372.34 - 414398.68 Level: 229.30	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND. (TOPSOIL)
				0.30	229.00		Light brown silty very sandy angular to subangular fine to coarse GRAVEL with a medium cobble content. (GRANULAR RESIDUAL SOIL)
▼							*At 0.8m groundwater seepage.*
				1.10	228.20		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.60	227.70		*At 1.6m, refusal on bedrock.*
							End of pit at 1.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP540
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411370.26 - 414433.52 Level: 229.10	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	228.90		Dark brown clayey silty fine to coarse SAND. (TOPSOIL)
	0.60	T		1.00	228.10		Light brown very sandy silty subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.40	227.70		Light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.4m, refusal on bedrock.* End of pit at 1.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP541
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411408.89 - 414459.68 Level: 226.85	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.30	226.55		Light brown silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	0.70	T					*From 1.2m, very gravelly and low cobble content.*
				1.50	225.35		Medium strong light brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	225.15		*At 1.7m, refusal on bedrock.* End of pit at 1.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP542
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411451.39 - 414476.41 Level: 223.65	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	223.35		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.60	223.05		Brown clayey fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
				1.20	222.45		Orangish brown silty very sandy subangular fine to course GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.50	T		1.60	222.05		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.6m, refusal on bedrock.* End of pit at 1.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP543
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411437.62 - 414521.15 Level: 223.25	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	222.95		Dark brown very clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
	0.90	T		1.40	221.85		Light brown silty gravelly fine to coarse SAND with a low sandstone gravel content. Gravel is subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
				1.90	221.35		Medium strong light yellowish brown fine to medium SANDSTONE. (ROUGH ROCK SANDSTONE)
							At 1.9m, refusal on bedrock.
							End of pit at 1.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP544
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411400.76 - 414545.38 Level: 224.90	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	224.70		Dark brown clayey silty fine to coarse SAND. Frequent rootlets. (TOPSOIL)
							Light brown silty very gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
				1.30	223.60		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
	1.60	T		1.70	223.20		End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP545
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411363.42 - 414518.08 Level: 228.15	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	227.85		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
	1.00	T		1.10	227.05		Light brown very gravelly fine to coarse SAND with a medium sandstone cobble content. Gravel is subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
				2.20	225.95		Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
							End of pit at 2.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP546
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411365.61 - 414470.06 Level: 229.35	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	229.15		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
							Light brown slightly silty very sandy subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				0.90	228.45		Medium strong light yellowish brown fine to coarse SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE)
	1.10	T					
				1.50	227.85		*At 1.5m, refusal on bedrock.* End of pit at 1.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP547
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411387.41 - 414370.87 Level: 227.55	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	227.25		MADE GROUND: Dark brown clayey silty fine to coarse SAND. (MADE GROUND TOPSOIL)
	0.50	J&T		0.70	226.85		MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some sandy gravel. (GRANULAR MADE GROUND)
				1.20	226.35		Light brown silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded sandstone. (GRANULAR RESIDUAL SOIL)
				1.40	226.15		Light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
							End of pit at 1.40 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit were unstable between ground level and 0.7m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TP548
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411353.25 - 414374.29 Level: 230.25	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Orangish brown silty clayey fine to coarse SAND. (TOPSOIL)
				0.40	229.85		Orange brown very sandy subangular fine to coarse GRAVEL of sandstone with a high cobble content. (GRANULAR RESIDUAL SOIL)
				1.00	229.25		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.30	228.95		*At 1.3m, refusal on bedrock.* End of pit at 1.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP549
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411338.54 - 414349.86 Level: 230.35	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	230.05		MADE GROUND: Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (MADE GROUND TOPSOIL)
	0.50	J&T		0.70	229.65		MADE GROUND: Greyish brown gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to medium sandstone and coal. (GRANULAR MADE GROUND)
				1.00	229.35		Orangish brown sandstone COBBLES and BOULDERS with some sandy gravel. (GRANULAR RESIDUAL SOIL)
				1.70	228.65		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE) *At 1.7m, refusal on bedrock.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP600
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411523.77 - 414933.51 Level: 213.60	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.30	213.30		Light brown silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
							At 1.0m, low sandstone cobble content.
				1.50	212.10		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	211.90		*At 1.7m, refusal on bedrock.*
							End of pit at 1.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP601
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411560.86 - 414909.14 Level: 211.55	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND with rare sandstone and coal fine to medium gravel. Frequent rootlets. (TOPSOIL)
				0.40	211.15		Light brown silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL) *At 1.4m, low sandstone cobble content.*
	1.70	T		1.60	209.95		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.8m, refusal on bedrock.*
				1.80	209.75		End of pit at 1.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP602
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411567.14 - 414946.64 Level: 211.05	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	210.75		Dark brown clayey silty firm SAND. (TOPSOIL)
	0.70	T		0.80	210.25		Light orangish brown very gravelly silty fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
	2.00	D		1.70	209.35		Light yellowish brown very sandy subangular to subrounded fine to coarse GRAVEL of sandstone with a medium cobble content. (GRANULAR RESIDUAL SOIL)
				2.20	208.85		Firm to stiff light brownish mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine with lithologies of siltstone and sandstone. (ROUGH ROCK SANDSTONE) End of pit at 2.20 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP603
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411596.13 - 414970.60 Level: 210.15	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.10	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	209.85		Dark brown clayey silty fine to coarse SAND with a moderately rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				1.00	209.15		Light brown silty very gravelly fine to coarse SAND. Gravel is a subangular to subrounded fine to coarse sandstone and rare coal. (GRANULAR RESIDUAL SOIL)
	1.60	T		1.90	208.25		Light yellowish brown very sandy subangular to subrounded fine to coarse GRAVEL of sandstone with a low cobble content. (GRANULAR RESIDUAL SOIL)
	2.10	T		2.10	208.05		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 2.1m, refusal on bedrock.* End of pit at 2.10 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP604
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411610.66 - 414935.59 Level: 208.60	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	208.30		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.50	208.10		Brown very silty fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
	1.00	T		1.40	207.20		Light yellowish brown silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.60	T	HVP=43	2.10	206.50		Orangish brown clayey fine SAND. (GRANULAR RESIDUAL SOIL)
	2.30	D		2.50	206.10		Firm orangish brown sandy CLAY. (COHESIVE RESIDUAL SOIL)
							At 2.5m, refusal on bedrock. End of pit at 2.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TP605
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411652.51 - 414965.39 Level: 207.10	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.40	206.70		Orangish brown very gravelly fine to coarse SAND with a high sandstone cobble content. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.20	T					
				1.30	205.80		Weak to medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	205.40		*At 1.7m, refusal on bedrock.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP606
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411658.10 - 414872.77 Level: 205.20	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	204.90		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				1.00	204.20		Light brown very silty very gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
	1.30	T		1.90	203.30		Weak to medium strong light yellowish brown fine to medium SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.9m, refusal on bedrock.* End of pit at 1.90 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP607
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411611.16 - 414898.52 Level: 208.30	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.40	207.90		Dark brown clayey silty fine to coarse SAND with rare gravel of sandstone. (TOPSOIL)
				1.30	207.00		Light yellowish brown very silty very gravelly fine to coarse SAND with a low sandstone cobble content. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.80	T		2.00	206.30		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 2.0m refusal on bedrock.* End of pit at 2.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP608
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411610.59 - 414848.16 Level: 208.40	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.30	208.10		Light brown and light yellowish brown silty gravelly fine to coarse SAND with a low cobble content. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	0.80	T					
				1.30	207.10		Weak to medium strong light yellowish brown fine to medium SANDSTONE recovered as a sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.80	206.60		*At 1.8m, refusal on bedrock.*
							End of pit at 2.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP609
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411577.24 - 414869.18 Level: 210.30	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	210.00		Dark brown clayey silty fine to coarse SAND with a rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.80	209.50		Reddish brown very silty fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
				1.70	208.60		Light yellowish brown very silty gravelly fine to coarse SAND with a low cobble content. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
	1.90	T		2.20	208.10		Weak to medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE) *At 2.2m, refusal at bedrock.* End of pit at 2.20 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP610
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411541.43 - 414843.93 Level: 212.40	Date 30/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown slightly clayey silty fine to coarse SAND with a rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.30	212.10		
	0.90	T					Light brown very silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.30	211.10		
				1.50	210.90		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.5m, refusal at bedrock.* End of pit at 1.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP611
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411584.78 - 414826.08 Level: 209.75	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	J&T		0.30	209.45		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				1.40	208.35		Light yellowish brown silty gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.60	208.15		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as cobbles. (ROUGH ROCK SANDSTONE) *At 1.6m, soakaway undertaken.* *At 1.6m, hydraulic breaker unable to penetrate bedrock.* End of pit at 1.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP612
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411666.55 - 414926.66 Level: 205.30	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	B		0.30	205.00		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
							Light yellowish brown silty very gravelly SAND. Gravel is angular to subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
							From 1.2m, low sandstone cobble content.
				1.50	203.80		Weak to moderately strong light yellowish brown fine to medium SANDSTONE. (ROUGH ROCK SANDSTONE)
							At 2.0m, soakaway undertaken.
				2.00	203.30		*At 2.0m refusal on bedrock.*
							End of pit at 2.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP613
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411510.67 - 414982.22 Level: 214.10	Date 31/10/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B		0.40	213.70		Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				1.60	212.50		Light yellowish brown silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
				2.20	211.90		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles (ROUGH ROCK SANDSTONE) *At 2.2m, soakaway undertaken.* *At 2.2m, refusal on bedrock.* End of pit at 2.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Appendix I

Trial Trench Logs

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT301C
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.30 — 4 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.50			MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of ash, clinker and coal. (ASH & CLINKER)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some brown sandy Gravel. Boulders up to 1.0m diameter. (QUARRY BACKFILL)
							From 0.55m, boulders up to 1m diameter.
				1.60			MADE GROUND: Light orangish brown very sandy angular to subangular fine to coarse GRAVEL with a high cobble and boulder content. (QUARRY BACKFILL)
				3.30			*At 3.3m, subvertical highwall identified between TT301C and TT301S.* End of pit at 3.30 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.1m and 3.3m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT301N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411342.06 - 414851.87 Level: 222.50	Date 24/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.80, 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	T		0.10	222.40		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.40	J,K&T		0.50	222.00		MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of ash, clinker and coal. (ASH & CLINKER)
				1.40	221.10		MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some brown sandy Gravel. Boulders up to 0.6m diameter. (QUARRY BACKFILL)
				2.80	219.70		MADE GROUND: Light orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high cobble and boulder content. (QUARRY BACKFILL)
							At 2.85m, continual collapse of side walls. Unable to excavate further. End of pit at 2.80 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.1m and 2.8m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT301S
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411348.77 - 414842.56 Level: 222.50	Date 24/08/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90 — 3.2 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	222.40		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of ash, clinker and coal. (ASH & CLINKER)
				0.60	221.90		Light yellowish brown sandy very clayey angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. (GRANULAR RESIDUAL SOIL)
				1.40	221.10		Weak light yellowish brown SANDSTONE. (ROUGH ROCK SANDSTONE)
				1.90	220.60		*At 1.9m, refusal on bedrock.* End of pit at 1.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT302C
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.40 — 5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Dark grey very sandy angular to subrounded fine to coarse GRAVEL of clinker, coal, mudstone and red shale. (GRANULAR MADE GROUND)
				0.60			MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium cobble content. (QUARRY BACKFILL) *From 0.6m, continual collapse of sidewalls.*
				1.80			MADE GROUND: Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble and boulder content. (QUARRY BACKFILL)
				2.40			End of pit at 2.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.6m and 2.4m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT302E
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411292.12 - 414785.43 Level: 226.60	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.3 × 0.6, Depth 2.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	226.50		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Dark grey very sandy angular to subrounded fine to coarse GRAVEL of clinker, coal, mudstone and red shale. (GRANULAR MADE GROUND)
				0.70	225.90		MADE GROUND: Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble and boulder content. (QUARRY BACKFILL)
							From 0.7m, continual collapse of sidewalls.
				2.40	224.20		End of pit at 2.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 2.4m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT302W
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411279.51 - 414775.88 Level: 227.40	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.40, 0.6 x 7	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	227.30		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
	0.30	J,K&T		0.40	227.00		MADE GROUND: Dark grey very sandy angular to subrounded fine to coarse GRAVEL of clinker, coal, mudstone and red shale. (GRANULAR MADE GROUND)
				0.70	226.70		MADE GROUND: Brown very silty fine to coarse SAND. (GRANULAR MADE GROUND)
				1.40	226.00		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble and boulder content. (QUARRY BACKFILL) *From 0.7m, continual collapse of sidewalls.*
				2.40	225.00		MADE GROUND: Light orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble and boulder content. (QUARRY BACKFILL)
							End of pit at 2.40 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 2.4m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT303C
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 24 × 0.6, Depth 2.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30			MADE GROUND: Dark grey and reddish brown very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of limestone and red shale. (GRANULAR MADE GROUND)
							MADE GROUND: Light brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone. (REWORKED NATURAL GROUND)
							At 0.4m, sandstone boulder (1.0 x 1.5 x 0.5m)
				0.80			Dark brown silty fine to medium SAND. (RELICT TOPSOIL)
				1.00			Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				2.40			Weak light yellowish brown SANDSTONE. (ROUGH ROCK SANDSTONE)
				2.60			*At 2.6m, refusal on bedrock.* End of pit at 2.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT303E
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411270.99 - 414772.14 Level: 228.35	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 5.5 × 0.6, Depth 3.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	228.25		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Dark brown silty fine to medium SAND. (QUARRY BACKFILL)
				1.00	227.35		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high cobble content. (QUARRY BACKFILL)
							At 3.2m, possible highwall step identified between TT303C and TT303E.
							At 3.2m, refusal on bedrock.
				3.20	225.15		End of pit at 3.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.0m and 3.2m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT303W
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411235.71 - 414750.30 Level: 231.15	Date 25/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.20, 12, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	231.05		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	230.85		MADE GROUND: Dark grey and reddish brown very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of limestone and red shale. (GRANULAR MADE GROUND)
							MADE GROUND: Light brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR MADE GROUND)
				0.70	230.45		Dark brown silty fine to coarse SAND. (RELICT TOPSOIL)
				0.90	230.25		Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				2.00	229.15		Weak light yellowish brown SANDSTONE. (ROUGH ROCK SANDSTONE)
				2.20	228.95		*At 2.2m, refusal on bedrock.* End of pit at 2.20 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT304N
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411265.05 - 414813.80 Level: 226.95	Date 30/08/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 2.70	4.1 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.70	J,K&T		1.10	225.85		MADE GROUND: Dark brownish grey very sandy silty angular to subrounded fine to coarse GRAVEL of limestone, sandstone, concrete, brick and coal with a medium sandstone cobble and boulder content. (GRANULAR MADE GROUND)
				2.70	224.25		MADE GROUND: Dark grey sandstone and brick COBBLES and BOULDERS with some sandy gravel. (QUARRY BACKFILL) *At 2.7m, refusal on bedrock, possible highwall identified as 0.7m drop between TT304S.* End of pit at 2.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.0m and 2.7m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT304S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411265.92 - 414805.95 Level: 227.40	Date 30/08/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.4 × 0.6, Depth 2.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brownish grey very sandy silty angular to subrounded fine to coarse GRAVEL of limestone, sandstone, concrete, brick and coal with a medium sandstone cobble and boulder content. (GRANULAR MADE GROUND)
				0.90	226.50		Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				2.00	225.40		Weak light yellowish brown SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				2.20	225.20		*At 2.2m, refusal on bedrock.* End of pit at 2.20 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT305N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411473.92 - 414725.27 Level: 217.75	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.60 — 7 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of tarmac, limestone, concrete and brick. (GRANULAR MADE GROUND)
				0.60	217.15		MADE GROUND: Brownish grey locally light brown sandy gravelly CLAY with a low brick and sandstone cobble content. Gravel is angular to subangular fine to coarse of brick, sandstone and concrete. (COHESIVE MADE GROUND)
				1.50	216.25		MADE GROUND: Brown very clayey angular to subangular fine to coarse GRAVEL of sandstone and rare brick with a medium sandstone cobble and boulder content. (QUARRY BACKFILL) *From 1.5m, continual collapse of sidewalls.*
				3.60	214.15		*At 3.6m, complete collapse of sidewall.* *At 3.6m, highwall not directly observed due to presence of electric cable between TT305N & TT305S.* End of pit at 3.60 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.5m and 3.6m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT305S
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411476.04 - 414705.38 Level: 218.15	Date 04/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70, 9, 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	218.05		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.40	217.75		MADE GROUND: Reddish brown very sandy angular to subangular fine to coarse GRAVEL of red shale. (GRANULAR MADE GROUND)
				0.70	217.45		MADE GROUND: Light brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
				0.80	217.35		Dark brown very clayey fine to medium SAND. (RELICT TOPSOIL)
							Light orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	216.55		Weak light yellowish brown SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	216.45		*At 1.7m, refusal on bedrock.*
							End of pit at 1.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT306N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411374.59 - 414682.61 Level: 223.55	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 4.5 × 0.6 Depth 3.50	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	223.45		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Black very sandy angular to subangular fine to coarse GRAVEL of coal, shale, clinker and sandstone with pockets of light brown very clayey angular to subangular fine to coarse gravel of sandstone. Rare fragments of metal. (ASH & CLINKER)
							At 3.3m, hard obstruction (likely boulder).
				3.50	220.05		*At 3.5m, highwall identified.* End of pit at 3.50 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.1m and 3.5m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT306S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411379.33 - 414674.96 Level: 223.65	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.30, 4, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	223.55		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	223.35		MADE GROUND: Black very sandy angular to subangular fine to coarse GRAVEL of mudstone, shale, coal and clinker. (ASH & CLINKER)
				0.60	223.05		MADE GROUND: Light brown clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
				0.90	222.75		Dark brown very clayey fine to medium SAND. (RELICT TOPSOIL)
							Light yellowish brown and light grey sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse sandstone. (COHESIVE RESIDUAL SOIL)
				1.40	222.25		Firm light brown slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse lithorelict of sandstone. (COHESIVE RESIDUAL SOIL)
							From 1.9m, too gravelly for vanes.
							At 2.3m, refusal on bedrock.
				2.30	221.35		End of pit at 2.30 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT307N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411471.68 - 414774.14 Level: 217.85	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.60, 6.5, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of limestone, sandstone, concrete and brick. (GRANULAR MADE GROUND)
				0.40	217.45		MADE GROUND: Black clayey very sandy angular to subangular fine to coarse GRAVEL of clinker, sandstone and brick with a low cobble content. (ASH & CLINKER)
				0.60	217.25		MADE GROUND: Brown very clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. (QUARRY BACKFILL)
							At 1.0m, dark brown.
				1.10	216.75		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. (GRANULAR RESIDUAL SOIL)
							At 2.6m, refusal on bedrock.
				2.60	215.25		End of pit at 2.60 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability:

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT307S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411474.41 - 414763.77 Level: 217.85	Date 04/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.5 × 0.6, Depth 3.20	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of limestone, sandstone, concrete and brick. (GRANULAR MADE GROUND)
				0.40	217.45		
							MADE GROUND: Black clayey very sandy angular to subangular fine to coarse GRAVEL of clinker, sandstone and brick with a low cobble content. (ASH & CLINKER)
				0.60	217.25		
							MADE GROUND: Brown very clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. (QUARRY BACKFILL)
				1.10	216.75		
							MADE GROUND: Light brown COBBLES and BOULDERS of sandstone. (QUARRY BACKFILL)
							At 3.2m, unable to excavate sandstone boulder in the base of the pit.
							At 3.2m, highwall identified between TT307N and TT307S.
				3.20	214.65		End of pit at 3.20 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.6m and 3.2m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT308NE
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411253.48 - 414670.35 Level: 231.25	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.00, 3, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	231.15		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Light brown and light grey very sandy silty angular to subangular fine to coarse GRAVEL of sandstone, coal, limestone and tarmac. (GRANULAR MADE GROUND)
				0.60	230.65		MADE GROUND: Light brown very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high cobble and boulder content. (QUARRY BACKFILLL)
							From 0.6m, continual collapse of side walls.
							At 3.0m, complete collapse of sidewalls.
				3.00	228.25		*At 3.0m, highwall identified between TT308NE and TT308SW.* End of pit at 3.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.6m and 3.0m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT308SW
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411254.60 - 414662.96 Level: 231.55	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.20 — 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	231.35		MADE GROUND: Light grey CONCRETE. (CONCRETE)
				0.60	230.95		MADE GROUND: Light brown and light grey very sandy silty angular to subangular fine to coarse GRAVEL of sandstone, limestone, brick and concrete. (GRANULAR MADE GROUND)
				1.20	230.35		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low cobble content. (GRANULAR RESIDUAL SOIL) *At 1.2m, refusal on bedrock.* End of pit at 1.20 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT309C
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.6 × 0.6, Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20			MADE GROUND: Light grey very sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
							MADE GROUND: Brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble content. (QUARRY BACKFILL)
				1.30			Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.70			*At 1.7m, refusal on bedrock.* End of pit at 1.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.6m and 1.3m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT309N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411266.36 - 414678.56 Level: 231.00	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.3 × 0.6, Depth 2.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	230.90		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	230.80		MADE GROUND: Light grey very sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
							MADE GROUND: Brown sandstone COBBLES and BOULDERS of sandstone with much silty sandy gravel. (Boulders up to 1.2m diameter) (QUARRY BACKFILL)
							From 0.2m, continual collapse of sidewalls.
				2.40	228.60		*At 2.4m, highwall step identified between TT309C and TT309N.*
							End of pit at 2.40 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.2m and 2.4m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT309S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411271.76 - 414670.47 Level: 230.45	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.30, 2.2 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	230.35		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	230.25		MADE GROUND: Light grey very sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
				0.50	229.95		MADE GROUND: Brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone and limestone. (QUARRY BACKFILL)
							Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.30	229.15		*At 1.3m, refusal on bedrock.* End of pit at 1.30 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT310N
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411242.36 - 414715.43 Level: 231.50	Date 05/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.90 — 6.3 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	231.40		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	231.20		MADE GROUND: Brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of coal, sandstone and limestone. (SUB-BASE)
							Orangish brown and light yellowish brown very sandy angular to subangular fine to coarse GRAVEL with a medium sandstone cobble content. (GRANULAR RESIDUAL SOIL)
							At 1.3m, 150mm drain pipe. Light yellowish brown backfill loose but within natural ground.
							From 1.5m, becoming difficult to excavate.
				1.90	229.60		*At 1.9m, refusal on bedrock.*
							End of pit at 1.90 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT310S
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411250.42 - 414704.56 Level: 231.50	Date 05/09/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 2.30	7 / 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	231.35		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Light brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble and boulder content. Rare fragments of wood. (QUARRY BACKFILL)
				0.60	230.90		*At 0.6m, concrete boulder slab (2.5m diameter).*
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with much clayey sandy GRAVEL. (QUARRY BACKFILL)
							From 0.6, continual collapse of sidewall.
				2.30	229.20		*At 2.3m, unable to excavate further due to collapse and method of excavation.*
							End of pit at 2.30 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.15m and 2.6m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT311E
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411270.89 - 414712.62 Level: 230.75	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	230.55		MADE GROUND: Dark brown silty fine to medium SAND. (MADE GROUND TOPSOIL)
				0.80	229.95		MADE GROUND: Brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
				2.70	228.05		MADE GROUND: Brown sandstone COBBLES and BOULDERS and black tarmac COBBLES with much clayey sandy gravel . (QUARRY BACKFILL)
							At 2.7m, refusal on bedrock or hard obstruction (possible sandstone bedrock or boulder). End of pit at 2.70 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.8m and 2.7m depth during excavation.

AGS

Trial Pit Log

Trialpit No: **TT311W**

Sheet 1 of 1

Project Name:	Black Cats	Project No.: 4486	Co-ords: 411264.46 - 414708.46 Level: 231.10
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 3.40	3.5 × 0.6
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		

Date: 05/09/2023

Scale: 1:25

Logged: JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	231.00		MADE GROUND: Black macadam hardstand. (MADE GROUND TOPSOIL)
							MADE GROUND: Brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
				0.80	230.30		MADE GROUND: Brown sandstone COBBLES and BOULDERS with much clayey sandy gravel. (QUARRY BACKFILL)
							From 0.8m continual collapse of sidewalls.
				3.40	227.70		*At 3.4m, complete collapse of sidewalls.*
							End of pit at 3.40 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.1m and 3.1m depth during excavation.

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Trial Pit Log

Trialpit No
TT312N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.2 × 0.6, Depth 3.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Brown locally black very sandy silty angular to subangular fine to coarse GRAVEL of sandstone, coal and clinker. (ASH & CLINKER)
				0.60			MADE GROUND: Dark grey and dark reddish brown very sandy silty angular to subangular fine to coarse GRAVEL of clinker, brick and shale, sandstone and concrete. Rare fragments of metal and glass. (ASH & CLINKER)
				3.40			*At 3.4m, highwall identified between TT312N and TT312S.* End of pit at 3.40 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.6m and 3.4m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT312S
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411301.14 - 414832.23 Level: 225.00	Date 05/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.8 × 0.6 Depth 1.80	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	224.90		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Brown locally black very sandy silty angular to subangular fine to coarse GRAVEL of sandstone, coal and clinker. (ASH & CLINKER)
				0.80	224.20		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.80	223.20		*From 1.8m, becoming difficult to excavate.* End of pit at 1.80 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TT313
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411301.90 - 414827.77 Level: 225.00	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.80 — 5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	224.90		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone and tarmac. (SUB-BASE)
				0.80	224.20		MADE GROUND: Brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble and boulder content. (QUARRY BACKFILL)
							From 0.8m, continual spalling and collapse of side walls.
				2.80	222.20		*At 2.8m, highwall identified between TP323 and TT313.*
							End of pit at 2.80 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability:

AGS

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Trial Pit Log

Trialpit No
TT314N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411316.37 - 414791.96 Level: 224.70	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.90, 2.5 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	224.60		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	224.40		MADE GROUND: Light yellowish brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium of limestone. (SUB-BASE)
				0.70	224.00		MADE GROUND: Dark brown very sandy silty angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
							MADE GROUND: Dark brown and light brown very sandy fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (QUARRY BACKFILL)
							From 2.1m, frequent fragments of wood, metal, tile and bricks.
				2.90	221.80		*At 2.85m, highwall identified between TT314N and TT314S.* End of pit at 2.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 2.9m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT314S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411319.68 - 414785.15 Level: 224.90	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.7 × 0.6 Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	224.80		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	224.60		MADE GROUND: Light yellowish brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium of limestone. (SUB-BASE)
				0.70	224.20		MADE GROUND: Brown very sandy clayey angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble content. (QUARRY BACKFILL)
							Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.60	223.30		*At 1.6m, becoming difficult to excavate.* End of pit at 1.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TT315N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411377.82 - 414881.73 Level: 220.30	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2.8 × 0.6, Depth 2.90	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown very gravelly clayey fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, clinker, coal and brick. (ASH & CLINKER)
				0.50	219.80		MADE GROUND: Brown locally dark brown clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone with a medium sandstone cobble content. (QUARRY BACKFILL) *From 0.5m, continual collapse of sidewalls.* *At 0.6m, water pipe (redundant).*
				1.30	219.00		MADE GROUND: Brown COBBLES and BOULDERS of sandstone with much clayey sandy gravel. (QUARRY BACKFILL)
				2.90	217.40		*At 2.9m, highwall identified between TT315N and TT315S.* End of pit at 2.90 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.5m and 2.9m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT315S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411383.98 - 414875.33 Level: 220.30	Date 05/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.6 × 0.6 Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark grey very sandy angular to subangular fine to coarse GRAVEL of coal, clinker, mudstone and sandstone. (ASH & CLINKER)
				0.50	219.80		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.60	218.70		*At 1.6m, becoming difficult to excavate.* End of pit at 1.60 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT316N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411445.38 - 414760.34 Level: 218.65	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.4 × 0.6 Depth 2.80	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.50	218.15		MADE GROUND: Dark brown very sandy angular to subangular fine to coarse GRAVEL of brick, limestone, concrete and sandstone with a brick cobble content. (GRANULAR MADE GROUND)
				2.00	216.65		MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some clayey sandy gravel. (QUARRY BACKFILL)
	2.50	D					Firm light brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse lithorelicts. (COHESIVE RESIDUAL SOIL) *From 2.0m, too gravelly for vanes.*
				2.80	215.85		End of pit at 2.80 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.5m and 2.0m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT316S
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411450.44 - 414752.67 Level: 218.50	Date 06/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 3.20, 4.8 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	218.20		MADE GROUND: Dark brown very sandy angular to subangular fine to coarse GRAVEL of brick, tarmac, limestone and concrete. (GRANULAR MADE GROUND)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some clayey sandy gravel. (QUARRY BACKFILL)
							From 0.3m, continual collapse of sidewalls.
				3.20	215.30		End of pit at 3.20 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.0m and 3.2m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT317C
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2 × 0.6, Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown very clayey gravelly fine to coarse GRAVEL of sandstone, tarmac, red shale and clinker. (ASH & CLINKER)
				0.70			MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some clayey sandy gravel. (QUARRY BACKFILL)
				1.30			Orangish brown very gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.70			*At 1.7m, becoming difficult to excavate.* End of pit at 1.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 1.3m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT317E
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411318.11 - 414716.61 Level: 226.25	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70, 2, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown very clayey gravelly fine to coarse GRAVEL of sandstone, tarmac, red shale and clinker. (ASH & CLINKER)
				0.70	225.55		Orangish brown very gravelly fine to coarse SAND. (GRANULAR RESIDUAL SOIL)
				1.70	224.55		*At 1.7m, becoming difficult to excavate.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT317NW
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: - Level:	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 2 × 0.6, Depth 2.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown very clayey gravelly fine to coarse GRAVEL of sandstone, tarmac, red shale and clinker. (ASH & CLINKER)
				0.70			MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some clayey sandy gravel. (QUARRY BACKFILL) *From 0.7m, continual collapse of the side walls.*
				2.70			*At 2.65m, highwall identified between TT317NW and TT317C.* End of pit at 2.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.7m and 2.7m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT318E
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411308.40 - 414717.98 Level: 226.85	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6, Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	226.55		MADE GROUND: Brown very gravelly silty fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone, tarmac and red shale. (GRANULAR MADE GROUND)
				0.60	226.25		MADE GROUND: Dark brown silty fine to medium SAND. (GRANULAR MADE GROUND)
				2.00	224.85		MADE GROUND: Light brown sandstone COBBLES and BOULDERS. (QUARRY BACKFILL) End of pit at 2.00 m

1 2 3 4 5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.6m and 2.0m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT318W
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411301.62 - 414716.13 Level: 227.20	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 3.5 × 0.6 Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	226.90		MADE GROUND: Brown very gravelly silty fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone, tarmac and red shale. (GRANULAR MADE GROUND)
				0.60	226.60		MADE GROUND: Dark brown silty fine to medium SAND. (GRANULAR MADE GROUND)
				1.40	225.80		Light orangish brown gravelly fine to coarse SAND with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL) *At 1.4m, becoming difficult to excavate.* End of pit at 1.40 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT319N
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411359.80 - 414838.50 Level: 222.05	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.40 — 2.6 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	221.75		MADE GROUND: Dark brown very sandy angular to subangular fine to coarse GRAVEL of limestone. (GRANULAR MADE GROUND)
				1.40	220.65		Orangish brown very gravelly fine to coarse SAND with a medium sandstone cobble content. Gravel is subangular to subrounded fine to coarse sandstone. (GRANULAR RESIDUAL SOIL) *At 1.4m, highwall identified between TT319N and TT319S, t rial pit terminated.* End of pit at 1.40 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
TT319S
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411362.98 - 414832.89 Level: 222.05	Date 07/09/2023
Location:	Blackmoorfoot Road, Huddersfield	Dimensions (m): Depth 3.00	3.2 × 0.6	Scale 1:25
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	221.75		MADE GROUND: Dark brown very sandy angular to subangular fine to coarse GRAVEL of limestone. (GRANULAR MADE GROUND)
							MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some sandy gravel. (QUARRY BACKFILL)
							From 1.0m, continual collapse of sidewalls.
				3.00	219.05		*At 3.0m, large diameter (1.5m) boulders of sandstone. Unable to excavate further.*
							End of pit at 3.00 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 0.3m and 3.0m depth during excavation.

AGS

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Trial Pit Log

Trialpit No
TT320NW
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411405.99 - 414758.88 Level: 220.65	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.70, 3, 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	220.55		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Dark reddish brown and dark brown very sandy angular to subangular fine to coarse GRAVEL of shale, red shale, clinker, coal, mudstone and sandstone. (ASH & CLINKER)
				1.00	219.65		MADE GROUND: Light brown very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
							From 1.0m, continual collapse of sidewalls.
				2.70	217.95		*At 2.7m, highwall identified between TT320NW and TT320SE.* End of pit at 2.70 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit were unstable between 1.0m and 2.4m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TT320SE
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411411.72 - 414754.46 Level: 220.90	Date 07/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.50, 3.4 × 0.6	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	220.80		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Light brown very gravelly clayey fine to coarse SAND. Gravel is angular to subangular fine to medium sandstone. (REWORKED NATURAL GROUND)
				0.80	220.10		Orangish brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.50	219.40		*Trial pit terminated as highwall identified (see TP320NW log).* End of pit at 1.50 m

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Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Appendix J

Foundation Pit Logs

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Trial Pit Log

Trialpit No
FP301
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411363.80 - 414840.68 Level: 221.50	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 1 × 0.6 Depth 0.60	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	221.40		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.30	221.20		MADE GROUND: Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of limestone, sandstone and rare brick. (SUB-BASE)
				0.40	221.10		Dark brown slightly sandy silty CLAY. (RELICT TOPSOIL)
				0.60	220.90		Light orangish brown gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
							End of pit at 0.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Trial Pit Log

Trialpit No **FP302** Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411313.57 - 414868.86 Level: 222.75	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.60; 1 × 0.6	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	222.65		MADE GROUND: Light grey CONCRETE. (CONCRETE)
							MADE GROUND: Dark grey and light brown very clayey very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of shale and mudstone. (GRANULAR MADE GROUND) *At 0.2m, concrete foundation 150mm thick protruding 200mm, sloping at 45° to allow service entry through brick.*
				0.60	222.15		End of pit at 0.60 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

LITHOS CONSULTING

Trial Pit Log

Trialpit No
FP303
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411310.07 - 414837.81 Level: 224.15	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.00 — 1 × 0.6	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	224.05		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND) *At 0.1m, concrete floor slab foundation 100mm thick, protruding 50mm. Unable to excavate down side due to drain pipe.*
							MADE GROUND: Light brown sandy fine to coarse GRAVEL of sandstone. (SUB-BASE) *At 0.15m, orange drain pipe (100mm diameter)*
				0.30	223.85		Orangish brown and brown sandy silty CLAY. (COHESIVE RESIDUAL SOIL)
				0.50	223.65		Orangish brown clay sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.00	223.15		End of pit at 1.00 m

1
2

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
FP304
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411246.10 - 414808.63 Level: 227.85	Date 08/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.00 — 1 × 0.6	Scale 1:10
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Brown very clayey gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone and brick. (GRANULAR MADE GROUND) *At 0.1m, concrete foundation 150mm thick, protruding 150mm.*
				0.30	227.55		MADE GROUND: Brown and grey sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone, brick and coal. (GRANULAR MADE GROUND)
				1.00	226.85		End of pit at 1.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Trial Pit Log

Trialpit No **FP305** Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411195.94 - 414808.26 Level: 227.90	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.60 — 1 × 0.6	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, clinker and limestone. (ASH & CLINKER)
							At 0.2m, concrete foundation 100mm thick (highly weathered) protruding 300mm.
				0.30	227.60		MADE GROUND: Dark grey gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium of clinker and coal. (ASH & CLINKER)
				0.60	227.30		End of pit at 0.60 m

1

2

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

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Trial Pit Log

Trialpit No
FP306
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411279.63 - 414766.89 Level: 227.95	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.80 — 1 × 0.6	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	227.85		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
				0.20	227.75		MADE GROUND: Light yellowish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
							Firm brown slightly sandy silty CLAY. (COHESIVE RESIDUAL SOIL) *At 0.2m, concrete foundation (highly weathered) 50mm to 100mm thick, with protrusion.*
				0.40	227.55		Orangish brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				0.80	227.15		End of pit at 0.80 m

1

2

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

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Trial Pit Log

Trialpit No
FP307
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411118.14 - 414661.12 Level: 238.50	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): 1 × 0.6 Depth 0.80	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	238.30		MADE GROUND: Dark brown slightly sandy silty CLAY. (MADE GROUND TOPSOIL)
				0.50	238.00		MADE GROUND: Light brown sandstone COBBLES with some clayey gravel. (REWORKED NATURAL GROUND) *At 0.4m, concrete foundation, 100mm thick protruding 100mm to 150mm.*
				0.80	237.70		Firm light brown slightly gravelly CLAY. Gravel is angular to subangular fine lithorelict of sandstone. (COHESIVE RESIDUAL SOIL) *At 0.8m, refusal on bedrock.* End of pit at 0.80 m

1

2

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
FP308
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411097.90 - 414678.72 Level: 240.50	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.70 — 1 × 0.6	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	240.40		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND) *At 0.1m, concrete foundation for wall 200mm thick protruding 50mm to 100mm.*
							MADE GROUND: Light grey very sandy angular to subangular fine to coarse GRAVEL of limestone. (SUB-BASE)
				0.30	240.20		Brown slightly sandy silty CLAY. (COHESIVE RESIDUAL SOIL)
				0.40	240.10		Orangish brown slightly gravelly fine to medium SAND. Gravel is angular to subangular of sandstone. (GRANULAR RESIDUAL SOIL)
				0.70	239.80		End of pit at 0.70 m

1

2

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
FP309
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411275.45 - 414661.42 Level: 230.45	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.90 — 1 × 0.6	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone. (MADE GROUND TOPSOIL)
							At 0.2m, concrete foundation for structural column. 600mm x 500mm protruding 150mm. Foundation along wall (highly weathered) 50mm thick protruding 50mm.
				0.50	229.95		Orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				0.90	229.55		End of pit at 0.90 m

1

2

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
FP310
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411376.16 - 414652.77 Level: 224.35	Date 08/09/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.00; 1; 0.6	Scale 1:10
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND: Dark brown slightly gravelly silty CLAY. (MADE GROUND TOPSOIL)
							At 0.2m, brick wall laid onto sandstone cobbles over lying reworked natural. No concrete foundations apparent.
				0.20	224.15		MADE GROUND: Light yellowish brown very clayey sandy angular to subangular fine to coarse GRAVEL of sandstone. (REWORKED NATURAL GROUND)
				0.50	223.85		Brown sandy CLAY. (COHESIVE RESIDUAL SOIL)
				0.80	223.55		Orangish brown gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone. (GRANULAR RESIDUAL SOIL)
				1.00	223.35		End of pit at 1.00 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
FP311
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411384.68 - 414734.53 Level: 220.90	Date 08/09/2023
Location:	Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 0.90 — 1 × 0.6	Scale 1:10
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JB

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	220.80		MADE GROUND: Black macadam hardstand. (MACADAM HARDSTAND)
							MADE GROUND: Brown, dark grey and light yellowish brown very clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone, shale, brick, clinker and tarmac. Rare cement sheeting fragments (possible ACM). (ASH & CLINKER) *At 0.25m, concrete foundation 150mm thick, protruding 150mm.*
				0.90	220.00		End of pit at 0.90 m

1

2

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

Appendix K

Window Sample Borehole Logs

Borehole Log

Borehole No. **WS301**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.04			MADE GROUND: Grey CONCRETE (30% clasts, 65% matrix, 5% voids). (CONCRETE)
					0.06			
					0.17			MADE GROUND: Light brown CONCRETE. (100% matrix). (CONCRETE)
								MADE GROUND: Light pinkish grey CONCRETE (30% clasts, 65% matrix, 5% voids). (CONCRETE)
					0.55			Dark brown very clayey fine and medium SAND. (RELICT TOPSOIL)
								Light yellowish brown silty very sandy angular and subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
					1.90			*At 1.9m, refusal on bedrock.* End of borehole at 1.90 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No. **WS302**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.03			MADE GROUND: Light pinkish red CONCRETE (30% clasts, 65% matrix, 5 % voids). (CONCRETE)
					0.15			MADE GROUND: Light brown CONCRETE (35% clasts, 50% matrix, 15% voids) (CONCRETE)
					0.50			MADE GROUND: Light greyish brown slightly silty very sandy angular and subangular fine to coarse GRAVEL of concrete, sandstone and coal. (GRANULAR MADE GROUND)
					0.70			MADE GROUND: Light brown very silty slightly gravelly fine and medium SAND. Gravel is angular and subangular fine and medium sandstone. (REWORKED NATURAL GROUND)
					0.80			Dark brown very silty fine and medium SAND. Gravel is angular to subangular fine and medium sandstone. (RELICT TOPSOIL)
								Light brown sandstone COBBLES with much sandy gravel. (GRANULAR RESIDUAL SOIL)
					1.60			*At 1.6m, refusal on bedrock.* End of borehole at 1.60 m

1 2 3 4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

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Borehole Log

Borehole No.
WS303
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			MADE GROUND: Light grey CONCRETE (30% clasts, 65% matrix, 5 % voids) with 5mm diameter steel mesh rebar. (CONCRETE)
								At 0.16m, blue plastic sheeting.
					0.60			MADE GROUND: Light brown very sandy subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.70			MADE GROUND: Dark brown very gravelly silty fine to coarse SAND. Gravel is angular to subangular fine and medium sandstone and concrete. (GRANULAR MADE GROUND)
								At 0.7m, refusal on bedrock.
								End of borehole at 0.70 m

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Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

AGS

Borehole Log

Borehole No. **WS304**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.02			MADE GROUND: Light yellow CONCRETE (100% matrix) (CONCRETE)
					0.16			MADE GROUND: Light grey CONCRETE (30% clasts, 65% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE)
								At 0.17m, plastic sheeting.
					0.50			MADE GROUND: Brown and light brown very sandy angular and subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.60			MADE GROUND: Brown very gravelly fine to coarse SAND. Gravel is subangular fine and medium sandstone and concrete. (GRANULAR MADE GROUND)
								At 0.6m, refusal on bedrock.
								End of borehole at 0.60 m

1 2 3 4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

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Borehole Log

Borehole No. **WS305**

Sheet 1 of 2

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.12			MADE GROUND: Light grey CONCRETE (35% clasts, 60% matrix, 5% voids). (CONCRETE)
								MADE GROUND: Brown and light brown clayey very sandy subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.70			
					0.80			MADE GROUND Light grey sandstone COBBLE. (GRANULAR MADE GROUND)
					0.95			MADE GROUND: Black very gravelly fine to coarse SAND. Gravel is angular and subangular fine and medium clinker and coal. (ASH & CLINKER)
								MADE GROUND: Light brown and brown very sandy angular and subangular fine to coarse GRAVEL of sandstone. (QUARRY BACKFILL)
					4.00			Continued on next sheet

1 2 3 4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

AGS

Borehole Log

Borehole No. **WS305**

Sheet 2 of 2

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								At 4.0m, hole collapsed back to 2.5m. Unable to continue borehole.
								End of borehole at 4.00 m

5

6

7

8

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No. **WS306**

Sheet 1 of 2

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Light grey CONCRETE (30% clasts, 65% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE)
					0.17			*At 0.18m, blue plastic sheeting.*
					0.30			MADE GROUND: Light brown clayey very sandy angular and subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.60			MADE GROUND: Dark brown clayey very gravelly fine to coarse SAND. Gravel is angular and subangular fine to coarse sandstone, mudstone and coal. (GRANULAR MADE GROUND)
					1.00			MADE GROUND: Black clayey very gravelly fine to coarse SAND. Frequent fragments of pottery. Gravel is angular to subangular fine to coarse coal, clinker, red shale and sandstone. (ASH & CLINKER)
								MADE GROUND: Dark brown very sandy angular and subangular fine to coarse GRAVEL of clinker, sandstone, mudstone and coal. (ASH & CLINKER)
								From 2.5m to 2.8m. Gravel includes concrete.
					2.80			MADE GROUND: Brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse sandstone, mudstone, coal and clinker. (ASH & CLINKER)
					3.50			MADE GROUND: Black very sandy angular and subangular fine and medium GRAVEL of clinker, coal and shale. (ASH & CLINKER)
								Continued on next sheet

1 2 3 4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

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Borehole Log

Borehole No.
WS306
Sheet 2 of 2

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					5.00			End of borehole at 5.00 m

5
6
7
8

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

AGS

Borehole Log

Borehole No. **WS307**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.14			MADE GROUND: Light grey CONCRETE (30% clasts, 65% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE)
					0.55			MADE GROUND: Dark grey and black very clayey very sandy angular and subangular fine to coarse GRAVEL of tarmac, clinker, coal and concrete. (ASH & CLINKER)
					0.60			MADE GROUND: Light grey CONCRETE. (CONCRETE)
								At 0.6m, refusal on obstruction.
								End of borehole at 0.60 m

1
2
3
4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

AGS

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Borehole Log

Borehole No.
WS308
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Light grey CONCRETE (35% clasts, 60% matrix, 5% voids) (CONCRETE)
								VOID (likely basement/subfloor void)
								At 0.10m to 0.11m, steel layer.
					3.60			*At 3.6m, possible concrete floor (assessed from photos and downhole inspection).*
								End of borehole at 3.60 m

1
2
3
4

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

AGS

Borehole Log

Borehole No. **WS309**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.16			MADE GROUND: Light grey CONCRETE (35% clasts, 60% matrix, 5% voids). (CONCRETE)
								VOID (likely basement/subfloor void)
								At 0.16m to 0.17m, steel layer.
					1.45			*At 1.45m, possible concrete floor (assessed from photos and downhole inspection).*
								End of borehole at 1.45 m

1

2

3

4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No. **WS310**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 01/09/2023 - 01/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Light grey CONCRETE (30% clasts, 65% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE)
					0.19			*At 0.20m, blue plastic sheeting.*
								MADE GROUND: Light brown sandy angular and subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.70			MADE GROUND: Brown gravelly fine to coarse SAND with a low brick cobble content. Gravel is angular to subangular fine to coarse brick, concrete, sandstone and coal. (GRANULAR MADE GROUND)
					2.20			Dark brown very silty fine and medium SAND. (RELICT TOPSOIL)
					2.30			Yellowish brown very sandy angular and subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
					2.80			*At 2.8m, refusal on bedrock.*
								End of borehole at 2.80 m

1 2 3 4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No. **WS311**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 01/09/2023 - 01/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.16			MADE GROUND: Light pinkish grey CONCRETE (35% clasts, 60% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE)
								At 0.17m, blue plastic sheeting.
								MADE GROUND: Light brown silty very sandy angular and subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.80			MADE GROUND: Black very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone, coal and clinker. (ASH & CLINKER)
					1.10			*At 1.1m, refusal on obstruction.*
								End of borehole at 1.10 m

1 2 3 4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No. **WS312**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 01/09/2023 - 01/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.18			MADE GROUND: Light pinkish grey CONCRETE (35% clasts, 60% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE) *At 0.19m, blue plastic sheeting.*
					0.60			MADE GROUND: Light brown sandy subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					1.80			MADE GROUND: Reddish brown sandy subangular fine to coarse GRAEL of brick with a low brick cobble content. Frequent fragments of metal. (GRANULAR MADE GROUND)
					2.00			MADE GROUND: Brown very gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse sandstone and concrete. (GRANULAR MADE GROUND) *At 2.0m, hole collapsed back to 0.5m.* End of borehole at 2.00 m

1
2
3
4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No. **WS313**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 01/09/2023 - 01/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.16			MADE GROUND: Light pinkish grey CONCRETE (30% clasts, 65% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE)
								At 0.17m, blue plastic sheeting.
								MADE GROUND: Light brown clayey very sandy angular and subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					1.20			*At 1.2m, borehole refusal on obstruction.*
								End of borehole at 1.20 m

1
2
3
4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

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Borehole Log

Borehole No. **WS314**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 01/09/2023 - 01/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.14			MADE GROUND: Grey CONCRETE (40% clasts, 55% matrix, 5% voids). (CONCRETE)
								At 0.15m, blue plastic sheeting.
								MADE GROUND: Light brown clayey very sandy angular and subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.70			MADE GROUND: Dark grey very gravelly fine to coarse SAND. Gravel is subangular fine and medium clinker. (ASH & CLINKER)
					0.80			MADE GROUND: Light brown very sandy angular and subangular fine to coarse GRAVEL of sandstone with a low sandstone cobble content. (REWORKED NATURAL GROUND)
					1.40			*At 1.4m, refusal on obstruction.* End of borehole at 1.40 m

1 2 3 4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

AGS

Borehole Log

Borehole No. **WS315**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 01/09/2023 - 01/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Grey CONCRETE (40% clasts,55% matrix, 5% voids) (CONCRETE)
					0.18			*At 0.19m, blue plastic sheeting.*
					0.30			MADE GROUND: Light yellowish brown very sandy angular and subangular fine to coarse GRAVEL of sandstone. (SUB-BASE)
					0.60			Brown clayey slightly gravelly fine to coarse SAND. Gravel is angular and subangular fine to coarse sandstone. (RELICT TOPSOIL)
								Yellowish brown silty very gravelly fine to coarse SAND. Gravel is angular and subangular fine to coarse sandstone. (GRANULAR RESIDUAL SOIL)
					1.60			*At 1.6m, refusal on bedrock.* End of borehole at 1.60 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No. **WS316**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: -	Hole Type WS
Location: Blackmoorfoot Road, Huddersfield		Level:	Scale 1:20
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 01/09/2023 - 01/09/2023	Logged By JBR

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			MADE GROUND: Grey CONCRETE (40% clasts, 55% matrix, 5% voids) with 5mm diameter steel mesh rebar. (CONCRETE)
								At 0.16m, blue plastic sheeting.
								Light brown silty very gravelly fine to coarse SAND. Gravel is subangular fine to coarse sandstone. (SUB-BASE)
					0.80			Dark brown slightly gravelly silty fine and medium SAND. Gravel is subangular fine to coarse sandstone. (RELICT TOPSOIL)
					1.00			Light yellowish brown very clayey very sandy angular and subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
					1.70			*At 1.7m refusal on bedrock.*
								End of borehole at 1.70 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Appendix L

Probehole Logs

Borehole Log

Borehole No. **PH01**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411472.95 - 414741.92	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	04/09/2023 - 04/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH01
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411472.95 - 414741.92	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	04/09/2023 - 04/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					20.50	197.30		Solid ground. (SOLID GROUND)
					25.50	192.30		End of borehole at 25.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH03
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411429.50 - 414718.89	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.80	220.15		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	214.95		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH04**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411383.37 - 414769.31	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					18.60	202.40		Solid ground. (SOLID GROUND)
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH04**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411383.37 - 414769.31	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					22.00	199.00		*Stopped at 22.0m, drilling tools kept getting stuck* End of borehole at 22.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH05
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411378.00 - 414743.63	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					19.70	201.55		Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH05
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411378.00 - 414743.63	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Solid ground. (SOLID GROUND)
					24.70	196.55		End of borehole at 24.70 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH06
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411389.55 - 414718.68	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH06**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411389.55 - 414718.68	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.50	199.65		Solid ground. (SOLID GROUND)
					26.50	194.65		End of borehole at 26.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH07**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411329.78 - 414816.57	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	223.70	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					9.00	214.70		Solid ground. (SOLID GROUND)
					14.00	209.70		End of borehole at 14.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH08
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411314.92 - 414866.07	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
					9.00	213.95		Solid ground. (SOLID GROUND)
					14.00	208.95		End of borehole at 14.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH12
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411215.57 - 414822.13	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					7.40	220.70		Solid ground. (SOLID GROUND)
					12.40	215.70		End of borehole at 12.40 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH13** Sheet 1 of 1			
Project Name: Black Cats	Project No. 4486	Co-ords: 411237.28 - 414796.92	Hole Type PH
Location: Blackmoorfoot Road, Huddersfield		Level: 227.95	Scale 1:100
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					9.50	218.45		Solid ground. (SOLID GROUND)
					14.50	213.45		End of borehole at 14.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH14**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411243.02 - 414775.57	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					7.50	221.10		Solid ground. (SOLID GROUND)
					12.50	216.10		End of borehole at 12.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH15**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411198.96 - 414799.83	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					14.60	213.50		Solid ground. (SOLID GROUND)
					19.60	208.50		End of borehole at 19.60 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH16**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411133.26 - 414784.32	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.50	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					12.50	218.00		Solid ground. (SOLID GROUND)
					17.50	213.00		End of borehole at 17.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH17**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411105.14 - 414758.95	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					12.40	218.65		Solid ground. (SOLID GROUND)
					17.40	213.65		End of borehole at 17.40 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH18**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411062.98 - 414762.76	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.90	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					10.50	221.40		Solid ground. (SOLID GROUND)
					15.50	216.40		End of borehole at 15.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH22**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411344.00 - 414740.74	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					18.60	205.50		Solid ground. (SOLID GROUND)
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH22**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411344.00 - 414740.74	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					23.60	200.50		End of borehole at 23.60 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH23
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411366.76 - 414683.64	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	223.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH23**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411366.76 - 414683.64	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	223.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					23.00	200.65		Solid ground. (SOLID GROUND)
					28.00	195.65		End of borehole at 28.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH26**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411417.43 - 414648.85	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					14.50	207.35		Solid ground. (SOLID GROUND)
					19.50	202.35		End of borehole at 19.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH27
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411411.25 - 414622.28	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.50	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					14.50	208.00		Solid ground. (SOLID GROUND)
					19.50	203.00		End of borehole at 19.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH29**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411246.76 - 414670.35	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					12.50	219.05		Solid ground. (SOLID GROUND)
					17.50	214.05		End of borehole at 17.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH31
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411260.43 - 414693.51	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.40	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					13.50	217.90		Solid ground. (SOLID GROUND)
					18.50	212.90		End of borehole at 18.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH33**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411275.51 - 414698.06	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					13.50	217.35		Solid ground. (SOLID GROUND)
					18.50	212.35		End of borehole at 18.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH34**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411375.82 - 414886.29	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					13.40	206.75		Solid ground. (SOLID GROUND)
					18.40	201.75		End of borehole at 18.40 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH35
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411470.85 - 414539.12	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.40	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Boulder between 18m and 20m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH35**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411470.85 - 414539.12	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.40	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					20.90	196.50		Solid ground. (SOLID GROUND)
					25.90	191.50		End of borehole at 25.90 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH36
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411483.93 - 414553.67	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.20	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	216.70		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	211.70		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH38
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411497.41 - 414554.42	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden (OVERBURDEN)
					1.20	215.90		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.20	210.90		End of borehole at 6.20 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH39**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411514.94 - 414538.02	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
					3.00	213.55		Solid ground. (SOLID GROUND)
					8.00	208.55		End of borehole at 8.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH41
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411562.69 - 414548.33	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	214.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH41**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411562.69 - 414548.33	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	214.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.50	193.10		Solid ground. (ROUGH ROCK SANDSTONE)
					26.50	188.10		End of borehole at 26.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH45**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411360.78 - 414818.31	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	223.20	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					12.50	210.70		Solid ground. (ROUGH ROCK SANDSTONE)
					17.50	205.70		End of borehole at 17.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH46**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411316.54 - 414793.42	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH46**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411316.54 - 414793.42	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.00	203.65		Solid ground. (ROUGH ROCK SANDSTONE)
					26.00	198.65		End of borehole at 26.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH47
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411430.81 - 414777.71	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	219.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.60	217.65		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.60	212.65		End of borehole at 6.60 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH49**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411495.52 - 414756.02	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	215.40	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 1.0m.
					13.00	202.40		Solid ground. (ROUGH ROCK SANDSTONE)
					18.00	197.40		End of borehole at 18.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 1.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH50
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411504.42 - 414755.58	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	214.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 1.0m.
					19.20	195.65		Solid ground. (ROUGH ROCK SANDSTONE)
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 1.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH50
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411504.42 - 414755.58	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	214.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					24.20	190.65		End of borehole at 24.20 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 1.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Appendix M

Stitch Line Borehole Logs

Borehole Log

Borehole No. **PH02**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411477.59 - 414719.97	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	04/09/2023 - 04/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					12.50	205.15		Solid ground. (SOLID GROUND)
					17.50	200.15		End of borehole at 17.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH02A**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411477.86 - 414715.55	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	04/09/2023 - 04/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					12.50	205.10		Solid ground. (SOLID GROUND)
					17.50	200.10		End of borehole at 17.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH02B**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411477.92 - 414711.50	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	04/09/2023 - 04/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					12.50	205.10		Solid ground. (SOLID GROUND)
					17.50	200.10		End of borehole at 17.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH02C**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411476.85 - 414722.68	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	04/09/2023 - 04/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					13.50	204.15		Solid ground. (SOLID GROUND)
					18.50	199.15		End of borehole at 18.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH02D
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411477.84 - 414706.43	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	218.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	217.00		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	212.00		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH02E**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411477.84 - 414709.32	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	216.80		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	211.80		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH02F
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411476.72 - 414725.74	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.70	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					20.00	197.70		Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH02F
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411476.72 - 414725.74	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.70	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Solid ground. (SOLID GROUND)
					25.00	192.70		End of borehole at 25.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH09**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411300.28 - 414838.09	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					7.00	217.95		Solid ground. (SOLID GROUND)
					12.00	212.95		End of borehole at 12.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH09A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411302.80 - 414835.30	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	224.35		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	219.35		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH09B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411304.74 - 414829.87	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
					8.50	216.30		Solid ground. (SOLID GROUND)
					13.50	211.30		End of borehole at 13.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH10**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411290.62 - 414850.22	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	225.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					16.50	208.55		Solid ground. (SOLID GROUND)
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH10**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411290.62 - 414850.22	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	225.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	05/09/2023 - 05/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.50	203.55		End of borehole at 21.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH10A**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411295.59 - 414843.42	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	225.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					16.40	208.60		Solid ground. (SOLID GROUND)
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH10A** Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411295.59 - 414843.42	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	225.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.40	203.60		End of borehole at 21.40 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH11
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411263.08 - 414839.14	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.40	225.20		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.40	220.20		End of borehole at 6.40 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH11A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411265.99 - 414836.59	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.40	225.15		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.40	220.15		End of borehole at 6.40 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH11B**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411258.83 - 414840.99	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.70	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.50	225.20		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.50	220.20		End of borehole at 6.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH11C**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411249.62 - 414847.88	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					15.50	211.05		Solid ground. (SOLID GROUND)
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH11C
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411249.62 - 414847.88	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					20.50	206.05		End of borehole at 20.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH11D
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411254.46 - 414844.89	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					15.50	211.10		Solid ground. (SOLID GROUND)
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

LITHOS CONSULTING

Borehole Log

Borehole No.
PH11D
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411254.46 - 414844.89	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					20.50	206.10		End of borehole at 20.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH11E
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411268.35 - 414832.85	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					3.50	223.10		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					8.50	218.10		End of borehole at 8.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH11F**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411270.13 - 414828.62	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.50	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	06/09/2023 - 06/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					12.50	214.00		Solid ground. (SOLID GROUND)
					17.50	209.00		End of borehole at 17.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH19
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411265.89 - 414765.47	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.70	228.10		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.70	223.10		End of borehole at 5.70 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH19A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411269.58 - 414768.05	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.50	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.70	227.80		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.70	222.80		End of borehole at 5.70 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH19B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411272.35 - 414770.00	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.70	227.55		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.70	222.55		End of borehole at 5.70 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH19C
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411278.92 - 414773.19	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					7.00	220.60		Solid ground. (SOLID GROUND)
					12.00	215.60		End of borehole at 12.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH19D
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411275.47 - 414770.88	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.70	227.25		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.70	222.25		End of borehole at 5.70 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No.
PH19E
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411291.54 - 414780.55	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					9.00	217.80		Solid ground. (SOLID GROUND)
					14.00	212.80		End of borehole at 14.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH20
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411260.49 - 414746.94	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	229.25		Light brown SANDSTONE (ROUGH ROCK SANDSTONE)
					6.00	224.25		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH20A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411267.35 - 414744.93	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	229.45	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					7.50	221.95		Solid ground. (SOLID GROUND)
					12.50	216.95		End of borehole at 12.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No.
PH20B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411275.36 - 414743.69	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					9.00	219.65		Solid ground. (SOLID GROUND)
					14.00	214.65		End of borehole at 14.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No.
PH20C
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411285.14 - 414742.63	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.90	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					9.00	218.90		Solid ground. (SOLID GROUND)
					14.00	213.90		End of borehole at 14.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH20D
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411295.46 - 414744.29	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					2.00	225.60		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					7.00	220.60		End of borehole at 7.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH20E
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411300.49 - 414748.42	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	07/09/2023 - 07/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					10.40	216.95		Solid ground. (SOLID GROUND)
					15.40	211.95		End of borehole at 15.40 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH21
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411340.92 - 414720.32	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.70	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH21**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411340.92 - 414720.32	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.70	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.00	203.70		Solid ground. (SOLID GROUND)
					26.00	198.70		End of borehole at 26.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH21A
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411332.40 - 414717.86	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	225.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No.
PH21A
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411332.40 - 414717.86	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	225.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					20.70	204.45		Solid ground. (SOLID GROUND)
					25.70	199.45		End of borehole at 25.70 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH21B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411326.28 - 414716.19	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	225.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	224.65		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	219.65		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH21C
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411320.08 - 414716.43	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	225.05		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	220.05		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH21D**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411314.74 - 414717.61	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
					4.50	221.85		Solid ground. (SOLID GROUND)
					9.50	216.85		End of borehole at 9.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH21E
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411308.41 - 414718.45	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No.
PH21E
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411308.41 - 414718.45	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					20.50	206.30		Solid ground. (SOLID GROUND)
					25.50	201.30		End of borehole at 25.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH21F**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411303.28 - 414716.94	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.20	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.0	226.20		
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	221.20		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH21G
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411293.40 - 414714.88	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.40	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.00	222.40		End of borehole at 5.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH21H
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411287.13 - 414713.14	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.45	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.00	222.45		End of borehole at 5.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH24
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411357.85 - 414666.57	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					18.00	206.85		Solid ground. (SOLID GROUND)
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH24**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411357.85 - 414666.57	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	08/09/2023 - 08/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					23.00	201.85		End of borehole at 23.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH24A**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411362.30 - 414664.37	Hole Type PH
Location: Blackmoorfoot Road, Huddersfield		Level: 224.85	Scale 1:100
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
					4.00	220.85		Solid ground. (SOLID GROUND)
					9.00	215.85		End of borehole at 9.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH24B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411367.00 - 414665.14	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden (OVERBURDEN)
					1.00	223.55		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	218.55		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH25
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411396.60 - 414671.62	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 4.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 4.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH25**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411396.60 - 414671.62	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					24.30	198.55		Solid ground. (SOLID GROUND)
					29.30	193.55		End of borehole at 29.30 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 4.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH25A
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411395.32 - 414674.60	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 7.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 7.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH25A
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411395.32 - 414674.60	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					24.00	198.80		Solid ground. (SOLID GROUND)
					29.00	193.80		End of borehole at 29.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 7.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH25B
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411395.22 - 414677.09	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.75	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 6.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 6.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH25B
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411395.22 - 414677.09	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.75	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					24.00	198.75		Solid ground. (SOLID GROUND)
					29.00	193.75		End of borehole at 29.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 6.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH25C
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411394.39 - 414680.44	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					10.00	212.65		Solid ground. (SOLID GROUND)
					15.00	207.65		End of borehole at 15.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH28
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411273.82 - 414673.19	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	230.35		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.30	225.35		End of borehole at 5.30 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH28A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411272.41 - 414676.28	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.75	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					6.00	224.75		Solid ground. (SOLID GROUND)
					11.00	219.75		End of borehole at 11.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH28B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411271.27 - 414679.32	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	11/09/2023 - 11/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					9.60	221.35		Solid ground. (SOLID GROUND)
					14.60	216.35		End of borehole at 14.60 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH28C**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411270.13 - 414682.11	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
					14.70	216.40		Solid ground. (SOLID GROUND)
					19.70	211.40		End of borehole at 19.70 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH30
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411228.06 - 414665.32	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	232.40	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	231.90		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	226.90		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH30A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411229.89 - 414668.08	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	232.20	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	231.70		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	226.70		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH30B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411230.42 - 414671.46	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	232.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	231.85		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	226.85		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH30C**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411230.82 - 414675.34	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	232.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					3.00	229.35		Solid ground. (SOLID GROUND)
					8.00	224.35		End of borehole at 8.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH32
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411262.62 - 414712.07	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH32**

Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411262.62 - 414712.07	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					22.00	209.15		Solid ground. (SOLID GROUND)
					27.00	204.15		End of borehole at 27.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH32A
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411261.00 - 414714.95	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH32A
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411261.00 - 414714.95	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					22.00	209.05		Solid ground. (SOLID GROUND)
					27.00	204.05		End of borehole at 27.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH32B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411259.29 - 414718.14	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					9.50	221.55		Solid ground. (SOLID GROUND)
					14.50	216.55		End of borehole at 14.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH32C
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411257.35 - 414721.77	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	12/09/2023 - 12/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	230.55		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	225.55		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

LITHOS CONSULTING

Borehole Log

Borehole No.
PH37
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411505.31 - 414584.08	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.60	216.05		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.60	211.05		End of borehole at 5.60 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

LITHOS CONSULTING

Borehole Log

Borehole No.
PH37A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411501.98 - 414580.88	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden (OVERBURDEN)
					1.50	215.30		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	210.80		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH37B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411499.92 - 414577.21	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden (OVERBURDEN)
					1.50	215.50		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.00	211.00		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH40
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411498.46 - 414540.41	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
					4.50	212.45		Light brown sandstone. (ROUGH ROCK SANDSTONE)
					9.50	207.45		End of borehole at 9.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH40A
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411498.75 - 414536.93	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Boulder between 16.6m and 17.0m & 17.8m to 21.0m
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

LITHOS CONSULTING

Borehole Log

Borehole No.
PH40A
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411498.75 - 414536.93	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					23.50	193.45		Solid ground. (ROUGH ROCK SANDSTONE)
					28.50	188.45		End of borehole at 28.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH42
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411418.52 - 414746.59	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					2.20	218.80		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					7.20	213.80		End of borehole at 7.20 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH42A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411415.04 - 414744.09	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					2.20	218.80		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					7.20	213.80		End of borehole at 7.20 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH42B**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411411.75 - 414741.03	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.90	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dark grey QUARRY BACKFILL. (QUARRY BACKFILL)
					4.20	216.70		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					9.20	211.70		End of borehole at 9.20 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH42C
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411404.22 - 414736.22	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dark grey QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH42C
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411404.22 - 414736.22	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.80	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					22.50	198.30		Solid ground. (ROUGH ROCK SANDSTONE)
					27.50	193.30		End of borehole at 27.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH43**

Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411457.75 - 414773.44	Hole Type PH
Location: Blackmoorfoot Road, Huddersfield		Level: 218.15	Scale 1:100
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	217.85		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.30	212.85		End of borehole at 5.30 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH43A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411460.45 - 414769.13	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	218.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	217.60		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	212.60		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH43B**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411462.53 - 414765.06	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	218.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	217.55		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	212.55		End of borehole at 5.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH43C**

Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411464.15 - 414761.58	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	218.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No.
PH43C
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411464.15 - 414761.58	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	218.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.90	196.20		Solid ground. (ROUGH ROCK SANDSTONE)
					26.90	191.20		End of borehole at 26.90 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH44
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411384.07 - 414892.89	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.15	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					7.50	212.65		Solid ground. (ROUGH ROCK SANDSTONE)
					12.50	207.65		End of borehole at 12.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH44A**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411385.90 - 414889.66	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.50	218.85		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					6.50	213.85		End of borehole at 6.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH48
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411429.26 - 414687.09	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.45	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	220.95		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	215.95		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH48A
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411425.24 - 414685.43	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.60	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	221.10		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	216.10		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH48B
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411421.30 - 414684.35	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.75	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40	221.35		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.40	216.35		End of borehole at 5.40 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH48C**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411417.98 - 414683.24	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	221.55		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.30	216.55		End of borehole at 5.30 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH48D**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411414.10 - 414682.46	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	221.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	221.65		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.30	216.65		End of borehole at 5.30 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH48E
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411410.51 - 414680.78	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	221.80		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.30	216.80		End of borehole at 5.30 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH48F
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411407.92 - 414679.89	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	221.95		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.30	216.95		End of borehole at 5.30 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH48G
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411404.59 - 414678.77	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	221.85		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
					5.50	216.85		End of borehole at 5.50 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

LITHOS CONSULTING

Borehole Log

Borehole No.
PH48H
Sheet 1 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411399.17 - 414676.75	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Continued on next sheet

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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LITHOS CONSULTING

Borehole Log

Borehole No.
PH48H
Sheet 2 of 2

Project Name:	Black Cats	Project No. 4486	Co-ords:	411399.17 - 414676.75	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	18/09/2023 - 18/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					24.10	198.55		Solid ground. (ROUGH ROCK SANDSTONE)
					29.10	193.55		End of borehole at 29.10 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Appendix N

Gas Monitoring Well Logs

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Borehole Log

Borehole No.
PH101
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411491.85 - 414562.04	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.45	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden (OVERBURDEN)
					1.50	215.95		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	211.45		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH102
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411500.02 - 414533.58	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Hole drilled to allow gas well installation.
					6.00	210.85		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH103
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411575.94 - 414567.87	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	214.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	13/09/2023 - 13/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	213.50		Overburden (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	208.00		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH104**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411564.70 - 414719.90	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	212.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	212.75		Topsoil. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	206.95		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH105
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411598.34 - 414762.93	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	209.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	209.15		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	203.25		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

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Borehole Log

Borehole No.
PH106
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411491.32 - 414808.26	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	215.85		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	210.35		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH107**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411420.54 - 414881.06	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level: 219.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	218.75		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	213.25		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH108
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411334.33 - 414861.68	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.20	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Hole drilled to allow gas well installation.
					6.00	216.20		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH109**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411309.64 - 414806.98	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.50	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dark grey QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Hole drilled to allow gas well installation.
					6.00	218.50		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH110**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411241.28 - 414825.75	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	227.30	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Hole drilled to allow gas well installation.
					6.00	221.30		*Hole collapsed by 1.0m before putting well in.* End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH111**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411196.78 - 414800.98	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.10	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dark grey QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					6.00	222.10		*Hole collapsed by 0.5m before putting well in.* End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH112
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411103.23 - 414766.36	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
					6.00	225.25		*Hole collapsed in, redrilled but only got 2m of pipe in.* End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH113
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411053.69 - 414807.50	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	234.05	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	228.05		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH114
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411243.48 - 414746.91	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.90	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	229.90		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	224.90		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH115
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411164.63 - 414695.84	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	236.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	236.15		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	230.65		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH116
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411265.07 - 414696.83	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	231.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Hole drilled to allow gas well installation.
					6.00	225.25		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH117
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411298.68 - 414638.04	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	14/09/2023 - 14/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40	228.15		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	222.55		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH118
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411391.53 - 414679.57	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	222.90	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	221.90		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	216.90		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH119**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411339.39 - 414734.59	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	224.40	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Hole drilled to allow gas well installation.
					6.00	218.40		*Hole collapsed by 1.5m before well could be installed.* End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH120
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411386.89 - 414730.31	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.85	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 3.0m.
								Hole drilled to allow gas well installation.
					6.00	214.85		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 3.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH121
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411413.01 - 414788.63	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	220.30	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	219.30		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	214.30		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No. **PH122**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411468.28 - 414742.88	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	217.95	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dark grey QUARRY BACKFILL. (QUARRY BACKFILL)
								Loss of flush from 2.0m.
								Hole drilled to allow gas well installation.
					6.00	211.95		*Hole collapsed by 1.5m before well could be installed.* End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Flush returns were lost from 2.0m. 4. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH123
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411500.06 - 414701.12	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	216.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.00	215.25		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	210.25		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

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Borehole Log

Borehole No.
PH124
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411355.59 - 414618.70	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	226.00	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	15/09/2023 - 15/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Overburden. (OVERBURDEN)
					1.40	224.60		Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	220.00		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No.
PH125
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411075.21 - 414607.76	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level: 245.30	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 19/09/2023 - 19/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	245.00		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	239.30		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH126**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411209.17 - 414642.85	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	235.55	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	19/09/2023 - 19/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	235.25		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	229.55		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH127**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411310.47 - 414554.39	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	230.25	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	19/09/2023 - 19/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	229.95		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	224.25		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

LITHOS CONSULTING

Borehole Log

Borehole No.
PH128
Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords:	411353.48 - 414523.95	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level:	228.65	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates:	19/09/2023 - 19/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	228.35		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	222.65		End of borehole at 6.00 m

Remarks
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

AGS

Borehole Log

Borehole No. **PH129** Sheet 1 of 1			
Project Name: Black Cats	Project No. 4486	Co-ords: 411425.01 - 414564.64	Hole Type PH
Location: Blackmoorfoot Road, Huddersfield		Level: 223.30	Scale 1:100
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 19/09/2023 - 19/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	223.00		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	217.30		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

Borehole Log

Borehole No. **PH130**

Sheet 1 of 1

Project Name:	Black Cats	Project No. 4486	Co-ords: 411468.52 - 414485.32	Hole Type PH
Location:	Blackmoorfoot Road, Huddersfield		Level: 222.35	Scale 1:100
Client:	Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group		Dates: 19/09/2023 - 19/09/2023	Logged By CC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	222.05		Overburden. (OVERBURDEN)
								Light brown SANDSTONE. (ROUGH ROCK SANDSTONE)
								Hole drilled to allow gas well installation.
					6.00	216.35		End of borehole at 6.00 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling. 3. Exploratory hole surveyed in (level and co-ordinates) on completion.

Appendix O

Chemical Results

Certificate of Analysis

Certificate Number 23-20813 *Issued:* 13-Oct-23

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference 23-20813

Client Reference 4486

Order No 21171/4486/CC

Contract Title Black Cats

Description 33 Soil samples, 2 Misc samples.

Date Received 01-Sep-23

Date Started 01-Sep-23

Date Completed 13-Oct-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226676	2226677	2226678	2226679	2226680	2226681
				.Sample ID	TP306	TP322	TP326	TP327	TP340	TP301
				Depth	0.55	0.60	0.50	1.50	0.20	0.60
				Other ID	2	2	3	2	1	2
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	24/08/2023	25/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	19	28	11	21	32	20
Moisture Content	DETSC 1004	0.1	%	13	8.3	15	20	11	15
Metals										
Antimony	DETSC 2301*	1	mg/kg						
Arsenic	DETSC 2301#	0.2	mg/kg	4.0	13	20	11	23	4.0
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.8	0.5	0.2	1.0	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.6	0.4	< 0.1	0.3	0.6
Chromium	DETSC 2301#	0.15	mg/kg	44	19	30	14	88	31
Chromium III	DETSC 2301*	0.15	mg/kg	44	19	30	14	88	31
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	28	94	55	110	410	21
Lead	DETSC 2301#	0.3	mg/kg	9.8	120	240	16	310	26
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l						
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.09	1.3	0.08	0.38	< 0.05
Nickel	DETSC 2301#	1	mg/kg	44	26	17	46	200	28
Potassium	DETSC 2301*	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	90	41	65	49	50	39
Zinc	DETSC 2301#	1	mg/kg	750	3400	750	170	140	100
Inorganics										
pH	DETSC 2008#		pH	7.3	10.7	9.9	8.3	8.0	6.8
Calorific Value	DETSC 5008	1	MJ/kg	< 1.0	2.8	8.3	8.2	2.5	< 1.0
Total Organic Carbon	DETSC 2084#	0.5	%	< 0.5	10	21	29	7.9	1.8
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l						
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l						
Sulphide	DETSC 2024*	10	mg/kg						
Sulphur as S, Total	DETSC 2320	0.01	%						
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	1.4				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	2.3				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	190				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	190				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	6.5				

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226676	2226677	2226678	2226679	2226680	2226681
			.Sample ID	TP306	TP322	TP326	TP327	TP340	TP301
			Depth	0.55	0.60	0.50	1.50	0.20	0.60
			Other ID	2	2	3	2	1	2
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	24/08/2023	25/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	5.4	25				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	48	170				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	63	600				
Aromatic C5-C35	DETSC 3072*	10	mg/kg	120	800				
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	120	990				
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	1.4	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	420	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	55	1500	< 10	130	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	410	7600	19	1200	< 10	< 10
EPH (C21-C35)	DETSC 3311	10	mg/kg	490	8800	34	1600	< 10	< 10
EPH (C35-C40)	DETSC 3311	10	mg/kg	26	590	< 10	81	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg	990	19000	58	3000	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	0.21				
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01				
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	1.2	< 0.30	0.04	0.36	< 0.03	0.05
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.07	< 0.30	< 0.03	0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	3.8	1.3	0.19	2.3	< 0.03	0.17
Fluorene	DETSC 3303	0.03	mg/kg	2.3	1.4	0.13	1.4	< 0.03	0.11
Phenanthrene	DETSC 3303#	0.03	mg/kg	30	17	1.6	11	0.15	1.2
Anthracene	DETSC 3303	0.03	mg/kg	4.5	3.9	0.39	3.0	< 0.03	0.22
Fluoranthene	DETSC 3303#	0.03	mg/kg	34	52	2.1	14	0.23	1.9
Pyrene	DETSC 3303#	0.03	mg/kg	30	40	1.8	13	0.21	1.8
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	6.2	26	0.55	4.0	0.08	0.58
Chrysene	DETSC 3303	0.03	mg/kg	6.5	30	0.58	4.3	0.09	0.69
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	5.3	34	0.48	3.5	0.08	0.60
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	2.0	14	0.16	1.2	< 0.03	0.23
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	4.1	23	0.36	2.6	0.05	0.40
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	1.0	10	0.11	0.65	< 0.03	0.14
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.29	4.3	< 0.03	0.19	< 0.03	0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	1.4	12	0.11	0.85	< 0.03	0.16
Naphthalene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Acenaphthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3301	0.1	mg/kg						

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226676	2226677	2226678	2226679	2226680	2226681
				.Sample ID	TP306	TP322	TP326	TP327	TP340	TP301
				Depth	0.55	0.60	0.50	1.50	0.20	0.60
				Other ID	2	2	3	2	1	2
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	24/08/2023	25/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	130	270	8.6	62	0.88	8.2
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg							
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g							
mass of removed material	DETSC 3401#	0.1	g							
mass after grinding	DETSC 3401#	0.1	g							
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg							
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg							
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg							
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg							
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg							
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg							
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg							
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg							
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg							
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg							
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg							
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg							
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg							
chlorate	DETSC 3401#	1	mg/kg							
perchlorate	DETSC 3401#	0.5	mg/kg							
description of removed material	DETSC 3401#	n/a								

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226682	2226683	2226684	2226685	2226686	2226687
				.Sample ID	TP303	TP309	TP317	TP319	TP324	TP327
				Depth	0.10	0.80	0.60	0.30	0.15	0.30
				Other ID	1	1	1	1	2	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	24/08/2023	24/08/2023	24/08/2023	24/08/2023	25/08/2023	25/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	43	28	16	33	19	14
Moisture Content	DETSC 1004	0.1	%	2.7	11	16	3.9	6.6	6.5
Metals										
Antimony	DETSC 2301*	1	mg/kg		< 1.0	2.3			
Arsenic	DETSC 2301#	0.2	mg/kg	29	2.3	17	23	9.0	26
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4	< 0.2	0.3	0.4	0.4	1.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.2	0.3	0.3	0.6	0.4
Chromium	DETSC 2301#	0.15	mg/kg	19	15	13	24	41	50
Chromium III	DETSC 2301*	0.15	mg/kg	19	15	13	24	41	50
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	86	8.0	23	73	35	1100
Lead	DETSC 2301#	0.3	mg/kg	89	4.9	38	110	28	520
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10		< 10	< 10		< 10
Mercury	DETSC 2325#	0.05	mg/kg	1.2	< 0.05	0.33	0.29	0.12	0.14
Nickel	DETSC 2301#	1	mg/kg	37	6.5	10	23	34	130
Potassium	DETSC 2301*	1	mg/kg		510	570			
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.0
Vanadium	DETSC 2301#	0.8	mg/kg	76	15	23	46	46	100
Zinc	DETSC 2301#	1	mg/kg	83	33	140	110	110	140
Inorganics										
pH	DETSC 2008#		pH	8.0	8.7	8.3	7.9	10.7	8.7
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%	3.2	5.8	2.5	6.1	6.5	20
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	18		3.7	2.2		7.6
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	3.9		2.6	4.3		24
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	60		35	44		120
Sulphide	DETSC 2024*	10	mg/kg		44	36		28	
Sulphur as S, Total	DETSC 2320	0.01	%		0.03	0.08		0.16	
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226682	2226683	2226684	2226685	2226686	2226687
				.Sample ID	TP303	TP309	TP317	TP319	TP324	TP327
				Depth	0.10	0.80	0.60	0.30	0.15	0.30
				Other ID	1	1	1	1	2	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	24/08/2023	24/08/2023	24/08/2023	24/08/2023	25/08/2023	25/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg							
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg							
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg							
Aromatic C5-C35	DETSC 3072*	10	mg/kg							
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg							
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 200.0	< 10	< 10	< 200.0	< 200.0	< 10	
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 200.0	14	< 10	< 200.0	1200	11	
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 200.0	83	39	320	7200	57	
EPH (C21-C35)	DETSC 3311	10	mg/kg	< 200.0	170	120	1100	7600	110	
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 200.0	16	19	270	360	15	
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 200.0	280	190	1800	16000	200	
Benzene	DETSC 3321#	0.01	mg/kg							
Ethylbenzene	DETSC 3321#	0.01	mg/kg							
Toluene	DETSC 3321#	0.01	mg/kg							
Xylene	DETSC 3321#	0.01	mg/kg							
MTBE	DETSC 3321	0.01	mg/kg							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.07	0.07	0.71	3.2	0.04	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.15	< 0.30	< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.30	0.20	2.7	6.8	0.17	
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.17	0.12	1.8	4.2	0.10	
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.22	2.3	1.4	21	46	1.3	
Anthracene	DETSC 3303	0.03	mg/kg	0.05	0.46	0.28	3.9	11	0.24	
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.32	3.4	2.0	27	71	2.0	
Pyrene	DETSC 3303#	0.03	mg/kg	0.29	3.2	1.8	24	64	1.8	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.15	1.1	0.60	6.7	29	0.63	
Chrysene	DETSC 3303	0.03	mg/kg	0.20	1.2	0.71	7.2	30	0.69	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.25	1.1	0.68	7.2	26	0.63	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.10	0.40	0.24	2.7	11	0.22	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.16	0.83	0.47	5.5	22	0.45	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.11	0.26	0.19	2.4	7.1	0.15	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06	0.05	0.61	2.4	0.04	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.15	0.31	0.25	3.0	7.5	0.17	
Naphthalene	DETSC 3301	0.1	mg/kg							
Acenaphthylene	DETSC 3301	0.1	mg/kg							
Acenaphthene	DETSC 3301	0.1	mg/kg							
Fluorene	DETSC 3301	0.1	mg/kg							
Phenanthrene	DETSC 3301	0.1	mg/kg							
Anthracene	DETSC 3301	0.1	mg/kg							
Fluoranthene	DETSC 3301	0.1	mg/kg							
Pyrene	DETSC 3301	0.1	mg/kg							

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226682	2226683	2226684	2226685	2226686	2226687
				.Sample ID	TP303	TP309	TP317	TP319	TP324	TP327
				Depth	0.10	0.80	0.60	0.30	0.15	0.30
				Other ID	1	1	1	1	2	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	24/08/2023	24/08/2023	24/08/2023	24/08/2023	25/08/2023	25/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	2.0	15	9.1	120	340	8.6	
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		1.1	1.5				
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g		99.4	106				
mass of removed material	DETSC 3401#	0.1	g		12.8	22.1				
mass after grinding	DETSC 3401#	0.1	g		74.8	83.3				
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg		< 1.00	< 1.00				
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg		< 0.50	< 0.50				
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg		< 1.000	< 1.000				
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg		< 1.00	< 1.00				
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg		< 1.00	< 1.00				
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg		< 1.00	< 1.00				
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg		< 0.50	< 0.50				
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg		< 5.00	< 5.00				
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg		< 0.10	< 0.10				
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg		< 0.10	< 0.10				
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg		< 1.00	< 1.00				
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg		< 1.00	< 1.00				
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg		< 5000	< 5000				
chlorate	DETSC 3401#	1	mg/kg		< 1.00	< 1.00				
perchlorate	DETSC 3401#	0.5	mg/kg		< 0.50	< 0.50				
description of removed material	DETSC 3401#	n/a			Rocks, hardened soil (TC)	Rocks, hardened soil (TC)				

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

Test	Method	LOD	Units	2226688	2226689	2226690	2226691	2226692	2226693
Lab No				2226688	2226689	2226690	2226691	2226692	2226693
.Sample ID				TP330	TP332	TP338	TP313	TP323	TP305
Depth				0.40	0.40	0.20	0.70	0.40	0.05
Other ID				1	1	2	2	1	1
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date				25/08/2023	25/08/2023	25/08/2023	24/08/2023	24/08/2023	24/08/2023
Sampling Time				n/s	n/s	n/s	n/s	n/s	n/s
Preparation									
Stones >10mm	DETSC 1003*	1	% m/m	27	30	34	22	39	
Moisture Content	DETSC 1004	0.1	%	11	12	11	15	12	
Metals									
Antimony	DETSC 2301*	1	mg/kg	1.1				4.1	
Arsenic	DETSC 2301#	0.2	mg/kg	10	19	14	18	25	
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.2	0.7	0.9	0.3	0.4	
Cadmium	DETSC 2301#	0.1	mg/kg	2.8	0.4	0.5	0.2	0.4	
Chromium	DETSC 2301#	0.15	mg/kg	10	41	22	16	20	
Chromium III	DETSC 2301*	0.15	mg/kg	10	41	22	16	20	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	31	74	89	59	47	
Lead	DETSC 2301#	0.3	mg/kg	29	96	83	62	59	
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10	< 10	< 10	< 10	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.48	0.15	0.13	< 0.05	
Nickel	DETSC 2301#	1	mg/kg	13	20	20	20	20	
Potassium	DETSC 2301*	1	mg/kg	1500				940	
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Vanadium	DETSC 2301#	0.8	mg/kg	28	40	32	26	38	
Zinc	DETSC 2301#	1	mg/kg	160	120	130	100	180	
Inorganics									
pH	DETSC 2008#		pH	8.4	10.2	9.3	7.5	9.0	
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%	4.7	5.2	6.4	4.1	5.3	
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		3.4	3.4	6.7	5.6	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		2.4	6.0	3.1	2.9	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		180	130	41	55	
Sulphide	DETSC 2024*	10	mg/kg	72	12	40		60	
Sulphur as S, Total	DETSC 2320	0.01	%	0.09	0.11	0.08		0.06	
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226688	2226689	2226690	2226691	2226692	2226693
				.Sample ID	TP330	TP332	TP338	TP313	TP323	TP305
				Depth	0.40	0.40	0.20	0.70	0.40	0.05
				Other ID	1	1	2	2	1	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	25/08/2023	25/08/2023	25/08/2023	24/08/2023	24/08/2023	24/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg							
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg							
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg							
Aromatic C5-C35	DETSC 3072*	10	mg/kg							
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg							
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 200.0	< 10	< 10	< 10	< 200.0		
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 200.0	39	< 10	11	350		
EPH (C16-C21)	DETSC 3311	10	mg/kg	270	290	27	83	1800		
EPH (C21-C35)	DETSC 3311	10	mg/kg	1200	480	69	300	1800		
EPH (C35-C40)	DETSC 3311	10	mg/kg	280	45	13	21	< 200.0		
EPH (C10-C40)	DETSC 3311#	10	mg/kg	1900	850	120	420	4300		
Benzene	DETSC 3321#	0.01	mg/kg							
Ethylbenzene	DETSC 3321#	0.01	mg/kg							
Toluene	DETSC 3321#	0.01	mg/kg							
Xylene	DETSC 3321#	0.01	mg/kg							
MTBE	DETSC 3321	0.01	mg/kg							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	0.17	0.22	< 0.03	0.20	0.75		
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.20	0.03	0.04	< 0.03	0.17		
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.87	1.1	0.44	0.22	2.9		
Fluorene	DETSC 3303	0.03	mg/kg	0.48	0.65	0.40	0.14	2.0		
Phenanthrene	DETSC 3303#	0.03	mg/kg	4.2	7.2	2.6	2.6	20		
Anthracene	DETSC 3303	0.03	mg/kg	1.5	1.7	1.1	0.54	5.2		
Fluoranthene	DETSC 3303#	0.03	mg/kg	11	11	3.6	4.8	27		
Pyrene	DETSC 3303#	0.03	mg/kg	11	10	3.2	4.5	24		
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	5.3	3.8	1.2	2.2	7.2		
Chrysene	DETSC 3303	0.03	mg/kg	5.8	4.7	1.4	2.7	8.3		
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	7.7	4.3	1.8	2.6	6.7		
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	2.9	1.4	0.56	0.80	2.2		
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	6.2	3.3	1.5	1.8	5.1		
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	3.0	1.1	0.76	0.62	1.5		
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.70	0.32	0.19	0.24	0.46		
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	3.8	1.2	0.92	1.0	1.6		
Naphthalene	DETSC 3301	0.1	mg/kg							< 2.0
Acenaphthylene	DETSC 3301	0.1	mg/kg							< 2.0
Acenaphthene	DETSC 3301	0.1	mg/kg							< 2.0
Fluorene	DETSC 3301	0.1	mg/kg							< 2.0
Phenanthrene	DETSC 3301	0.1	mg/kg							13
Anthracene	DETSC 3301	0.1	mg/kg							3.6
Fluoranthene	DETSC 3301	0.1	mg/kg							4.4
Pyrene	DETSC 3301	0.1	mg/kg							3.8

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226688	2226689	2226690	2226691	2226692	2226693
				.Sample ID	TP330	TP332	TP338	TP313	TP323	TP305
				Depth	0.40	0.40	0.20	0.70	0.40	0.05
				Other ID	1	1	2	2	1	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	25/08/2023	25/08/2023	25/08/2023	24/08/2023	24/08/2023	24/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							< 2.0
Chrysene	DETSC 3301	0.1	mg/kg							< 2.0
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							< 2.0
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							< 2.0
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							< 2.0
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							< 2.0
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							< 2.0
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							< 2.0
Coronene	DETSC 3301*	0.1	mg/kg							< 2.0
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	64	52	20	25	120		
PAH 16 Total	DETSC 3301	1.6	mg/kg							25
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.6				< 0.3		
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g	99.7				167		
mass of removed material	DETSC 3401#	0.1	g	53.4				12.8		
mass after grinding	DETSC 3401#	0.1	g	113				74.8		
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg	< 1.00				< 1.00		
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg	< 0.50				< 0.50		
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg	< 1.000				< 1.000		
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg	< 1.00				< 1.00		
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg	< 1.00				< 1.00		
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg	< 1.00				< 1.00		
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg	< 0.50				< 0.50		
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg	< 5.00				< 5.00		
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg	< 0.10				< 0.10		
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg	< 0.10				< 0.10		
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg	< 1.00				< 1.00		
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg	< 1.00				< 1.00		
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg	< 5000				< 5000		
chlorate	DETSC 3401#	1	mg/kg	< 1.00				< 1.00		
perchlorate	DETSC 3401#	0.5	mg/kg	< 0.50				< 0.50		
description of removed material	DETSC 3401#	n/a		Rocks, hardened soil (TC)				Rocks, hardened soil (TC)		

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226694	2226695	2226696	2226697	2226698	2226699
			.Sample ID	TP312	TP324	TP326	TP339	TP308	TP332
			Depth	0.05	0.05	0.05	0.05	1.00	1.40
			Other ID	1	1	1	1	2	2
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	24/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023	25/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Preparation									
Stones >10mm	DETSC 1003*	1	% m/m					8.0	44
Moisture Content	DETSC 1004	0.1	%					11	11
Metals									
Antimony	DETSC 2301*	1	mg/kg						
Arsenic	DETSC 2301#	0.2	mg/kg					12	6.3
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg					0.3	1.2
Cadmium	DETSC 2301#	0.1	mg/kg					0.2	0.6
Chromium	DETSC 2301#	0.15	mg/kg					17	16
Chromium III	DETSC 2301*	0.15	mg/kg					17	16
Chromium, Hexavalent	DETSC 2204*	1	mg/kg					< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg					270	23
Lead	DETSC 2301#	0.3	mg/kg					67	34
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l					< 10	< 10
Mercury	DETSC 2325#	0.05	mg/kg					0.21	0.08
Nickel	DETSC 2301#	1	mg/kg					24	11
Potassium	DETSC 2301*	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg					< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg					23	18
Zinc	DETSC 2301#	1	mg/kg					100	100
Inorganics									
pH	DETSC 2008#		pH					8.3	11.2
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%					4.0	1.6
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l					3.0	20
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l					4.4	3.8
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l					24	110
Sulphide	DETSC 2024*	10	mg/kg						
Sulphur as S, Total	DETSC 2320	0.01	%						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226694	2226695	2226696	2226697	2226698	2226699
				.Sample ID	TP312	TP324	TP326	TP339	TP308	TP332
				Depth	0.05	0.05	0.05	0.05	1.00	1.40
				Other ID	1	1	1	1	2	2
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	24/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023	25/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg							
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg							
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg							
Aromatic C5-C35	DETSC 3072*	10	mg/kg							
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg							
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg						< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg						< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg						< 10	19
EPH (C16-C21)	DETSC 3311	10	mg/kg						< 10	100
EPH (C21-C35)	DETSC 3311	10	mg/kg						< 10	99
EPH (C35-C40)	DETSC 3311	10	mg/kg						< 10	11
EPH (C10-C40)	DETSC 3311#	10	mg/kg						< 10	230
Benzene	DETSC 3321#	0.01	mg/kg							
Ethylbenzene	DETSC 3321#	0.01	mg/kg							
Toluene	DETSC 3321#	0.01	mg/kg							
Xylene	DETSC 3321#	0.01	mg/kg							
MTBE	DETSC 3321	0.01	mg/kg							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg						0.04	0.12
Acenaphthylene	DETSC 3303#	0.03	mg/kg						0.04	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg						< 0.03	0.28
Fluorene	DETSC 3303	0.03	mg/kg						0.03	0.16
Phenanthrene	DETSC 3303#	0.03	mg/kg						0.46	1.5
Anthracene	DETSC 3303	0.03	mg/kg						0.07	0.30
Fluoranthene	DETSC 3303#	0.03	mg/kg						0.57	1.6
Pyrene	DETSC 3303#	0.03	mg/kg						0.48	1.4
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						0.17	0.38
Chrysene	DETSC 3303	0.03	mg/kg						0.23	0.44
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg						0.22	0.30
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg						0.10	0.13
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg						0.17	0.23
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg						0.09	0.08
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg						< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg						0.10	0.08
Naphthalene	DETSC 3301	0.1	mg/kg	< 2.0	0.1	0.1	< 0.1			
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1			
Acenaphthene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1			
Fluorene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1			
Phenanthrene	DETSC 3301	0.1	mg/kg	< 2.0	0.3	< 0.1	0.2			
Anthracene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1			
Fluoranthene	DETSC 3301	0.1	mg/kg	< 2.0	0.5	1.2	0.2			
Pyrene	DETSC 3301	0.1	mg/kg	< 2.0	0.9	< 0.1	1.1			

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226694	2226695	2226696	2226697	2226698	2226699
			.Sample ID	TP312	TP324	TP326	TP339	TP308	TP332
			Depth	0.05	0.05	0.05	0.05	1.00	1.40
			Other ID	1	1	1	1	2	2
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	24/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023	25/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
Chrysene	DETSC 3301	0.1	mg/kg	< 2.0	1.6	< 0.1	< 0.1		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
Coronene	DETSC 3301*	0.1	mg/kg	< 2.0	< 0.1	< 0.1	< 0.1		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg					2.8	7.0
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	3.4	< 1.6	< 1.6		
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						
Subcontracted Analysis									
mass before grinding	DETSC 3401#	0.1	g						
mass of removed material	DETSC 3401#	0.1	g						
mass after grinding	DETSC 3401#	0.1	g						
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg						
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg						
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg						
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg						
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226700	2226704	2226705	2226706	2226707	2226708
				.Sample ID	TP333	TP301	TP336	TP328	TP335	TP301
				Depth	1.00	0.60	1.60	0.50	2.00	0.05
				Other ID	2	3	2	1	3	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	25/08/2023	24/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	21	9.0	< 1.0	38	16	50
Moisture Content	DETSC 1004	0.1	%	13	14	20	9.4	11	1.1
Metals										
Antimony	DETSC 2301*	1	mg/kg						
Arsenic	DETSC 2301#	0.2	mg/kg	6.7	5.9	23	11	1.7	0.9
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3	0.3	0.3	0.7	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.6	0.3	0.2	< 0.1	0.5
Chromium	DETSC 2301#	0.15	mg/kg	22	27	16	16	8.8	< 0.15
Chromium III	DETSC 2301*	0.15	mg/kg	22	27	16	16	8.8	< 0.15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	22	48	45	21	4.9	< 0.2
Lead	DETSC 2301#	0.3	mg/kg	60	39	71	47	7.3	< 0.3
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10	< 10	< 10	< 10	< 10	< 10
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.33	0.11	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	21	25	19	11	5.3	1.3
Potassium	DETSC 2301*	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Vanadium	DETSC 2301#	0.8	mg/kg	28	34	35	28	11	6.2
Zinc	DETSC 2301#	1	mg/kg	59	89	110	48	48	28
Inorganics										
pH	DETSC 2008#		pH	8.4	8.0	7.1	6.9	7.1	8.9
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%	1.9	2.5	3.7	3.7	< 0.5	7.0
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	2.6	1.4	16	2.0	2.5	5.2
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	2.8	3.0	4.4	1.3	2.3	1.1
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	30	38	46	16	11	10
Sulphide	DETSC 2024*	10	mg/kg						
Sulphur as S, Total	DETSC 2320	0.01	%						
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226700	2226704	2226705	2226706	2226707	2226708
				.Sample ID	TP333	TP301	TP336	TP328	TP335	TP301
				Depth	1.00	0.60	1.60	0.50	2.00	0.05
				Other ID	2	3	2	1	3	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	25/08/2023	24/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg							
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg							
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg							
Aromatic C5-C35	DETSC 3072*	10	mg/kg							
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg							
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	15	< 10	91	
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	170	< 10	1500	
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	1600	< 10	4000	
EPH (C21-C35)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	3300	< 10	9700	
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	310	< 10	980	
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	< 10	5400	< 10	16000	
Benzene	DETSC 3321#	0.01	mg/kg							
Ethylbenzene	DETSC 3321#	0.01	mg/kg							
Toluene	DETSC 3321#	0.01	mg/kg							
Xylene	DETSC 3321#	0.01	mg/kg							
MTBE	DETSC 3321	0.01	mg/kg							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.10	< 0.03	3.2	< 0.03	< 0.30	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.20	< 0.03	< 0.30	
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.05	0.29	< 0.03	6.7	< 0.03	< 0.30	
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.16	< 0.03	4.4	< 0.03	< 0.30	
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.33	1.7	< 0.03	51	0.11	0.46	
Anthracene	DETSC 3303	0.03	mg/kg	0.06	0.30	< 0.03	9.4	0.03	0.57	
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.62	2.3	< 0.03	61	0.15	0.41	
Pyrene	DETSC 3303#	0.03	mg/kg	0.59	2.0	< 0.03	54	0.14	3.2	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.21	0.64	< 0.03	21	0.07	0.99	
Chrysene	DETSC 3303	0.03	mg/kg	0.28	0.84	< 0.03	23	0.07	1.1	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.28	0.56	< 0.03	20	0.07	< 0.30	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.13	0.26	< 0.03	6.7	0.04	< 0.30	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.20	0.41	< 0.03	16	0.05	< 0.30	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.12	0.14	< 0.03	4.3	0.03	< 0.30	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	1.4	< 0.03	< 0.30	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.13	0.14	< 0.03	5.1	0.03	< 0.30	
Naphthalene	DETSC 3301	0.1	mg/kg							
Acenaphthylene	DETSC 3301	0.1	mg/kg							
Acenaphthene	DETSC 3301	0.1	mg/kg							
Fluorene	DETSC 3301	0.1	mg/kg							
Phenanthrene	DETSC 3301	0.1	mg/kg							
Anthracene	DETSC 3301	0.1	mg/kg							
Fluoranthene	DETSC 3301	0.1	mg/kg							
Pyrene	DETSC 3301	0.1	mg/kg							

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

				Lab No	2226700	2226704	2226705	2226706	2226707	2226708
				.Sample ID	TP333	TP301	TP336	TP328	TP335	TP301
				Depth	1.00	0.60	1.60	0.50	2.00	0.05
				Other ID	2	3	2	1	3	1
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	25/08/2023	24/08/2023	25/08/2023	25/08/2023	25/08/2023	24/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	3.0	9.9	< 0.10	290	0.73	6.7	
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg							
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g							
mass of removed material	DETSC 3401#	0.1	g							
mass after grinding	DETSC 3401#	0.1	g							
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg							
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg							
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg							
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg							
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg							
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg							
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg							
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg							
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg							
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg							
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg							
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg							
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg							
chlorate	DETSC 3401#	1	mg/kg							
perchlorate	DETSC 3401#	0.5	mg/kg							
description of removed material	DETSC 3401#	n/a								

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226709	2226710
			.Sample ID	TP306	TP312
			Depth	0.40	0.50
			Other ID	1	3
			Sample Type	SOIL	SOIL
			Sampling Date	24/08/2023	24/08/2023
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Preparation					
Stones >10mm	DETSC 1003*	1	% m/m	27	30
Moisture Content	DETSC 1004	0.1	%	11	11
Metals					
Antimony	DETSC 2301*	1	mg/kg		
Arsenic	DETSC 2301#	0.2	mg/kg	2.9	7.0
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4
Chromium	DETSC 2301#	0.15	mg/kg	8.5	17
Chromium III	DETSC 2301*	0.15	mg/kg	8.5	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	28	68
Lead	DETSC 2301#	0.3	mg/kg	31	64
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10	< 10
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	8.9	28
Potassium	DETSC 2301*	1	mg/kg		
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	14	22
Zinc	DETSC 2301#	1	mg/kg	88	4600
Inorganics					
pH	DETSC 2008#		pH	11.7	7.9
Calorific Value	DETSC 5008	1	MJ/kg		
Total Organic Carbon	DETSC 2084#	0.5	%	1.7	1.5
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	21	2.0
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	3.5	2.7
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	19	51
Sulphide	DETSC 2024*	10	mg/kg		
Sulphur as S, Total	DETSC 2320	0.01	%		
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226709	2226710
			.Sample ID	TP306	TP312
			Depth	0.40	0.50
			Other ID	1	3
			Sample Type	SOIL	SOIL
			Sampling Date	24/08/2023	24/08/2023
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		
Aromatic C5-C35	DETSC 3072*	10	mg/kg		
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg		
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C21-C35)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg		
Ethylbenzene	DETSC 3321#	0.01	mg/kg		
Toluene	DETSC 3321#	0.01	mg/kg		
Xylene	DETSC 3321#	0.01	mg/kg		
MTBE	DETSC 3321	0.01	mg/kg		
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.06	0.15
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.09
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.54	1.1
Anthracene	DETSC 3303	0.03	mg/kg	0.08	0.16
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.1	1.5
Pyrene	DETSC 3303#	0.03	mg/kg	1.2	1.4
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.44	0.44
Chrysene	DETSC 3303	0.03	mg/kg	0.55	0.55
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.62	0.50
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.25	0.21
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.59	0.47
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.13	0.09
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.18	0.13
Naphthalene	DETSC 3301	0.1	mg/kg		
Acenaphthylene	DETSC 3301	0.1	mg/kg		
Acenaphthene	DETSC 3301	0.1	mg/kg		
Fluorene	DETSC 3301	0.1	mg/kg		
Phenanthrene	DETSC 3301	0.1	mg/kg		
Anthracene	DETSC 3301	0.1	mg/kg		
Fluoranthene	DETSC 3301	0.1	mg/kg		
Pyrene	DETSC 3301	0.1	mg/kg		

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226709	2226710
			.Sample ID	TP306	TP312
			Depth	0.40	0.50
			Other ID	1	3
			Sample Type	SOIL	SOIL
			Sampling Date	24/08/2023	24/08/2023
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		
Chrysene	DETSC 3301	0.1	mg/kg		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		
Coronene	DETSC 3301*	0.1	mg/kg		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	5.8	6.7
PAH 16 Total	DETSC 3301	1.6	mg/kg		
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		
Subcontracted Analysis					
mass before grinding	DETSC 3401#	0.1	g		
mass of removed material	DETSC 3401#	0.1	g		
mass after grinding	DETSC 3401#	0.1	g		
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg		
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg		
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg		
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg		
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg		
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg		
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg		
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg		
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg		
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg		
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg		
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg		
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg		
chlorate	DETSC 3401#	1	mg/kg		
perchlorate	DETSC 3401#	0.5	mg/kg		
description of removed material	DETSC 3401#	n/a			

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil VOC Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226676	2226677
			.Sample ID	TP306	TP322
			Depth	0.55	0.60
			Other ID	2	2
			Sample Type	SOIL	SOIL
			Sampling Date	24/08/2023	25/08/2023
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

			Lab No	2226676	2226677
			.Sample ID	TP306	TP322
			Depth	0.55	0.60
			Other ID	2	2
			Sample Type	SOIL	SOIL
			Sampling Date	24/08/2023	25/08/2023
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-20813
Client Ref 4486
Contract Title Black Cats

Lab No	Sample ID	Sample Location	Material Type*	Result	Comment*	Analyst
2226676	TP306 2 0.55		SOIL	Chrysotile Amosite	Bundles of Chrysotile fibres & Amosite bundle	Keith Wilson
2226677	TP322 2 0.60		SOIL	Chrysotile	Bundle of Chrysotile fibres	Keith Wilson
2226678	TP326 3 0.50		SOIL	NAD	none	Keith Wilson
2226679	TP327 2 1.50		SOIL	NAD	none	Keith Wilson
2226680	TP340 1 0.20		SOIL	NAD	none	Keith Wilson
2226681	TP301 2 0.60		SOIL	Chrysotile	Bundles of Chrysotile fibres	Keith Wilson
2226682	TP303 1 0.10		SOIL	NAD	none	Keith Wilson
2226683	TP309 1 0.80		SOIL	NAD	none	Keith Wilson
2226684	TP317 1 0.60		SOIL	NAD	none	Keith Wilson
2226685	TP319 1 0.30		SOIL	NAD	none	Keith Wilson
2226686	TP324 2 0.15		SOIL	NAD	none	Keith Wilson
2226687	TP327 1 0.30		SOIL	NAD	none	Keith Wilson
2226688	TP330 1 0.40		SOIL	NAD	none	Keith Wilson
2226689	TP332 1 0.40		SOIL	NAD	none	Keith Wilson
2226690	TP338 2 0.20		SOIL	NAD	none	Keith Wilson
2226691	TP313 2 0.70		SOIL	NAD	none	Keith Wilson
2226692	TP323 1 0.40		SOIL	NAD	none	Keith Wilson
2226698	TP308 2 1.00		SOIL	NAD	none	Keith Wilson
2226699	TP332 2 1.40		SOIL	NAD	none	Keith Wilson
2226700	TP333 2 1.00		SOIL	NAD	none	Keith Wilson
2226701	TP308 1 0.60		Cement	Chrysotile	none	Keith Wilson
2226702	TP312 2 0.20		Cement	Chrysotile	none	Keith Wilson
2226703	TP334 2 1.60		SOIL	NAD	none	Keith Wilson
2226704	TP301 3 0.60		SOIL	NAD	none	Keith Wilson
2226705	TP336 2 1.60		SOIL	NAD	none	Keith Wilson
2226706	TP328 1 0.50		SOIL	NAD	none	Keith Wilson
2226707	TP335 3 2.00		SOIL	NAD	none	Keith Wilson
2226708	TP301 1 0.05		SOIL	NAD	none	Keith Wilson
2226709	TP306 1 0.40		SOIL	Chrysotile	Bundles of Chrysotile fibres	Keith Wilson
2226710	TP312 3 0.50		SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-20813
Client Ref 4486
Contract Black Cats

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2226676	TP306 0.55 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
2226677	TP322 0.60 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226678	TP326 0.50 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226679	TP327 1.50 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226680	TP340 0.20 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226681	TP301 0.60 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226682	TP303 0.10 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226683	TP309 0.80 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2226684	TP317 0.60 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2226685	TP319 0.30 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226686	TP324 0.15 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226687	TP327 0.30 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226688	TP330 0.40 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226689	TP332 0.40 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226690	TP338 0.20 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226691	TP313 0.70 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226692	TP323 0.40 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2226693	TP305 0.05 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226694	TP312 0.05 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226695	TP324 0.05 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226696	TP326 0.05 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226697	TP339 0.05 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226698	TP308 1.00 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226699	TP332 1.40 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226700	TP333 1.00 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226701	TP308 0.60 MISC	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226702	TP312 0.20 MISC	24/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226703	TP334 1.60 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226704	TP301 0.60 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226705	TP336 1.60 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226706	TP328 0.50 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226707	TP335 2.00 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2226708	TP301 0.05 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226709	TP306 0.40 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2226710	TP312 0.50 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Information in Support of the Analytical Results

Our Ref 23-20813
Client Ref 4486
Contract Black Cats

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-21123	*Issued:*	17-Oct-23

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference	23-21123
Client Reference	4486
Order No	21171/4486/CC
Contract Title	Black Cats
Description	73 Soil samples, 3 Misc samples.
Date Received	06-Sep-23
Date Started	06-Sep-23
Date Completed	17-Oct-23
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228849	2228850	2228851	2228852	2228853	2228854
				.Sample ID	TP341	TP343	TP349	TP350	TP353	TP374
				Depth	0.30	0.50	0.40	0.15	0.40	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	20	24	7.0	9.0	10	8.0
Moisture Content	DETSC 1004	0.1	%	13	11	13	14	14	12
Metals										
Antimony	DETSC 2301*	1	mg/kg		4.8				
Arsenic	DETSC 2301#	0.2	mg/kg	55	39	74	35	24	51
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.8	0.5	0.5	0.4	0.7	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.2	0.8	0.4	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	810	46	63	29	35	110
Chromium III	DETSC 2301*	0.15	mg/kg	810	46	63	29	35	110
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	3900	140	660	200	350	1200
Lead	DETSC 2301#	0.3	mg/kg	280	120	460	120	140	210
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10		< 10		< 10	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.07	0.38	0.08	0.11	1.7
Nickel	DETSC 2301#	1	mg/kg	1800	79	120	55	36	230
Potassium	DETSC 2301*	1	mg/kg		1300				
Selenium	DETSC 2301#	0.5	mg/kg	6.7	0.7	0.7	0.8	< 0.5	0.9
Vanadium	DETSC 2301#	0.8	mg/kg	250	62	49	58	36	73
Zinc	DETSC 2301#	1	mg/kg	840	100	360	2400	250	330
Inorganics										
pH	DETSC 2008#		pH	8.8	7.9	6.6	7.9	8.3	8.7
Calorific Value	DETSC 5008	1	MJ/kg	3.9	< 1.0	2.3	3.9		< 1.0
Total Organic Carbon	DETSC 2084#	0.5	%	5.4	6.2	6.6	12	3.7	7.8
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	3.8		3.4		2.8	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	1.7		16		7.6	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	82		36		49	
Sulphide	DETSC 2024*	10	mg/kg	79	59		63		44
Sulphur as S, Total	DETSC 2320	0.01	%	0.08	0.11		0.11		0.11
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	13	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	< 10	63	13	83	20
EPH (C21-C35)	DETSC 3311	10	mg/kg	23	< 10	220	420	240	110
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 10	< 10	17	170	22	13
EPH (C10-C40)	DETSC 3311#	10	mg/kg	35	< 10	310	600	350	150
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.83	< 0.03	0.83	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.08	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.55	< 0.03	1.1	0.04
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.54	< 0.03	0.86	< 0.03

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228849	2228850	2228851	2228852	2228853	2228854
				.Sample ID	TP341	TP343	TP349	TP350	TP353	TP374
				Depth	0.30	0.50	0.40	0.15	0.40	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.11	3.2	0.09	7.3	0.32
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.74	< 0.03	2.0	0.07
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.03	0.15	4.0	0.17	8.7	0.55
Pyrene	DETSC 3303#	0.03	mg/kg	0.03	0.14	3.6	0.17	8.0	0.54
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	1.7	0.06	3.2	0.21
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.06	1.7	0.11	3.0	0.23
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.07	1.8	0.08	2.7	0.24
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06	0.67	< 0.03	1.1	0.09
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03	1.4	0.06	2.2	0.20
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.57	< 0.03	0.78	0.10
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.18	< 0.03	0.26	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.67	0.03	0.89	0.11
Naphthalene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Acenaphthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3301	0.1	mg/kg						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg						
Chrysene	DETSC 3301	0.1	mg/kg						
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg						
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg						
Coronene	DETSC 3301*	0.1	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.65	22	0.74	43	2.7
PAH 16 Total	DETSC 3301	1.6	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		1.7				
Subcontracted Analysis									
mass before grinding	DETSC 3401#	0.1	g						
mass of removed material	DETSC 3401#	0.1	g						
mass after grinding	DETSC 3401#	0.1	g						
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg						
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg						
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg						
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg						
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg						

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228849	2228850	2228851	2228852	2228853	2228854
			.Sample ID	TP341	TP343	TP349	TP350	TP353	TP374
			Depth	0.30	0.50	0.40	0.15	0.40	0.30
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Test	Method	LOD	Units	2228855	2228856	2228857	2228858	2228859	2228860
Lab No				2228855	2228856	2228857	2228858	2228859	2228860
.Sample ID				TP410	TT301N	TP314	TP348	TP349	TP351
Depth				3.20	0.40	0.70	0.10	0.40	0.30
Other ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date				01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
Sampling Time				n/s	n/s	n/s	n/s	n/s	n/s
Preparation									
Stones >10mm	DETSC 1003*	1	% m/m	5.0	11	4.0	1.0	6.0	12
Moisture Content	DETSC 1004	0.1	%	20	13	17	28	16	5.1
Metals									
Antimony	DETSC 2301*	1	mg/kg				5.5		
Arsenic	DETSC 2301#	0.2	mg/kg	70	36	35	18	53	
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	1.9	1.2	0.5	0.6	0.4	
Cadmium	DETSC 2301#	0.1	mg/kg	0.7	0.3	0.4	0.5	0.8	
Chromium	DETSC 2301#	0.15	mg/kg	470	86	35	24	44	
Chromium III	DETSC 2301*	0.15	mg/kg	470	86	35	24	44	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	2800	320	160	77	160	
Lead	DETSC 2301#	0.3	mg/kg	1100	120	280	110	230	
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10		< 10			< 10
Mercury	DETSC 2325#	0.05	mg/kg	0.47	0.12	0.49	0.23	0.33	
Nickel	DETSC 2301#	1	mg/kg	800	79	36	24	36	
Potassium	DETSC 2301*	1	mg/kg				630		
Selenium	DETSC 2301#	0.5	mg/kg	5.0	1.1	0.6	< 0.5	0.6	
Vanadium	DETSC 2301#	0.8	mg/kg	170	130	42	29	42	
Zinc	DETSC 2301#	1	mg/kg	400	95	180	240	290	
Inorganics									
pH	DETSC 2008#		pH	8.6	7.7	7.8	7.6	7.8	
Calorific Value	DETSC 5008	1	MJ/kg		2.3				
Total Organic Carbon	DETSC 2084#	0.5	%	11	9.6	6.5	6.5	7.2	
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	7.0		4.6			4.9
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	5.0		2.9			< 1.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	110		37			22
Sulphide	DETSC 2024*	10	mg/kg			36	24		
Sulphur as S, Total	DETSC 2320	0.01	%			0.04	0.05		
Petroleum Hydrocarbons									
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10	
EPH (C12-C16)	DETSC 3311	10	mg/kg	23	< 10	< 10	< 10	11	
EPH (C16-C21)	DETSC 3311	10	mg/kg	300	36	39	14	95	
EPH (C21-C35)	DETSC 3311	10	mg/kg	2400	160	100	100	270	
EPH (C35-C40)	DETSC 3311	10	mg/kg	240	40	12	28	20	
EPH (C10-C40)	DETSC 3311#	10	mg/kg	2900	240	160	150	400	
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	0.10	0.03	0.41	< 0.03	1.0	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.34	0.04	0.58	0.04	1.3	
Fluorene	DETSC 3303	0.03	mg/kg	0.20	< 0.03	0.43	< 0.03	0.93	

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228855	2228856	2228857	2228858	2228859	2228860
				.Sample ID	TP410	TT301N	TP314	TP348	TP349	TP351
				Depth	3.20	0.40	0.70	0.10	0.40	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg	2.1	0.30	3.0	0.29	5.6	
Anthracene	DETSC 3303	0.03	mg/kg	0.50	0.06	0.77	0.05	1.5	
Fluoranthene	DETSC 3303#	0.03	mg/kg	3.0	0.53	3.0	0.47	5.8	
Pyrene	DETSC 3303#	0.03	mg/kg	2.7	0.45	2.6	0.38	5.1	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	1.0	0.19	1.0	0.16	1.9	
Chrysene	DETSC 3303	0.03	mg/kg	0.99	0.20	1.0	0.18	2.0	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.68	0.16	0.69	0.15	1.3	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.28	0.07	0.23	0.05	0.48	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.62	0.14	0.60	0.12	1.2	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.18	0.05	0.17	0.05	0.34	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.06	< 0.03	0.06	< 0.03	0.11	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.24	0.06	0.20	0.07	0.42	
Naphthalene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Acenaphthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3301	0.1	mg/kg						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg						
Chrysene	DETSC 3301	0.1	mg/kg						
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg						
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg						
Coronene	DETSC 3301*	0.1	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	13	2.3	15	2.0	29	
PAH 16 Total	DETSC 3301	1.6	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg				2.2		
Subcontracted Analysis									
mass before grinding	DETSC 3401#	0.1	g				62.5		
mass of removed material	DETSC 3401#	0.1	g				3.7		
mass after grinding	DETSC 3401#	0.1	g				58.5		
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg				< 1.00		
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg				< 0.50		
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg				< 1.00		
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg				< 1.00		
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg				< 1.00		

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228855	2228856	2228857	2228858	2228859	2228860
			.Sample ID	TP410	TT301N	TP314	TP348	TP349	TP351
			Depth	3.20	0.40	0.70	0.10	0.40	0.30
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg				< 1.00		
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg				< 0.50		
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg				< 5.00		
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg				< 0.10		
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg				< 0.10		
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg				< 0.10		
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg				< 0.10		
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg				< 5000		
chlorate	DETSC 3401#	1	mg/kg				< 1.00		
perchlorate	DETSC 3401#	0.5	mg/kg				< 0.50		
description of removed material	DETSC 3401#	n/a					Rocks, hardened soil (TC)		

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Test	Method	LOD	Units	Lab No	2228861	2228862	2228863	2228864	2228865	2228866
				.Sample ID	TP360	TP364	TP376	TP380	TP381	TP382
				Depth	0.35	0.40	0.30	0.30	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/09/2023	01/09/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m		5.0	31	9.0		2.0	8.0
Moisture Content	DETSC 1004	0.1	%		13	12	13		15	9.2
Metals										
Antimony	DETSC 2301*	1	mg/kg							
Arsenic	DETSC 2301#	0.2	mg/kg		14		10		20	18
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.5		0.2		0.7	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg		0.4		0.4		0.5	0.4
Chromium	DETSC 2301#	0.15	mg/kg		20		17		24	62
Chromium III	DETSC 2301*	0.15	mg/kg		20		17		24	62
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0		< 1.0		< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		40		40		95	43
Lead	DETSC 2301#	0.3	mg/kg		89		53		160	35
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l			< 10			< 10	< 10
Mercury	DETSC 2325#	0.05	mg/kg		0.17		0.10		0.36	0.08
Nickel	DETSC 2301#	1	mg/kg		17		15		29	24
Potassium	DETSC 2301*	1	mg/kg							
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5		< 0.5		< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg		28		21		35	30
Zinc	DETSC 2301#	1	mg/kg		120		190		130	93
Inorganics										
pH	DETSC 2008#		pH		7.8		8.6		7.7	8.3
Calorific Value	DETSC 5008	1	MJ/kg							
Total Organic Carbon	DETSC 2084#	0.5	%		3.2		1.9		6.2	3.4
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l			2.0			3.6	2.1
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l			< 1.0			10	< 1.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l			13			12	< 10
Sulphide	DETSC 2024*	10	mg/kg		< 10			32		
Sulphur as S, Total	DETSC 2320	0.01	%		0.03			0.01		
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg		< 0.1		< 0.1		< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg		< 10		< 10		< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg		< 10		< 10		69	34
EPH (C16-C21)	DETSC 3311	10	mg/kg		< 10		< 10		610	450
EPH (C21-C35)	DETSC 3311	10	mg/kg		80		84		1200	1200
EPH (C35-C40)	DETSC 3311	10	mg/kg		28		18		110	110
EPH (C10-C40)	DETSC 3311#	10	mg/kg		110		110		2000	1800
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03		< 0.03		0.81	0.24
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03		< 0.03		0.04	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		0.04		< 0.03		2.8	2.5
Fluorene	DETSC 3303	0.03	mg/kg		0.04		< 0.03		1.9	1.3

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228861	2228862	2228863	2228864	2228865	2228866
				.Sample ID	TP360	TP364	TP376	TP380	TP381	TP382
				Depth	0.35	0.40	0.30	0.30	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/09/2023	01/09/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.38		0.11		17	16
Anthracene	DETSC 3303	0.03	mg/kg		0.05		< 0.03		4.0	3.3
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.73		0.20		19	23
Pyrene	DETSC 3303#	0.03	mg/kg		0.66		0.16		18	24
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.28		0.08		6.4	7.5
Chrysene	DETSC 3303	0.03	mg/kg		0.31		0.08		7.7	8.4
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.28		0.06		5.8	5.8
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.11		< 0.03		2.3	2.1
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.20		0.05		5.1	5.0
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.06		< 0.03		1.7	1.5
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03		< 0.03		0.50	0.54
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.08		< 0.03		2.0	2.0
Naphthalene	DETSC 3301	0.1	mg/kg							
Acenaphthylene	DETSC 3301	0.1	mg/kg							
Acenaphthene	DETSC 3301	0.1	mg/kg							
Fluorene	DETSC 3301	0.1	mg/kg							
Phenanthrene	DETSC 3301	0.1	mg/kg							
Anthracene	DETSC 3301	0.1	mg/kg							
Fluoranthene	DETSC 3301	0.1	mg/kg							
Pyrene	DETSC 3301	0.1	mg/kg							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		3.2		0.74		96	100
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg							
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g							
mass of removed material	DETSC 3401#	0.1	g							
mass after grinding	DETSC 3401#	0.1	g							
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg							
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg							
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg							
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg							
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg							

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228861	2228862	2228863	2228864	2228865	2228866
			.Sample ID	TP360	TP364	TP376	TP380	TP381	TP382
			Depth	0.35	0.40	0.30	0.30	0.20	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	01/09/2023	01/09/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228867	2228868	2228869	2228870	2228871	2228872
				.Sample ID	TP383	TP383	TP385	TP390	TP390	TP391W
				Depth	0.10	0.60	0.50	0.70	1.50	0.90
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m		12	22	4.0	20	17
Moisture Content	DETSC 1004	0.1	%		13	14	23	14	20
Metals										
Antimony	DETSC 2301*	1	mg/kg	31					
Arsenic	DETSC 2301#	0.2	mg/kg		25	6.7	42	12	23
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.3	< 0.2	2.3	2.8	3.2
Cadmium	DETSC 2301#	0.1	mg/kg		2.9	0.5	2.1	2.9	1.9
Chromium	DETSC 2301#	0.15	mg/kg		37	11	48	47	38
Chromium III	DETSC 2301*	0.15	mg/kg		37	11	48	47	38
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		2400	32	580	410	1300
Lead	DETSC 2301#	0.3	mg/kg		990	72	370	220	320
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10		< 10		11
Mercury	DETSC 2325#	0.05	mg/kg		0.74	< 0.05	0.48	0.12	0.08
Nickel	DETSC 2301#	1	mg/kg		40	13	33	35	51
Potassium	DETSC 2301*	1	mg/kg	1300					
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5	< 0.5	0.7	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg		25	15	31	37	23
Zinc	DETSC 2301#	1	mg/kg		1400	100	660	310	1300
Inorganics										
pH	DETSC 2008#		pH		7.9	8.9	8.3	9.0	8.0
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%		3.2	1.6	5.5	1.8	6.0
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		5.0		13		20
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		2.0		1.9		8.4
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		13		55		84
Sulphide	DETSC 2024*	10	mg/kg	59		20			28
Sulphur as S, Total	DETSC 2320	0.01	%	0.06		0.03			0.10
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg		62	< 10	20	< 10	< 10
EPH (C21-C35)	DETSC 3311	10	mg/kg		170	23	60	79	< 10
EPH (C35-C40)	DETSC 3311	10	mg/kg		12	< 10	< 10	22	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg		250	36	91	110	< 10
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		0.12	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		0.48	< 0.03	0.04	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg		0.34	< 0.03	< 0.03	< 0.03	< 0.03

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228867	2228868	2228869	2228870	2228871	2228872
				.Sample ID	TP383	TP383	TP385	TP390	TP390	TP391W
				Depth	0.10	0.60	0.50	0.70	1.50	0.90
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		2.8	0.17	0.26	0.07	0.07
Anthracene	DETSC 3303	0.03	mg/kg		0.72	0.03	0.06	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg		3.4	0.24	0.34	0.10	0.09
Pyrene	DETSC 3303#	0.03	mg/kg		3.0	0.19	0.27	0.09	0.08
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		1.2	0.08	0.10	0.04	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg		1.3	0.08	0.09	0.04	0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		1.0	0.05	0.06	< 0.03	0.04
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.42	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.97	0.04	0.05	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.31	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		0.09	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.37	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Acenaphthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3301	0.1	mg/kg						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg						
Chrysene	DETSC 3301	0.1	mg/kg						
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg						
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg						
Coronene	DETSC 3301*	0.1	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		17	0.85	1.3	0.34	0.24
PAH 16 Total	DETSC 3301	1.6	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.9					
Subcontracted Analysis									
mass before grinding	DETSC 3401#	0.1	g						
mass of removed material	DETSC 3401#	0.1	g						
mass after grinding	DETSC 3401#	0.1	g						
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg						
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg						
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg						
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg						
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg						

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228867	2228868	2228869	2228870	2228871	2228872
			.Sample ID	TP383	TP383	TP385	TP390	TP390	TP391W
			Depth	0.10	0.60	0.50	0.70	1.50	0.90
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228873	2228874	2228875	2228876	2228877	2228878
				.Sample ID	TP397	TP399	TP410	TP410	TP411	TT302W
				Depth	0.50	0.10	0.10	0.40	0.30	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	29/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m		11	2.0		8.0	
Moisture Content	DETSC 1004	0.1	%		11	20		18	
Metals										
Antimony	DETSC 2301*	1	mg/kg	70			3.5		4.5
Arsenic	DETSC 2301#	0.2	mg/kg		12	16		20	
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.2	1.0		0.3	
Cadmium	DETSC 2301#	0.1	mg/kg		0.2	0.5		0.2	
Chromium	DETSC 2301#	0.15	mg/kg		14	21		21	
Chromium III	DETSC 2301*	0.15	mg/kg		14	21		21	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0		< 1.0	
Copper	DETSC 2301#	0.2	mg/kg		72	140		140	
Lead	DETSC 2301#	0.3	mg/kg		39	210		90	
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10	< 10		< 10	
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05	0.19		0.12	
Nickel	DETSC 2301#	1	mg/kg		17	30		28	
Potassium	DETSC 2301*	1	mg/kg	4000			430		780
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5	< 0.5		< 0.5	
Vanadium	DETSC 2301#	0.8	mg/kg		24	27		37	
Zinc	DETSC 2301#	1	mg/kg		62	120		210	
Inorganics										
pH	DETSC 2008#		pH		7.8	7.1		8.2	
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%		5.6	5.1		14	
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		5.3	6.3		3.0	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		1.0	16		< 1.0	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		20	18		16	
Sulphide	DETSC 2024*	10	mg/kg	55			28	67	24
Sulphur as S, Total	DETSC 2320	0.01	%	0.14			0.02	0.08	0.02
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg		< 0.1	< 0.1		< 0.1	
EPH (C10-C12)	DETSC 3311	10	mg/kg		< 10	< 10		< 10	
EPH (C12-C16)	DETSC 3311	10	mg/kg		< 10	< 10		< 10	
EPH (C16-C21)	DETSC 3311	10	mg/kg		< 10	25		12	
EPH (C21-C35)	DETSC 3311	10	mg/kg		< 10	65		10	
EPH (C35-C40)	DETSC 3311	10	mg/kg		< 10	< 10		< 10	
EPH (C10-C40)	DETSC 3311#	10	mg/kg		< 10	97		27	
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03	0.03		0.20	
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg		< 0.03	0.15		0.55	
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03	0.10		0.32	

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228873	2228874	2228875	2228876	2228877	2228878
				.Sample ID	TP397	TP399	TP410	TP410	TP411	TT302W
				Depth	0.50	0.10	0.10	0.40	0.30	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	29/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.18	1.2		3.7	
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03	0.24		0.67	
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.37	2.0		4.6	
Pyrene	DETSC 3303#	0.03	mg/kg		0.36	1.8		4.1	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.14	0.69		1.3	
Chrysene	DETSC 3303	0.03	mg/kg		0.19	0.85		1.5	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.15	0.77		1.1	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.06	0.30		0.44	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.11	0.56		0.75	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.04	0.22		0.22	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	0.04		0.06	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.04	0.24		0.27	
Naphthalene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Acenaphthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3301	0.1	mg/kg						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg						
Chrysene	DETSC 3301	0.1	mg/kg						
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg						
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg						
Coronene	DETSC 3301*	0.1	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		1.6	9.1		20	
PAH 16 Total	DETSC 3301	1.6	mg/kg						
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.1			1.1		1.2
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g	181					
mass of removed material	DETSC 3401#	0.1	g	111					
mass after grinding	DETSC 3401#	0.1	g	70.2					
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg	< 1.00					
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg	< 0.50					
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg	< 1.00					
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg	< 1.00					
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg	< 1.00					

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228873	2228874	2228875	2228876	2228877	2228878
			.Sample ID	TP397	TP399	TP410	TP410	TP411	TT302W
			Depth	0.50	0.10	0.10	0.40	0.30	0.30
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	29/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg	< 1.00					
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg	< 0.50					
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg	< 5.00					
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg	< 0.10					
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg	< 0.10					
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg	< 0.10					
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg	< 0.10					
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg	< 5000					
chlorate	DETSC 3401#	1	mg/kg	< 1.00					
perchlorate	DETSC 3401#	0.5	mg/kg	< 0.50					
description of removed material	DETSC 3401#	n/a		Rocks, hardened soil (TC)					

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Test	Method	LOD	Units	Lab No	2228879	2228880	2228881	2228882	2228883	2228884
				.Sample ID	TT304N	TP341	TP350	TP364	TP375	TP382
				Depth	0.70	0.05	0.05	0.05	0.05	0.05
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m		16					
Moisture Content	DETSC 1004	0.1	%		7.4					
Metals										
Antimony	DETSC 2301*	1	mg/kg							
Arsenic	DETSC 2301#	0.2	mg/kg		8.1					
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		< 0.2					
Cadmium	DETSC 2301#	0.1	mg/kg		0.5					
Chromium	DETSC 2301#	0.15	mg/kg		19					
Chromium III	DETSC 2301*	0.15	mg/kg		19					
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0					
Copper	DETSC 2301#	0.2	mg/kg		26					
Lead	DETSC 2301#	0.3	mg/kg		35					
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10					
Mercury	DETSC 2325#	0.05	mg/kg		0.10					
Nickel	DETSC 2301#	1	mg/kg		19					
Potassium	DETSC 2301*	1	mg/kg							
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5					
Vanadium	DETSC 2301#	0.8	mg/kg		23					
Zinc	DETSC 2301#	1	mg/kg		92					
Inorganics										
pH	DETSC 2008#		pH		7.9					
Calorific Value	DETSC 5008	1	MJ/kg							
Total Organic Carbon	DETSC 2084#	0.5	%		1.2					
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		3.1					
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		1.0					
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		11					
Sulphide	DETSC 2024*	10	mg/kg							
Sulphur as S, Total	DETSC 2320	0.01	%							
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg		< 0.1					
EPH (C10-C12)	DETSC 3311	10	mg/kg		< 10					
EPH (C12-C16)	DETSC 3311	10	mg/kg		< 10					
EPH (C16-C21)	DETSC 3311	10	mg/kg		22					
EPH (C21-C35)	DETSC 3311	10	mg/kg		26					
EPH (C35-C40)	DETSC 3311	10	mg/kg		< 10					
EPH (C10-C40)	DETSC 3311#	10	mg/kg		51					
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		0.05					
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03					
Acenaphthene	DETSC 3303#	0.03	mg/kg		0.38					
Fluorene	DETSC 3303	0.03	mg/kg		0.20					

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228879	2228880	2228881	2228882	2228883	2228884
			.Sample ID	TT304N	TP341	TP350	TP364	TP375	TP382
			Depth	0.70	0.05	0.05	0.05	0.05	0.05
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Phenanthrene	DETSC 3303#	0.03	mg/kg	2.5					
Anthracene	DETSC 3303	0.03	mg/kg	0.47					
Fluoranthene	DETSC 3303#	0.03	mg/kg	3.9					
Pyrene	DETSC 3303#	0.03	mg/kg	3.5					
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	1.2					
Chrysene	DETSC 3303	0.03	mg/kg	1.4					
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	1.1					
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.42					
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.82					
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.24					
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.05					
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.27					
Naphthalene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acenaphthylene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acenaphthene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Fluorene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Phenanthrene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	2.3	< 1.0	< 1.0
Anthracene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Fluoranthene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	2.5	< 1.0	2.8
Pyrene	DETSC 3301	0.1	mg/kg		1.6	< 1.0	1.6	< 1.0	3.2
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chrysene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		2.6	2.8	< 1.0	< 1.0	< 1.0
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		6.4	6.4	< 1.0	< 1.0	< 1.0
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		8.3	10	< 1.0	< 1.0	< 1.0
Coronene	DETSC 3301*	0.1	mg/kg		2.0	< 1.0	< 1.0	< 1.0	< 1.0
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	16					
PAH 16 Total	DETSC 3301	1.6	mg/kg		19	19	6.4	< 1.6	6.0
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						
Subcontracted Analysis									
mass before grinding	DETSC 3401#	0.1	g						
mass of removed material	DETSC 3401#	0.1	g						
mass after grinding	DETSC 3401#	0.1	g						
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg						
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg						
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg						
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg						
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg						

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228879	2228880	2228881	2228882	2228883	2228884
			.Sample ID	TT304N	TP341	TP350	TP364	TP375	TP382
			Depth	0.70	0.05	0.05	0.05	0.05	0.05
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Test	Method	LOD	Units						
Lab No					2228885	2228886	2228887	2228888	2228889	2228890
.Sample ID					TT301N	TP315	TP365	TP368	TP369	TP392
Depth					0.05	0.10	0.10	0.10	0.10	0.50
Other ID										
Sample Type					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date					30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
Sampling Time					n/s	n/s	n/s	n/s	n/s	n/s
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m		3.0	7.0	6.0	9.0	14
Moisture Content	DETSC 1004	0.1	%		14	17	15	14	7.2
Metals										
Antimony	DETSC 2301*	1	mg/kg							
Arsenic	DETSC 2301#	0.2	mg/kg		16	37	8.9	4.4	10
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.3	0.8	0.4	0.4	0.8
Cadmium	DETSC 2301#	0.1	mg/kg		0.2	0.4	0.3	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg		17	20	21	15	26
Chromium III	DETSC 2301*	0.15	mg/kg		17	20	21	15	26
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		54	94	49	18	27
Lead	DETSC 2301#	0.3	mg/kg		66	150	70	37	45
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l						
Mercury	DETSC 2325#	0.05	mg/kg		0.19	0.16	0.07	< 0.05	0.14
Nickel	DETSC 2301#	1	mg/kg		13	30	24	14	13
Potassium	DETSC 2301*	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg		0.7	0.9	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg		30	42	26	19	35
Zinc	DETSC 2301#	1	mg/kg		91	86	96	60	55
Inorganics										
pH	DETSC 2008#		pH		5.6	8.0	6.7	7.3	7.0
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%		3.0	8.2	2.4	2.1	6.0
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l						
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l						
Sulphide	DETSC 2024*	10	mg/kg						
Sulphur as S, Total	DETSC 2320	0.01	%						
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg		15	< 10	< 10	< 10	14
EPH (C21-C35)	DETSC 3311	10	mg/kg		17	12	12	< 10	26
EPH (C35-C40)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg		35	23	21	11	44
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		0.05	< 0.03	< 0.03	0.08	0.05
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		0.11	0.07	0.05	0.08	0.17
Fluorene	DETSC 3303	0.03	mg/kg		0.06	0.04	< 0.03	0.05	0.09

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228885	2228886	2228887	2228888	2228889	2228890
				.Sample ID	TT301N	TP315	TP365	TP368	TP369	TP392
				Depth	0.05	0.10	0.10	0.10	0.10	0.50
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.63	0.53	0.32	0.52	1.3
Anthracene	DETSC 3303	0.03	mg/kg		0.11	0.09	0.05	0.09	0.22
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.69	0.83	0.46	0.62	2.0
Pyrene	DETSC 3303#	0.03	mg/kg		0.61	0.75	0.40	0.54	1.8
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.23	0.26	0.16	0.19	0.73
Chrysene	DETSC 3303	0.03	mg/kg		0.31	0.36	0.21	0.25	0.90
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.21	0.28	0.15	0.18	0.86
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.08	0.11	0.07	0.08	0.35
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.14	0.20	0.11	0.13	0.59
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.06	0.09	0.05	0.05	0.26
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	0.06
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.05	0.09	0.05	0.06	0.28
Naphthalene	DETSC 3301	0.1	mg/kg	< 1.0					
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 1.0					
Acenaphthene	DETSC 3301	0.1	mg/kg	1.5					
Fluorene	DETSC 3301	0.1	mg/kg	< 1.0					
Phenanthrene	DETSC 3301	0.1	mg/kg	8.3					
Anthracene	DETSC 3301	0.1	mg/kg	1.9					
Fluoranthene	DETSC 3301	0.1	mg/kg	11					
Pyrene	DETSC 3301	0.1	mg/kg	8.7					
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	4.1					
Chrysene	DETSC 3301	0.1	mg/kg	3.8					
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	3.7					
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	9.3					
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	4.9					
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 1.0					
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 1.0					
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 1.0					
Coronene	DETSC 3301*	0.1	mg/kg	< 1.0					
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		3.4	3.7	2.1	2.9	9.6
PAH 16 Total	DETSC 3301	1.6	mg/kg	57					
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						
Subcontracted Analysis									
mass before grinding	DETSC 3401#	0.1	g						
mass of removed material	DETSC 3401#	0.1	g						
mass after grinding	DETSC 3401#	0.1	g						
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg						
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg						
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg						
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg						
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg						

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228885	2228886	2228887	2228888	2228889	2228890
			.Sample ID	TT301N	TP315	TP365	TP368	TP369	TP392
			Depth	0.05	0.10	0.10	0.10	0.10	0.50
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Test	Method	LOD	Units	Lab No	2228891	2228892	2228893	2228897	2228898	2228899
				.Sample ID	TP398	TP403	TP495	TP344	TP357	TP366
				Depth	0.20	0.20	0.20	0.80	0.60	0.60
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/08/2023	30/08/2023	30/08/2023	31/08/2023	31/08/2023	31/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m		8.0	5.0	21	17	13	14
Moisture Content	DETSC 1004	0.1	%		15	17	12	11	12	16
Metals										
Antimony	DETSC 2301*	1	mg/kg							
Arsenic	DETSC 2301#	0.2	mg/kg		7.4	72	26	68	3.4	34
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.5	0.6	1.0	0.7	< 0.2	0.4
Cadmium	DETSC 2301#	0.1	mg/kg		0.2	1.3	0.9	0.5	0.7	0.3
Chromium	DETSC 2301#	0.15	mg/kg		13	67	28	69	21	20
Chromium III	DETSC 2301*	0.15	mg/kg		13	67	28	69	21	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		26	650	180	580	20	69
Lead	DETSC 2301#	0.3	mg/kg		48	330	180	290	34	150
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l					< 10	< 10	< 10
Mercury	DETSC 2325#	0.05	mg/kg		0.09	0.28	0.19	0.26	< 0.05	0.34
Nickel	DETSC 2301#	1	mg/kg		12	170	66	110	26	21
Potassium	DETSC 2301*	1	mg/kg							
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5	0.5	0.5	< 0.5	0.6	0.6
Vanadium	DETSC 2301#	0.8	mg/kg		21	55	29	38	26	33
Zinc	DETSC 2301#	1	mg/kg		63	350	320	310	75	130
Inorganics										
pH	DETSC 2008#		pH		5.9	6.6	9.4	7.9	6.4	8.0
Calorific Value	DETSC 5008	1	MJ/kg							
Total Organic Carbon	DETSC 2084#	0.5	%		2.9	6.3	3.5	6.7	0.5	5.1
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l					9.6	11	3.1
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l					4.1	8.5	3.9
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l					160	24	23
Sulphide	DETSC 2024*	10	mg/kg					28		79
Sulphur as S, Total	DETSC 2320	0.01	%					0.10		0.05
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	22	< 10	58
EPH (C16-C21)	DETSC 3311	10	mg/kg		< 10	21	< 10	96	< 10	240
EPH (C21-C35)	DETSC 3311	10	mg/kg		< 10	59	30	350	< 10	420
EPH (C35-C40)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	47	< 10	19
EPH (C10-C40)	DETSC 3311#	10	mg/kg		< 10	85	43	510	< 10	740
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03	0.06	< 0.03	0.23	< 0.03	0.20
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	0.07	< 0.03	0.05
Acenaphthene	DETSC 3303#	0.03	mg/kg		0.04	0.15	< 0.03	0.35	< 0.03	0.48
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03	0.10	< 0.03	0.31	< 0.03	0.26

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228891	2228892	2228893	2228897	2228898	2228899
			.Sample ID	TP398	TP403	TP495	TP344	TP357	TP366
			Depth	0.20	0.20	0.20	0.80	0.60	0.60
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	30/08/2023	30/08/2023	30/08/2023	31/08/2023	31/08/2023	31/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.27	1.1	0.03	2.1	< 0.03	2.5
Anthracene	DETSC 3303	0.03	mg/kg	0.04	0.29	< 0.03	0.42	< 0.03	0.44
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.37	2.1	0.08	2.3	< 0.03	3.5
Pyrene	DETSC 3303#	0.03	mg/kg	0.33	2.0	0.10	2.1	< 0.03	3.1
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.12	0.76	0.05	0.88	< 0.03	0.94
Chrysene	DETSC 3303	0.03	mg/kg	0.17	0.94	0.09	1.0	< 0.03	1.2
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.13	0.82	0.11	0.80	< 0.03	0.91
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.05	0.33	0.04	0.29	< 0.03	0.34
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.08	0.60	0.04	0.57	< 0.03	0.64
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.04	0.21	0.06	0.19	< 0.03	0.21
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	0.06	< 0.03	0.06
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.04	0.26	0.06	0.23	< 0.03	0.24
Naphthalene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Acenaphthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3301	0.1	mg/kg						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg						
Chrysene	DETSC 3301	0.1	mg/kg						
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg						
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg						
Coronene	DETSC 3301*	0.1	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	1.6	9.7	0.62	12	< 0.10	15
PAH 16 Total	DETSC 3301	1.6	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						
Subcontracted Analysis									
mass before grinding	DETSC 3401#	0.1	g						
mass of removed material	DETSC 3401#	0.1	g						
mass after grinding	DETSC 3401#	0.1	g						
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg						
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg						
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg						
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg						
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg						

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228891	2228892	2228893	2228897	2228898	2228899
				.Sample ID	TP398	TP403	TP495	TP344	TP357	TP366
				Depth	0.20	0.20	0.20	0.80	0.60	0.60
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/08/2023	30/08/2023	30/08/2023	31/08/2023	31/08/2023	31/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg							
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg							
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg							
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg							
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg							
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg							
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg							
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg							
chlorate	DETSC 3401#	1	mg/kg							
perchlorate	DETSC 3401#	0.5	mg/kg							
description of removed material	DETSC 3401#	n/a								

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228900	2228901	2228902	2228903	2228904	2228905
				.Sample ID	TP380	TP384	TP389	TP411	TP369	TP377
				Depth	1.10	1.50	2.20	2.00	1.60	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	15	12	7.0	11	4.0	14
Moisture Content	DETSC 1004	0.1	%	13	16	13	10	19	13
Metals										
Antimony	DETSC 2301*	1	mg/kg						
Arsenic	DETSC 2301#	0.2	mg/kg	6.1	68	12	2.8	16	3.1
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.6	1.1	0.4	0.6	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.8	0.2	0.3	0.3	0.1
Chromium	DETSC 2301#	0.15	mg/kg	7.7	71	15	29	14	12
Chromium III	DETSC 2301*	0.15	mg/kg	7.7	71	15	29	14	12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	20	340	57	19	28	12
Lead	DETSC 2301#	0.3	mg/kg	21	850	61	44	73	20
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10		< 10		< 10	
Mercury	DETSC 2325#	0.05	mg/kg	0.06	2.2	0.17	< 0.05	0.16	< 0.05
Nickel	DETSC 2301#	1	mg/kg	8.8	36	17	26	13	11
Potassium	DETSC 2301*	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.5	< 0.5	< 0.5	0.6	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	12	33	20	34	23	17
Zinc	DETSC 2301#	1	mg/kg	25	730	72	84	72	39
Inorganics										
pH	DETSC 2008#		pH	7.5	8.1	6.7	7.6	6.3	6.6
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%	1.0	5.7	2.7	0.9	3.5	1.2
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	2.7		22		2.8	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	< 1.0		20		5.5	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	< 10		20		29	
Sulphide	DETSC 2024*	10	mg/kg			20			32
Sulphur as S, Total	DETSC 2320	0.01	%			0.04			0.01
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	30	< 10	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	170	< 10	12	13	< 10
EPH (C21-C35)	DETSC 3311	10	mg/kg	< 10	460	17	20	27	< 10
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 10	32	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg	11	700	26	34	44	< 10
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.32	< 0.03	0.07	0.22	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.21	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.48	0.03	0.33	0.31	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.44	< 0.03	0.19	0.19	< 0.03

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228900	2228901	2228902	2228903	2228904	2228905
				.Sample ID	TP380	TP384	TP389	TP411	TP369	TP377
				Depth	1.10	1.50	2.20	2.00	1.60	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.11	6.4	0.25	2.0	1.5	0.06
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03	1.2	0.04	0.37	0.25	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.15	10	0.33	2.4	1.7	0.07
Pyrene	DETSC 3303#	0.03	mg/kg		0.14	9.1	0.29	2.1	1.4	0.06
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.06	3.1	0.10	0.67	0.46	0.03
Chrysene	DETSC 3303	0.03	mg/kg		0.07	3.7	0.13	0.78	0.65	0.04
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.05	3.2	0.10	0.57	0.42	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03	1.3	0.04	0.23	0.16	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.04	2.3	0.06	0.43	0.25	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03	0.81	< 0.03	0.15	0.10	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	0.17	< 0.03	0.04	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		< 0.03	1.0	< 0.03	0.15	0.09	< 0.03
Naphthalene	DETSC 3301	0.1	mg/kg							
Acenaphthylene	DETSC 3301	0.1	mg/kg							
Acenaphthene	DETSC 3301	0.1	mg/kg							
Fluorene	DETSC 3301	0.1	mg/kg							
Phenanthrene	DETSC 3301	0.1	mg/kg							
Anthracene	DETSC 3301	0.1	mg/kg							
Fluoranthene	DETSC 3301	0.1	mg/kg							
Pyrene	DETSC 3301	0.1	mg/kg							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		0.62	44	1.3	10	7.7	0.23
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg							
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g							
mass of removed material	DETSC 3401#	0.1	g							
mass after grinding	DETSC 3401#	0.1	g							
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg							
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg							
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg							
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg							
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228900	2228901	2228902	2228903	2228904	2228905
			.Sample ID	TP380	TP384	TP389	TP411	TP369	TP377
			Depth	1.10	1.50	2.20	2.00	1.60	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Test	Method	LOD	Units	Lab No	2228906	2228907	2228908	2228909	2228910	2228911
				.Sample ID	TP379	TP347	TP349	TP354	TP361	TP368
				Depth	0.40	0.90	1.00	0.60	0.10	0.50
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m		10	16	12	8.0	19	11
Moisture Content	DETSC 1004	0.1	%		13	13	9.4	12	5.2	12
Metals										
Antimony	DETSC 2301*	1	mg/kg							
Arsenic	DETSC 2301#	0.2	mg/kg		3.6	4.6	23	2.7	1.4	6.3
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.3	< 0.2	1.1	0.3	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg		0.2	0.2	1.1	< 0.1	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg		11	14	32	10	15	15
Chromium III	DETSC 2301*	0.15	mg/kg		11	14	32	10	15	15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		13	15	95	8.8	7.2	16
Lead	DETSC 2301#	0.3	mg/kg		21	24	150	12	13	36
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10	< 10			< 10	
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05	< 0.05	0.09	< 0.05	< 0.05	0.06
Nickel	DETSC 2301#	1	mg/kg		12	13	36	7.7	13	14
Potassium	DETSC 2301*	1	mg/kg							
Selenium	DETSC 2301#	0.5	mg/kg		0.5	< 0.5	0.9	0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg		16	18	66	12	17	20
Zinc	DETSC 2301#	1	mg/kg		60	65	120	38	40	70
Inorganics										
pH	DETSC 2008#		pH		7.1	6.6	9.6	9.8	8.3	7.7
Calorific Value	DETSC 5008	1	MJ/kg							
Total Organic Carbon	DETSC 2084#	0.5	%		1.0	1.0	10	0.9	< 0.5	1.6
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		2.1	3.7			2.2	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		< 1.0	< 1.0			< 1.0	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		25	14			< 10	
Sulphide	DETSC 2024*	10	mg/kg			16		20		
Sulphur as S, Total	DETSC 2320	0.01	%			< 0.01		0.02		
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg		< 10	< 10	23	< 10	< 10	< 10
EPH (C21-C35)	DETSC 3311	10	mg/kg		61	< 10	290	15	< 10	< 10
EPH (C35-C40)	DETSC 3311	10	mg/kg		< 10	< 10	87	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg		74	< 10	410	22	< 10	14
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	0.06	< 0.03	< 0.03	0.18
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		0.06	< 0.03	0.10	< 0.03	0.06	0.07
Fluorene	DETSC 3303	0.03	mg/kg		0.03	< 0.03	0.05	< 0.03	0.04	0.04

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228906	2228907	2228908	2228909	2228910	2228911
				.Sample ID	TP379	TP347	TP349	TP354	TP361	TP368
				Depth	0.40	0.90	1.00	0.60	0.10	0.50
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.33	0.07	0.87	0.03	0.53	0.41
Anthracene	DETSC 3303	0.03	mg/kg		0.05	< 0.03	0.19	< 0.03	0.08	0.07
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.39	0.09	1.4	0.05	0.83	0.53
Pyrene	DETSC 3303#	0.03	mg/kg		0.35	0.08	1.3	0.05	0.72	0.47
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.12	< 0.03	0.52	< 0.03	0.20	0.18
Chrysene	DETSC 3303	0.03	mg/kg		0.20	0.05	0.65	< 0.03	0.23	0.23
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.17	< 0.03	0.55	< 0.03	0.16	0.18
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.15	< 0.03	0.23	< 0.03	0.07	0.07
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.07	< 0.03	0.39	< 0.03	0.11	0.12
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.03	< 0.03	0.19	< 0.03	0.05	0.05
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	0.05	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.03	< 0.03	0.28	< 0.03	0.04	0.05
Naphthalene	DETSC 3301	0.1	mg/kg							
Acenaphthylene	DETSC 3301	0.1	mg/kg							
Acenaphthene	DETSC 3301	0.1	mg/kg							
Fluorene	DETSC 3301	0.1	mg/kg							
Phenanthrene	DETSC 3301	0.1	mg/kg							
Anthracene	DETSC 3301	0.1	mg/kg							
Fluoranthene	DETSC 3301	0.1	mg/kg							
Pyrene	DETSC 3301	0.1	mg/kg							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		1.9	0.29	6.8	< 0.10	3.1	2.7
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg							
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g							
mass of removed material	DETSC 3401#	0.1	g							
mass after grinding	DETSC 3401#	0.1	g							
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg							
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg							
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg							
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg							
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228906	2228907	2228908	2228909	2228910	2228911
			.Sample ID	TP379	TP347	TP349	TP354	TP361	TP368
			Depth	0.40	0.90	1.00	0.60	0.10	0.50
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg						
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg						
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg						
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg						
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg						
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg						
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg						
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg						
chlorate	DETSC 3401#	1	mg/kg						
perchlorate	DETSC 3401#	0.5	mg/kg						
description of removed material	DETSC 3401#	n/a							

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228912	2228913	2228914	2228915	2228916	2228917
				.Sample ID	TP370	TP372	TP398	TP358	TP359	TP366
				Depth	0.80	0.60	1.00	0.20	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/08/2023	31/08/2023	31/08/2023	29/08/2023	29/08/2023	29/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	7.0	8.0	5.0	36	4.0	27
Moisture Content	DETSC 1004	0.1	%	11	11	14	7.4	9.2	6.1
Metals										
Antimony	DETSC 2301*	1	mg/kg						
Arsenic	DETSC 2301#	0.2	mg/kg	9.2	18	7.2	3.7	2.4	1.4
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.2	0.2	< 0.2	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	1.2	0.2	0.3	0.2	0.1
Chromium	DETSC 2301#	0.15	mg/kg	18	20	16	21	14	7.7
Chromium III	DETSC 2301*	0.15	mg/kg	18	20	16	21	14	7.7
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	41	140	37	44	19	4.8
Lead	DETSC 2301#	0.3	mg/kg	86	57	40	28	14	11
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10		< 10	< 10		< 10
Mercury	DETSC 2325#	0.05	mg/kg	0.08	0.09	0.07	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	20	37	17	25	14	7.2
Potassium	DETSC 2301*	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg	0.6	0.8	< 0.5	0.5	< 0.5	0.5
Vanadium	DETSC 2301#	0.8	mg/kg	22	24	23	23	19	8.5
Zinc	DETSC 2301#	1	mg/kg	68	200	57	52	54	21
Inorganics										
pH	DETSC 2008#		pH	7.6	7.5	5.3	7.9	7.7	8.2
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%	1.5	1.3	2.6	1.1	0.7	< 0.5
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	2.1		2.3	2.3		2.3
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	3.3		1.4	1.6		< 1.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	15		< 10	11		< 10
Sulphide	DETSC 2024*	10	mg/kg	< 10				< 10	
Sulphur as S, Total	DETSC 2320	0.01	%	0.02				0.01	
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10	21
EPH (C21-C35)	DETSC 3311	10	mg/kg	34	31	< 10	1000	190	1100
EPH (C35-C40)	DETSC 3311	10	mg/kg	11	< 10	< 10	400	72	380
EPH (C10-C40)	DETSC 3311#	10	mg/kg	51	45	< 10	1400	260	1500
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03	0.15	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.04	0.04	0.10	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.06	< 0.03	< 0.03	< 0.03

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228912	2228913	2228914	2228915	2228916	2228917
				.Sample ID	TP370	TP372	TP398	TP358	TP359	TP366
				Depth	0.80	0.60	1.00	0.20	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/08/2023	31/08/2023	31/08/2023	29/08/2023	29/08/2023	29/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.30	0.23	0.52	< 0.03	< 0.03	0.16
Anthracene	DETSC 3303	0.03	mg/kg		0.06	0.04	0.09	< 0.03	< 0.03	0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.42	0.32	0.53	< 0.03	< 0.03	0.23
Pyrene	DETSC 3303#	0.03	mg/kg		0.38	0.29	0.47	< 0.03	< 0.03	0.21
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.16	0.13	0.16	< 0.03	< 0.03	0.08
Chrysene	DETSC 3303	0.03	mg/kg		0.25	0.16	0.19	< 0.03	< 0.03	0.08
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.19	0.13	0.15	< 0.03	< 0.03	0.06
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.07	0.05	0.06	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.12	0.08	0.11	< 0.03	< 0.03	0.05
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.06	0.03	0.04	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.08	0.04	0.04	< 0.03	< 0.03	< 0.03
Naphthalene	DETSC 3301	0.1	mg/kg							
Acenaphthylene	DETSC 3301	0.1	mg/kg							
Acenaphthene	DETSC 3301	0.1	mg/kg							
Fluorene	DETSC 3301	0.1	mg/kg							
Phenanthrene	DETSC 3301	0.1	mg/kg							
Anthracene	DETSC 3301	0.1	mg/kg							
Fluoranthene	DETSC 3301	0.1	mg/kg							
Pyrene	DETSC 3301	0.1	mg/kg							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		2.2	1.5	2.7	< 0.10	< 0.10	0.87
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg							
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g							
mass of removed material	DETSC 3401#	0.1	g							
mass after grinding	DETSC 3401#	0.1	g							
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg							
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg							
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg							
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg							
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228912	2228913	2228914	2228915	2228916	2228917
				.Sample ID	TP370	TP372	TP398	TP358	TP359	TP366
				Depth	0.80	0.60	1.00	0.20	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/08/2023	31/08/2023	31/08/2023	29/08/2023	29/08/2023	29/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg							
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg							
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg							
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg							
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg							
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg							
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg							
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg							
chlorate	DETSC 3401#	1	mg/kg							
perchlorate	DETSC 3401#	0.5	mg/kg							
description of removed material	DETSC 3401#	n/a								

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228918	2228919	2228920	2228921	2228922	2228923
				.Sample ID	TP362	TP367	TP373	TP378	TP386	TP406
				Depth	0.20	0.20	0.20	0.20	0.30	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	6.0	3.0	4.0	3.0	5.0	2.0
Moisture Content	DETSC 1004	0.1	%	13	13	16	12	16	17
Metals										
Antimony	DETSC 2301*	1	mg/kg						
Arsenic	DETSC 2301#	0.2	mg/kg	13	13	16	8.4	13	29
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3	0.3	0.3	0.3	0.4	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.2	0.3	0.2	0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg	14	13	19	8.8	11	17
Chromium III	DETSC 2301*	0.15	mg/kg	14	13	19	8.8	11	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	33	37	38	23	28	52
Lead	DETSC 2301#	0.3	mg/kg	72	76	76	47	67	110
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10		< 10		< 10
Mercury	DETSC 2325#	0.05	mg/kg	0.16	0.12	0.25	0.10	0.16	0.38
Nickel	DETSC 2301#	1	mg/kg	13	9.2	15	8.6	9.4	13
Potassium	DETSC 2301*	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg	0.8	< 0.5	1.0	0.6	0.8	1.1
Vanadium	DETSC 2301#	0.8	mg/kg	23	19	28	15	20	31
Zinc	DETSC 2301#	1	mg/kg	60	51	74	50	59	71
Inorganics										
pH	DETSC 2008#		pH	5.3	5.5	5.4	5.6	5.3	5.3
Calorific Value	DETSC 5008	1	MJ/kg						
Total Organic Carbon	DETSC 2084#	0.5	%	3.0	3.1	3.0	2.4	2.7	4.1
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		3.2		2.4		2.2
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		1.5		1.4		4.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		< 10		< 10		< 10
Sulphide	DETSC 2024*	10	mg/kg		16			24	
Sulphur as S, Total	DETSC 2320	0.01	%		0.03			0.04	
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg						
EPH (C10-C12)	DETSC 3311	10	mg/kg						
EPH (C12-C16)	DETSC 3311	10	mg/kg						
EPH (C16-C21)	DETSC 3311	10	mg/kg						
EPH (C21-C35)	DETSC 3311	10	mg/kg						
EPH (C35-C40)	DETSC 3311	10	mg/kg						
EPH (C10-C40)	DETSC 3311#	10	mg/kg						
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.05	0.21	0.09	0.34
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	0.12	0.16	0.15	0.51
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.07	0.11	0.09	0.33

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228918	2228919	2228920	2228921	2228922	2228923
				.Sample ID	TP362	TP367	TP373	TP378	TP386	TP406
				Depth	0.20	0.20	0.20	0.20	0.30	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.21	0.34	0.72	0.97	0.78	2.7
Anthracene	DETSC 3303	0.03	mg/kg		0.05	0.07	0.15	0.19	0.14	0.54
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.43	0.56	1.0	0.98	0.92	3.4
Pyrene	DETSC 3303#	0.03	mg/kg		0.40	0.51	0.92	0.86	0.82	3.0
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.18	0.21	0.37	0.34	0.31	1.2
Chrysene	DETSC 3303	0.03	mg/kg		0.21	0.22	0.41	0.38	0.35	1.3
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.23	0.22	0.37	0.32	0.26	1.1
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.09	0.08	0.13	0.10	0.10	0.38
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.14	0.16	0.25	0.21	0.18	0.75
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.06	0.07	0.10	0.09	0.07	0.26
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	0.03	< 0.03	< 0.03	0.09
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.06	0.07	0.11	0.09	0.07	0.28
Naphthalene	DETSC 3301	0.1	mg/kg							
Acenaphthylene	DETSC 3301	0.1	mg/kg							
Acenaphthene	DETSC 3301	0.1	mg/kg							
Fluorene	DETSC 3301	0.1	mg/kg							
Phenanthrene	DETSC 3301	0.1	mg/kg							
Anthracene	DETSC 3301	0.1	mg/kg							
Fluoranthene	DETSC 3301	0.1	mg/kg							
Pyrene	DETSC 3301	0.1	mg/kg							
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg							
Chrysene	DETSC 3301	0.1	mg/kg							
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg							
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg							
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg							
Coronene	DETSC 3301*	0.1	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		2.1	2.6	4.8	5.0	4.3	16
PAH 16 Total	DETSC 3301	1.6	mg/kg							
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg							
Subcontracted Analysis										
mass before grinding	DETSC 3401#	0.1	g							
mass of removed material	DETSC 3401#	0.1	g							
mass after grinding	DETSC 3401#	0.1	g							
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg							
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg							
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg							
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg							
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

				Lab No	2228918	2228919	2228920	2228921	2228922	2228923
				.Sample ID	TP362	TP367	TP373	TP378	TP386	TP406
				Depth	0.20	0.20	0.20	0.20	0.30	0.30
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	29/08/2023	29/08/2023	29/08/2023	29/08/2023	29/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg							
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg							
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg							
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg							
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg							
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg							
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg							
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg							
chlorate	DETSC 3401#	1	mg/kg							
perchlorate	DETSC 3401#	0.5	mg/kg							
description of removed material	DETSC 3401#	n/a								

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

			Lab No	2228924
			.Sample ID	TP493
			Depth	0.20
			Other ID	
			Sample Type	SOIL
			Sampling Date	30/08/2023
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Preparation				
Stones >10mm	DETSC 1003*	1	% m/m	18
Moisture Content	DETSC 1004	0.1	%	9.9
Metals				
Antimony	DETSC 2301*	1	mg/kg	
Arsenic	DETSC 2301#	0.2	mg/kg	30
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.1
Chromium	DETSC 2301#	0.15	mg/kg	21
Chromium III	DETSC 2301*	0.15	mg/kg	21
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	56
Lead	DETSC 2301#	0.3	mg/kg	81
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	29
Potassium	DETSC 2301*	1	mg/kg	
Selenium	DETSC 2301#	0.5	mg/kg	0.7
Vanadium	DETSC 2301#	0.8	mg/kg	29
Zinc	DETSC 2301#	1	mg/kg	74
Inorganics				
pH	DETSC 2008#		pH	7.9
Calorific Value	DETSC 5008	1	MJ/kg	
Total Organic Carbon	DETSC 2084#	0.5	%	1.3
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	2.4
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	10
Sulphide	DETSC 2024*	10	mg/kg	< 10
Sulphur as S, Total	DETSC 2320	0.01	%	0.08
Petroleum Hydrocarbons				
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	
EPH (C10-C12)	DETSC 3311	10	mg/kg	
EPH (C12-C16)	DETSC 3311	10	mg/kg	
EPH (C16-C21)	DETSC 3311	10	mg/kg	
EPH (C21-C35)	DETSC 3311	10	mg/kg	
EPH (C35-C40)	DETSC 3311	10	mg/kg	
EPH (C10-C40)	DETSC 3311#	10	mg/kg	
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	0.05
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.23
Fluorene	DETSC 3303	0.03	mg/kg	0.14

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Lab No	2228924
.Sample ID	TP493
Depth	0.20
Other ID	
Sample Type	SOIL
Sampling Date	30/08/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Phenanthrene	DETSC 3303#	0.03	mg/kg	1.7
Anthracene	DETSC 3303	0.03	mg/kg	0.33
Fluoranthene	DETSC 3303#	0.03	mg/kg	2.1
Pyrene	DETSC 3303#	0.03	mg/kg	1.9
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.56
Chrysene	DETSC 3303	0.03	mg/kg	0.56
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.44
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.16
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.32
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.11
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.12
Naphthalene	DETSC 3301	0.1	mg/kg	
Acenaphthylene	DETSC 3301	0.1	mg/kg	
Acenaphthene	DETSC 3301	0.1	mg/kg	
Fluorene	DETSC 3301	0.1	mg/kg	
Phenanthrene	DETSC 3301	0.1	mg/kg	
Anthracene	DETSC 3301	0.1	mg/kg	
Fluoranthene	DETSC 3301	0.1	mg/kg	
Pyrene	DETSC 3301	0.1	mg/kg	
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	
Chrysene	DETSC 3301	0.1	mg/kg	
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	
Coronene	DETSC 3301*	0.1	mg/kg	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	8.7
PAH 16 Total	DETSC 3301	1.6	mg/kg	
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	
Subcontracted Analysis				
mass before grinding	DETSC 3401#	0.1	g	
mass of removed material	DETSC 3401#	0.1	g	
mass after grinding	DETSC 3401#	0.1	g	
2,4,6-trinitrophenyl-N-methylnitramine (tetryl)	DETSC 3401#	1	mg/kg	
2,4,6-trinitrotoluene (2,4,6-TNT)	DETSC 3401#	0.5	mg/kg	
2,4-dinitrotoluene (2,4-DNT)	DETSC 3401#	1	mg/kg	
2,6-dinitrotoluene (2,6-DNT)	DETSC 3401#	1	mg/kg	
cyclo-1,3,5-trimethylene-2,4,6-trinitramine (hexogen, RDX)	DETSC 3401#	1	mg/kg	

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Lab No	2228924
.Sample ID	TP493
Depth	0.20
Other ID	
Sample Type	SOIL
Sampling Date	30/08/2023
Sampling Time	n/s

Test	Method	LOD	Units	
cyclotetramethylenetetranitramine (HMX)	DETSC 3401#	1	mg/kg	
hexanitrostilbene (HNS)	DETSC 3401#	0.5	mg/kg	
pentaerythritol tetranitrate (PETN)	DETSC 3401#	5	mg/kg	
2,4,6-trinitrophenol (picric acid)	DETSC 3401#	0.1	mg/kg	
picrite (nitroguanidine)	DETSC 3401#	0.1	mg/kg	
ethylene glycol dinitrate (EGDN)	DETSC 3401#	0.1	mg/kg	
nitroglycerine (NG)	DETSC 3401#	0.1	mg/kg	
nitrocellulose (NC)	DETSC 3401#	5000	mg/kg	
chlorate	DETSC 3401#	1	mg/kg	
perchlorate	DETSC 3401#	0.5	mg/kg	
description of removed material	DETSC 3401#	n/a		

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Lab No	Sample ID	Sample Location	Material Type*	Result	Comment*	Analyst
2228849	TP341 0.30		SOIL	NAD	none	Robertas Ciparis
2228850	TP343 0.50		SOIL	NAD	none	Robertas Ciparis
2228851	TP349 0.40		SOIL	NAD	none	Robertas Ciparis
2228852	TP350 0.15		SOIL	NAD	none	Robertas Ciparis
2228853	TP353 0.40		SOIL	Amosite	Amosite present as fibre bundles	Robertas Ciparis
2228854	TP374 0.30		SOIL	NAD	none	Robertas Ciparis
2228855	TP410 3.20		SOIL	NAD	none	Robertas Ciparis
2228856	TT301N 0.40		SOIL	NAD	none	Robertas Ciparis
2228857	TP314 0.70		SOIL	NAD	none	Robertas Ciparis
2228858	TP348 0.10		SOIL	NAD	none	Robertas Ciparis
2228859	TP349 0.40		SOIL	NAD	none	Robertas Ciparis
2228861	TP360 0.35		SOIL	NAD	none	Robertas Ciparis
2228863	TP376 0.30		SOIL	NAD	none	Robertas Ciparis
2228865	TP381 0.20		SOIL	NAD	none	Robertas Ciparis
2228866	TP382 0.20		SOIL	NAD	none	Robertas Ciparis
2228868	TP383 0.60		SOIL	NAD	none	Robertas Ciparis
2228869	TP385 0.50		SOIL	NAD	none	Robertas Ciparis
2228870	TP390 0.70		SOIL	Chrysotile	Chrysotile present in microscopic insulation debris	Robertas Ciparis
2228871	TP390 1.50		SOIL	NAD	none	Robertas Ciparis
2228872	TP391W 0.90		SOIL	NAD	none	Robertas Ciparis
2228874	TP399 0.10		SOIL	NAD	none	Robertas Ciparis
2228875	TP410 0.10		SOIL	NAD	none	Robertas Ciparis
2228877	TP411 0.30		SOIL	NAD	none	Robertas Ciparis
2228879	TT304N 0.70		SOIL	NAD	none	Robertas Ciparis
2228886	TP315 0.10		SOIL	NAD	none	Robertas Ciparis
2228887	TP365 0.10		SOIL	NAD	none	Robertas Ciparis
2228888	TP368 0.10		SOIL	NAD	none	Robertas Ciparis
2228889	TP369 0.10		SOIL	NAD	none	Robertas Ciparis
2228890	TP392 0.50		SOIL	NAD	none	Robertas Ciparis
2228891	TP398 0.20		SOIL	NAD	none	Robertas Ciparis
2228892	TP403 0.20		SOIL	NAD	none	Robertas Ciparis
2228893	TP495 0.20		SOIL	Chrysotile Amosite	Chrysotile and Amosite present as fibre bundles	Robertas Ciparis
2228894	TP342 1.10		Cement	Chrysotile	none	Robertas Ciparis
2228895	TP344 1.30		Cement	Chrysotile	none	Robertas Ciparis
2228896	TP388 0.10		Cement	Chrysotile	none	Robertas Ciparis
2228897	TP344 0.80		SOIL	NAD	none	Robertas Ciparis
2228898	TP357 0.60		SOIL	NAD	none	Robertas Ciparis
2228899	TP366 0.60		SOIL	NAD	none	Robertas Ciparis
2228900	TP380 1.10		SOIL	NAD	none	Robertas Ciparis
2228901	TP384 1.50		SOIL	NAD	none	Robertas Ciparis
2228902	TP389 2.20		SOIL	NAD	none	Robertas Ciparis
2228903	TP411 2.00		SOIL	NAD	none	Robertas Ciparis
2228904	TP369 1.60		SOIL	NAD	none	Robertas Ciparis
2228905	TP377 0.20		SOIL	NAD	none	Robertas Ciparis
2228906	TP379 0.40		SOIL	NAD	none	Robertas Ciparis

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-21123
Client Ref 4486
Contract Title Black Cats

Lab No	Sample ID	Sample Location	Material Type*	Result	Comment*	Analyst
2228907	TP347 0.90		SOIL	NAD	none	Robertas Ciparis
2228908	TP349 1.00		SOIL	NAD	none	Robertas Ciparis
2228909	TP354 0.60		SOIL	NAD	none	Robertas Ciparis
2228910	TP361 0.10		SOIL	NAD	none	Robertas Ciparis
2228911	TP368 0.50		SOIL	NAD	none	Robertas Ciparis
2228912	TP370 0.80		SOIL	NAD	none	Robertas Ciparis
2228913	TP372 0.60		SOIL	NAD	none	Robertas Ciparis
2228914	TP398 1.00		SOIL	NAD	none	Robertas Ciparis
2228915	TP358 0.20		SOIL	NAD	none	Robertas Ciparis
2228916	TP359 0.20		SOIL	NAD	none	Robertas Ciparis
2228917	TP366 0.20		SOIL	NAD	none	Robertas Ciparis
2228918	TP362 0.20		SOIL	NAD	none	Robertas Ciparis
2228919	TP367 0.20		SOIL	NAD	none	Robertas Ciparis
2228920	TP373 0.20		SOIL	NAD	none	Robertas Ciparis
2228921	TP378 0.20		SOIL	NAD	none	Robertas Ciparis
2228922	TP386 0.30		SOIL	NAD	none	Robertas Ciparis
2228923	TP406 0.30		SOIL	NAD	none	Robertas Ciparis
2228924	TP493 0.20		SOIL	NAD	none	Robertas Ciparis

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-21123
Client Ref 4486
Contract Black Cats

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2228849	TP341 0.30 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228850	TP343 0.50 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228851	TP349 0.40 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228852	TP350 0.15 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228853	TP353 0.40 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228854	TP374 0.30 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228855	TP410 3.20 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228856	TT301N 0.40 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228857	TP314 0.70 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228858	TP348 0.10 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228859	TP349 0.40 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228860	TP351 0.30 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228861	TP360 0.35 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228862	TP364 0.40 SOIL	01/09/23	GJ 250ml, GJ 60ml, PT 1L		
2228863	TP376 0.30 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228864	TP380 0.30 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days)	
2228865	TP381 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228866	TP382 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228867	TP383 0.10 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days)	
2228868	TP383 0.60 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228869	TP385 0.50 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2228870	TP390 0.70 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228871	TP390 1.50 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228872	TP391W 0.90 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2228873	TP397 0.50 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days)	
2228874	TP399 0.10 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228875	TP410 0.10 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228876	TP410 0.40 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228877	TP411 0.30 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228878	TT302W 0.30 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228879	TT304N 0.70 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228880	TP341 0.05 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228881	TP350 0.05 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228882	TP364 0.05 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228883	TP375 0.05 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228884	TP382 0.05 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228885	TT301N 0.05 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228886	TP315 0.10 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228887	TP365 0.10 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228888	TP368 0.10 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228889	TP369 0.10 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228890	TP392 0.50 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228891	TP398 0.20 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228892	TP403 0.20 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		

Information in Support of the Analytical Results

Our Ref 23-21123
Client Ref 4486
Contract Black Cats

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2228893	TP495 0.20 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228894	TP342 1.10 MISC	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228895	TP344 1.30 MISC	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228896	TP388 0.10 MISC	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228897	TP344 0.80 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228898	TP357 0.60 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228899	TP366 0.60 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228900	TP380 1.10 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228901	TP384 1.50 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228902	TP389 2.20 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228903	TP411 2.00 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228904	TP369 1.60 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228905	TP377 0.20 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228906	TP379 0.40 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228907	TP347 0.90 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228908	TP349 1.00 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228909	TP354 0.60 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228910	TP361 0.10 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228911	TP368 0.50 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228912	TP370 0.80 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228913	TP372 0.60 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228914	TP398 1.00 SOIL	31/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228915	TP358 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228916	TP359 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2228917	TP366 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228918	TP362 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228919	TP367 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2228920	TP373 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228921	TP378 0.20 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2228922	TP386 0.30 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2228923	TP406 0.30 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2228924	TP493 0.20 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Information in Support of the Analytical Results

Our Ref 23-21123
Client Ref 4486
Contract Black Cats

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number 23-21621 *Issued:* 26-Sep-23

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference 23-21621

Client Reference 4486

Order No PO21200

Contract Title Black Cats

Description 8 Soil samples, 1 Misc sample.

Date Received 11-Sep-23

Date Started 11-Sep-23

Date Completed 26-Sep-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21621
Client Ref 4486
Contract Title Black Cats

				Lab No	2231671	2231672	2231673	2231674	2231676	2231677
				.Sample ID	TP413	TP414	TP415	TP417	TP418	TP401
				Depth	0.50	1.00	0.80	1.40	0.60	0.40
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Moisture Content	DETSC 1004	0.1	%	13	10	7.7	16	14	12
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	31	13	8.4	12	39	11
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4	0.3	0.8	2.2	0.3	0.5
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.1	1.0	0.2	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	16	17	30	23	16	17
Chromium III	DETSC 2301*	0.15	mg/kg	16	17	30	23	16	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	69	55	55	770	56	47
Lead	DETSC 2301#	0.3	mg/kg	350	190	99	250	540	90
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10		20	< 10	
Mercury	DETSC 2325#	0.05	mg/kg	0.18	0.27	0.05	0.10	0.31	0.22
Nickel	DETSC 2301#	1	mg/kg	18	14	15	19	16	14
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	31	22	33	22	25	26
Zinc	DETSC 2301#	1	mg/kg	110	140	72	630	110	60
Inorganics										
pH	DETSC 2008#		pH	8.4	8.6	10.7	9.6	9.9	8.1
Total Organic Carbon	DETSC 2084#	0.5	%	4.6	2.3	1.7	2.1	4.4	2.0
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		4.3		35	6.8	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		1.7		8.6	2.2	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		42		130	83	
Sulphide	DETSC 2024*	10	mg/kg		87		71	71	
Sulphur as S, Total	DETSC 2320	0.01	%		0.05		0.11	0.05	
Petroleum Hydrocarbons										
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	16	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	49	98	< 10	< 10	22
EPH (C16-C21)	DETSC 3311	10	mg/kg	47	410	470	36	65	100
EPH (C21-C35)	DETSC 3311	10	mg/kg	110	1000	930	130	260	190
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 10	170	89	23	31	19
EPH (C10-C40)	DETSC 3311#	10	mg/kg	170	1700	1600	190	360	340
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	0.14	0.29	0.29	0.07	4.5	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	0.03	< 0.03	0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.29	0.92	0.55	0.14	2.0	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	0.18	0.87	0.42	0.10	1.8	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	1.6	6.0	3.0	0.95	8.2	0.18
Anthracene	DETSC 3303	0.03	mg/kg	0.33	1.6	0.78	0.24	2.9	0.05
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.9	6.5	3.3	1.4	7.2	0.29

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21621
Client Ref 4486
Contract Title Black Cats

			Lab No	2231671	2231672	2231673	2231674	2231676	2231677
			.Sample ID	TP413	TP414	TP415	TP417	TP418	TP401
			Depth	0.50	1.00	0.80	1.40	0.60	0.40
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Pyrene	DETSC 3303#	0.03	mg/kg	1.7	5.5	2.9	1.3	6.5	0.25
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.60	1.9	1.2	0.50	2.6	0.13
Chrysene	DETSC 3303	0.03	mg/kg	0.69	1.9	1.2	0.53	2.7	0.11
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.56	1.5	1.0	0.46	2.0	0.11
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.20	0.58	0.33	0.15	0.77	0.05
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.42	1.2	0.81	0.34	1.7	0.09
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.14	0.37	0.26	0.13	0.53	0.04
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.05	0.12	0.09	0.04	0.15	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.15	0.44	0.33	0.17	0.58	0.05
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	8.9	30	17	6.5	44	1.4

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21621
Client Ref 4486
Contract Title Black Cats

			Lab No	2231680	2231684
			.Sample ID	TP402	TP412
			Depth	4.50	0.40
			Other ID		
			Sample Type	SOIL	SOIL
			Sampling Date	29/08/2023	30/08/2023
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Preparation					
Stones >10mm	DETSC 1003*	1	% m/m	< 1.0	< 1.0
Moisture Content	DETSC 1004	0.1	%	16	5.1
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	12	3.0
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg	20	11
Chromium III	DETSC 2301*	0.15	mg/kg	20	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	81	7.1
Lead	DETSC 2301#	0.3	mg/kg	96	12
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10
Mercury	DETSC 2325#	0.05	mg/kg	0.11	< 0.05
Nickel	DETSC 2301#	1	mg/kg	21	10
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	28	15
Zinc	DETSC 2301#	1	mg/kg	96	29
Inorganics					
pH	DETSC 2008#		pH	8.2	8.2
Total Organic Carbon	DETSC 2084#	0.5	%	2.4	< 0.5
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		3.6
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		< 1.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		< 10
Sulphide	DETSC 2024*	10	mg/kg		24
Sulphur as S, Total	DETSC 2320	0.01	%		< 0.01
Petroleum Hydrocarbons					
EPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	23	< 10
EPH (C21-C35)	DETSC 3311	10	mg/kg	53	11
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg	85	17
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.07	0.06
Fluorene	DETSC 3303	0.03	mg/kg	0.06	0.04
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.49	0.45
Anthracene	DETSC 3303	0.03	mg/kg	0.13	0.10
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.51	0.82

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-21621
Client Ref 4486
Contract Title Black Cats

			Lab No	2231680	2231684
			.Sample ID	TP402	TP412
			Depth	4.50	0.40
			Other ID		
			Sample Type	SOIL	SOIL
			Sampling Date	29/08/2023	30/08/2023
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Pyrene	DETSC 3303#	0.03	mg/kg	0.42	0.74
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.17	0.36
Chrysene	DETSC 3303	0.03	mg/kg	0.15	0.36
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.11	0.33
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	0.13
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.10	0.28
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.03	0.09
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.04	0.12
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	2.3	3.9

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-21621
Client Ref 4486
Contract Title Black Cats

Lab No	Sample ID	Sample Location	Material Type*	Result	Comment*	Analyst
2231671	TP413 0.50		SOIL	Chrysotile	Chrysotile present in microscopic insulation residue	Barry Kelly
2231672	TP414 1.00		SOIL	Chrysotile	Chrysotile present in microscopic insulation debris	Barry Kelly
2231673	TP415 0.80		SOIL	NAD	none	Barry Kelly
2231674	TP417 1.40		SOIL	Chrysotile	Chrysotile present in brown microscopic insulation residue	Barry Kelly
2231675	TP417 1.60		Cement	Chrysotile	Chrysotile present in cement roof sheet	Barry Kelly
2231676	TP418 0.60		SOIL	NAD	none	Barry Kelly
2231677	TP401 0.40		SOIL	NAD	none	Barry Kelly
2231680	TP402 4.50		SOIL	NAD	none	Barry Kelly
2231684	TP412 0.40		SOIL	Chrysotile	Chrysotile present in microscopic insulation debris	Barry Kelly

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-21621
Client Ref 4486
Contract Black Cats

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2231671	TP413 0.50 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2231672	TP414 1.00 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2231673	TP415 0.80 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2231674	TP417 1.40 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2231675	TP417 1.60 MISC	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2231676	TP418 0.60 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2231677	TP401 0.40 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2231678	TP402 0.30 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2231679	TP401 1.00 SOIL	29/08/23	PT 1L		
2231680	TP402 4.50 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2231681	TP408 0.10 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L		
2231682	TP408 0.80 SOIL	29/08/23	GJ 250ml, GJ 60ml, PT 1L		
2231683	TP412 0.20 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L		
2231684	TP412 0.40 SOIL	30/08/23	GJ 250ml, GJ 60ml, PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-23453,23-23452,23-23451	*Issued:*	13-Nov-23

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference	23-23453,23-23452,23-23451
Client Reference	4486
Order No	PO21200
Contract Title	Black Cats
Description	11 Soil samples.
Date Received	11-Sep-23
Date Started	03-Oct-23
Date Completed	13-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Asbestos Analysis

Samples

Our Ref 23-23453,23-23452,23-23451
Client Ref 4486
Contract Title Black Cats

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Asbestos Quantification Analysis
Soil Samples

Our Ref 23-23453,23-23452,23-23451
Client Ref 4486
Contract Title Black Cats

			Lab No	2242335	2242336	2242337	2242338
			.Sample ID	TP306	TP322	TP301	TP306
			Depth	0.55	0.60	0.60	0.40
			Other ID	2	2	2	1
			Sample Type				
			Sampling Date	24/08/2023	25/08/2023	24/08/2023	24/08/2023
			Sampling Time				
Test	**Method**	**Units**					
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %		**0.005**	**< 0.001**	**0.001**	**0.002**
Gravimetric Quantification (a)	DETSC 1102	Mass %		na	na	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %		0.005	<0.001	0.001	0.002
Quantification by PCOM (c)	DETSC 1102	Mass %		na	na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g		na	na	na	na
Breakdown of Gravimetric Analysis (a)							
Mass of Sample		g		353.34	584.28	908.85	681.73
ACMs present*		type					
Mass of ACM in sample		g					
% ACM by mass		%					
% asbestos in ACM		%					
% asbestos in sample		%					
Breakdown of Detailed Gravimetric Analysis (b)							
% Amphibole bundles in sample		Mass %		<0.001	na	na	na
% Chrysotile bundles in sample		Mass %		0.004	<0.001	0.001	0.002
Breakdown of PCOM Analysis (c)							
% Amphibole fibres in sample		Mass %		na	na	na	na
% Chrysotile fibres in sample		Mass %		na	na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)							
Amphibole fibres		Fibres/g		na	na	na	na
Chrysotile fibres		Fibres/g		na	na	na	na

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
# denotes deviating sample

Information in Support of the Analytical Results

Our Ref 23-23453,23-23452,23-23451
Client Ref 4486
Contract Black Cats

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2242335	TP306 0.55 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L		
2242336	TP322 0.60 SOIL	25/08/23	GJ 250ml, GJ 60ml, PT 1L		
2242337	TP301 0.60 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L		
2242338	TP306 0.40 SOIL	24/08/23	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

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Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-23455	*Issued:*	18-Oct-23

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference	23-23455
Client Reference	4486
Order No	21171/4486/CC
Contract Title	Black Cats
Description	One Soil sample.
Date Received	01-Sep-23
Date Started	03-Oct-23
Date Completed	18-Oct-23
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-23455
Client Ref 4486
Contract Title Black Cats

			Lab No	2242339
			.Sample ID	TP301
			Depth	0.05
			Other ID	1
			Sample Type	SOIL
			Sampling Date	24/08/2023
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Preparation				
Stones >10mm	DETSC 1003*	1	% m/m	50
Moisture Content	DETSC 1004	0.1	%	1.1
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	69
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	710
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	1400
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	2100
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	4300
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	23
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	510
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	1500
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	4400
Aromatic C5-C35	DETSC 3072*	10	mg/kg	6400
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	11000
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 23-23455
Client Ref 4486
Contract Black Cats

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2242339	TP301 0.05 SOIL	24/08/23	GJ 250ml		BTEX / C5-C10

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-26199	*Issued:*	17-Nov-23

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference	23-26199
Client Reference	4486
Order No	21489/4486jbr
Contract Title	Black Cats
Description	56 Soil samples.
Date Received	07-Nov-23
Date Started	07-Nov-23
Date Completed	17-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258832	2258833	2258834	2258835	2258836	2258837
				.Sample ID	TP538	TP547	TP549	TP501	TP505	TP509
				Depth	0.70	0.50	0.50	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	02/11/2023	03/11/2023	03/11/2023	31/10/2023	30/10/2023	31/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	< 1.0	52	12	4.0	10	9.0
Moisture Content	DETSC 1004	0.1	%	19	11	16	21	20	17
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	2.8	3.3	3.2	13	12	13
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.2	< 0.2	< 0.2	0.3	0.3	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	0.3	0.2
Chromium	DETSC 2301#	0.15	mg/kg	6.5	12	4.6	18	11	7.1
Chromium III	DETSC 2301*	0.15	mg/kg	6.5	12	4.6	18	11	7.1
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	9.8	8.1	8.2	46	21	25
Lead	DETSC 2301#	0.3	mg/kg	15	13	12	83	49	58
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10	< 10	< 10			
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.16	0.16	0.12
Nickel	DETSC 2301#	1	mg/kg	4.7	6.9	2.1	13	8.4	5.8
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	12	14	9.8	23	17	15
Zinc	DETSC 2301#	1	mg/kg	16	28	21	84	55	39
Inorganics										
pH	DETSC 2008#		pH	5.8	6.1	5.6	5.3	5.8	5.5
Total Organic Carbon	DETSC 2084#	0.5	%	2.1	1.0	2.2	3.3	3.3	3.5
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	6.4	3.6	3.9			
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	< 1.0	< 1.0	< 1.0			
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	89	13	18			
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10			
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	< 10			
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	< 10	< 10			
EPH (C21-C35)	DETSC 3311	10	mg/kg	< 10	< 10	< 10			
EPH (C35-C40)	DETSC 3311	10	mg/kg	< 10	< 10	< 10			
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	< 10			
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.07	< 0.03	0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.09	< 0.03	0.08
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.06	< 0.03	0.05
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.89	0.10	0.46
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.13	< 0.03	0.11
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	1.4	0.18	0.72
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	1.5	0.15	0.61
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.41	0.06	0.22
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.57	0.06	0.27

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258832	2258833	2258834	2258835	2258836	2258837
				.Sample ID	TP538	TP547	TP549	TP501	TP505	TP509
				Depth	0.70	0.50	0.50	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	02/11/2023	03/11/2023	03/11/2023	31/10/2023	30/10/2023	31/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	0.31	0.05	0.21
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	0.12	< 0.03	0.06
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	0.23	0.04	0.15
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	0.07	< 0.03	0.05
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	0.08	< 0.03	0.05
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		< 0.10	< 0.10	< 0.10	5.9	0.63	3.0

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258838	2258839	2258840	2258841	2258842	2258843
				.Sample ID	TP513	TP515	TP517	TP521	TP525	TP527
				Depth	0.10	0.10	0.10	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/11/2023	01/11/2023	01/11/2023	01/11/2023	01/11/2023	02/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	3.0	8.0	3.0	1.0	< 1.0	< 1.0
Moisture Content	DETSC 1004	0.1	%	17	20	17	17	17	18
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	16	16	12	15	17	22
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3	0.3	0.2	0.4	0.3	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.3	0.2	0.2	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	9.2	18	8.8	8.4	12	20
Chromium III	DETSC 2301*	0.15	mg/kg	9.2	18	8.8	8.4	12	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	25	30	23	23	33	51
Lead	DETSC 2301#	0.3	mg/kg	54	63	53	60	130	95
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l						
Mercury	DETSC 2325#	0.05	mg/kg	0.15	0.15	0.14	0.14	0.19	0.29
Nickel	DETSC 2301#	1	mg/kg	6.9	11	5.0	5.5	9.1	15
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	19	28	16	18	21	32
Zinc	DETSC 2301#	1	mg/kg	48	80	37	38	49	74
Inorganics										
pH	DETSC 2008#		pH	6.0	5.6	5.7	5.6	6.4	5.4
Total Organic Carbon	DETSC 2084#	0.5	%	3.0	2.4	2.9	3.7	3.8	6.7
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l						
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l						
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg						
EPH (C10-C12)	DETSC 3311	10	mg/kg						
EPH (C12-C16)	DETSC 3311	10	mg/kg						
EPH (C16-C21)	DETSC 3311	10	mg/kg						
EPH (C21-C35)	DETSC 3311	10	mg/kg						
EPH (C35-C40)	DETSC 3311	10	mg/kg						
EPH (C10-C40)	DETSC 3311#	10	mg/kg						
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	0.07	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.12	< 0.03	< 0.03	0.05	0.10	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	0.08	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.63	0.17	0.06	0.34	0.80	0.07
Anthracene	DETSC 3303	0.03	mg/kg	0.13	0.03	< 0.03	0.07	0.18	0.07
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.84	0.33	0.12	0.60	1.9	0.11
Pyrene	DETSC 3303#	0.03	mg/kg	0.73	0.29	0.10	0.53	1.7	0.09
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.27	0.10	0.04	0.19	0.69	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.25	0.10	0.04	0.23	0.72	0.05

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258838	2258839	2258840	2258841	2258842	2258843
				.Sample ID	TP513	TP515	TP517	TP521	TP525	TP527
				Depth	0.10	0.10	0.10	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/11/2023	01/11/2023	01/11/2023	01/11/2023	01/11/2023	02/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.22	0.11	0.04	0.20	1.0	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.08	0.04	< 0.03	0.07	0.35	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.18	0.08	< 0.03	0.14	0.73	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.05	< 0.03	< 0.03	0.06	0.41	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	0.07	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.06	0.04	< 0.03	0.06	0.51	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		3.7	1.2	0.35	2.5	9.1	0.39

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258844	2258845	2258846	2258847	2258848	2258849
				.Sample ID	TP531	TP533	TP537	TP541	TP543	TP545
				Depth	0.10	0.10	0.10	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	02/11/2023	02/11/2023	02/11/2023	03/11/2023	03/11/2023	03/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	5.0	2.0	6.0	5.0	8.0	7.0
Moisture Content	DETSC 1004	0.1	%	15	18	18	17	17	15
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	9.7	14	10	15	21	18
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3	0.3	0.3	0.2	0.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.2	< 0.1	0.2	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	15	18	16	14	16	16
Chromium III	DETSC 2301*	0.15	mg/kg	15	18	16	14	16	16
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	17	24	15	28	33	30
Lead	DETSC 2301#	0.3	mg/kg	46	62	34	54	71	68
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l						
Mercury	DETSC 2325#	0.05	mg/kg	0.09	0.20	0.05	0.15	0.20	0.17
Nickel	DETSC 2301#	1	mg/kg	13	11	9.1	7.4	7.7	8.9
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	22	26	23	20	21	21
Zinc	DETSC 2301#	1	mg/kg	67	82	37	55	58	95
Inorganics										
pH	DETSC 2008#		pH	6.5	5.8	5.6	5.7	6.1	6.0
Total Organic Carbon	DETSC 2084#	0.5	%	1.9	2.6	3.5	3.3	3.7	4.9
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l						
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l						
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg						
EPH (C10-C12)	DETSC 3311	10	mg/kg						
EPH (C12-C16)	DETSC 3311	10	mg/kg						
EPH (C16-C21)	DETSC 3311	10	mg/kg						
EPH (C21-C35)	DETSC 3311	10	mg/kg						
EPH (C35-C40)	DETSC 3311	10	mg/kg						
EPH (C10-C40)	DETSC 3311#	10	mg/kg						
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.07
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.05
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.20	0.20	0.11	0.17	0.21	0.41
Anthracene	DETSC 3303	0.03	mg/kg	0.19	< 0.03	< 0.03	0.16	< 0.03	0.09
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.36	0.31	0.20	0.28	0.36	0.55
Pyrene	DETSC 3303#	0.03	mg/kg	0.32	0.28	0.18	0.25	0.32	0.47
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.10	0.07	0.05	0.07	0.10	0.14
Chrysene	DETSC 3303	0.03	mg/kg	0.15	0.13	0.09	0.13	0.16	0.21

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258844	2258845	2258846	2258847	2258848	2258849
				.Sample ID	TP531	TP533	TP537	TP541	TP543	TP545
				Depth	0.10	0.10	0.10	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	02/11/2023	02/11/2023	02/11/2023	03/11/2023	03/11/2023	03/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.12	0.09	0.07	0.09	0.12	0.14
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.04	0.04	0.03	0.04	0.05	0.05
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.09	0.07	0.05	0.07	0.09	0.11
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.04	0.03	< 0.03	< 0.03	0.04	0.05
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.04	< 0.03	< 0.03	< 0.03	< 0.03	0.04
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		1.6	1.2	0.75	1.2	1.5	2.4

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258850	2258851	2258852	2258853	2258854	2258855
				.Sample ID	TP600	TP601	TP602	TP603	TP604	TP605
				Depth	0.10	0.10	0.10	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/10/2023	30/10/2023	30/10/2023	30/10/2023	30/10/2023	30/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	10	4.0	4.0	12	6.0	8.0
Moisture Content	DETSC 1004	0.1	%	16	17	17	18	17	17
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	12	16	18	20	20	21
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.2	0.2	0.2	< 0.2	< 0.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.2	0.3	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	11	16	15	17	17	16
Chromium III	DETSC 2301*	0.15	mg/kg	11	16	15	17	17	16
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	27	36	33	38	46	42
Lead	DETSC 2301#	0.3	mg/kg	47	59	70	84	92	92
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l						
Mercury	DETSC 2325#	0.05	mg/kg	0.11	0.30	0.23	0.21	0.21	0.22
Nickel	DETSC 2301#	1	mg/kg	8.2	11	8.3	9.6	9.4	10
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.5	0.7	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	20	24	21	23	23	24
Zinc	DETSC 2301#	1	mg/kg	58	58	87	56	77	78
Inorganics										
pH	DETSC 2008#		pH	4.9	5.2	5.0	5.0	5.0	5.0
Total Organic Carbon	DETSC 2084#	0.5	%	3.1	4.0	4.5	4.9	5.8	5.5
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l						
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l						
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg						
EPH (C10-C12)	DETSC 3311	10	mg/kg						
EPH (C12-C16)	DETSC 3311	10	mg/kg						
EPH (C16-C21)	DETSC 3311	10	mg/kg						
EPH (C21-C35)	DETSC 3311	10	mg/kg						
EPH (C35-C40)	DETSC 3311	10	mg/kg						
EPH (C10-C40)	DETSC 3311#	10	mg/kg						
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.04	0.06	< 0.03	0.03	0.05	0.04
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.04	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.32	0.43	0.08	0.29	0.42	0.33
Anthracene	DETSC 3303	0.03	mg/kg	0.06	0.08	0.08	0.06	0.08	0.06
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.54	0.56	0.12	0.48	0.73	0.53
Pyrene	DETSC 3303#	0.03	mg/kg	0.47	0.49	0.10	0.43	0.66	0.47
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.13	0.13	< 0.03	0.13	0.22	0.13
Chrysene	DETSC 3303	0.03	mg/kg	0.20	0.19	0.05	0.19	0.27	0.19

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258850	2258851	2258852	2258853	2258854	2258855
				.Sample ID	TP600	TP601	TP602	TP603	TP604	TP605
				Depth	0.10	0.10	0.10	0.10	0.10	0.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/10/2023	30/10/2023	30/10/2023	30/10/2023	30/10/2023	30/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.14	0.12	< 0.03	0.14	0.25	0.14
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.06	0.06	< 0.03	0.06	0.09	0.05
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.11	0.07	< 0.03	0.11	0.15	0.10
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.04	0.03	< 0.03	0.04	0.08	0.04
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.04	< 0.03	< 0.03	0.04	0.07	0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		2.2	2.2	0.43	2.0	3.1	2.1

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258856	2258857	2258858	2258859	2258860	2258861
				.Sample ID	TP606	TP607	TP608	TP609	TP611	TP500
				Depth	0.10	0.10	0.10	0.10	0.20	1.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/10/2023	30/10/2023	30/10/2023	30/10/2023	30/10/2023	31/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m	1.0	< 1.0	< 1.0	2.0	2.0	
Moisture Content	DETSC 1004	0.1	%	19	19	17	18	19	
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	15	17	16	22	26	
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3	0.3	< 0.2	< 0.2	0.3	
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.3	0.3	0.5	
Chromium	DETSC 2301#	0.15	mg/kg	13	24	14	28	32	
Chromium III	DETSC 2301*	0.15	mg/kg	13	24	14	28	32	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	29	38	30	43	71	
Lead	DETSC 2301#	0.3	mg/kg	69	82	73	100	110	
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l						
Mercury	DETSC 2325#	0.05	mg/kg	0.18	0.32	0.19	0.27	0.32	
Nickel	DETSC 2301#	1	mg/kg	8.6	11	9.2	13	18	
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.5	< 0.5	0.5	0.9	
Vanadium	DETSC 2301#	0.8	mg/kg	21	25	21	31	37	
Zinc	DETSC 2301#	1	mg/kg	89	94	69	85	110	
Inorganics										
pH	DETSC 2008#		pH	5.2	5.2	5.3	5.3	5.7	6.4
Total Organic Carbon	DETSC 2084#	0.5	%	4.9	4.0	4.3	3.0	4.2	
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l						
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l						< 10
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg						
EPH (C10-C12)	DETSC 3311	10	mg/kg						
EPH (C12-C16)	DETSC 3311	10	mg/kg						
EPH (C16-C21)	DETSC 3311	10	mg/kg						
EPH (C21-C35)	DETSC 3311	10	mg/kg						
EPH (C35-C40)	DETSC 3311	10	mg/kg						
EPH (C10-C40)	DETSC 3311#	10	mg/kg						
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.27	0.06	0.13	0.06	0.13	
Fluorene	DETSC 3303	0.03	mg/kg	0.15	0.04	0.06	0.03	0.07	
Phenanthrene	DETSC 3303#	0.03	mg/kg	1.9	0.46	0.87	0.44	0.92	
Anthracene	DETSC 3303	0.03	mg/kg	0.37	0.09	0.18	0.08	0.19	
Fluoranthene	DETSC 3303#	0.03	mg/kg	2.7	0.68	1.2	0.60	1.3	
Pyrene	DETSC 3303#	0.03	mg/kg	2.3	0.60	1.1	0.52	1.1	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.71	0.17	0.28	0.14	0.34	
Chrysene	DETSC 3303	0.03	mg/kg	0.71	0.23	0.31	0.20	0.35	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258856	2258857	2258858	2258859	2258860	2258861
				.Sample ID	TP606	TP607	TP608	TP609	TP611	TP500
				Depth	0.10	0.10	0.10	0.10	0.20	1.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/10/2023	30/10/2023	30/10/2023	30/10/2023	30/10/2023	31/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.57	0.17	0.21	0.13	0.27	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.20	0.07	0.09	0.05	0.11	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.42	0.13	0.16	0.10	0.21	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.13	0.05	0.05	0.03	0.07	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.14	0.05	0.05	0.03	0.08	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		11	2.8	4.7	2.3	5.1	

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258862	2258863	2258864	2258865	2258866	2258867
				.Sample ID	TP503	TP506	TP512	TP514	TP516	TP519
				Depth	0.80	0.50	1.00	0.90	1.30	0.70
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/10/2023	31/10/2023	31/10/2023	01/11/2023	01/11/2023	01/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m							
Moisture Content	DETSC 1004	0.1	%							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg							
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg							
Cadmium	DETSC 2301#	0.1	mg/kg							
Chromium	DETSC 2301#	0.15	mg/kg							
Chromium III	DETSC 2301*	0.15	mg/kg							
Chromium, Hexavalent	DETSC 2204*	1	mg/kg							
Copper	DETSC 2301#	0.2	mg/kg							
Lead	DETSC 2301#	0.3	mg/kg							
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l							
Mercury	DETSC 2325#	0.05	mg/kg							
Nickel	DETSC 2301#	1	mg/kg							
Selenium	DETSC 2301#	0.5	mg/kg							
Vanadium	DETSC 2301#	0.8	mg/kg							
Zinc	DETSC 2301#	1	mg/kg							
Inorganics										
pH	DETSC 2008#		pH		6.0	6.8	7.9	6.2	6.4	6.2
Total Organic Carbon	DETSC 2084#	0.5	%							
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l							
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l							
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		< 10	< 10	12	< 10	< 10	< 10
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg							
EPH (C10-C12)	DETSC 3311	10	mg/kg							
EPH (C12-C16)	DETSC 3311	10	mg/kg							
EPH (C16-C21)	DETSC 3311	10	mg/kg							
EPH (C21-C35)	DETSC 3311	10	mg/kg							
EPH (C35-C40)	DETSC 3311	10	mg/kg							
EPH (C10-C40)	DETSC 3311#	10	mg/kg							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg							
Acenaphthylene	DETSC 3303#	0.03	mg/kg							
Acenaphthene	DETSC 3303#	0.03	mg/kg							
Fluorene	DETSC 3303	0.03	mg/kg							
Phenanthrene	DETSC 3303#	0.03	mg/kg							
Anthracene	DETSC 3303	0.03	mg/kg							
Fluoranthene	DETSC 3303#	0.03	mg/kg							
Pyrene	DETSC 3303#	0.03	mg/kg							
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg							
Chrysene	DETSC 3303	0.03	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258862	2258863	2258864	2258865	2258866	2258867
				.Sample ID	TP503	TP506	TP512	TP514	TP516	TP519
				Depth	0.80	0.50	1.00	0.90	1.30	0.70
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	31/10/2023	31/10/2023	31/10/2023	01/11/2023	01/11/2023	01/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg							
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg							

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258868	2258869	2258870	2258871	2258872	2258873
				.Sample ID	TP523	TP529	TP534	TP536	TP541	TP545
				Depth	1.10	0.80	1.10	0.80	0.70	1.00
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/11/2023	02/11/2023	02/11/2023	02/11/2023	03/11/2023	03/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m							
Moisture Content	DETSC 1004	0.1	%							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg							
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg							
Cadmium	DETSC 2301#	0.1	mg/kg							
Chromium	DETSC 2301#	0.15	mg/kg							
Chromium III	DETSC 2301*	0.15	mg/kg							
Chromium, Hexavalent	DETSC 2204*	1	mg/kg							
Copper	DETSC 2301#	0.2	mg/kg							
Lead	DETSC 2301#	0.3	mg/kg							
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l							
Mercury	DETSC 2325#	0.05	mg/kg							
Nickel	DETSC 2301#	1	mg/kg							
Selenium	DETSC 2301#	0.5	mg/kg							
Vanadium	DETSC 2301#	0.8	mg/kg							
Zinc	DETSC 2301#	1	mg/kg							
Inorganics										
pH	DETSC 2008#		pH		6.5	6.2	6.5	6.0	6.5	6.4
Total Organic Carbon	DETSC 2084#	0.5	%							
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l							
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l							
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		< 10	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg							
EPH (C10-C12)	DETSC 3311	10	mg/kg							
EPH (C12-C16)	DETSC 3311	10	mg/kg							
EPH (C16-C21)	DETSC 3311	10	mg/kg							
EPH (C21-C35)	DETSC 3311	10	mg/kg							
EPH (C35-C40)	DETSC 3311	10	mg/kg							
EPH (C10-C40)	DETSC 3311#	10	mg/kg							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg							
Acenaphthylene	DETSC 3303#	0.03	mg/kg							
Acenaphthene	DETSC 3303#	0.03	mg/kg							
Fluorene	DETSC 3303	0.03	mg/kg							
Phenanthrene	DETSC 3303#	0.03	mg/kg							
Anthracene	DETSC 3303	0.03	mg/kg							
Fluoranthene	DETSC 3303#	0.03	mg/kg							
Pyrene	DETSC 3303#	0.03	mg/kg							
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg							
Chrysene	DETSC 3303	0.03	mg/kg							

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258868	2258869	2258870	2258871	2258872	2258873
				.Sample ID	TP523	TP529	TP534	TP536	TP541	TP545
				Depth	1.10	0.80	1.10	0.80	0.70	1.00
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/11/2023	02/11/2023	02/11/2023	02/11/2023	03/11/2023	03/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg							
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg							

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

			Lab No	2258874	2258875	2258876	2258877	2258878	2258879
			.Sample ID	TP603	TP604	TP608	TP504	TP510	TP510
			Depth	1.60	1.60	0.80	0.80	0.80	1.50
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	30/10/2023	30/10/2023	30/10/2023	01/11/2023	31/10/2023	31/10/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Preparation									
Stones >10mm	DETSC 1003*	1	% m/m						
Moisture Content	DETSC 1004	0.1	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg						
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg						
Cadmium	DETSC 2301#	0.1	mg/kg						
Chromium	DETSC 2301#	0.15	mg/kg						
Chromium III	DETSC 2301*	0.15	mg/kg						
Chromium, Hexavalent	DETSC 2204*	1	mg/kg						
Copper	DETSC 2301#	0.2	mg/kg						
Lead	DETSC 2301#	0.3	mg/kg						
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l						
Mercury	DETSC 2325#	0.05	mg/kg						
Nickel	DETSC 2301#	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg						
Vanadium	DETSC 2301#	0.8	mg/kg						
Zinc	DETSC 2301#	1	mg/kg						
Inorganics									
pH	DETSC 2008#		pH	6.5	5.2	5.9	6.1	6.3	6.5
Total Organic Carbon	DETSC 2084#	0.5	%						
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l						
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	< 10	19	< 10	< 10	11	< 10
Petroleum Hydrocarbons									
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg						
EPH (C10-C12)	DETSC 3311	10	mg/kg						
EPH (C12-C16)	DETSC 3311	10	mg/kg						
EPH (C16-C21)	DETSC 3311	10	mg/kg						
EPH (C21-C35)	DETSC 3311	10	mg/kg						
EPH (C35-C40)	DETSC 3311	10	mg/kg						
EPH (C10-C40)	DETSC 3311#	10	mg/kg						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg						
Acenaphthylene	DETSC 3303#	0.03	mg/kg						
Acenaphthene	DETSC 3303#	0.03	mg/kg						
Fluorene	DETSC 3303	0.03	mg/kg						
Phenanthrene	DETSC 3303#	0.03	mg/kg						
Anthracene	DETSC 3303	0.03	mg/kg						
Fluoranthene	DETSC 3303#	0.03	mg/kg						
Pyrene	DETSC 3303#	0.03	mg/kg						
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						
Chrysene	DETSC 3303	0.03	mg/kg						

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258874	2258875	2258876	2258877	2258878	2258879
				.Sample ID	TP603	TP604	TP608	TP504	TP510	TP510
				Depth	1.60	1.60	0.80	0.80	0.80	1.50
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	30/10/2023	30/10/2023	30/10/2023	01/11/2023	31/10/2023	31/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg							
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258880	2258881	2258882	2258883	2258884	2258885
				.Sample ID	TP525	TP530	TP536	TP542	TP546	TP603
				Depth	2.20	1.60	1.40	1.50	1.10	2.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/11/2023	02/11/2023	02/11/2023	03/11/2023	03/11/2023	30/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Stones >10mm	DETSC 1003*	1	% m/m							
Moisture Content	DETSC 1004	0.1	%							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg							
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg							
Cadmium	DETSC 2301#	0.1	mg/kg							
Chromium	DETSC 2301#	0.15	mg/kg							
Chromium III	DETSC 2301*	0.15	mg/kg							
Chromium, Hexavalent	DETSC 2204*	1	mg/kg							
Copper	DETSC 2301#	0.2	mg/kg							
Lead	DETSC 2301#	0.3	mg/kg							
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l							
Mercury	DETSC 2325#	0.05	mg/kg							
Nickel	DETSC 2301#	1	mg/kg							
Selenium	DETSC 2301#	0.5	mg/kg							
Vanadium	DETSC 2301#	0.8	mg/kg							
Zinc	DETSC 2301#	1	mg/kg							
Inorganics										
pH	DETSC 2008#		pH		6.2	6.2	6.6	6.9	6.6	6.5
Total Organic Carbon	DETSC 2084#	0.5	%							
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l							
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l							
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		< 10	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons										
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg							
EPH (C10-C12)	DETSC 3311	10	mg/kg							
EPH (C12-C16)	DETSC 3311	10	mg/kg							
EPH (C16-C21)	DETSC 3311	10	mg/kg							
EPH (C21-C35)	DETSC 3311	10	mg/kg							
EPH (C35-C40)	DETSC 3311	10	mg/kg							
EPH (C10-C40)	DETSC 3311#	10	mg/kg							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg							
Acenaphthylene	DETSC 3303#	0.03	mg/kg							
Acenaphthene	DETSC 3303#	0.03	mg/kg							
Fluorene	DETSC 3303	0.03	mg/kg							
Phenanthrene	DETSC 3303#	0.03	mg/kg							
Anthracene	DETSC 3303	0.03	mg/kg							
Fluoranthene	DETSC 3303#	0.03	mg/kg							
Pyrene	DETSC 3303#	0.03	mg/kg							
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg							
Chrysene	DETSC 3303	0.03	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

				Lab No	2258880	2258881	2258882	2258883	2258884	2258885
				.Sample ID	TP525	TP530	TP536	TP542	TP546	TP603
				Depth	2.20	1.60	1.40	1.50	1.10	2.10
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	01/11/2023	02/11/2023	02/11/2023	03/11/2023	03/11/2023	30/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg							
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg							
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg							
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg							
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg							
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg							

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

Lab No	2258886	2258887
.Sample ID	TP607	TP524
Depth	1.80	1.10
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	30/10/2023	01/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Preparation					
Stones >10mm	DETSC 1003*	1	% m/m		
Moisture Content	DETSC 1004	0.1	%		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg		
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		
Cadmium	DETSC 2301#	0.1	mg/kg		
Chromium	DETSC 2301#	0.15	mg/kg		
Chromium III	DETSC 2301*	0.15	mg/kg		
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		
Copper	DETSC 2301#	0.2	mg/kg		
Lead	DETSC 2301#	0.3	mg/kg		
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		
Mercury	DETSC 2325#	0.05	mg/kg		
Nickel	DETSC 2301#	1	mg/kg		
Selenium	DETSC 2301#	0.5	mg/kg		
Vanadium	DETSC 2301#	0.8	mg/kg		
Zinc	DETSC 2301#	1	mg/kg		
Inorganics					
pH	DETSC 2008#		pH	6.4	6.4
Total Organic Carbon	DETSC 2084#	0.5	%		
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	< 10	< 10
Petroleum Hydrocarbons					
VPH (C6-C10)	DETSC 3321*	0.1	mg/kg		
EPH (C10-C12)	DETSC 3311	10	mg/kg		
EPH (C12-C16)	DETSC 3311	10	mg/kg		
EPH (C16-C21)	DETSC 3311	10	mg/kg		
EPH (C21-C35)	DETSC 3311	10	mg/kg		
EPH (C35-C40)	DETSC 3311	10	mg/kg		
EPH (C10-C40)	DETSC 3311#	10	mg/kg		
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg		
Acenaphthylene	DETSC 3303#	0.03	mg/kg		
Acenaphthene	DETSC 3303#	0.03	mg/kg		
Fluorene	DETSC 3303	0.03	mg/kg		
Phenanthrene	DETSC 3303#	0.03	mg/kg		
Anthracene	DETSC 3303	0.03	mg/kg		
Fluoranthene	DETSC 3303#	0.03	mg/kg		
Pyrene	DETSC 3303#	0.03	mg/kg		
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		
Chrysene	DETSC 3303	0.03	mg/kg		

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

	Lab No	2258886	2258887
	.Sample ID	TP607	TP524
	Depth	1.80	1.10
	Other ID		
	Sample Type	SOIL	SOIL
	Sampling Date	30/10/2023	01/11/2023
	Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-26199
Client Ref 4486
Contract Title Black Cats

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2258832	TP538 0.70	SOIL	NAD	none	Barry Kelly
2258833	TP547 0.50	SOIL	NAD	none	Barry Kelly
2258834	TP549 0.50	SOIL	NAD	none	Barry Kelly
2258835	TP501 0.10	SOIL	NAD	none	Barry Kelly
2258836	TP505 0.10	SOIL	NAD	none	Barry Kelly
2258837	TP509 0.10	SOIL	NAD	none	Barry Kelly
2258838	TP513 0.10	SOIL	NAD	none	Barry Kelly
2258839	TP515 0.10	SOIL	NAD	none	Barry Kelly
2258840	TP517 0.10	SOIL	NAD	none	Barry Kelly
2258841	TP521 0.10	SOIL	NAD	none	Barry Kelly
2258842	TP525 0.10	SOIL	NAD	none	Barry Kelly
2258843	TP527 0.10	SOIL	NAD	none	Barry Kelly
2258844	TP531 0.10	SOIL	NAD	none	Barry Kelly
2258845	TP533 0.10	SOIL	NAD	none	Barry Kelly
2258846	TP537 0.10	SOIL	NAD	none	Barry Kelly
2258847	TP541 0.10	SOIL	NAD	none	Barry Kelly
2258848	TP543 0.10	SOIL	NAD	none	Barry Kelly
2258849	TP545 0.10	SOIL	NAD	none	Barry Kelly
2258850	TP600 0.10	SOIL	NAD	none	Barry Kelly
2258851	TP601 0.10	SOIL	NAD	none	Barry Kelly
2258852	TP602 0.10	SOIL	NAD	none	Barry Kelly
2258853	TP603 0.10	SOIL	NAD	none	Barry Kelly
2258854	TP604 0.10	SOIL	NAD	none	Barry Kelly
2258855	TP605 0.10	SOIL	NAD	none	Barry Kelly
2258856	TP606 0.10	SOIL	NAD	none	Barry Kelly
2258857	TP607 0.10	SOIL	NAD	none	Barry Kelly
2258858	TP608 0.10	SOIL	NAD	none	Barry Kelly
2258859	TP609 0.10	SOIL	NAD	none	Barry Kelly
2258860	TP611 0.20	SOIL	NAD	none	Barry Kelly

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-26199
Client Ref 4486
Contract Black Cats

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2258832	TP538 0.70 SOIL	02/11/23	GJ 500ml, PT 1L		BTEX / C5-C10
2258833	TP547 0.50 SOIL	03/11/23	GJ 500ml, PT 1L		BTEX / C5-C10
2258834	TP549 0.50 SOIL	03/11/23	GJ 500ml, PT 1L		BTEX / C5-C10
2258835	TP501 0.10 SOIL	31/10/23	GJ 500ml, PT 1L		
2258836	TP505 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258837	TP509 0.10 SOIL	31/10/23	GJ 500ml, PT 1L		
2258838	TP513 0.10 SOIL	01/11/23	GJ 500ml, PT 1L		
2258839	TP515 0.10 SOIL	01/11/23	GJ 500ml, PT 1L		
2258840	TP517 0.10 SOIL	01/11/23	GJ 500ml, PT 1L		
2258841	TP521 0.10 SOIL	01/11/23	GJ 500ml, PT 1L		
2258842	TP525 0.10 SOIL	01/11/23	GJ 500ml, PT 1L		
2258843	TP527 0.10 SOIL	02/11/23	GJ 500ml, PT 1L		
2258844	TP531 0.10 SOIL	02/11/23	GJ 500ml, PT 1L		
2258845	TP533 0.10 SOIL	02/11/23	GJ 500ml, PT 1L		
2258846	TP537 0.10 SOIL	02/11/23	GJ 500ml, PT 1L		
2258847	TP541 0.10 SOIL	03/11/23	GJ 500ml, PT 1L		
2258848	TP543 0.10 SOIL	03/11/23	GJ 500ml, PT 1L		
2258849	TP545 0.10 SOIL	03/11/23	GJ 500ml, PT 1L		
2258850	TP600 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258851	TP601 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258852	TP602 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258853	TP603 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258854	TP604 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258855	TP605 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258856	TP606 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258857	TP607 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258858	TP608 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258859	TP609 0.10 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258860	TP611 0.20 SOIL	30/10/23	GJ 500ml, PT 1L	pH + Conductivity (7 days)	
2258861	TP500 1.10 SOIL	31/10/23	PT 1L		
2258862	TP503 0.80 SOIL	31/10/23	PT 1L		
2258863	TP506 0.50 SOIL	31/10/23	PT 1L		
2258864	TP512 1.00 SOIL	31/10/23	PT 1L		
2258865	TP514 0.90 SOIL	01/11/23	PT 1L		
2258866	TP516 1.30 SOIL	01/11/23	PT 1L		
2258867	TP519 0.70 SOIL	01/11/23	PT 1L		
2258868	TP523 1.10 SOIL	01/11/23	PT 1L		
2258869	TP529 0.80 SOIL	02/11/23	PT 1L		
2258870	TP534 1.10 SOIL	02/11/23	PT 1L		
2258871	TP536 0.80 SOIL	02/11/23	PT 1L		
2258872	TP541 0.70 SOIL	03/11/23	PT 1L		
2258873	TP545 1.00 SOIL	03/11/23	PT 1L		
2258874	TP603 1.60 SOIL	30/10/23	PT 1L	pH + Conductivity (7 days)	
2258875	TP604 1.60 SOIL	30/10/23	PT 1L	pH + Conductivity (7 days)	
2258876	TP608 0.80 SOIL	30/10/23	PT 1L	pH + Conductivity (7 days)	
2258877	TP504 0.80 SOIL	01/11/23	PT 1L		
2258878	TP510 0.80 SOIL	31/10/23	PT 1L		
2258879	TP510 1.50 SOIL	31/10/23	PT 1L		
2258880	TP525 2.20 SOIL	01/11/23	PT 1L		
2258881	TP530 1.60 SOIL	02/11/23	PT 1L		
2258882	TP536 1.40 SOIL	02/11/23	PT 1L		
2258883	TP542 1.50 SOIL	03/11/23	PT 1L		
2258884	TP546 1.10 SOIL	03/11/23	PT 1L		
2258885	TP603 2.10 SOIL	30/10/23	PT 1L	pH + Conductivity (7 days)	
2258886	TP607 1.80 SOIL	30/10/23	PT 1L	pH + Conductivity (7 days)	
2258887	TP524 1.10 SOIL	01/11/23	PT 1L		

Information in Support of the Analytical Results

Our Ref 23-26199
Client Ref 4486
Contract Black Cats

Key: G-Glass P-Plastic J-Jar T-Tub
DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

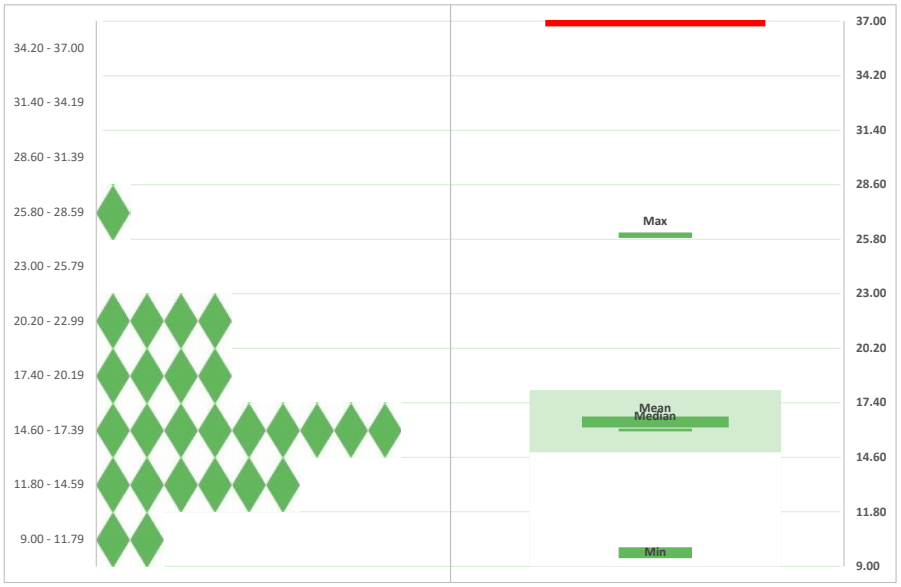
End of Report

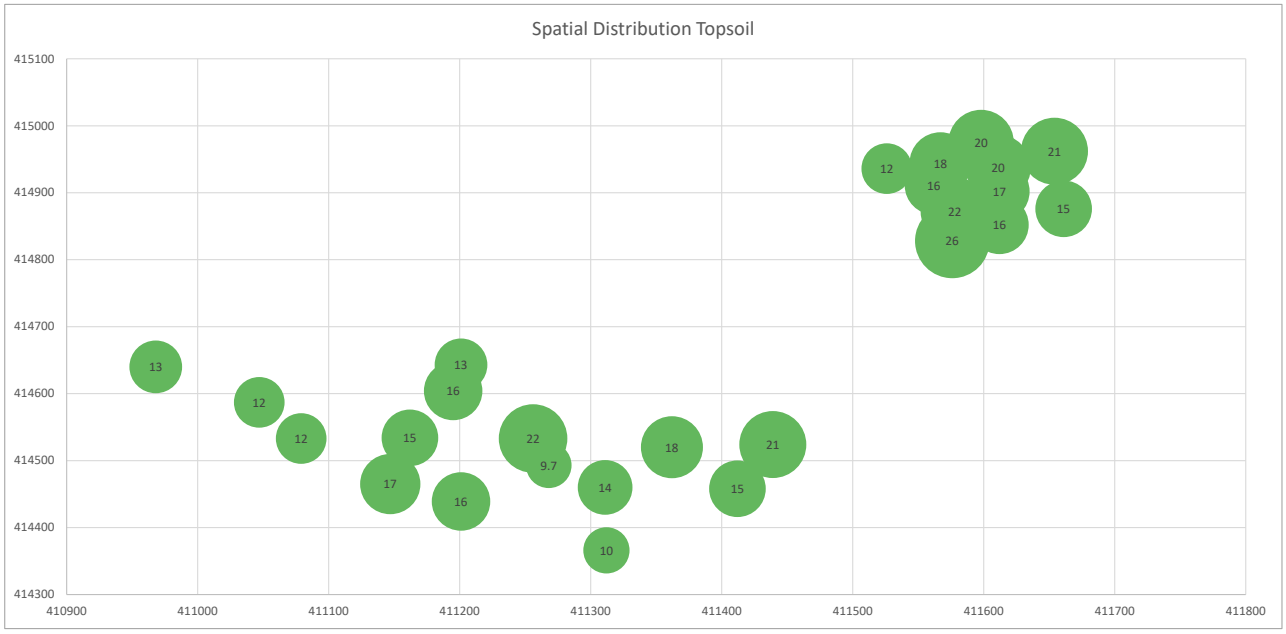
Black Cats, Blackmoorfoot Road, Huddersfield

Job No: 4486
Engineer: J Brown
Date: 21 November 2023

Topsoil: Dataset for As - Dot & Box Plots and Summary Statistics

Determinant	As
Critical concentration	37.00
No. samples	26.00
Max	26.00
Mean	16.41
Min	9.70
Median	16.00
Standard Deviation	4.04
Standard Error	0.79
T value	2.06
Upper Confidence Level (95%)	18.04
Upper Confidence Level (80%)	17.45
Lower Confidence Level (5%)	14.86
Transform data	Normal
Upper Confidence Level for chart	95%





Spatial distribution can show sampling clusters based on ground type it **does not** identify areas of contamintion

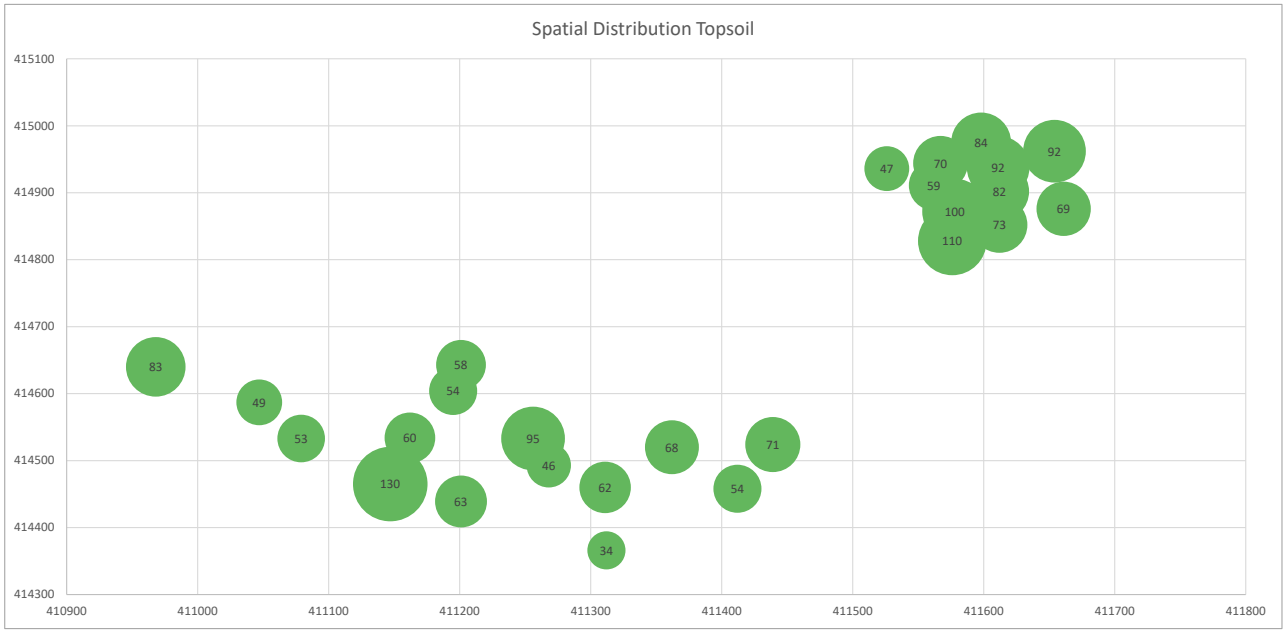
Black Cats, Blackmoorfoot Road, Huddersfield

Job No: 4486
Engineer: J Brown
Date: 21 November 2023

Topsoil: Dataset for Pb - Dot & Box Plots and Summary Statistics

Determinant	Pb
Critical concentration	200.00
No. samples	26.00
Max	130.00
Mean	68.32
Min	34.00
Median	68.50
Standard Deviation	22.17
Standard Error	4.35
T value	2.06
Upper Confidence Level (95%)	77.27
Upper Confidence Level (80%)	74.04
Lower Confidence Level (5%)	59.80
Transform data	Normal

Upper Confidence Level for chart	95%



Spatial distribution can show sampling clusters based on ground type it **does not** identify areas of contamintion

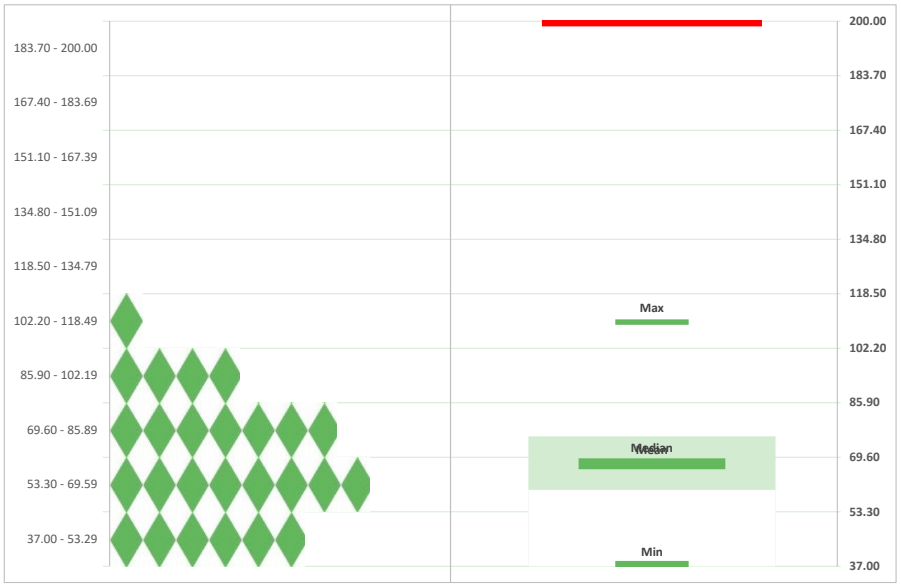
Black Cats, Blackmoorfoot Road, Huddersfield

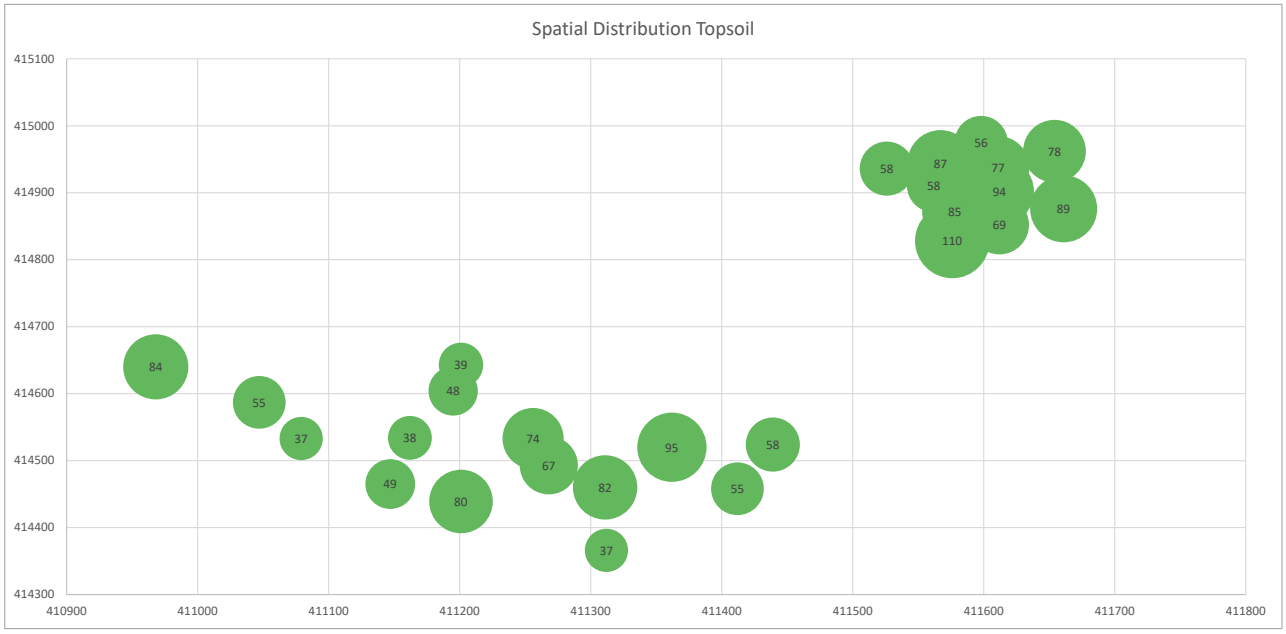
Job No: 4486
Engineer: J Brown
Date: 21 November 2023

Topsoil: Dataset for Zn - Dot & Box Plots and Summary Statistics

Determinant	Zn
Critical concentration	200.00
No. samples	26.00
Max	110.00
Mean	67.65
Min	37.00
Median	68.00
Standard Deviation	20.28
Standard Error	3.98
T value	2.06
Upper Confidence Level (95%)	75.84
Upper Confidence Level (80%)	72.89
Lower Confidence Level (5%)	59.86
Transform data	Normal

Upper Confidence Level for chart	95%





Spatial distribution can show sampling clusters based on ground type it **does not** identify areas of contamintion

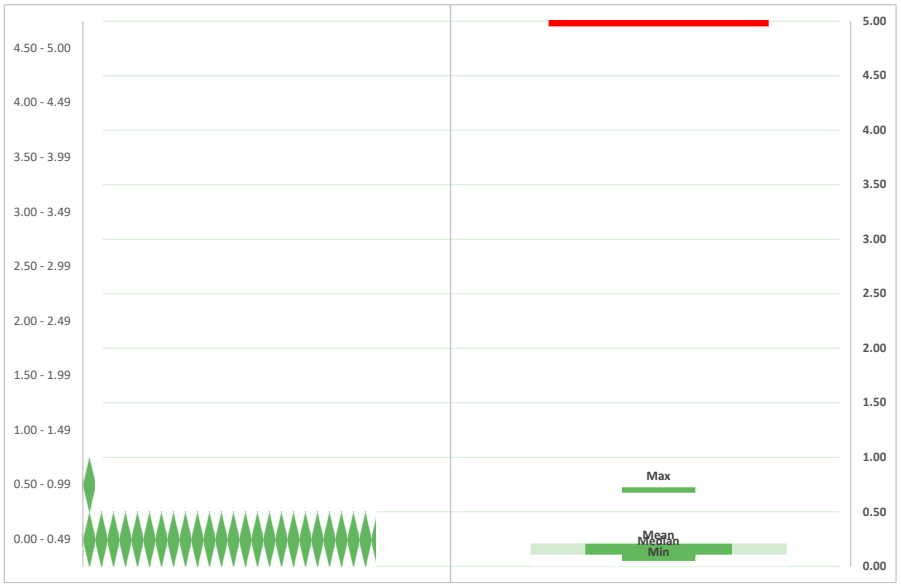
Black Cats, Blackmoorfoot Road, Huddersfield

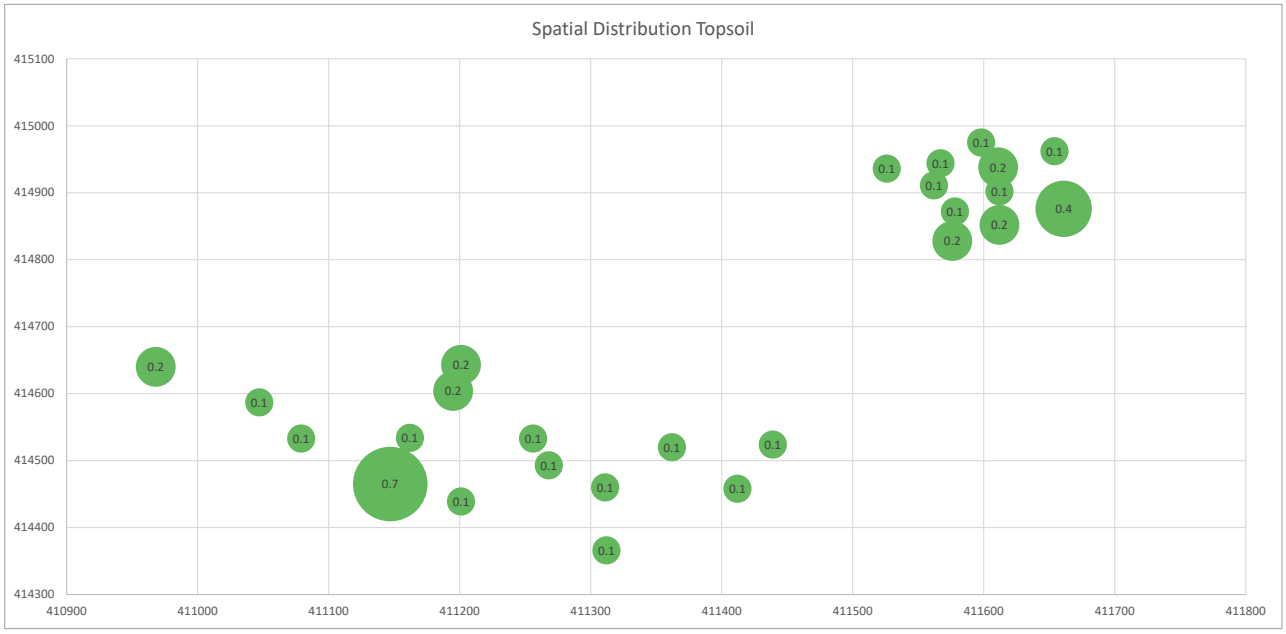
Job No: 4486
Engineer: J Brown
Date: 21 November 2023

Topsoil: Dataset for B(a)P - Dot & Box Plots and Summary Statistics

Determinant	B(a)P
Critical concentration	5.00
No. samples	26.00
Max	0.70
Mean	0.16
Min	0.10
Median	0.10
Standard Deviation	0.13
Standard Error	0.03
T value	2.06
Upper Confidence Level (95%)	0.21
Upper Confidence Level (80%)	0.19
Lower Confidence Level (5%)	0.11
Transform data	Normal

Upper Confidence Level for chart	95%





Spatial distribution can show sampling clusters based on ground type it **does not** identify areas of contamintion

Appendix P

Geotechnical Test Results

LABORATORY REPORT

Contract Number: PSL23/8167

Report Date:	27 October 2023
Client's Reference:	4486
Client Name:	Lithos Consulting Parkhill Walton Road Wetherby North Yorkshire LS22 5DZ
For the attention of:	**Charlotte Copley**
Contract Title:	Black Cats
Date Received:	27/9/2023
Date Commenced:	27/9/2023
Date Completed:	27/10/2023
Notes:	**Opinions and Interpretations are outside the UKAS Accreditation**

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

Checked and Approved Signatories:

A Watkins (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP341	3	B	2.00		MADE GROUND dark brown very sandy silty gravel.
TP345	3	B	3.50		MADE GROUND dark brown very gravelly silty sand.
TP352C	2	B	1.20		MADE GROUND dark brown very sandy slightly clayey silty gravel.
TP350	4	D	2.00		Brown mottled grey sandy CLAY.
TP358	2	D	1.00		Brown mottled grey slightly sandy CLAY.
TP311	3	B	2.50		Brown slightly gravelly sandy CLAY.
TP313	3	B	2.00		Brown slightly sandy clayey GRAVEL of cobbles.
TP326	4	B	0.70		Brown sandy clayey GRAVEL.
TP332	3	B	1.60		Brown sandy clayey GRAVEL with many cobbles.
TP357	2	B	0.80		Brown sandy clayey GRAVEL with many cobbles.
TP380	3	B	2.20		Brown very sandy very clayey GRAVEL of cobbles.
TP382	3	B	2.00		Brown very sandy slightly clayey silty GRAVEL.
TP385	2	B	1.50		Brown gravelly very sandy CLAY.
TP388	3	B	2.50		Brown sandy very clayey GRAVEL of cobbles.
TP389	3	B	2.20		Brown very sandy clayey silty GRAVEL.
TP401	3	B	2.00		MADE GROUND brown silty sand & gravel.
TP402	2	B	1.50		Brown sandy very clayey GRAVEL of cobbles.
TP408	3	B	0.80		Brown sandy clayey GRAVEL with many cobbles.
TP398	2	B	0.80		Brown very sandy very clayey GRAVEL of cobbles.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP399	2	B	1.00		MADE GROUND brown very sandy clayey silty gravel with cobbles.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP341	3	B	2.00		26		2.59					
TP345	3	B	3.50		15		2.57					
TP352C	2	B	1.20		24		2.54					
TP350	4	D	2.00		22			49	24	25	100	Intermediate Plasticity CI
TP358	2	D	1.00		27			59	27	32	100	High Plasticity CH
TP311	3	B	2.50		36		2.67					
TP313	3	B	2.00		21		2.69					
TP326	4	B	0.70		14		2.66					
TP332	3	B	1.60		15		2.69					
TP357	2	B	0.80		17		2.69					
TP380	3	B	2.20		20		2.68	38	21	17	34	Intermediate Plasticity CI
TP382	3	B	2.00		15		2.66					
TP385	2	B	1.50		31		2.69	55	26	29	81	High Plasticity CH
TP388	3	B	2.50		21		2.70					
TP389	3	B	2.20		19		2.66					
TP401	3	B	2.00		13		2.44					
TP402	2	B	1.50		28		2.65	51	24	27	31	High Plasticity CH
TP408	3	B	0.80		19		2.68					
TP398	2	B	0.80		21		2.67					

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

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

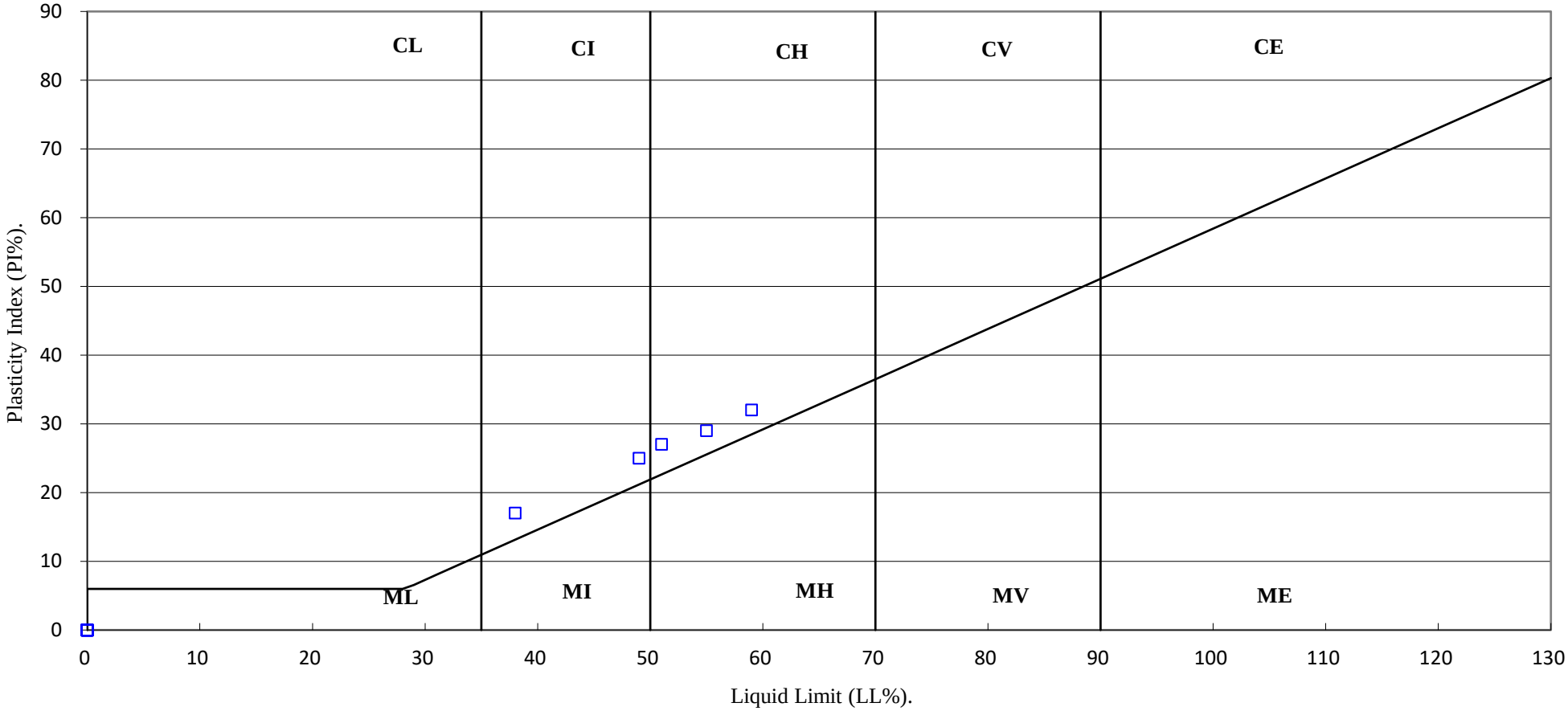
Contract No:

PSL23/8167

Client Ref:

4486

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Black Cats**

Contract No:
PSL23/8167
Client Ref:
4486

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP399	2	B	1.00		15		2.63					

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

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

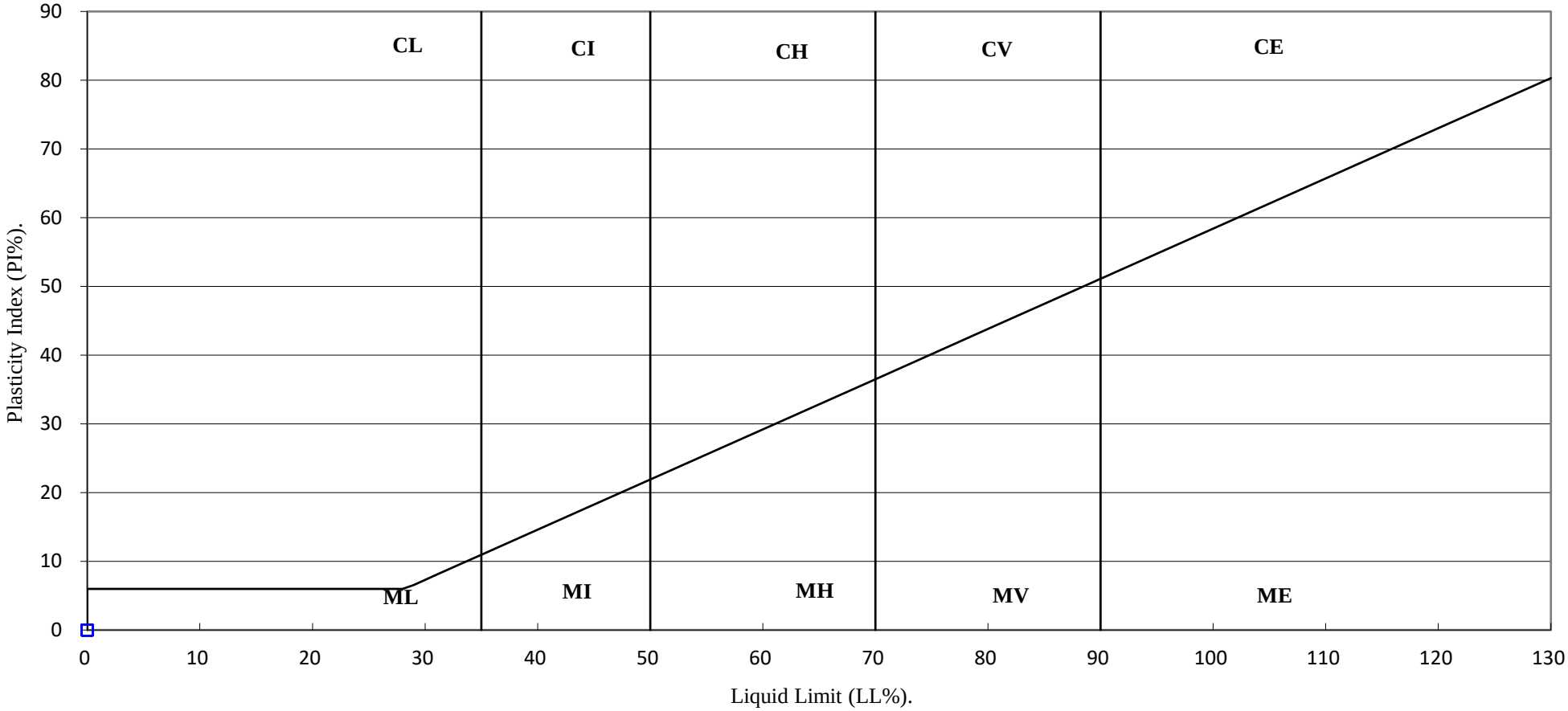
Contract No:

PSL23/8167

Client Ref:

4486

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Black Cats**	**Contract No:**
			PSL23/8167
			Client Ref:
			4486

PARTICLE SIZE DISTRIBUTION TEST

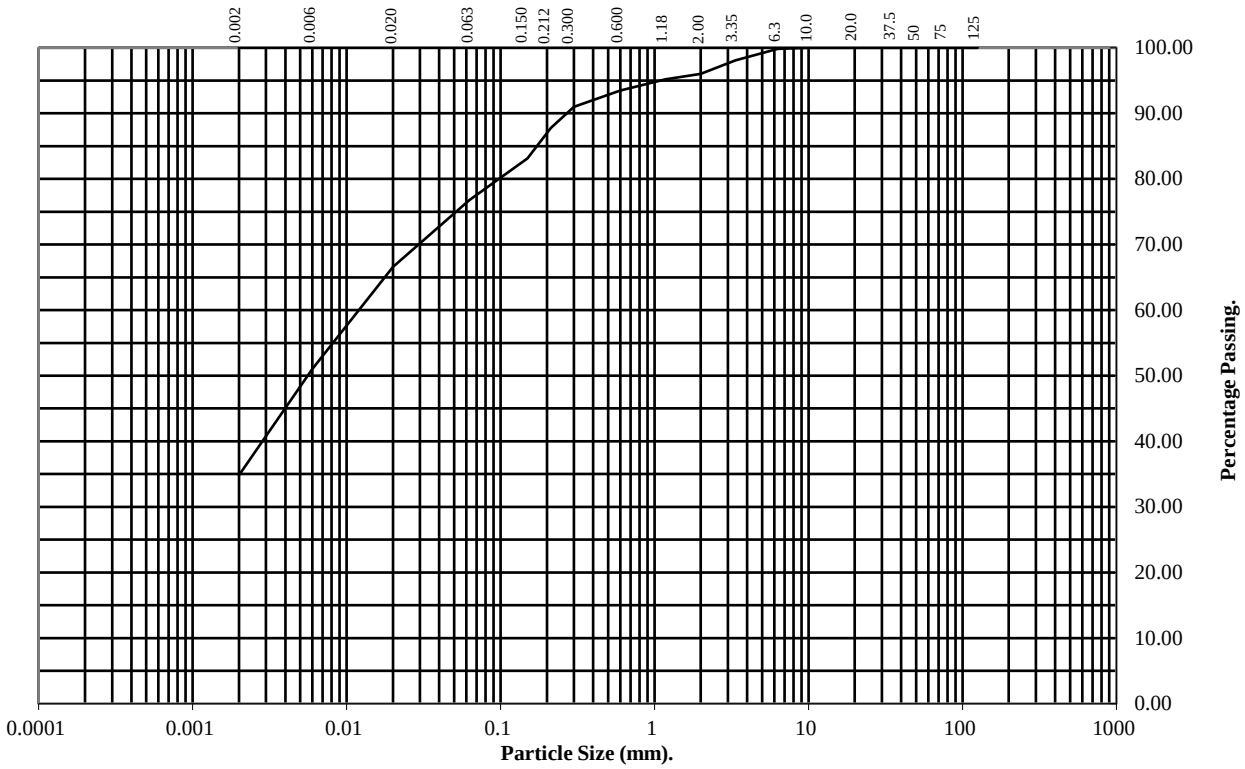
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP311 **Top Depth (m):** 2.50

Sample Number: 3 **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	100
10	100
6.3	100
3.35	98
2	96
1.18	95
0.6	93
0.3	91
0.212	88
0.15	83
0.063	77

Particle Diameter	Percentage Passing
0.02	67
0.006	51
0.002	35

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	19
Silt	42
Clay	35

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

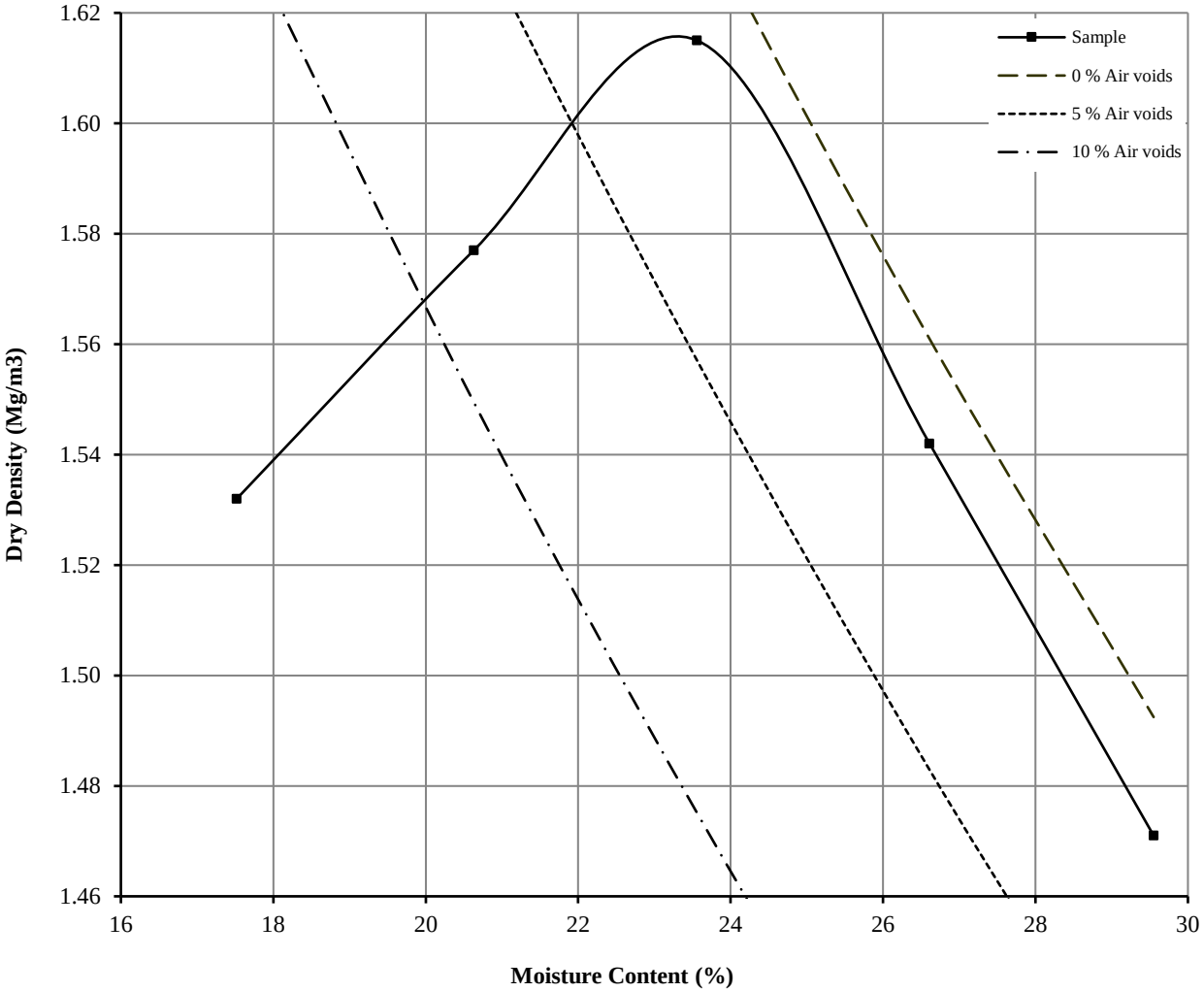
Contract No: PSL23/8167

Client Ref: 4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.5 : 1990

Hole Number:	**TP311**	**Top Depth (m) :**	**2.50**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		36	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.67	Measured	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.62	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		24			
Remarks See summary of soil descriptions					

PARTICLE SIZE DISTRIBUTION TEST

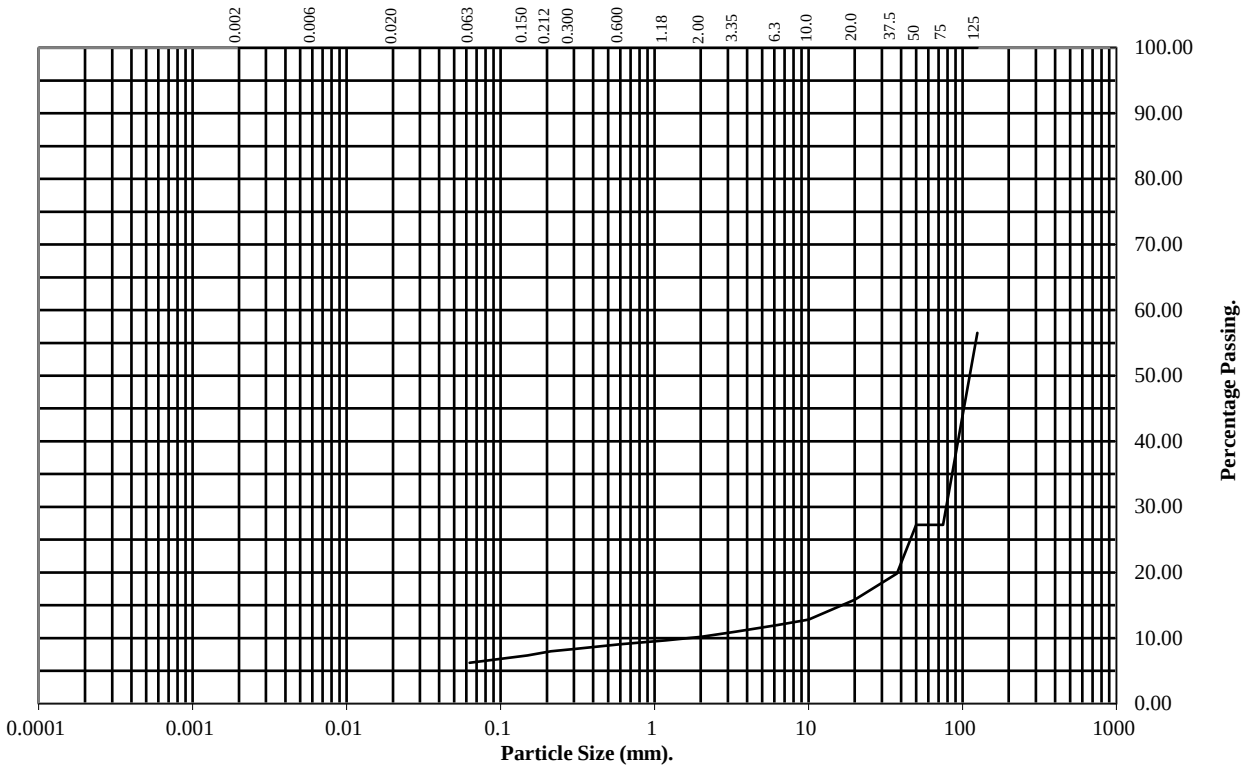
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP313** **Top Depth (m):** **2.00**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	57
75	27
50	27
37.5	20
20	16
10	13
6.3	12
3.35	11
2	10
1.18	10
0.6	9
0.3	8
0.212	8
0.15	7
0.063	6

Soil Fraction	Total Percentage
Cobbles	73
Gravel	17
Sand	4
Silt/Clay	6

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

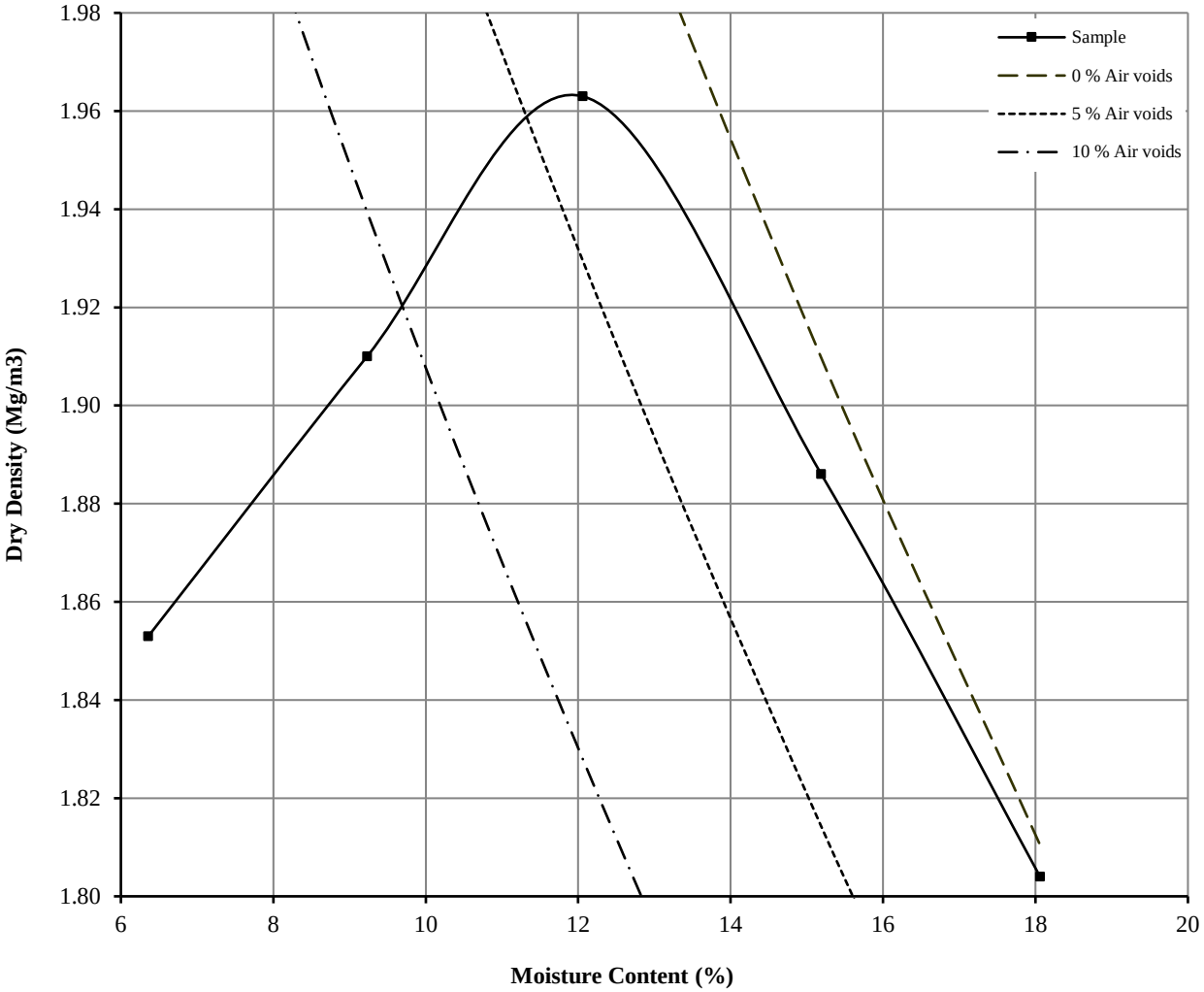
Contract No: **PSL23/8167**

Client Ref: **4486**

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP313**	**Top Depth (m) :**	**2.00**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		21	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.69	Measured	Material Retained on 37.5 mm Test Sieve (%):		80
Maximum Dry Density (Mg/m3):		1.96	Material Retained on 20.0 mm Test Sieve (%):		4
Optimum Moisture Content (%):		12			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

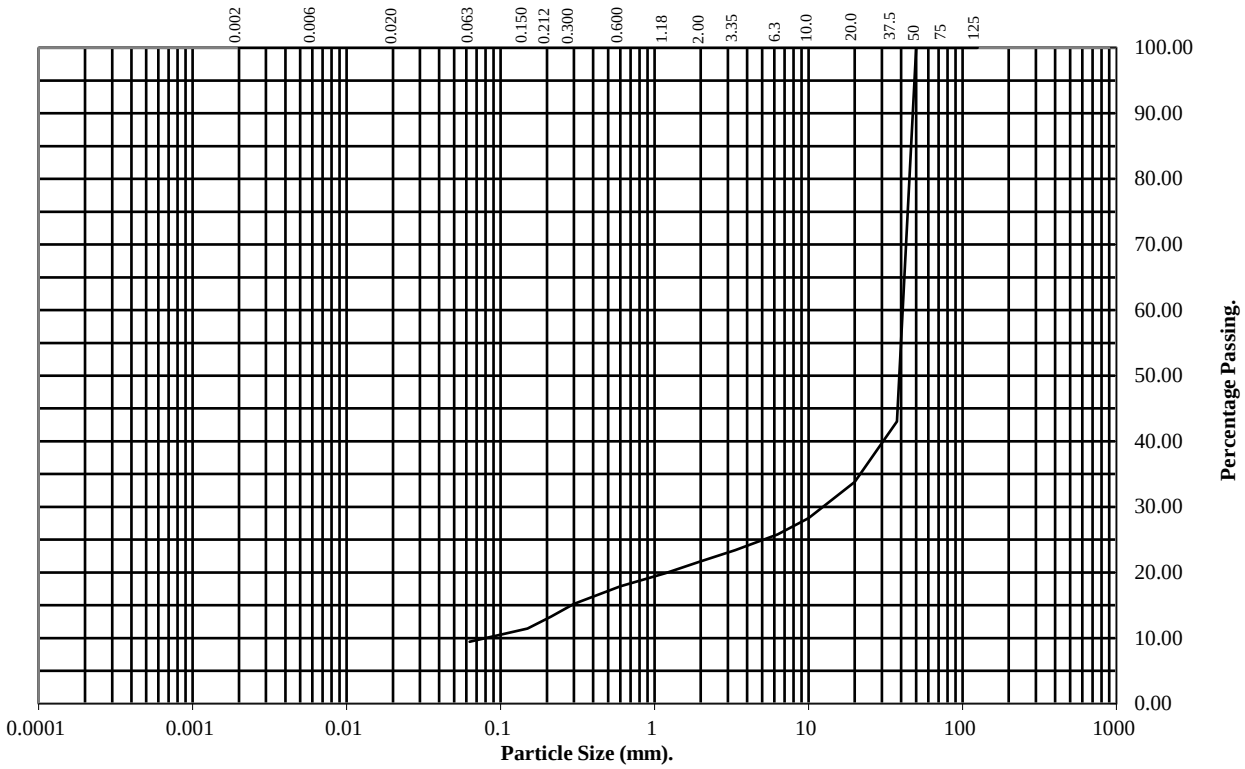
Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**TP326**	**Top Depth (m):**	**0.70**
Sample Number:	**4**	**Base Depth(m):**	
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	43
20	34
10	28
6.3	26
3.35	23
2	22
1.18	20
0.6	18
0.3	15
0.212	13
0.15	11
0.063	9

Soil Fraction	Total Percentage
Cobbles	0
Gravel	78
Sand	13
Silt/Clay	9

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

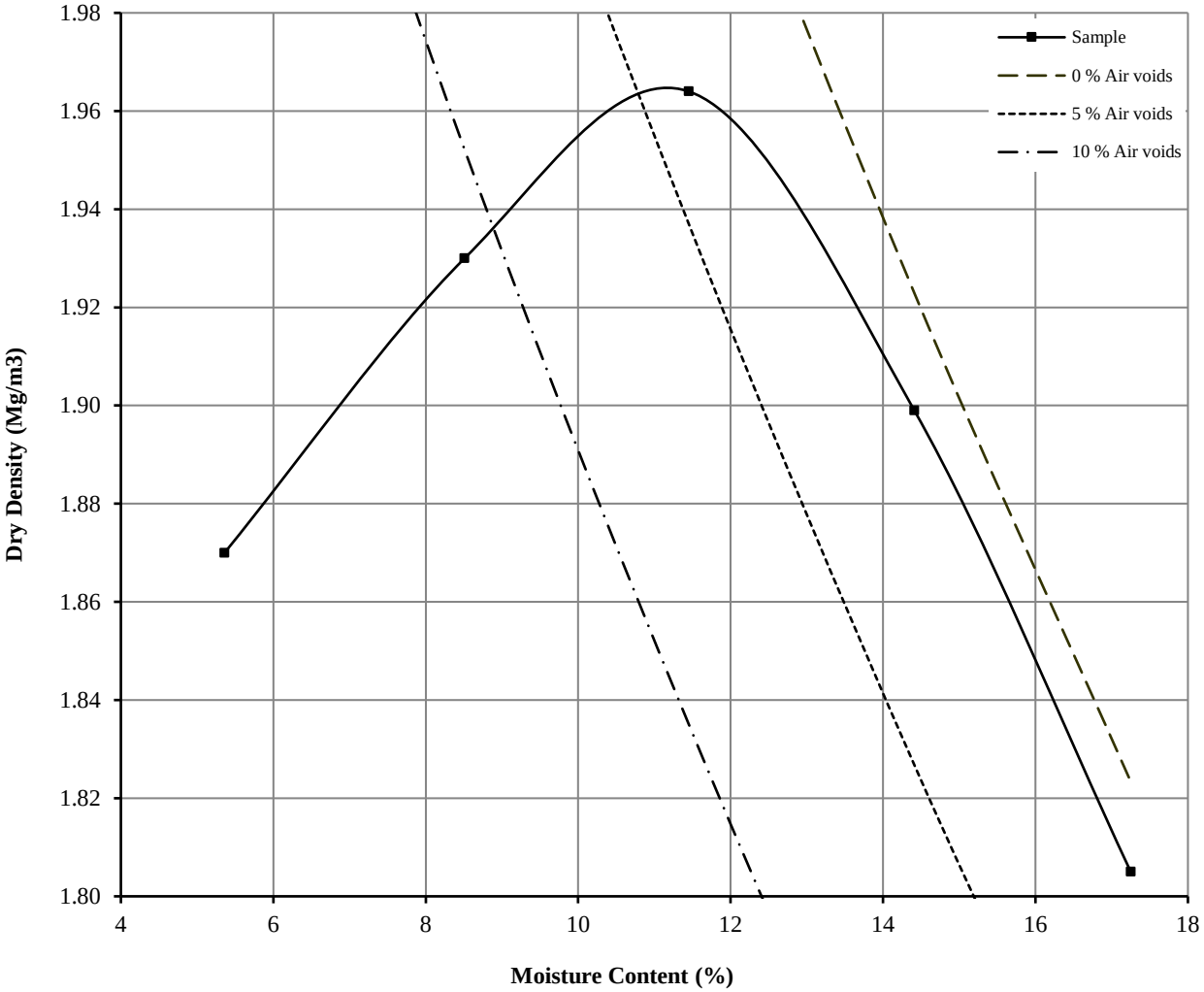
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP326**	**Top Depth (m) :**	**0.70**
Sample Number:	**4**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		14	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.66	Measured	Material Retained on 37.5 mm Test Sieve (%):		57
Maximum Dry Density (Mg/m3):		1.96	Material Retained on 20.0 mm Test Sieve (%):		9
Optimum Moisture Content (%):		11			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

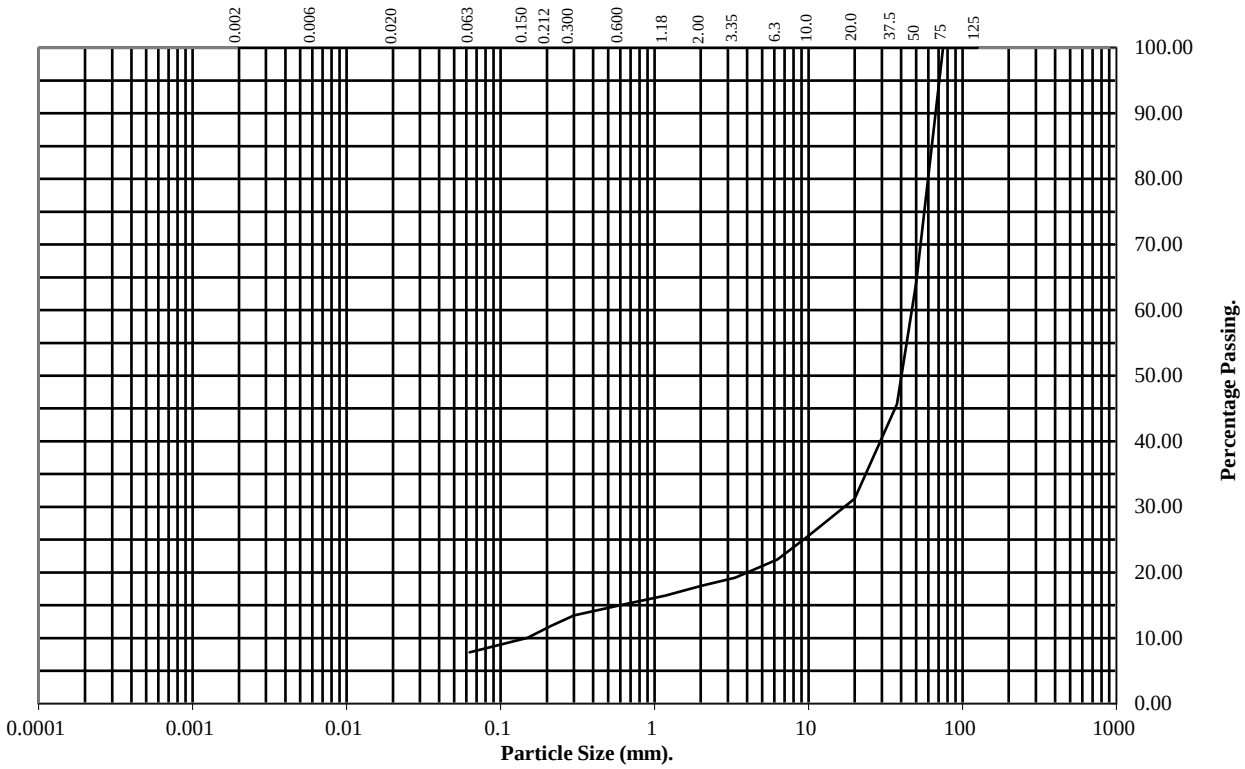
Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**TP332**	**Top Depth (m):**	**1.60**
Sample Number:	**3**	**Base Depth(m):**	
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	64
37.5	46
20	31
10	26
6.3	22
3.35	19
2	18
1.18	16
0.6	15
0.3	13
0.212	12
0.15	10
0.063	8

Soil Fraction	Total Percentage
Cobbles	36
Gravel	46
Sand	10
Silt/Clay	8

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

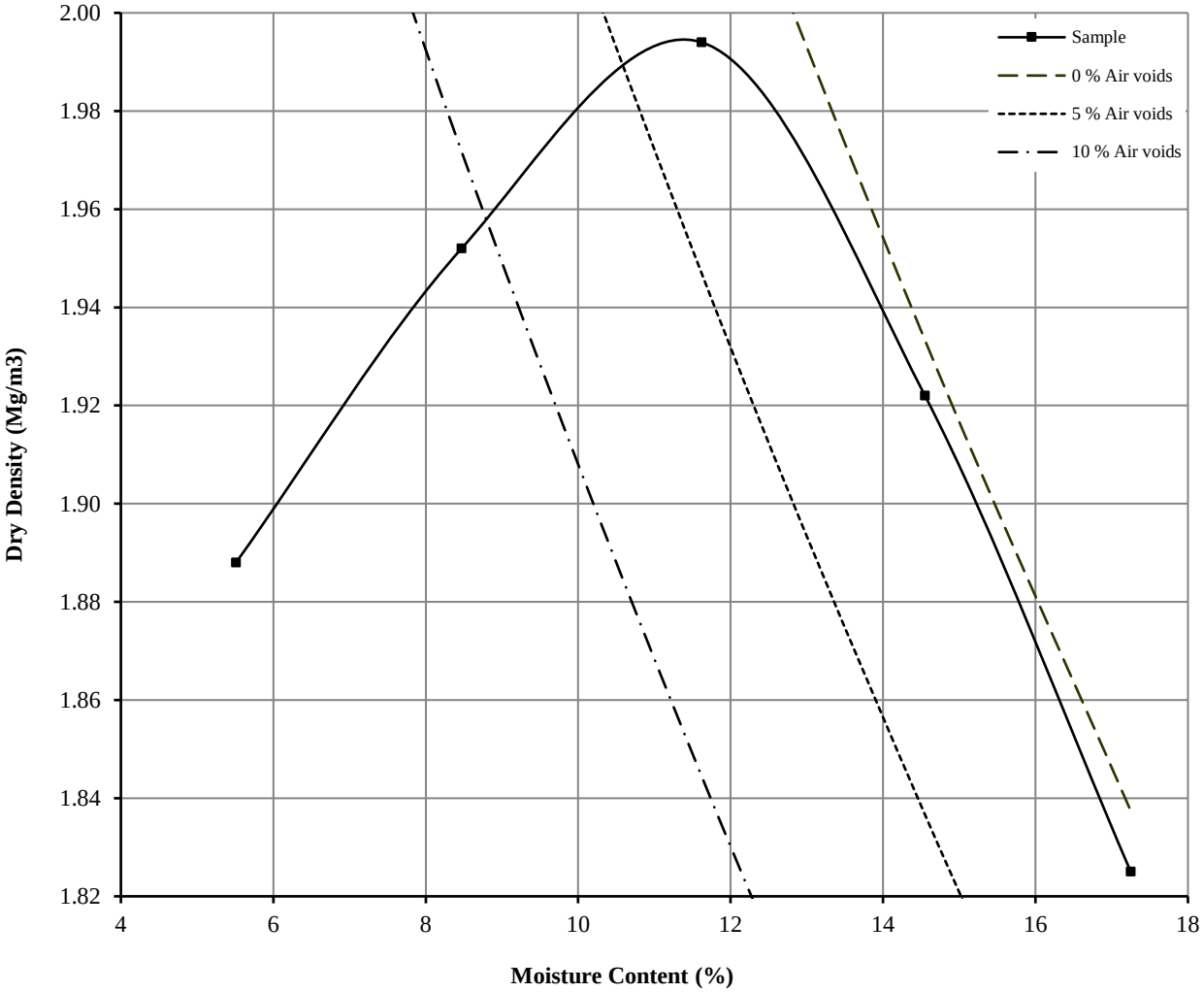
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP332**	**Top Depth (m) :**	**1.60**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		15	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.69	Measured	Material Retained on 37.5 mm Test Sieve (%):		54
Maximum Dry Density (Mg/m3):		1.99	Material Retained on 20.0 mm Test Sieve (%):		15
Optimum Moisture Content (%):		12			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

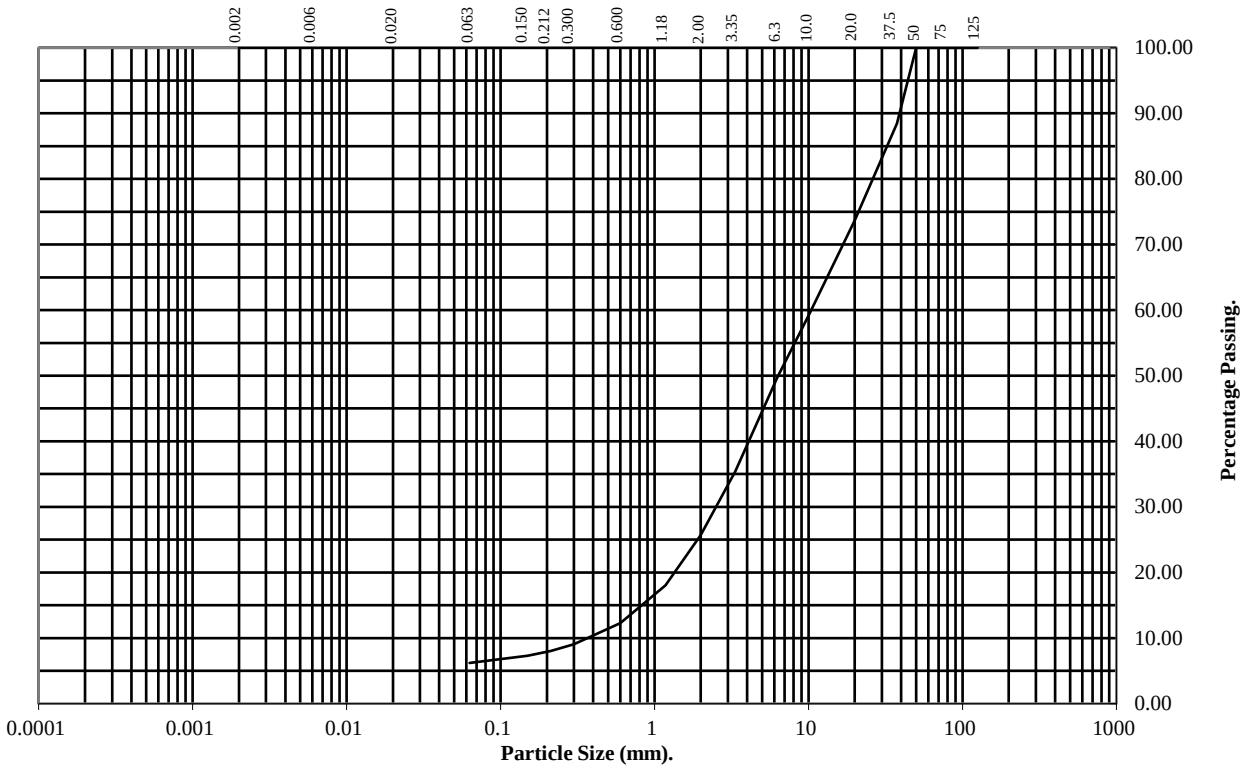
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP341** **Top Depth (m):** **2.00**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	88
20	74
10	59
6.3	50
3.35	35
2	26
1.18	18
0.6	12
0.3	9
0.212	8
0.15	7
0.063	6

Soil Fraction	Total Percentage
Cobbles	0
Gravel	74
Sand	20
Silt/Clay	6

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

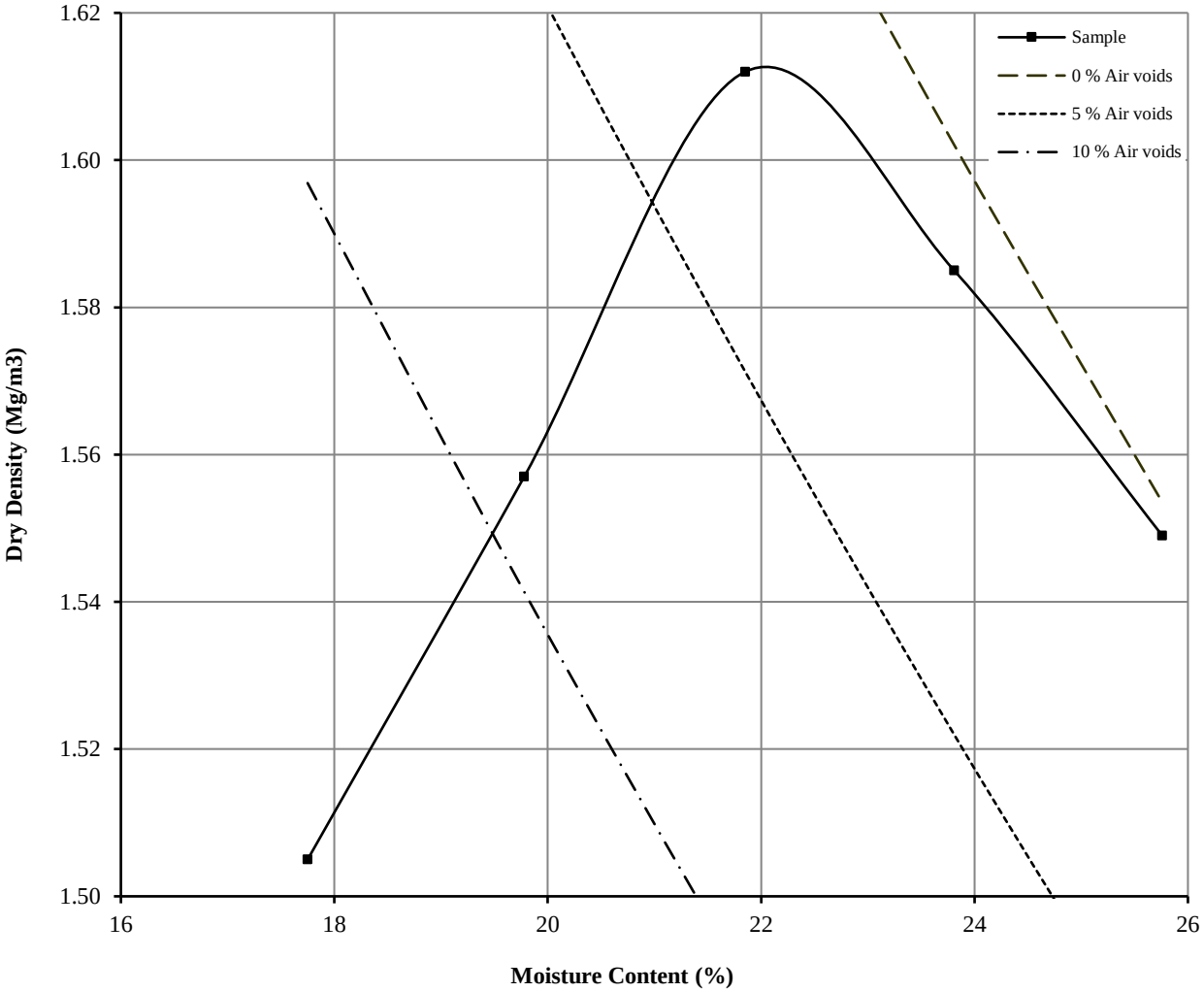
Contract No: **PSL23/8167**

Client Ref: **4486**

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP341**	**Top Depth (m) :**	**2.00**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		26	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.59	Measured	Material Retained on 37.5 mm Test Sieve (%):		12
Maximum Dry Density (Mg/m3):		1.61	Material Retained on 20.0 mm Test Sieve (%):		14
Optimum Moisture Content (%):		22			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

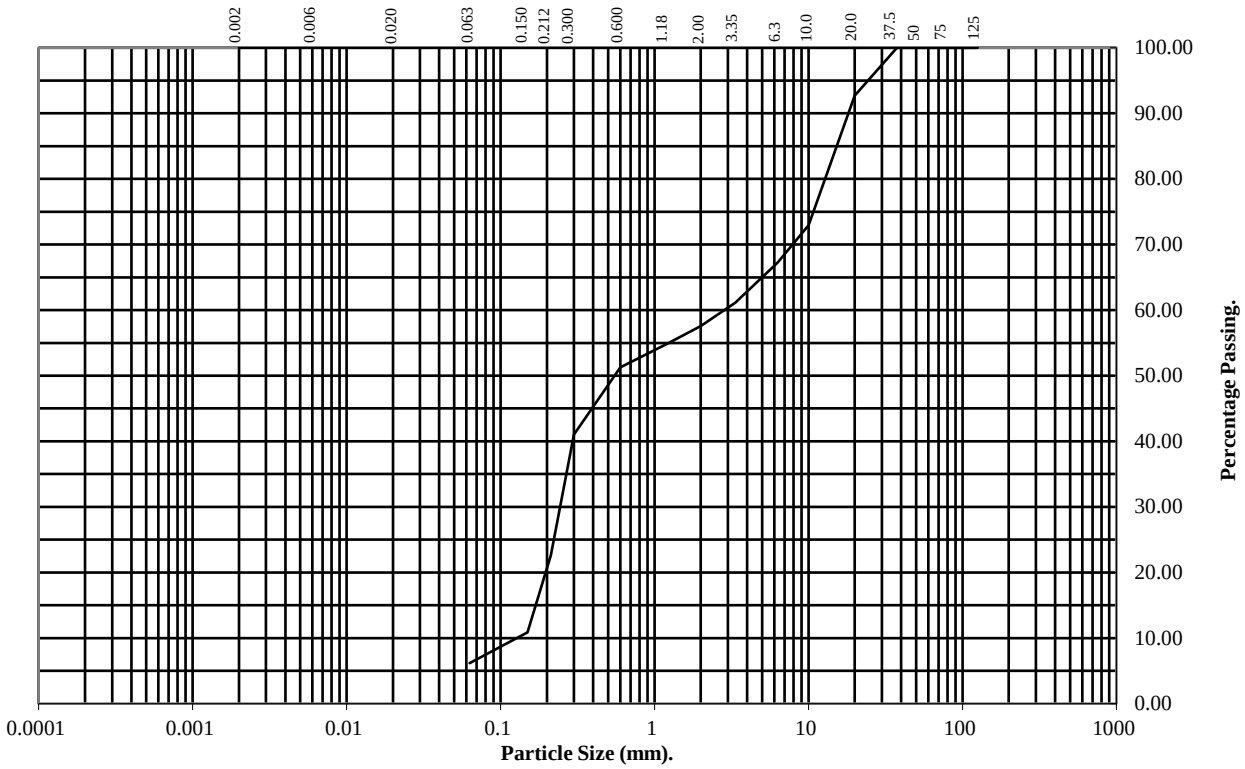
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP345** **Top Depth (m):** **3.50**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	93
10	73
6.3	67
3.35	61
2	58
1.18	55
0.6	51
0.3	41
0.212	23
0.15	11
0.063	6

Soil Fraction	Total Percentage
Cobbles	0
Gravel	42
Sand	52
Silt/Clay	6

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

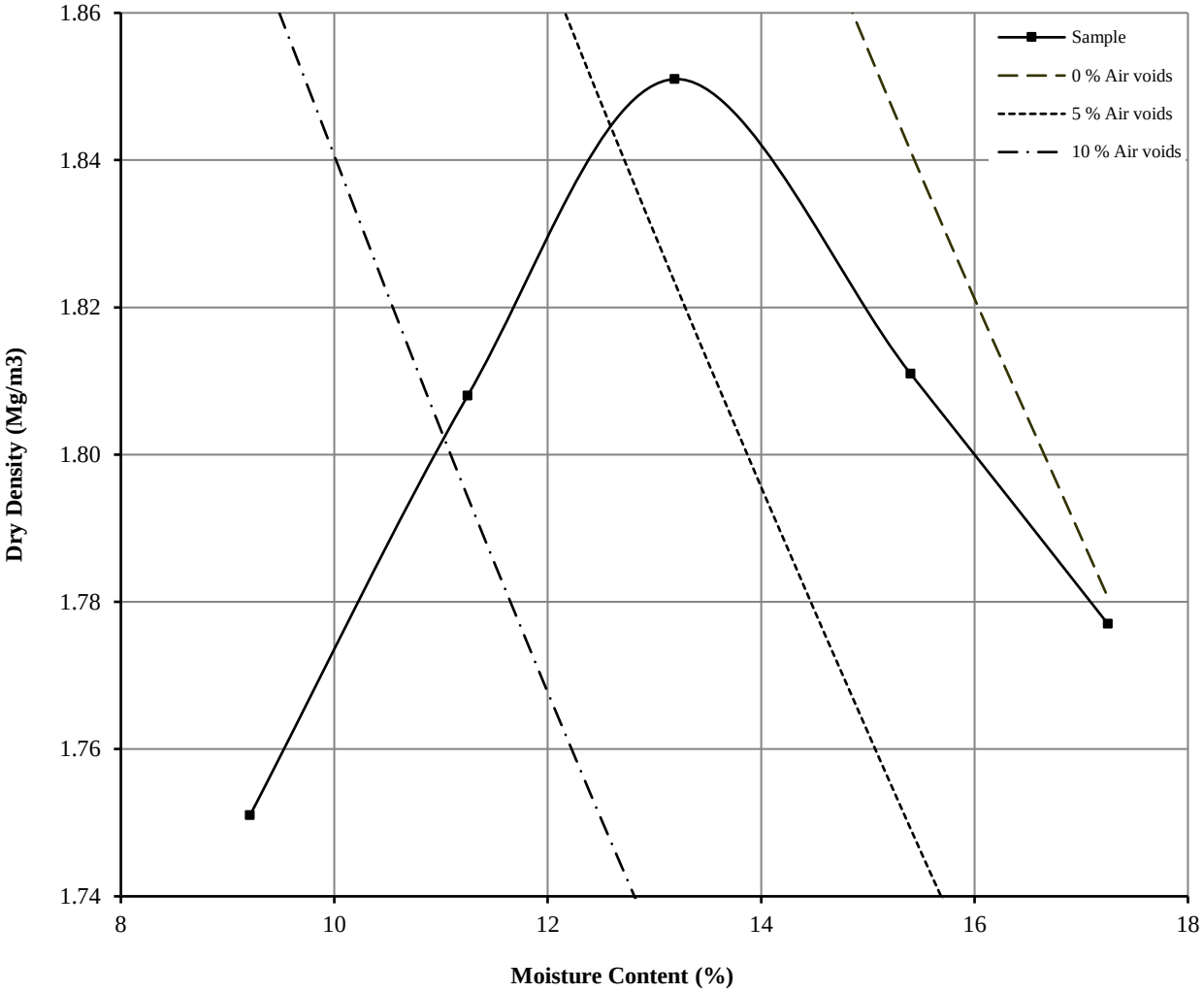
Contract No: **PSL23/8167**

Client Ref: **4486**

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP345**	**Top Depth (m) :**	**3.50**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		15	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.57	Measured	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.85	Material Retained on 20.0 mm Test Sieve (%):		7
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

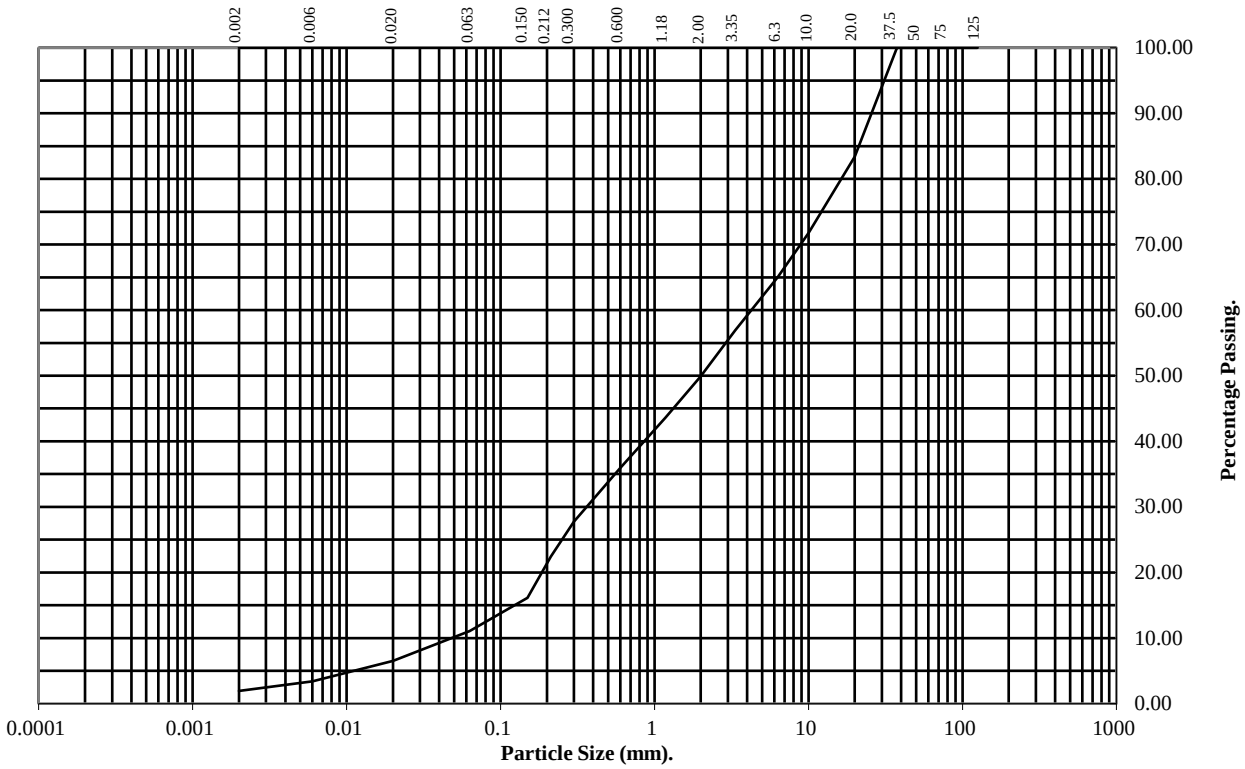
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP352C** **Top Depth (m):** **1.20**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	83
10	72
6.3	65
3.35	57
2	50
1.18	44
0.6	36
0.3	28
0.212	22
0.15	16
0.063	11

Particle Diameter	Percentage Passing
0.02	7
0.006	3
0.002	2

Soil Fraction	Total Percentage
Cobbles	0
Gravel	50
Sand	39
Silt	9
Clay	2

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

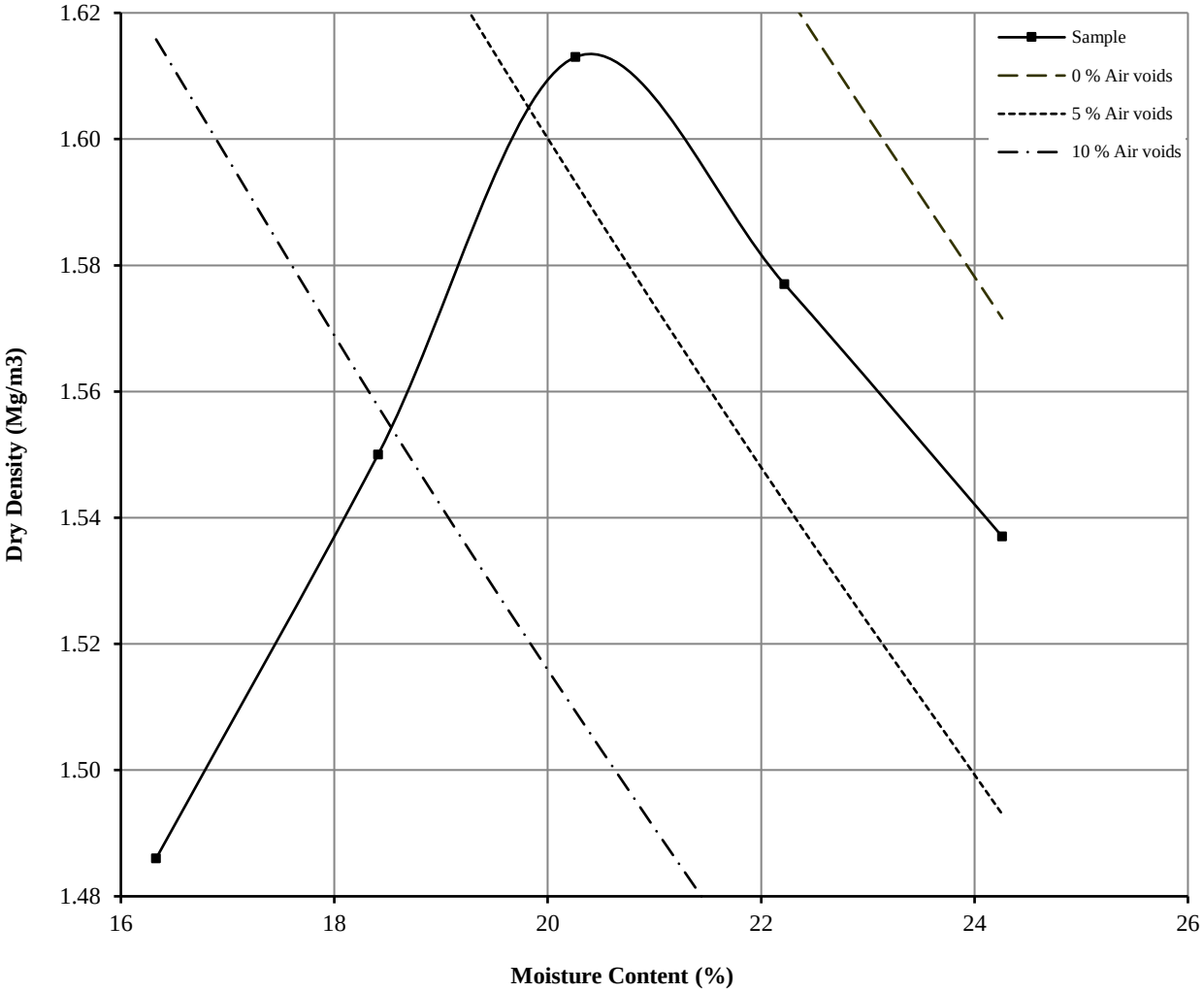
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP352C**	**Top Depth (m) :**	**1.20**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		24	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.54	Measured	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.61	Material Retained on 20.0 mm Test Sieve (%):		17
Optimum Moisture Content (%):		20			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

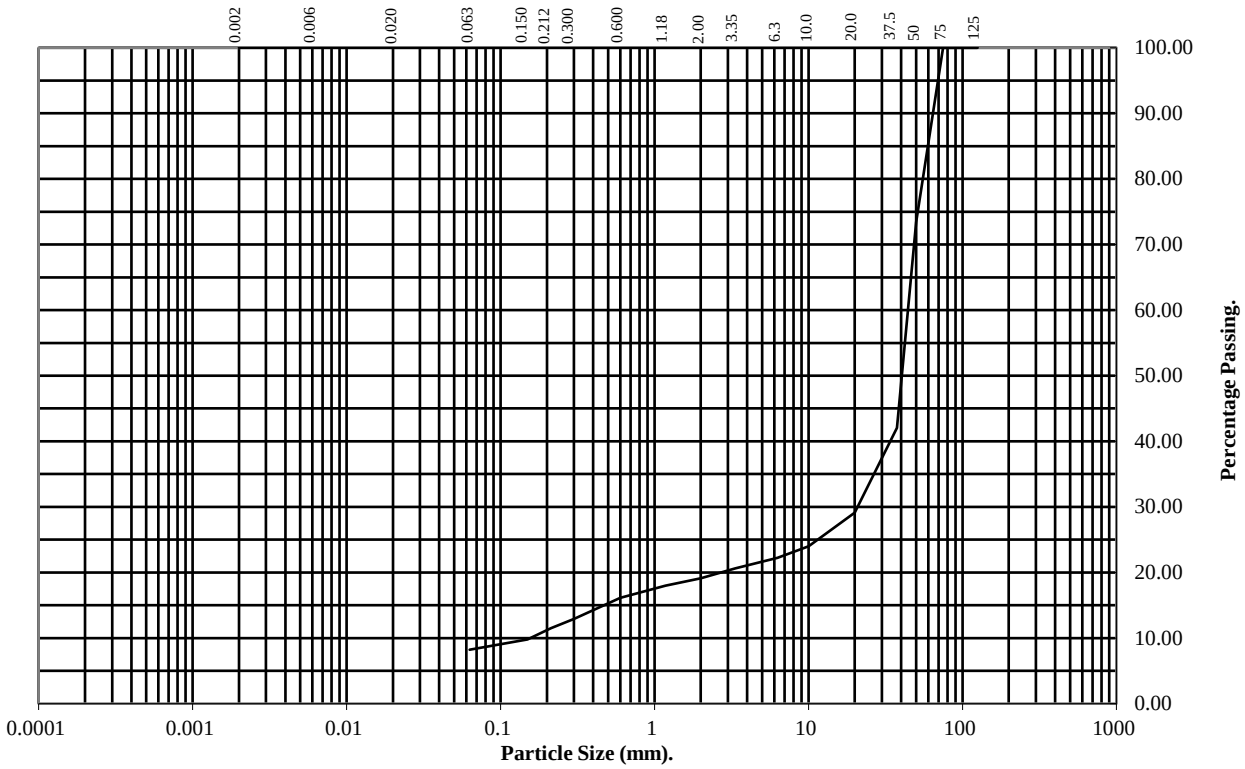
Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**TP357**	**Top Depth (m):**	**0.80**
Sample Number:	**2**	**Base Depth(m):**	
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	73
37.5	42
20	29
10	24
6.3	22
3.35	21
2	19
1.18	18
0.6	16
0.3	13
0.212	12
0.15	10
0.063	8

Soil Fraction	Total Percentage
Cobbles	27
Gravel	54
Sand	11
Silt/Clay	8

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

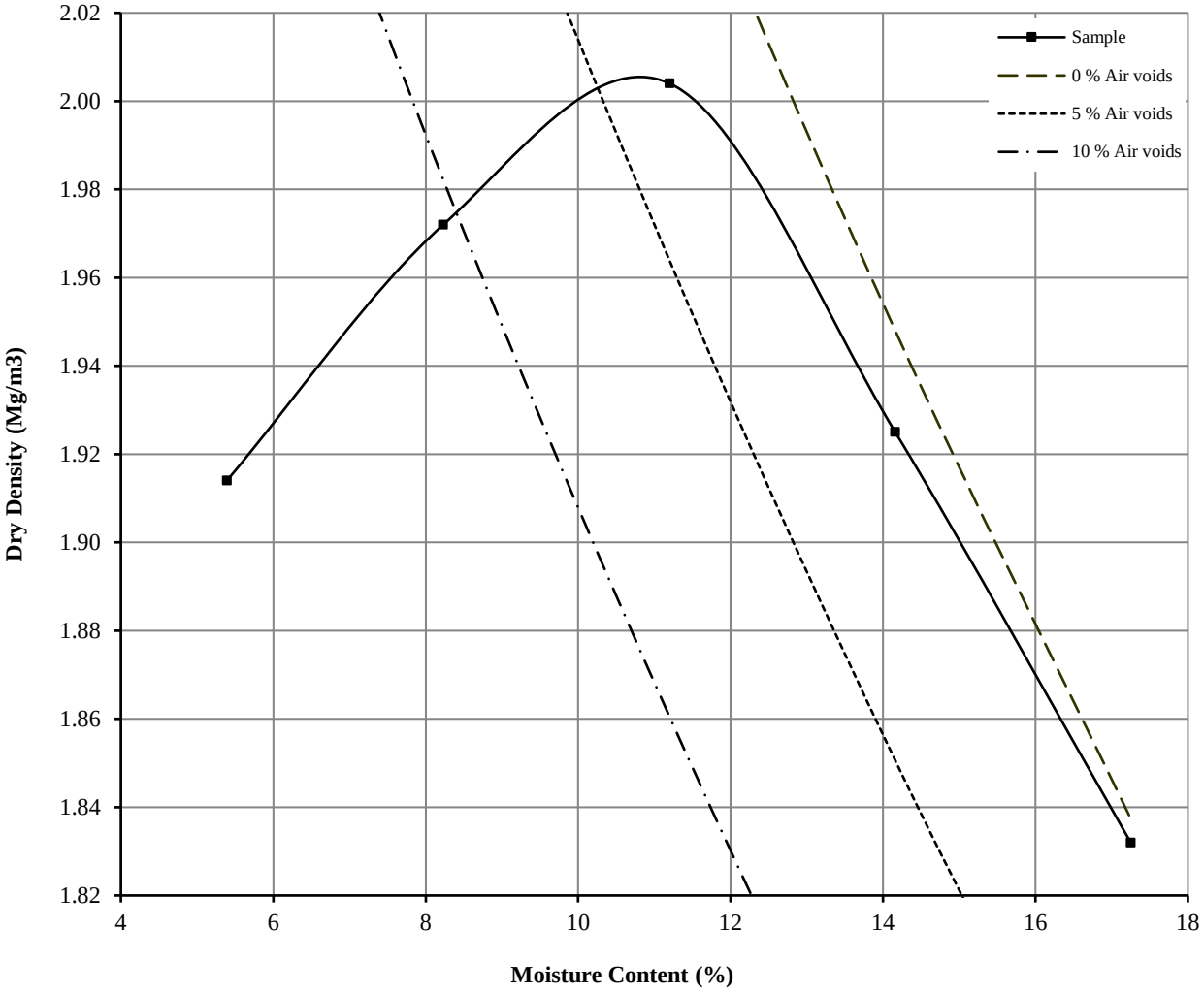
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP357**	**Top Depth (m) :**	**0.80**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		17	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.69	Measured	Material Retained on 37.5 mm Test Sieve (%):		58
Maximum Dry Density (Mg/m3):		2.00	Material Retained on 20.0 mm Test Sieve (%):		13
Optimum Moisture Content (%):		11			
Remarks See summary of soil descriptions					

PARTICLE SIZE DISTRIBUTION TEST

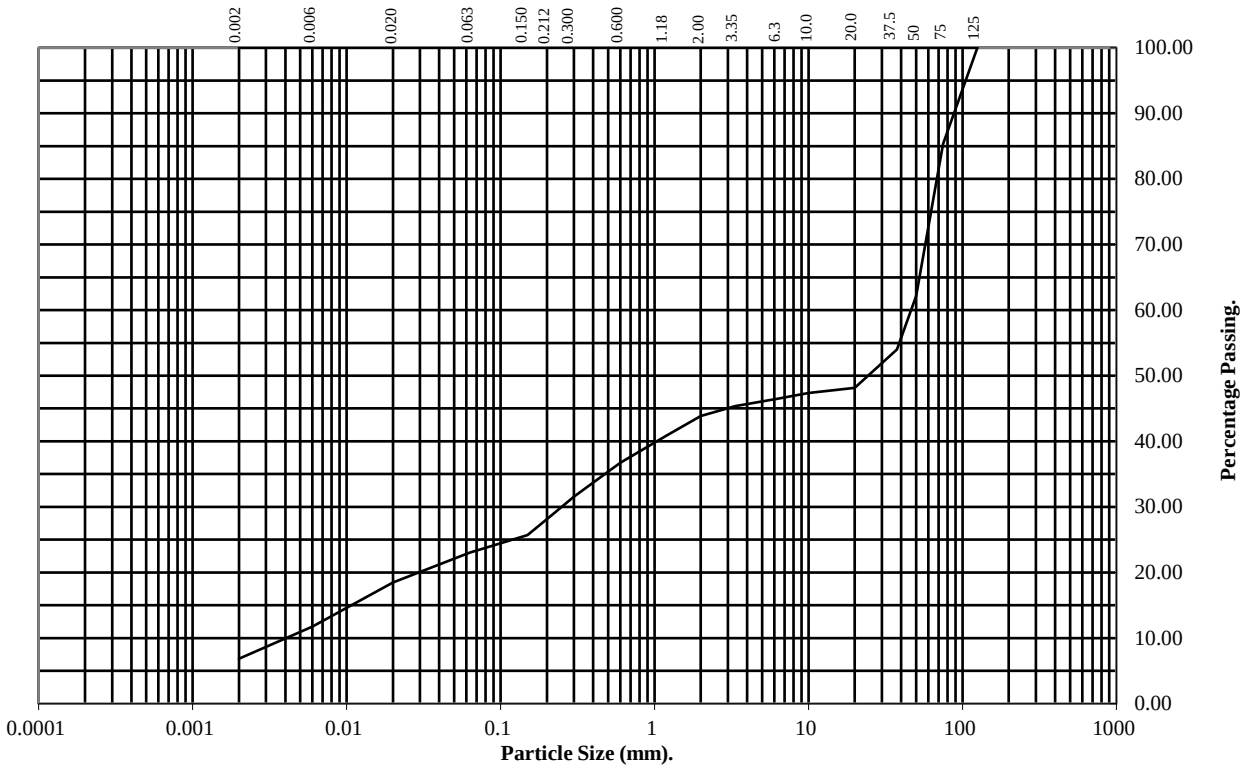
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP380** **Top Depth (m):** **2.20**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	85
50	62
37.5	54
20	48
10	47
6.3	47
3.35	45
2	44
1.18	41
0.6	37
0.3	32
0.212	29
0.15	26
0.063	23

Particle Diameter	Percentage Passing
0.02	18
0.006	12
0.002	7

Soil Fraction	Total Percentage
Cobbles	38
Gravel	18
Sand	21
Silt	16
Clay	7

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

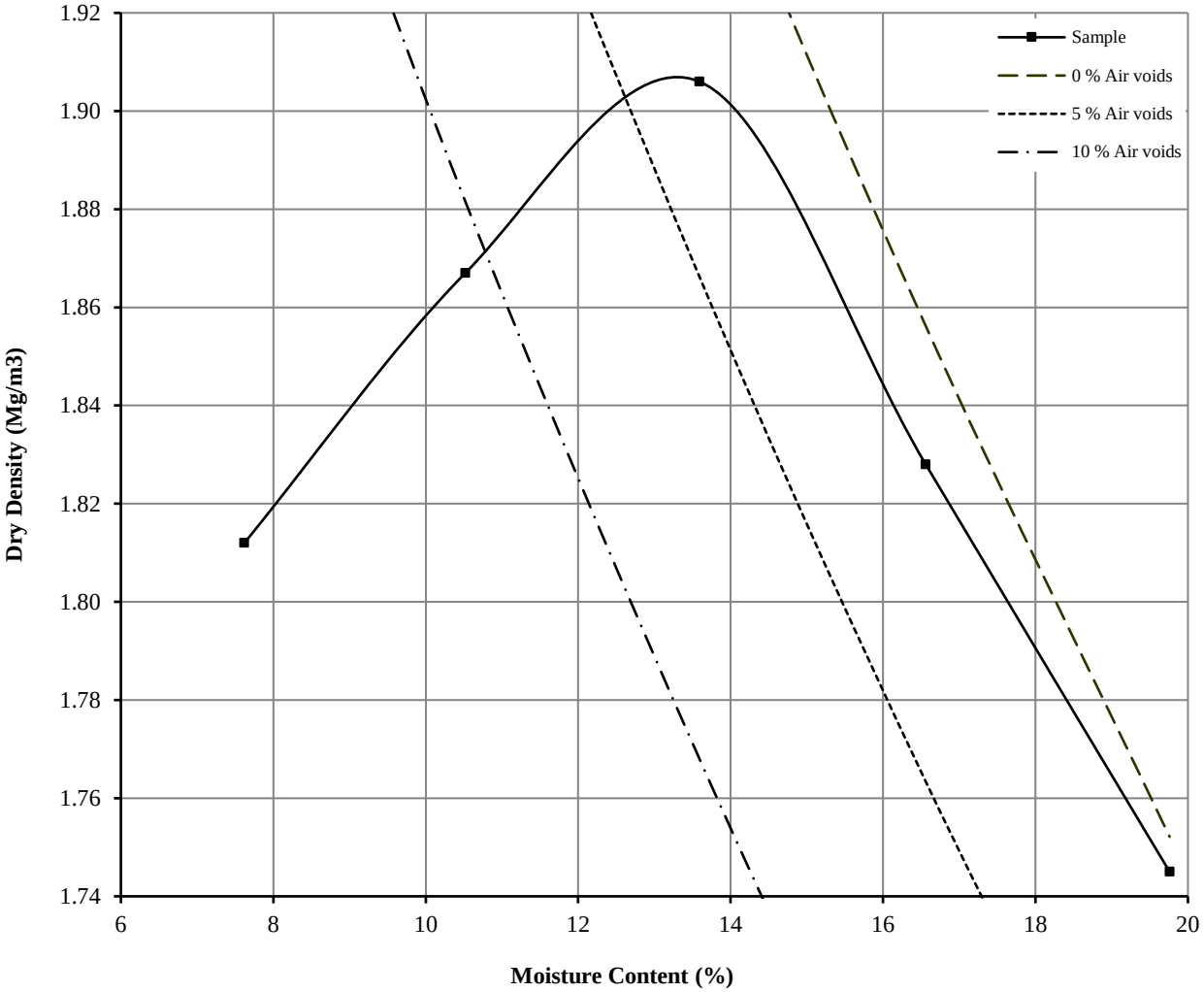
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP380**	**Top Depth (m) :**	**2.20**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		20	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.68	Measured	Material Retained on 37.5 mm Test Sieve (%):		56
Maximum Dry Density (Mg/m3):		1.91	Material Retained on 20.0 mm Test Sieve (%):		6
Optimum Moisture Content (%):		14			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

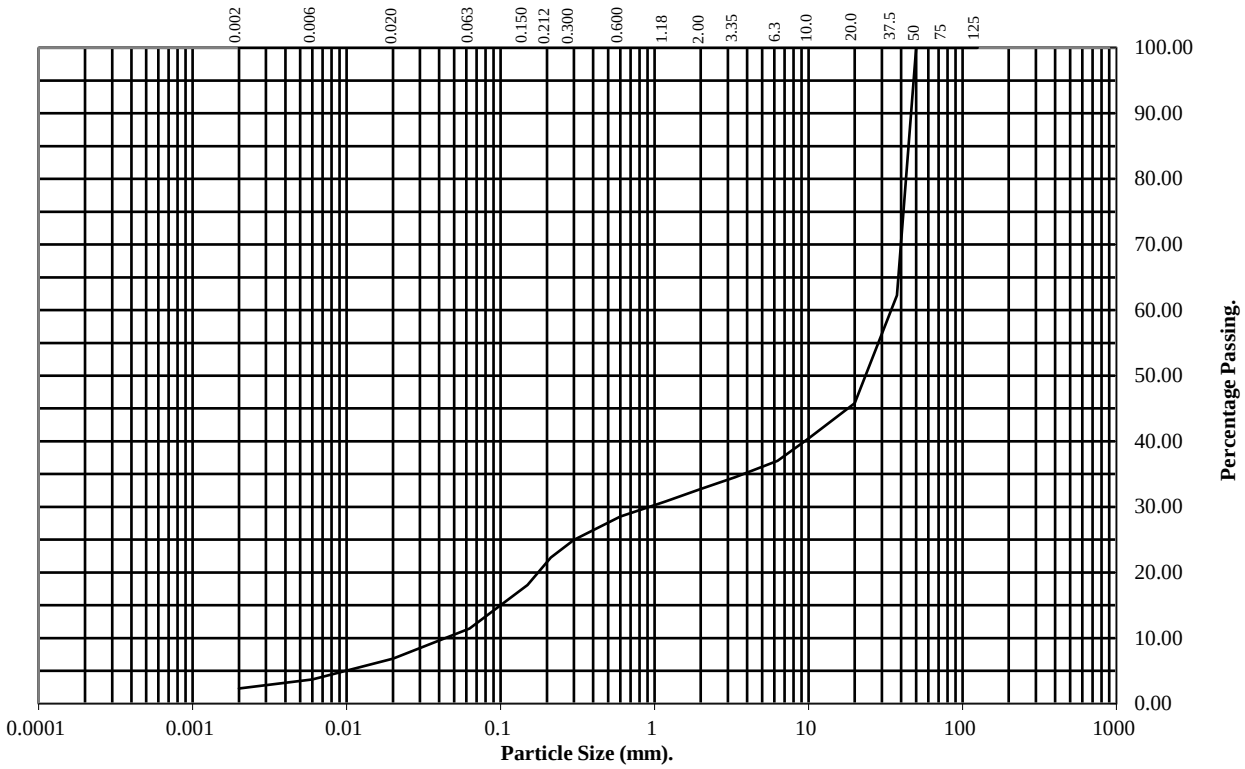
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP382** **Top Depth (m):** **2.00**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	62
20	46
10	40
6.3	37
3.35	35
2	33
1.18	31
0.6	29
0.3	25
0.212	22
0.15	18
0.063	11

Particle Diameter	Percentage Passing
0.02	7
0.006	4
0.002	2

Soil Fraction	Total Percentage
Cobbles	0
Gravel	67
Sand	22
Silt	9
Clay	2

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

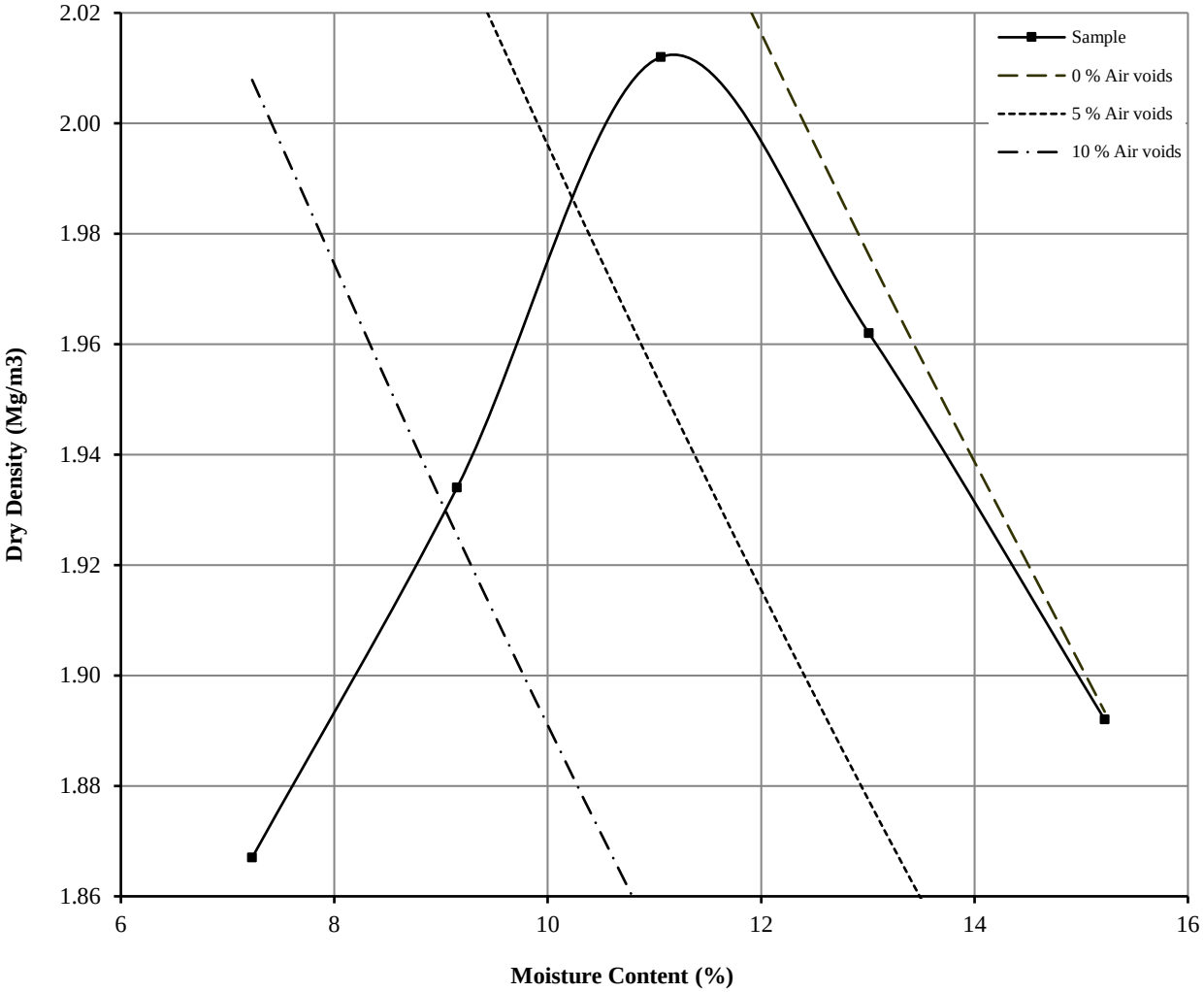
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP382**	**Top Depth (m) :**	**2.00**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		15	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.66	Measured	Material Retained on 37.5 mm Test Sieve (%):		38
Maximum Dry Density (Mg/m3):		2.01	Material Retained on 20.0 mm Test Sieve (%):		16
Optimum Moisture Content (%):		11			
Remarks See summary of soil descriptions					

PARTICLE SIZE DISTRIBUTION TEST

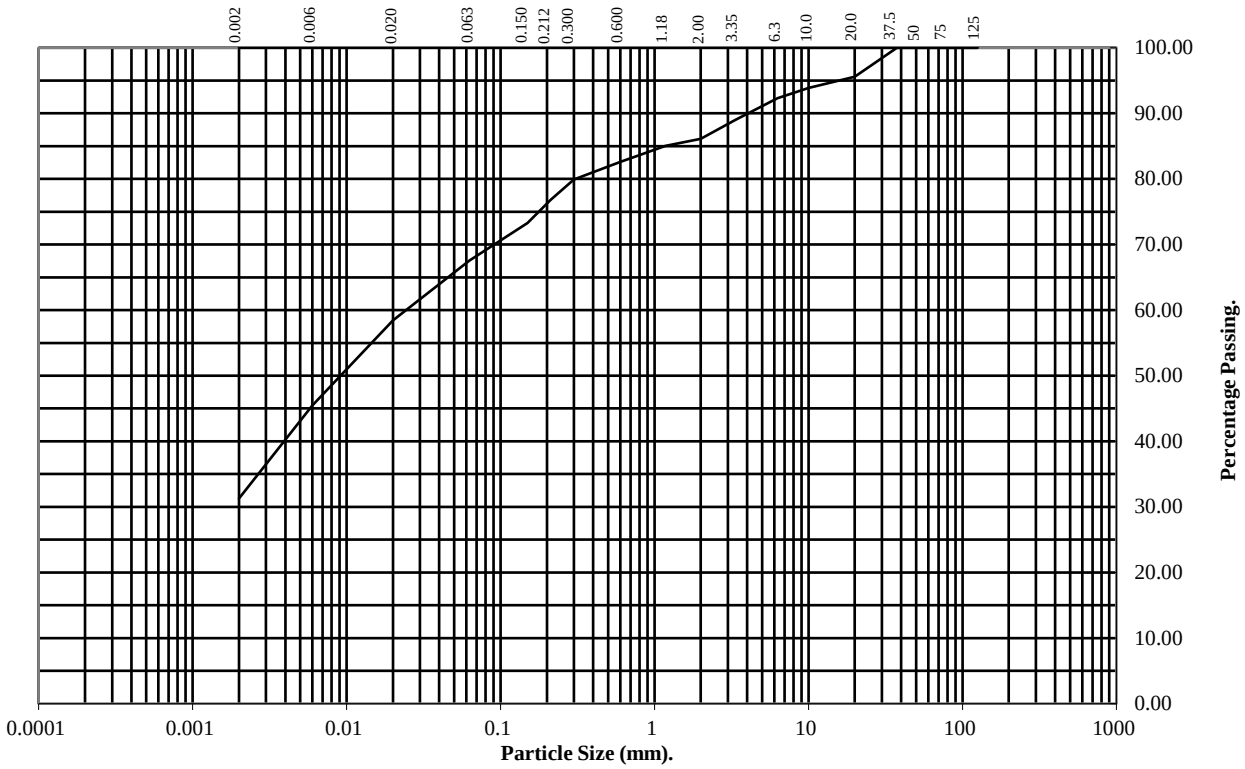
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP385** **Top Depth (m):** **1.50**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	96
10	94
6.3	92
3.35	89
2	86
1.18	85
0.6	83
0.3	80
0.212	77
0.15	73
0.063	68

Particle Diameter	Percentage Passing
0.02	58
0.006	45
0.002	31

Soil Fraction	Total Percentage
Cobbles	0
Gravel	14
Sand	18
Silt	37
Clay	31

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

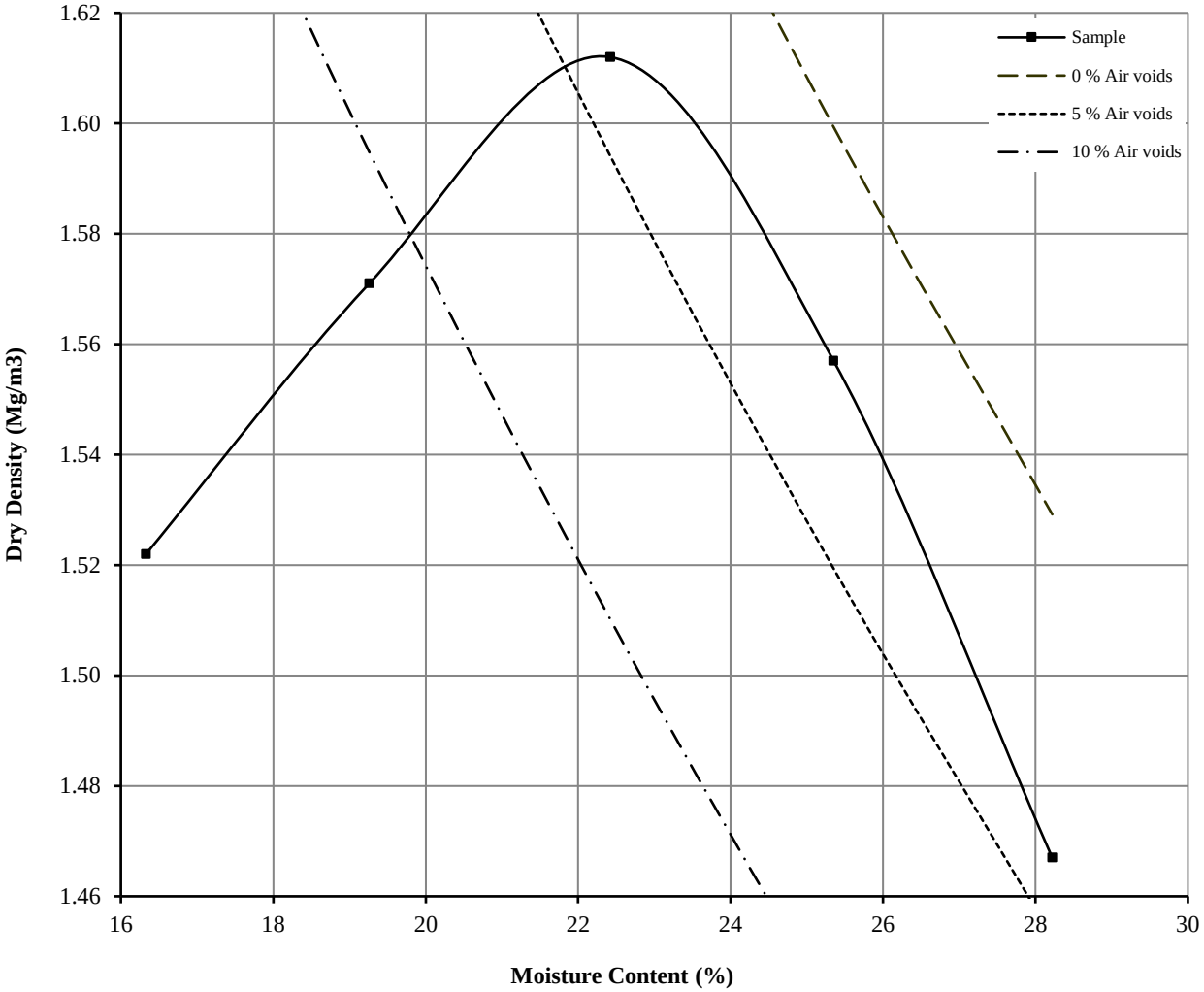
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.5 : 1990

Hole Number:	**TP385**	**Top Depth (m) :**	**1.50**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		31	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.69	Measured	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.61	Material Retained on 20.0 mm Test Sieve (%):		4
Optimum Moisture Content (%):		22			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

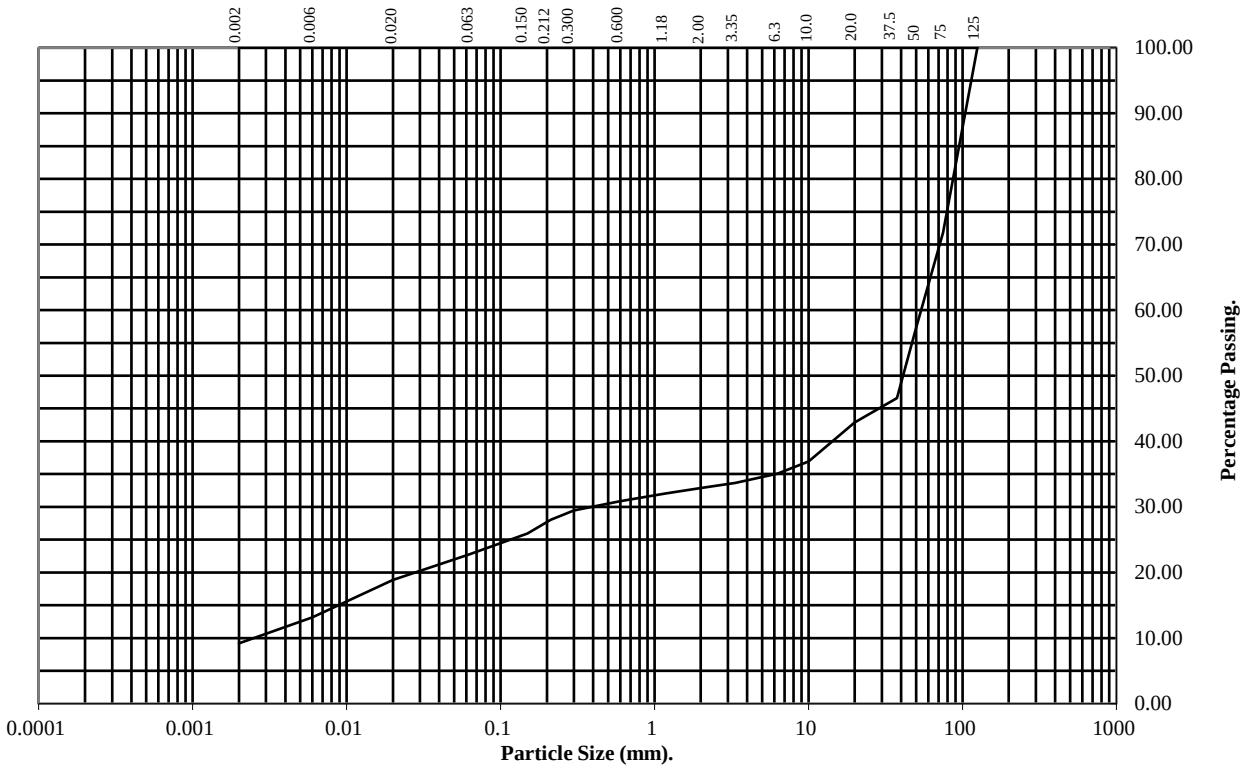
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP388** **Top Depth (m):** **2.50**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	72
50	57
37.5	47
20	43
10	37
6.3	35
3.35	34
2	33
1.18	32
0.6	31
0.3	29
0.212	28
0.15	26
0.063	23

Particle Diameter	Percentage Passing
0.02	19
0.006	13
0.002	9

Soil Fraction	Total Percentage
Cobbles	43
Gravel	24
Sand	10
Silt	14
Clay	9

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

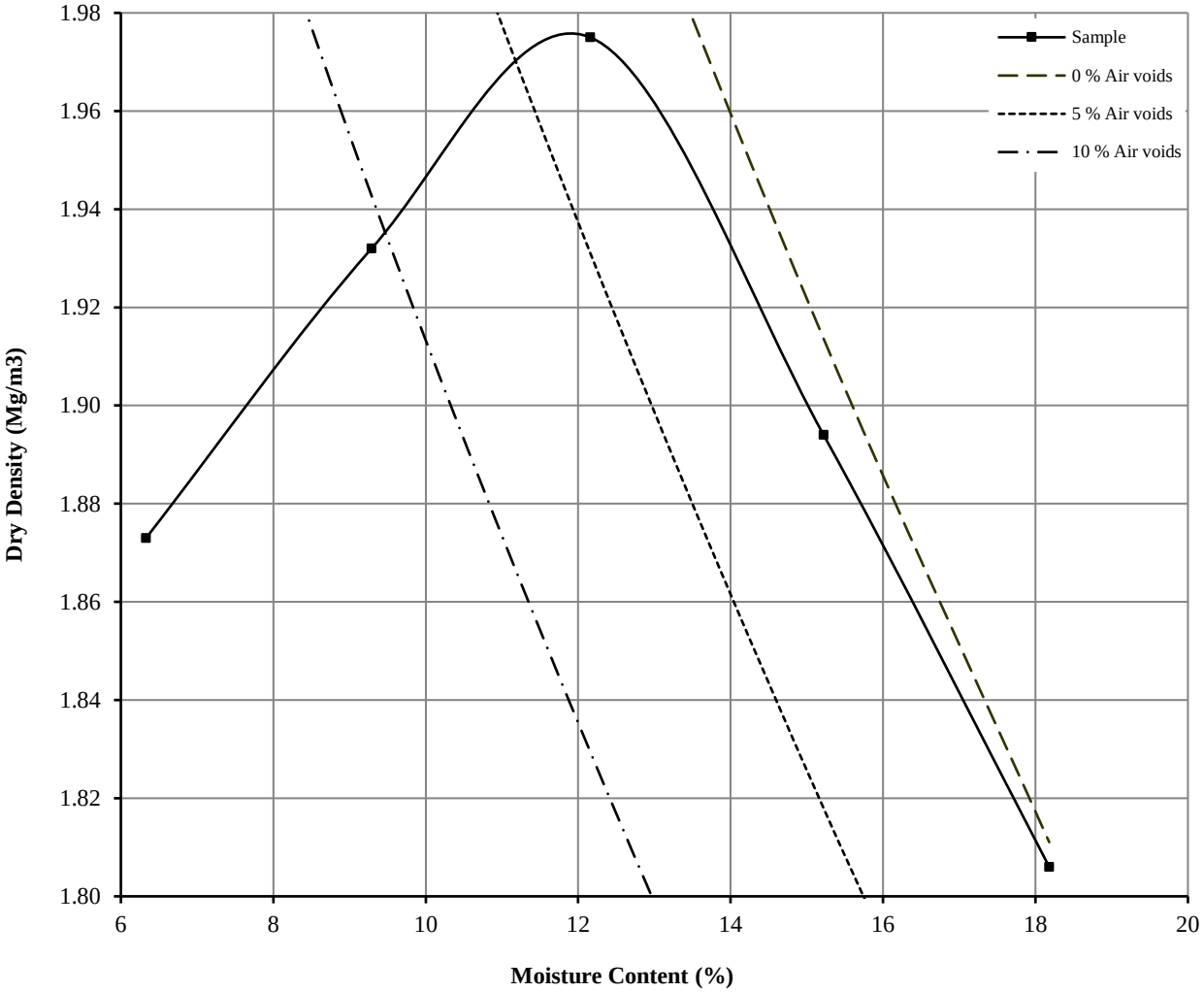
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.5 : 1990

Hole Number:	**TP388**	**Top Depth (m) :**	**2.50**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		21	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.70	Measured	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.98	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		12			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

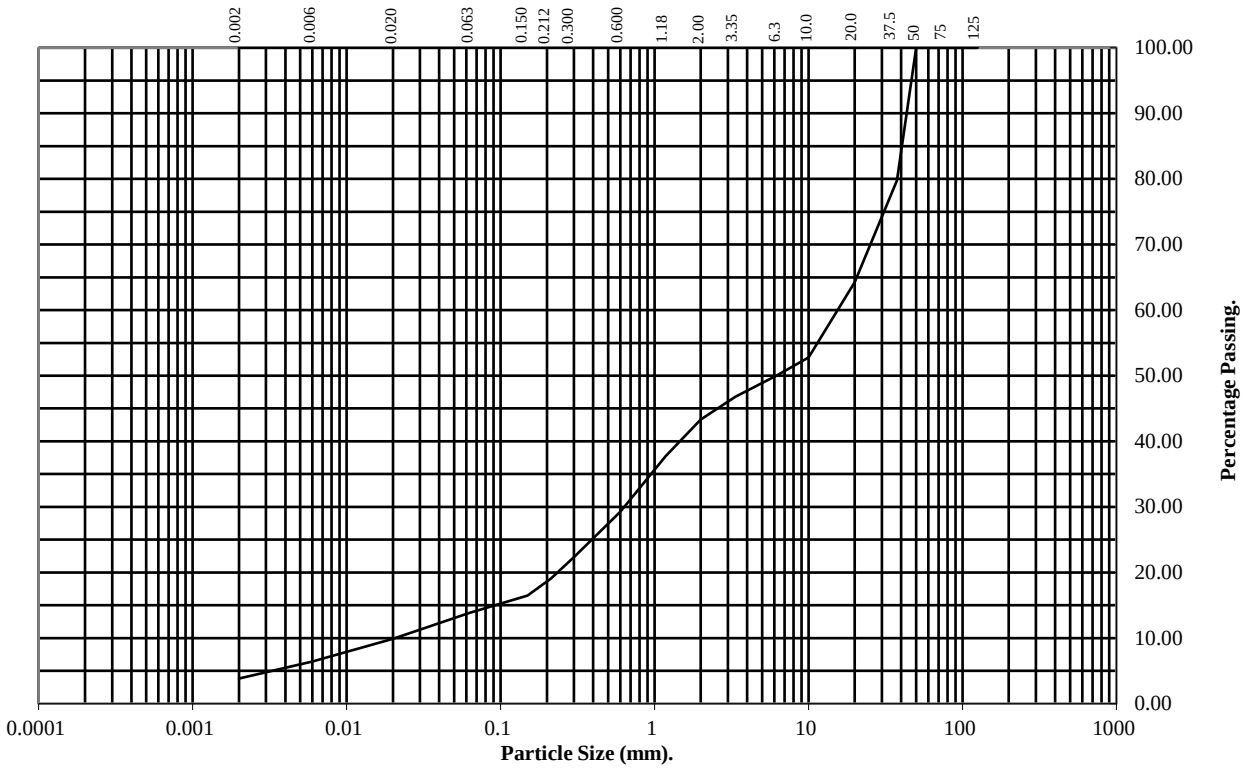
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP389** **Top Depth (m):** **2.20**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	80
20	64
10	53
6.3	50
3.35	47
2	43
1.18	38
0.6	29
0.3	22
0.212	19
0.15	16
0.063	14

Particle Diameter	Percentage Passing
0.02	10
0.006	6
0.002	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	57
Sand	29
Silt	10
Clay	4

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

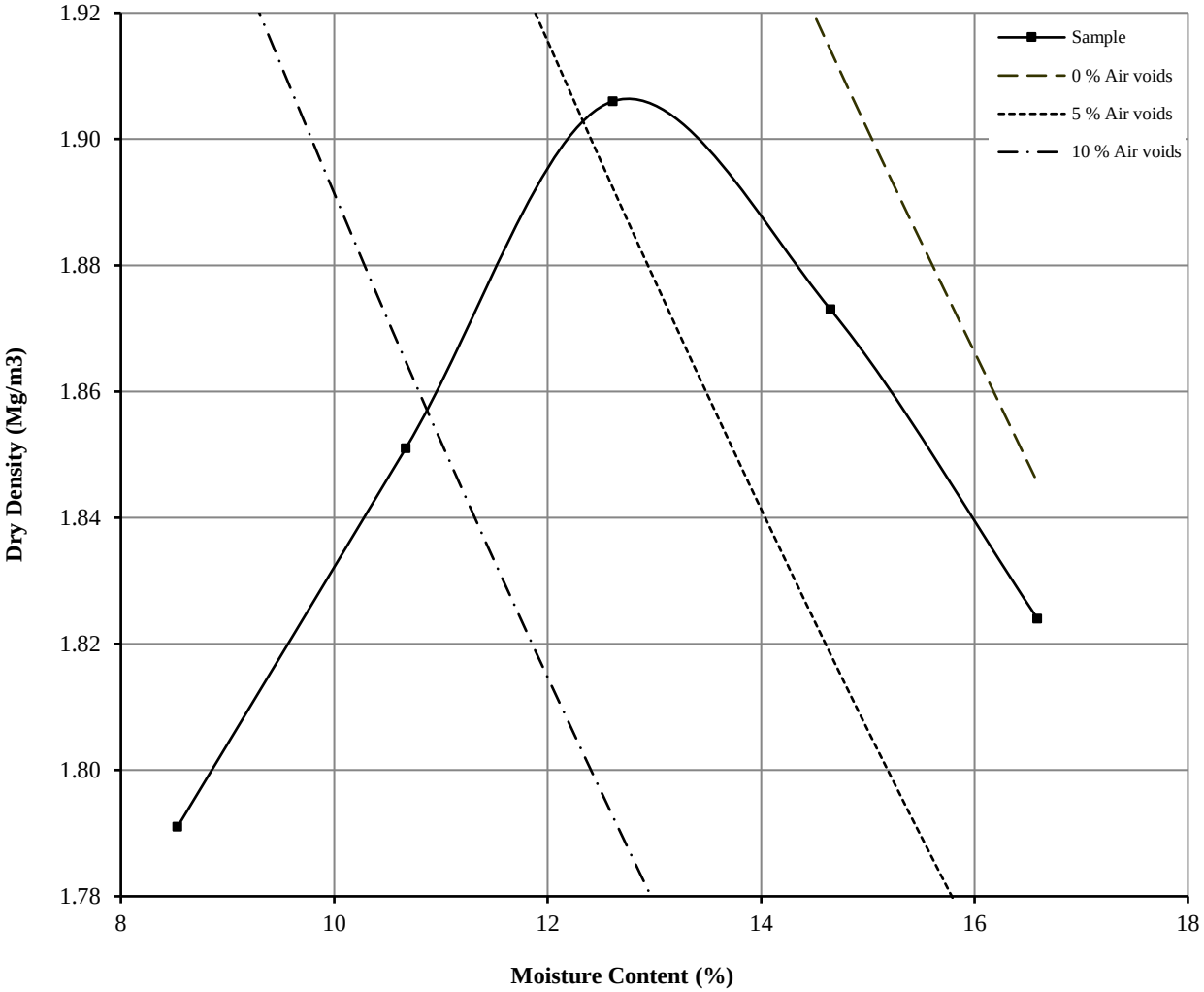
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP389**	**Top Depth (m) :**	**2.20**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		19	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.66	Measured	Material Retained on 37.5 mm Test Sieve (%):		20
Maximum Dry Density (Mg/m3):		1.91	Material Retained on 20.0 mm Test Sieve (%):		16
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

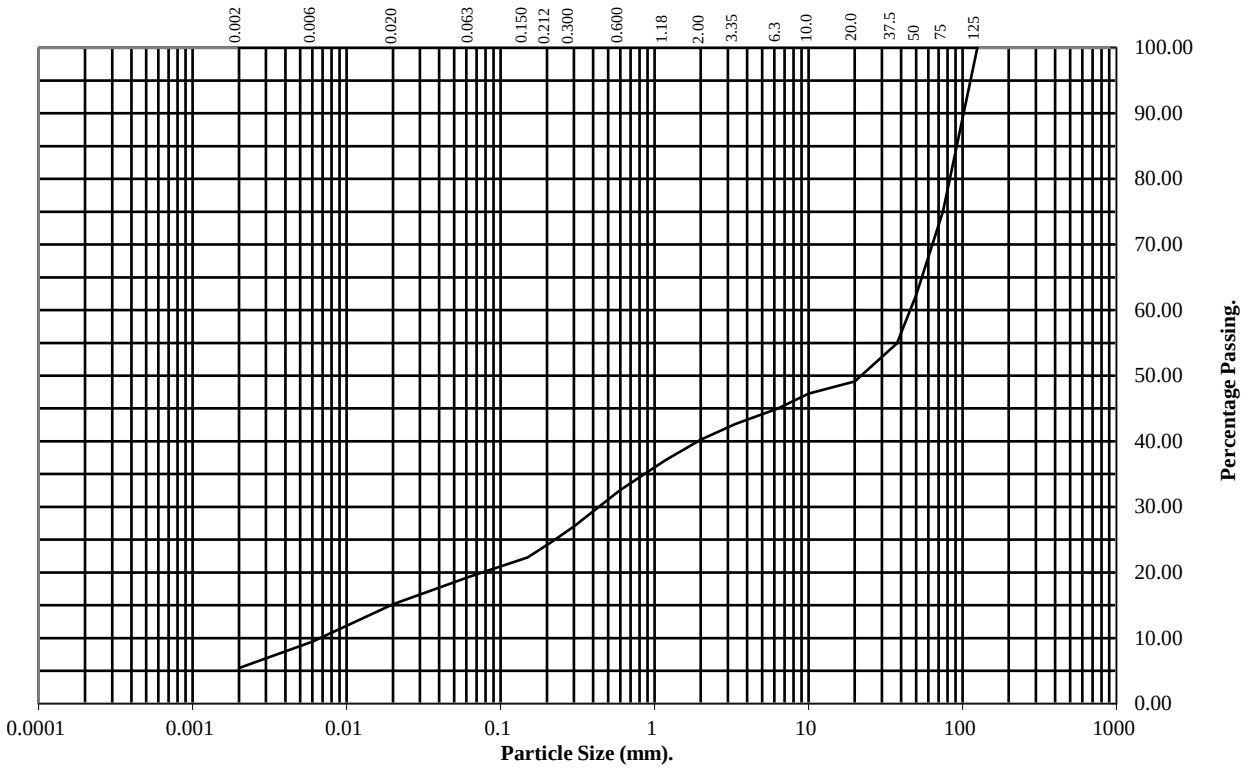
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP398** **Top Depth (m):** **0.80**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	75
50	62
37.5	55
20	49
10	47
6.3	45
3.35	43
2	40
1.18	37
0.6	33
0.3	27
0.212	25
0.15	22
0.063	19

Particle Diameter	Percentage Passing
0.02	15
0.006	9
0.002	5

Soil Fraction	Total Percentage
Cobbles	38
Gravel	22
Sand	21
Silt	14
Clay	5

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

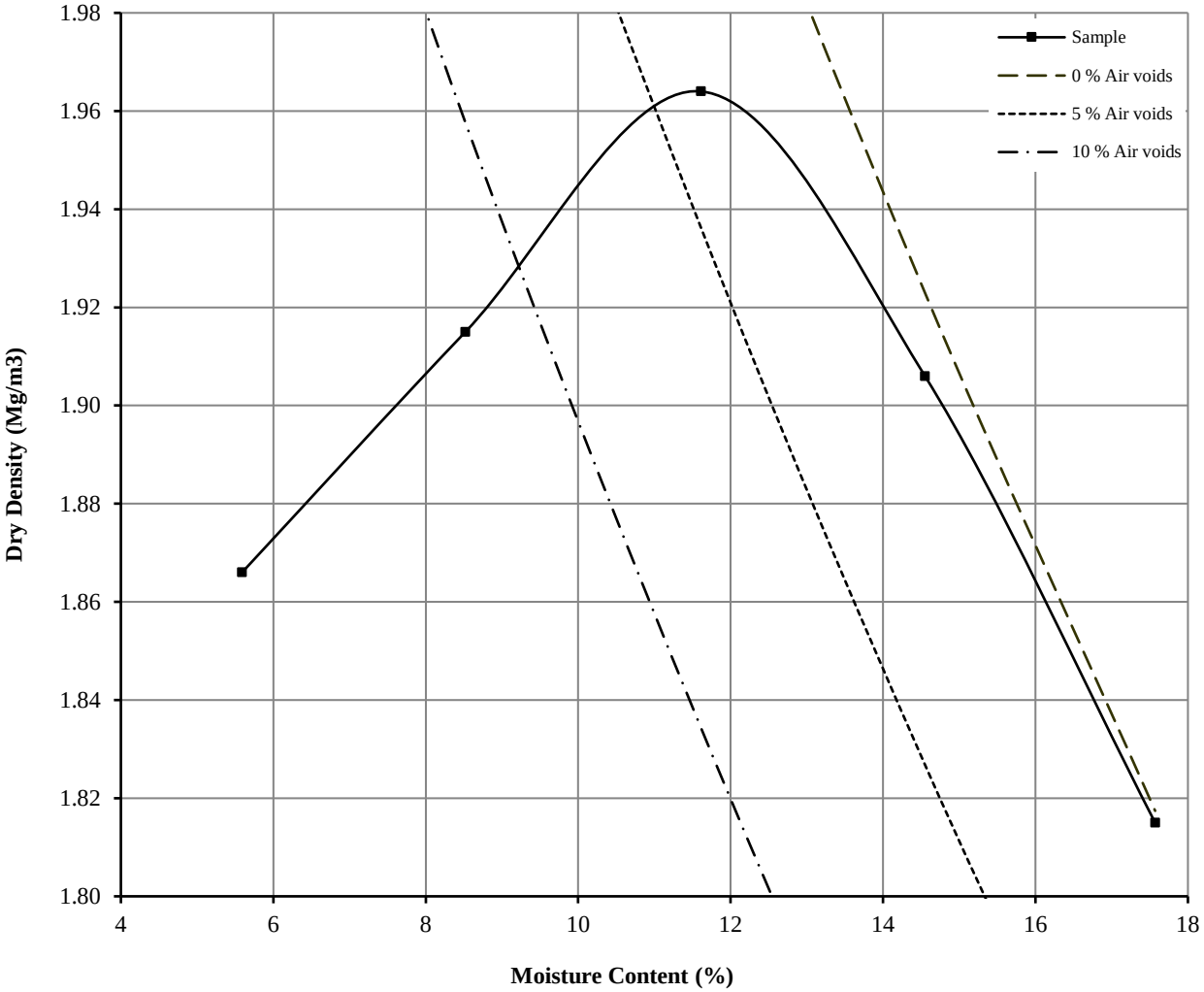
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP398**	**Top Depth (m) :**	**0.80**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		21	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.67	Measured	Material Retained on 37.5 mm Test Sieve (%):		45
Maximum Dry Density (Mg/m3):		1.96	Material Retained on 20.0 mm Test Sieve (%):		6
Optimum Moisture Content (%):		12			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

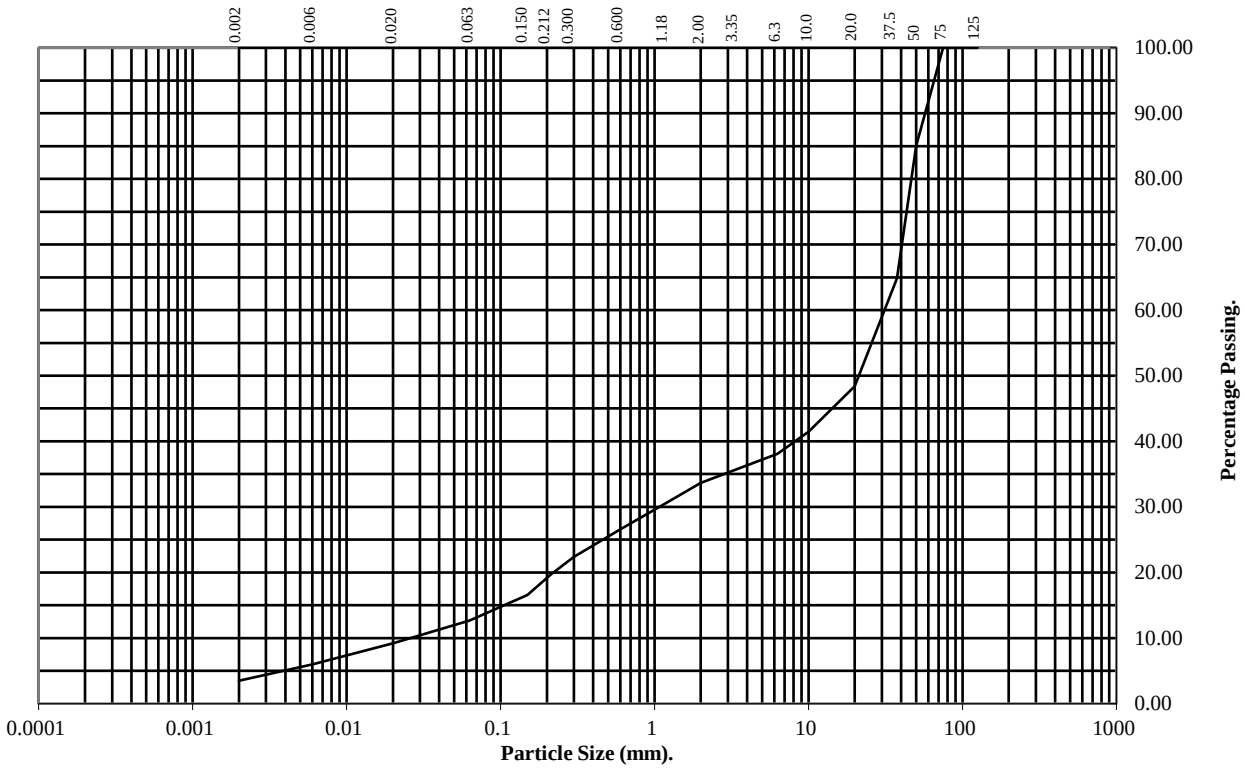
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP399** **Top Depth (m):** **1.00**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	85
37.5	65
20	48
10	41
6.3	38
3.35	36
2	34
1.18	31
0.6	27
0.3	22
0.212	20
0.15	17
0.063	13

Particle Diameter	Percentage Passing
0.02	9
0.006	6
0.002	3

Soil Fraction	Total Percentage
Cobbles	15
Gravel	51
Sand	21
Silt	10
Clay	3

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

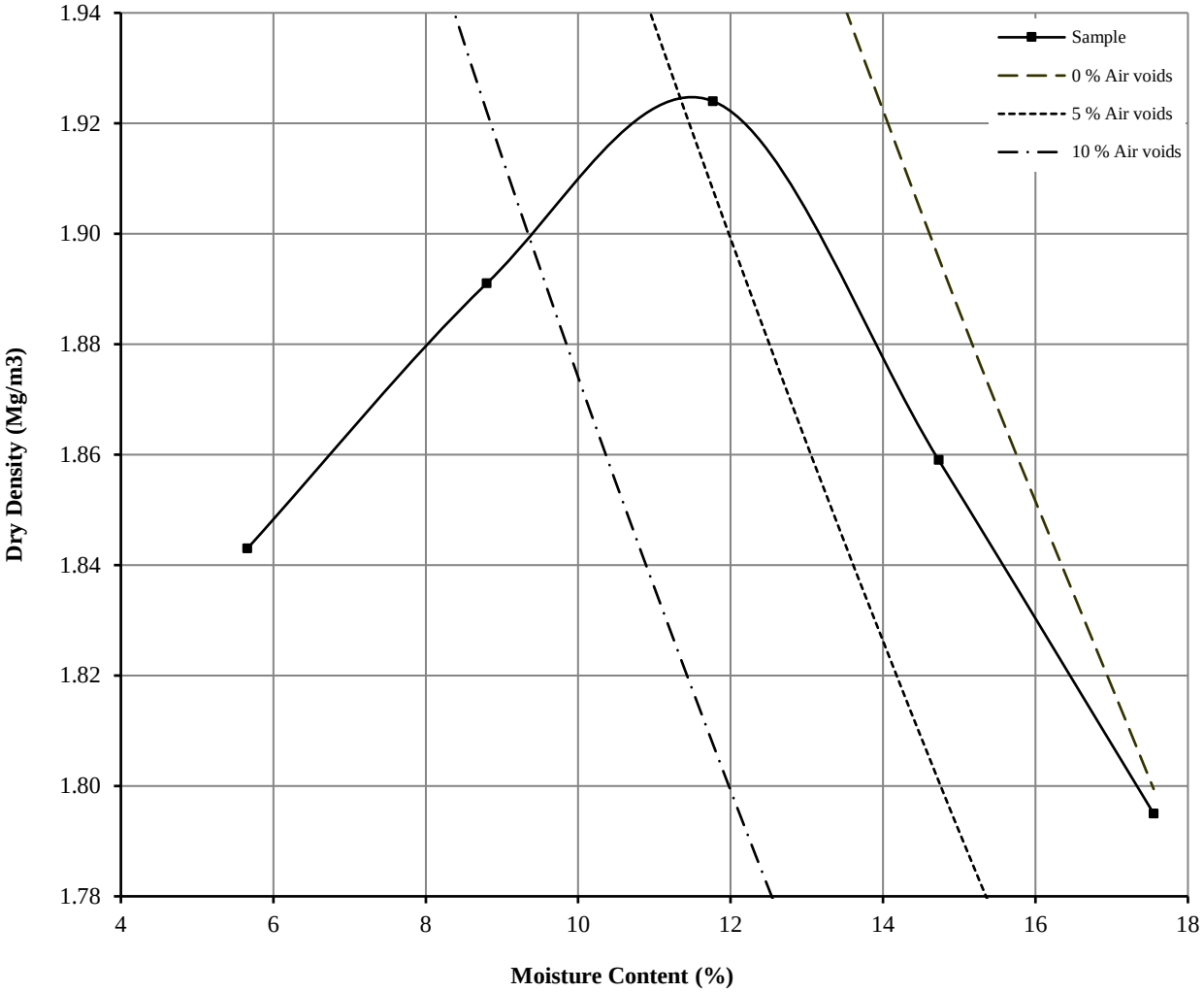
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP399**	**Top Depth (m) :**	**1.00**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		15	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.63	Measured	Material Retained on 37.5 mm Test Sieve (%):		35
Maximum Dry Density (Mg/m3):		1.92	Material Retained on 20.0 mm Test Sieve (%):		17
Optimum Moisture Content (%):		12			
Remarks See summary of soil descriptions					

PARTICLE SIZE DISTRIBUTION TEST

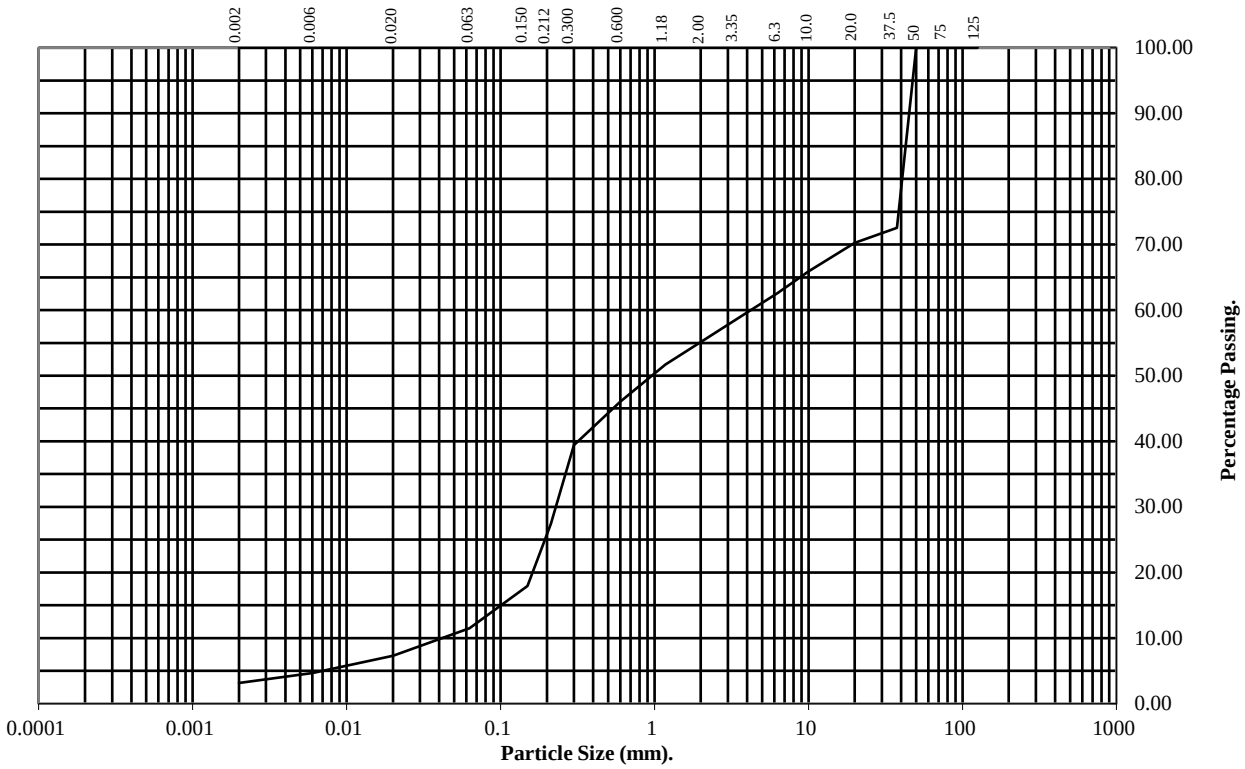
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP401** **Top Depth (m):** **2.00**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	73
20	70
10	66
6.3	63
3.35	59
2	55
1.18	52
0.6	46
0.3	39
0.212	27
0.15	18
0.063	11

Particle Diameter	Percentage Passing
0.02	7
0.006	5
0.002	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	45
Sand	44
Silt	8
Clay	3

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

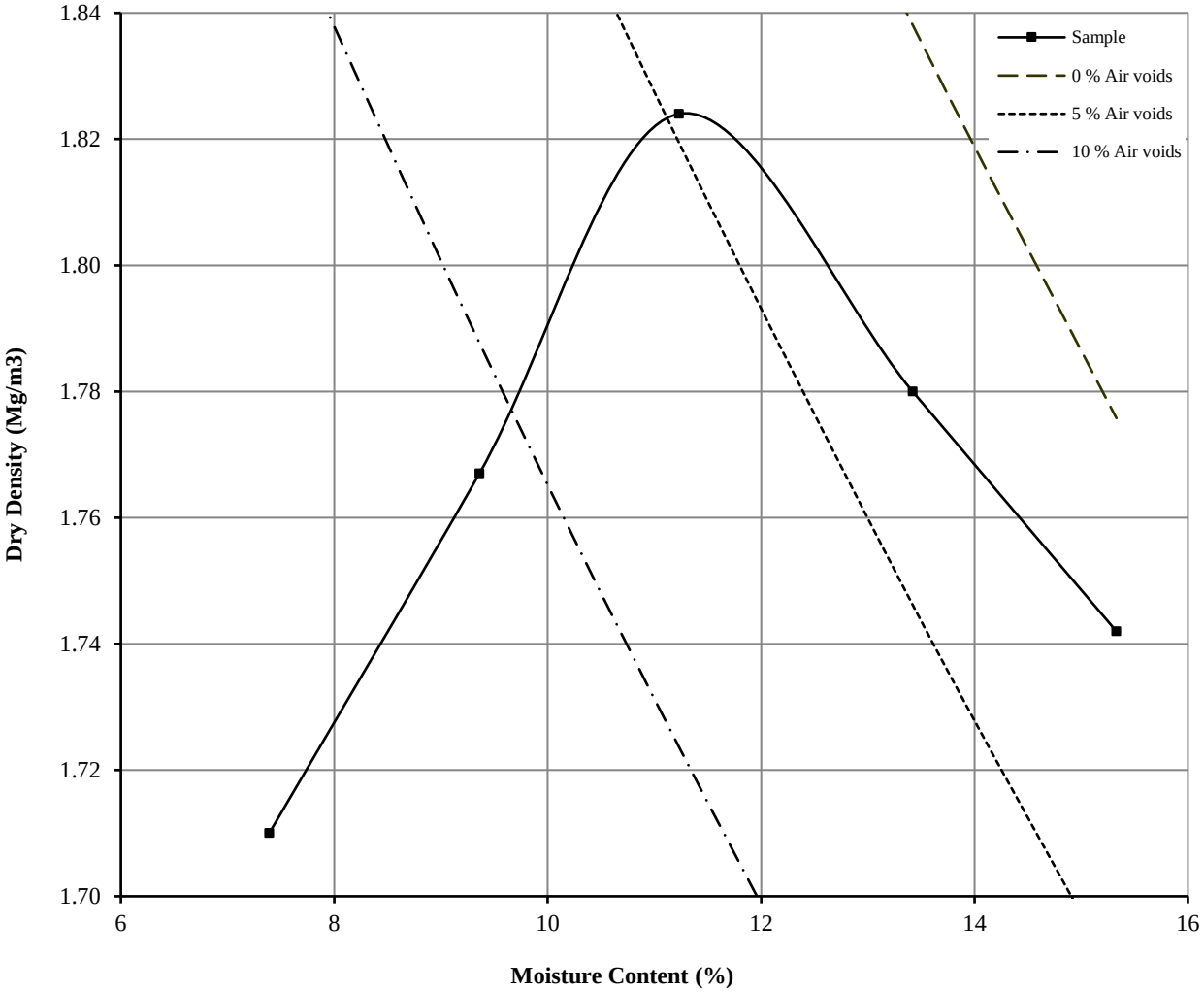
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP401**	**Top Depth (m) :**	**2.00**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		13	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.44	Measured	Material Retained on 37.5 mm Test Sieve (%):		27
Maximum Dry Density (Mg/m3):		1.82	Material Retained on 20.0 mm Test Sieve (%):		3
Optimum Moisture Content (%):		11			
Remarks See summary of soil descriptions					

PARTICLE SIZE DISTRIBUTION TEST

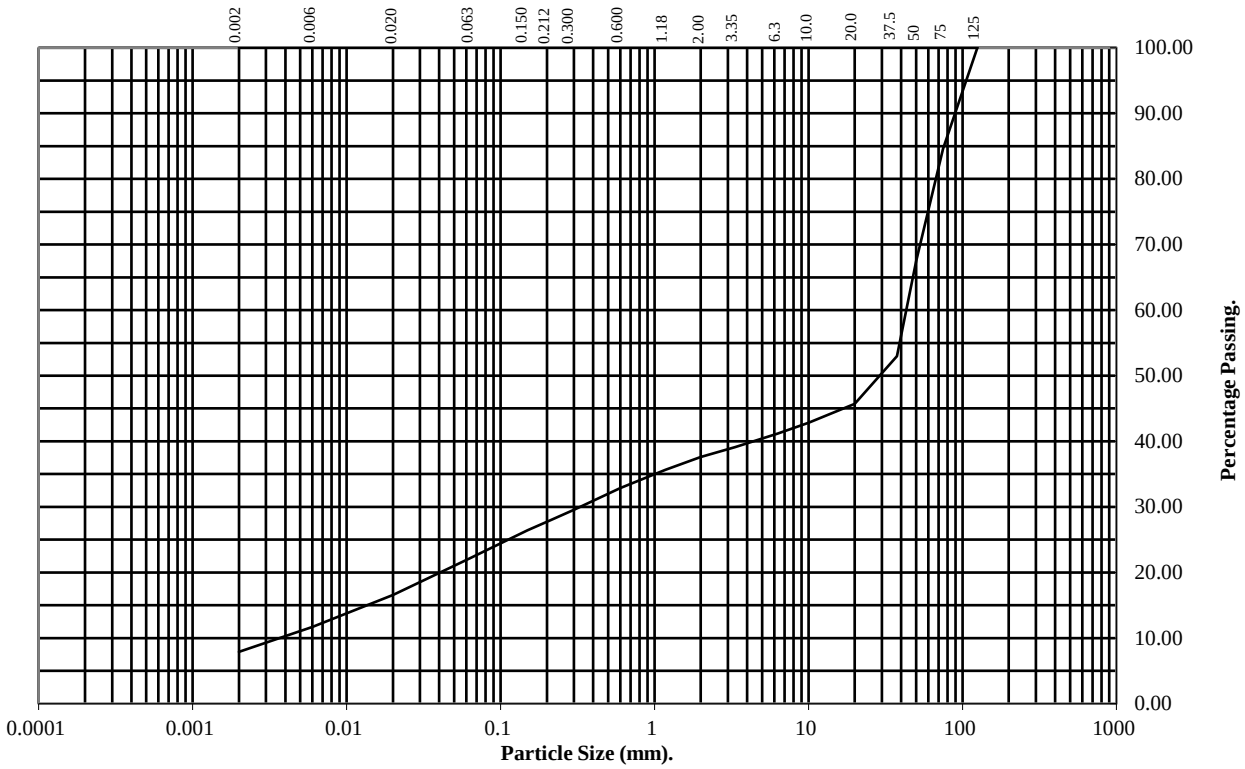
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP402** **Top Depth (m):** **1.50**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	85
50	67
37.5	53
20	46
10	43
6.3	41
3.35	39
2	38
1.18	36
0.6	33
0.3	30
0.212	28
0.15	26
0.063	22

Particle Diameter	Percentage Passing
0.02	17
0.006	12
0.002	8

Soil Fraction	Total Percentage
Cobbles	33
Gravel	29
Sand	16
Silt	14
Clay	8

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

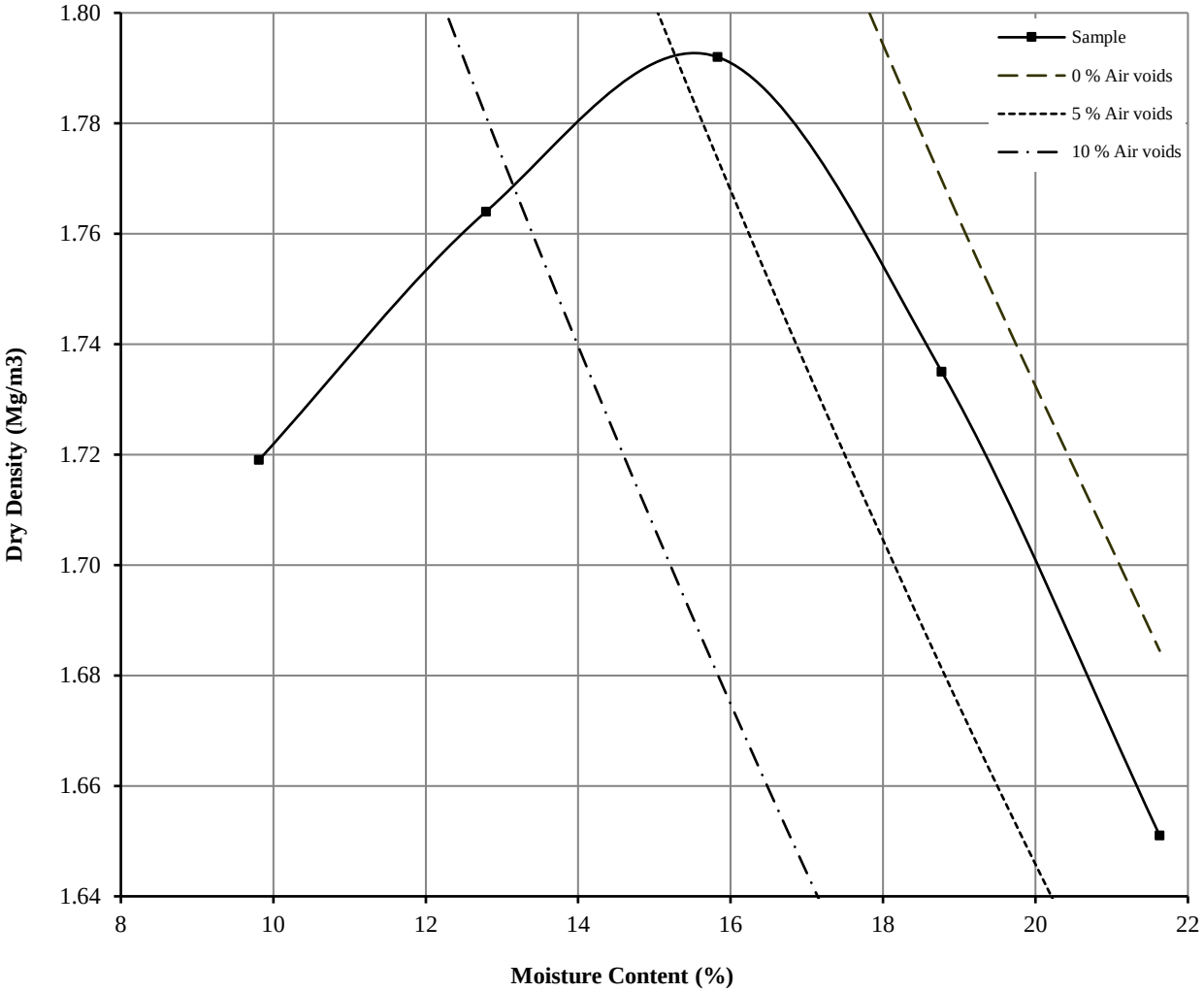
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP402**	**Top Depth (m) :**	**1.50**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		28	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):		47
Maximum Dry Density (Mg/m3):		1.79	Material Retained on 20.0 mm Test Sieve (%):		7
Optimum Moisture Content (%):		16			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

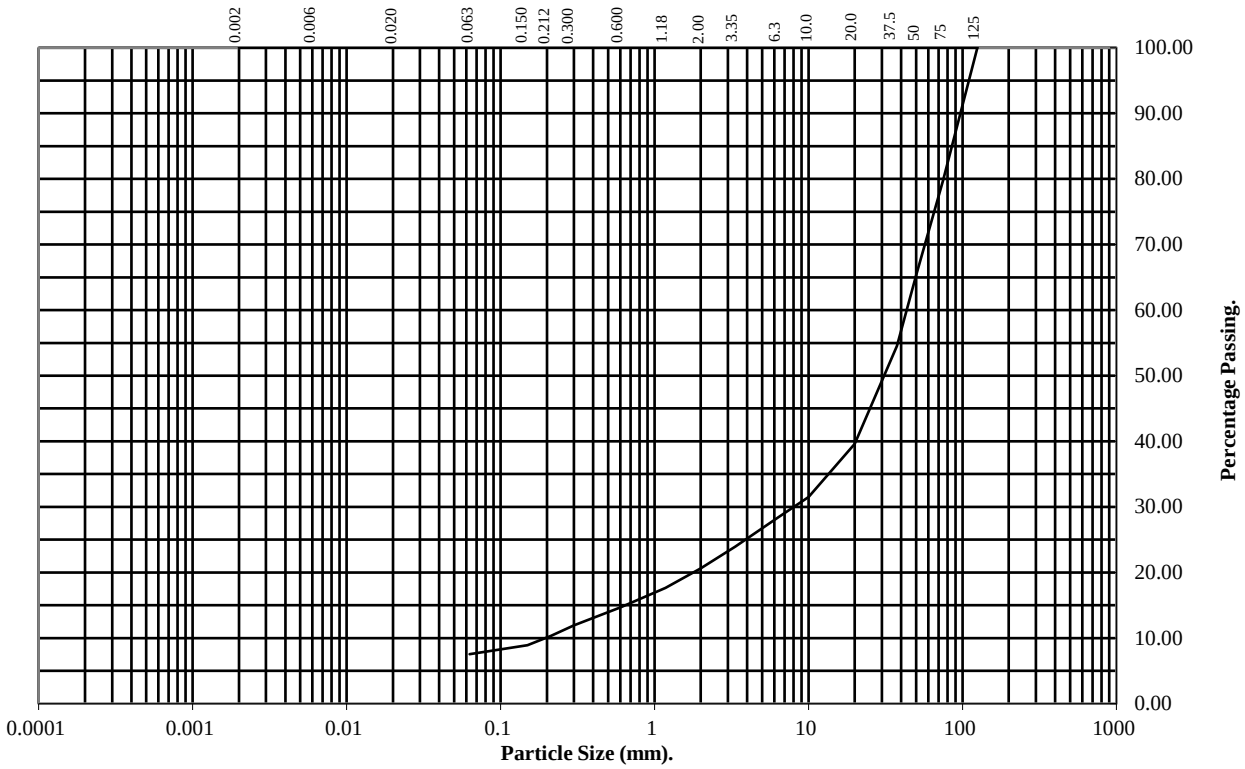
Contract
PSL23/8167
Client Ref
4486

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**TP408**	**Top Depth (m):**	**0.80**
Sample Number:	**3**	**Base Depth(m):**	
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	80
50	65
37.5	55
20	40
10	31
6.3	28
3.35	24
2	21
1.18	18
0.6	15
0.3	12
0.212	10
0.15	9
0.063	8

Soil Fraction	Total Percentage
Cobbles	35
Gravel	44
Sand	13
Silt/Clay	8

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

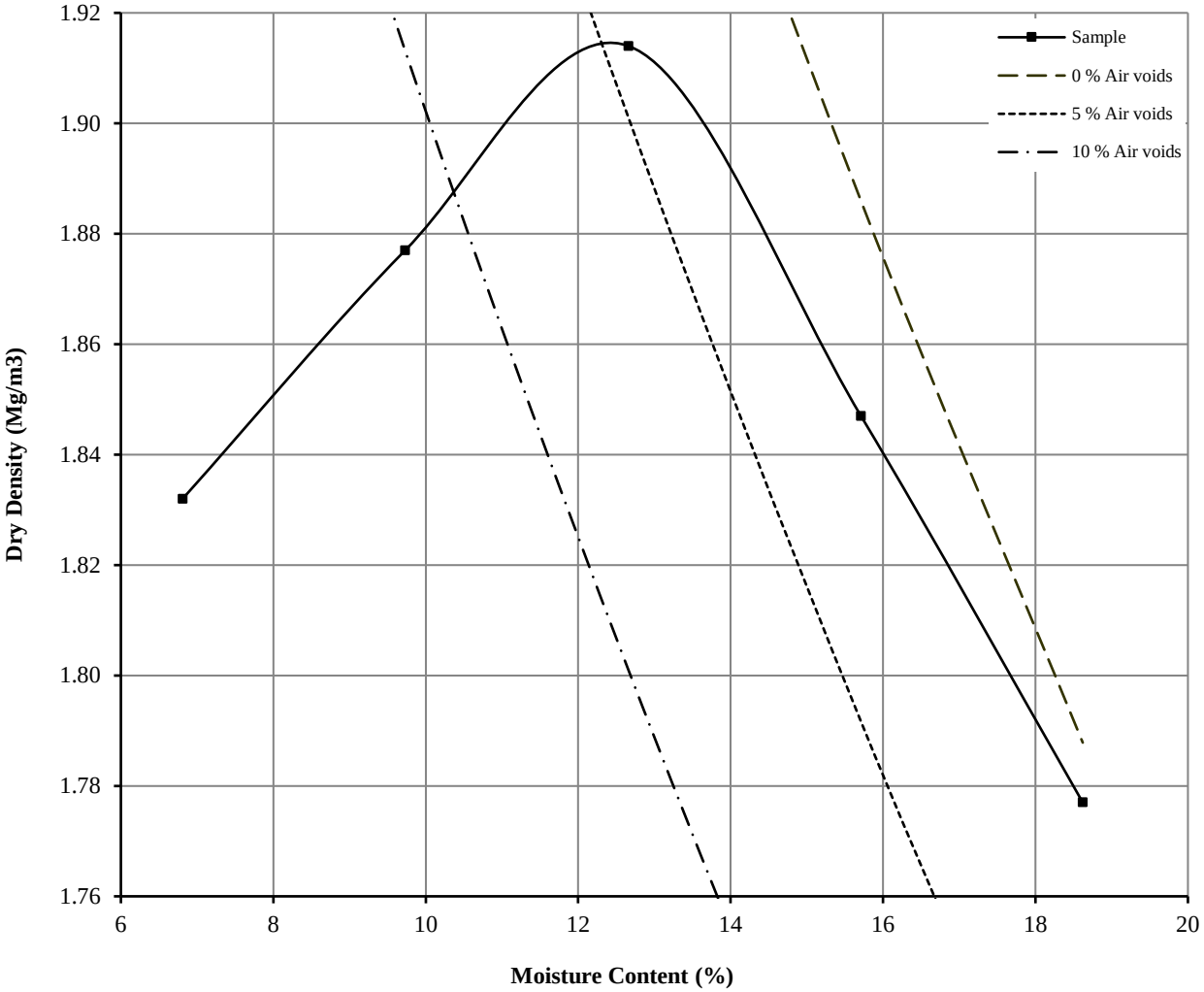
Black Cats

Contract No:
PSL23/8167
Client Ref:
4486

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP408**	**Top Depth (m) :**	**0.80**
Sample Number:	**3**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		19	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.68	Measured	Material Retained on 37.5 mm Test Sieve (%):		45
Maximum Dry Density (Mg/m3):		1.91	Material Retained on 20.0 mm Test Sieve (%):		15
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract
PSL23/8167
Client Ref
4486

7 - 11 Harding Street
Leicester
LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L23/05838/PSL - 23-37958

Your Project Reference:	**PSL23/8167 - Black Cats**		
Your Order Number:	PSL	Samples Received / Instructed:	05/10/2023 / 05/10/2023
Report Issue Number:	1	Sample Tested:	05/10 to 12/10/2023
Samples Analysed:	48 soil samples	Report issued:	12/10/2023

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 10.10.2023

Issued by: J. Gane

Issue No: 4

Rev No: 4

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/05838/PSL - 23-37958

Project Reference - PSL23/8167 - Black Cats

Analytical Test Results - Chemical Analysis

Lab Reference			318492	318493	318494	318495	318496	318497	318498
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP327	TP341	TP343	TP345	TP352C	TP410	TP350
Client Sample Type			D&B	D&B	D&B	D&B	D&B	D	D
Client Sample Number			3	3	2	3	2	4	4
Depth - Top (m)			3.50	2.00	1.20	3.50	1.20	4.00	2.00
Depth - Bottom (m)			3.50	2.00	1.20	3.50	1.20	4.00	2.00
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand	Clay
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	200	230	90	45	490	150	61
pH Value	pH Units	MCERTS	8.3	8.4	8.7	8.6	8.3	8.2	8.5

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Analytical Test Results - Chemical Analysis

Lab Reference			318499	318500	318501	318502	318503	318504	318505
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP358	TP314	TP390	TP413	TP414	TP418	TP303
Client Sample Type			D	D&B	D&B	D&B	D&B	D&B	D
Client Sample Number			2	2	1	2	2	2	2
Depth - Top (m)			1.00	2.20	0.50	1.00	1.50	0.70	0.70
Depth - Bottom (m)			1.00	2.20	0.50	1.00	1.50	0.70	0.70
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Clay	Sand	Sand	Sand	Sand	Sand	Sand
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	< 10	51	75	85	310	23	22
pH Value	pH Units	MCERTS	8.2	8.2	8.2	8.6	8.4	8.7	8.4

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Analytical Test Results - Chemical Analysis

Lab Reference			318506	318507	318508	318509	318510	318511	318512
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP307	TP315	TP316	TP320	TP328	TP336	TP338
Client Sample Type			D	D	D	D	D	D	D
Client Sample Number			2	2	2	2	2	3	3
Depth - Top (m)			1.00	1.00	1.30	1.00	1.20	2.40	1.50
Depth - Bottom (m)			1.00	1.00	1.30	1.00	1.20	2.40	1.50
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Clay	Sand
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	43	< 10	27	21	15	< 10	33
pH Value	pH Units	MCERTS	8.1	7.4	7.7	7.7	6.9	7.1	8.0

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Analytical Test Results - Chemical Analysis

Lab Reference			318513	318514	318515	318516	318517	318518	318519
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP355	TP360	TP362	TP371	TP378	TP404	TP408
Client Sample Type			D	D	D	D	D	D	D
Client Sample Number			2	2	2	2	2	2	4
Depth - Top (m)			0.70	1.00	0.60	0.60	0.90	1.00	1.70
Depth - Bottom (m)			0.70	1.00	0.60	0.60	0.90	1.00	1.70
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand	Sand
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	20	< 10	< 10	< 10	< 10	< 10	11
pH Value	pH Units	MCERTS	8.2	7.8	6.7	6.6	6.5	6.4	6.1

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Analytical Test Results - Chemical Analysis

Lab Reference			318520	318521	318522	318523	318524	318525	318526
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP311	TP313	TP324	TP326	TP332	TP335	TP357
Client Sample Type			D&B	D&B	D	D&B	D&B	D	D&B
Client Sample Number			3	3	3	4	3	2	2
Depth - Top (m)			2.50	2.00	0.90	0.70	1.60	1.60	0.80
Depth - Bottom (m)			2.50	2.00	0.90	0.70	1.60	1.60	0.80
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Clay	Sand	Sand	Sand	Sand	Sand	Sand
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	77	38	140	61	38	< 10	23
pH Value	pH Units	MCERTS	5.1	6.5	6.4	7.4	8.3	8.0	6.5

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Analytical Test Results - Chemical Analysis

Lab Reference			318527	318528	318529	318530	318531	318532	318533
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP380	TP382	TP385	TP388	TP389	TP389	TP401
Client Sample Type			D&B	D&B	D&B	D&B	D&B	D&B	D&B
Client Sample Number			3	3	2	3	-	3	3
Depth - Top (m)			2.20	2.00	1.50	2.50	2.20	2.20	2.00
Depth - Bottom (m)			2.20	2.00	1.50	2.50	2.20	2.20	2.00
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Sand	Sand	Clay	Clay	Clay	Clay	Sand
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	< 10	17	< 10	< 10	< 10	< 10	42
pH Value	pH Units	MCERTS	7.4	6.7	7.0	8.3	7.4	7.5	8.1

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Analytical Test Results - Chemical Analysis

Lab Reference			318534	318535	318536	318537	318538	318539
Client Sample ID			-	-	-	-	-	-
Client Sample Location			TP402	TP408	TP368	TP398	TP399	TP381
Client Sample Type			D&B	D&B	D	D&B	D&B	D
Client Sample Number			2	3	3	2	2	4
Depth - Top (m)			1.50	0.80	0.80	0.80	1.00	2.30
Depth - Bottom (m)			1.50	0.80	0.80	0.80	1.00	2.30
Date of Sampling			-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Clay	Sand	Sand	Sand	Sand	Sand
Determinant	**Units**	**Accreditation**						
Water soluble sulphate (as SO_4)	(mg/l)	u	41	79	< 10	< 10	< 10	< 10
pH Value	pH Units	MCERTS	8.4	5.8	7.5	6.1	7.1	7.4

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Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
318492	-	TP327	D&B	3	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	36
318493	-	TP341	D&B	3	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	32
318494	-	TP343	D&B	2	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	62
318495	-	TP345	D&B	3	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	77
318496	-	TP352C	D&B	2	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	44
318497	-	TP410	D	4	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	53
318498	-	TP350	D	4	Mottled orange brown silty clay	-	-	68
318499	-	TP358	D	2	Mottled orange brown silty clay	-	-	70
318500	-	TP314	D&B	2	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	66
318501	-	TP390	D&B	1	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	56
318502	-	TP413	D&B	2	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	75
318503	-	TP414	D&B	2	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	70
318504	-	TP418	D&B	2	Dark brown gravelly slightly clayey silty sand with rare brick fragments rootlets	-	-	56
318505	-	TP303	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	45
318506	-	TP307	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	70
318507	-	TP315	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	75
318508	-	TP316	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	66
318509	-	TP320	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	87
318510	-	TP328	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	49
318511	-	TP336	D	3	Mottled orange brown silty clay	-	-	62
318512	-	TP338	D	3	Orangish brown gravelly slightly clayey silty sand	-	-	72
318513	-	TP355	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	16

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Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
318514	-	TP360	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	51
318515	-	TP362	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	57
318516	-	TP371	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	60
318517	-	TP378	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	58
318518	-	TP404	D	2	Orangish brown gravelly slightly clayey silty sand	-	-	57
318519	-	TP408	D	4	Orangish brown gravelly slightly clayey silty sand	-	-	48
318520	-	TP311	D&B	3	Mottled orange brown silty clay	-	-	73
318521	-	TP313	D&B	3	Orangish brown gravelly slightly clayey silty sand	-	-	58
318522	-	TP324	D	3	Orangish brown gravelly slightly clayey silty sand	-	-	56
318523	-	TP326	D&B	4	Orangish brown gravelly slightly clayey silty sand	-	-	39
318524	-	TP332	D&B	3	Orangish brown gravelly slightly clayey silty sand	-	-	40
318525	-	TP335	D	2	Orangish brown slightly clayey silty sand	-	-	85
318526	-	TP357	D&B	2	Orangish brown gravelly slightly clayey silty sand	-	-	40
318527	-	TP380	D&B	3	Mottled black brown gravelly slightly clayey silty sand	-	-	61
318528	-	TP382	D&B	3	Orangish brown gravelly slightly clayey silty sand	-	-	60
318529	-	TP385	D&B	2	Brown slightly gravelly silty clay	-	-	66
318530	-	TP388	D&B	3	Brown slightly gravelly silty clay	-	-	37
318531	-	TP389	D&B	-	Brown slightly gravelly silty clay	-	-	78
318532	-	TP389	D&B	3	Brown slightly gravelly silty clay	-	-	69
318533	-	TP401	D&B	3	Made Ground- black gravelly silty sand with frequent brick fragments slag	-	-	85
318534	-	TP402	D&B	2	Brown slightly gravelly silty clay	-	-	78
318535	-	TP408	D&B	3	Brown gravelly slightly clayey silty sand	-	-	41
318536	-	TP368	D	3	Brown gravelly slightly clayey silty sand	-	-	41

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Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
318537	-	TP398	D&B	2	Brown gravelly slightly clayey silty sand with rare rootlets	-	-	51
318538	-	TP399	D&B	2	Brown gravelly slightly clayey silty sand with rare rootlets	-	-	45
318539	-	TP381	D	4	Orangish brown silty sand	-	-	77

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Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
318492	-	TP327	D&B	3	
318493	-	TP341	D&B	3	
318494	-	TP343	D&B	2	
318495	-	TP345	D&B	3	
318496	-	TP352C	D&B	2	
318497	-	TP410	D	4	
318498	-	TP350	D	4	
318499	-	TP358	D	2	
318500	-	TP314	D&B	2	
318501	-	TP390	D&B	1	
318502	-	TP413	D&B	2	
318503	-	TP414	D&B	2	
318504	-	TP418	D&B	2	
318505	-	TP303	D	2	
318506	-	TP307	D	2	
318507	-	TP315	D	2	
318508	-	TP316	D	2	
318509	-	TP320	D	2	
318510	-	TP328	D	2	
318511	-	TP336	D	3	
318512	-	TP338	D	3	
318513	-	TP355	D	2	
318514	-	TP360	D	2	

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Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
318515	-	TP362	D	2	
318516	-	TP371	D	2	
318517	-	TP378	D	2	
318518	-	TP404	D	2	
318519	-	TP408	D	4	
318520	-	TP311	D&B	3	
318521	-	TP313	D&B	3	
318522	-	TP324	D	3	
318523	-	TP326	D&B	4	
318524	-	TP332	D&B	3	
318525	-	TP335	D	2	
318526	-	TP357	D&B	2	
318527	-	TP380	D&B	3	
318528	-	TP382	D&B	3	
318529	-	TP385	D&B	2	
318530	-	TP388	D&B	3	
318531	-	TP389	D&B	-	
318532	-	TP389	D&B	3	
318533	-	TP401	D&B	3	
318534	-	TP402	D&B	2	
318535	-	TP408	D&B	3	
318536	-	TP368	D	3	
318537	-	TP398	D&B	2	

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Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
318538	-	TP399	D&B	2	
318539	-	TP381	D	4	

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Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis

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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
318492	-	TP327	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318492	-	TP327	D&B	3	MS - CL - Sample Preparation	A
318492	-	TP327	D&B	3	MS - CL - pH in Soils	A
318493	-	TP341	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318493	-	TP341	D&B	3	MS - CL - Sample Preparation	A
318493	-	TP341	D&B	3	MS - CL - pH in Soils	A
318494	-	TP343	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318494	-	TP343	D&B	2	MS - CL - Sample Preparation	A
318494	-	TP343	D&B	2	MS - CL - pH in Soils	A
318495	-	TP345	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318495	-	TP345	D&B	3	MS - CL - Sample Preparation	A
318495	-	TP345	D&B	3	MS - CL - pH in Soils	A
318496	-	TP352C	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318496	-	TP352C	D&B	2	MS - CL - Sample Preparation	A
318496	-	TP352C	D&B	2	MS - CL - pH in Soils	A
318497	-	TP410	D	4	MS - CL - Anions by Aquakem (2:1Extract)	A
318497	-	TP410	D	4	MS - CL - Sample Preparation	A
318497	-	TP410	D	4	MS - CL - pH in Soils	A
318498	-	TP350	D	4	MS - CL - Anions by Aquakem (2:1Extract)	A
318498	-	TP350	D	4	MS - CL - Sample Preparation	A
318498	-	TP350	D	4	MS - CL - pH in Soils	A
318499	-	TP358	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318499	-	TP358	D	2	MS - CL - Sample Preparation	A
318499	-	TP358	D	2	MS - CL - pH in Soils	A
318500	-	TP314	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318500	-	TP314	D&B	2	MS - CL - Sample Preparation	A
318500	-	TP314	D&B	2	MS - CL - pH in Soils	A
318501	-	TP390	D&B	1	MS - CL - Anions by Aquakem (2:1Extract)	A
318501	-	TP390	D&B	1	MS - CL - Sample Preparation	A
318501	-	TP390	D&B	1	MS - CL - pH in Soils	A
318502	-	TP413	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318502	-	TP413	D&B	2	MS - CL - Sample Preparation	A
318502	-	TP413	D&B	2	MS - CL - pH in Soils	A
318503	-	TP414	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318503	-	TP414	D&B	2	MS - CL - Sample Preparation	A
318503	-	TP414	D&B	2	MS - CL - pH in Soils	A

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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
318504	-	TP418	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318504	-	TP418	D&B	2	MS - CL - Sample Preparation	A
318504	-	TP418	D&B	2	MS - CL - pH in Soils	A
318505	-	TP303	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318505	-	TP303	D	2	MS - CL - Sample Preparation	A
318505	-	TP303	D	2	MS - CL - pH in Soils	A
318506	-	TP307	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318506	-	TP307	D	2	MS - CL - Sample Preparation	A
318506	-	TP307	D	2	MS - CL - pH in Soils	A
318507	-	TP315	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318507	-	TP315	D	2	MS - CL - Sample Preparation	A
318507	-	TP315	D	2	MS - CL - pH in Soils	A
318508	-	TP316	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318508	-	TP316	D	2	MS - CL - Sample Preparation	A
318508	-	TP316	D	2	MS - CL - pH in Soils	A
318509	-	TP320	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318509	-	TP320	D	2	MS - CL - Sample Preparation	A
318509	-	TP320	D	2	MS - CL - pH in Soils	A
318510	-	TP328	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318510	-	TP328	D	2	MS - CL - Sample Preparation	A
318510	-	TP328	D	2	MS - CL - pH in Soils	A
318511	-	TP336	D	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318511	-	TP336	D	3	MS - CL - Sample Preparation	A
318511	-	TP336	D	3	MS - CL - pH in Soils	A
318512	-	TP338	D	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318512	-	TP338	D	3	MS - CL - Sample Preparation	A
318512	-	TP338	D	3	MS - CL - pH in Soils	A
318513	-	TP355	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318513	-	TP355	D	2	MS - CL - Sample Preparation	A
318513	-	TP355	D	2	MS - CL - pH in Soils	A
318514	-	TP360	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318514	-	TP360	D	2	MS - CL - Sample Preparation	A
318514	-	TP360	D	2	MS - CL - pH in Soils	A
318515	-	TP362	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318515	-	TP362	D	2	MS - CL - Sample Preparation	A
318515	-	TP362	D	2	MS - CL - pH in Soils	A

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Project Reference - PSL23/8167 - Black Cats

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
318516	-	TP371	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318516	-	TP371	D	2	MS - CL - Sample Preparation	A
318516	-	TP371	D	2	MS - CL - pH in Soils	A
318517	-	TP378	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318517	-	TP378	D	2	MS - CL - Sample Preparation	A
318517	-	TP378	D	2	MS - CL - pH in Soils	A
318518	-	TP404	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318518	-	TP404	D	2	MS - CL - Sample Preparation	A
318518	-	TP404	D	2	MS - CL - pH in Soils	A
318519	-	TP408	D	4	MS - CL - Anions by Aquakem (2:1Extract)	A
318519	-	TP408	D	4	MS - CL - Sample Preparation	A
318519	-	TP408	D	4	MS - CL - pH in Soils	A
318520	-	TP311	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318520	-	TP311	D&B	3	MS - CL - Sample Preparation	A
318520	-	TP311	D&B	3	MS - CL - pH in Soils	A
318521	-	TP313	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318521	-	TP313	D&B	3	MS - CL - Sample Preparation	A
318521	-	TP313	D&B	3	MS - CL - pH in Soils	A
318522	-	TP324	D	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318522	-	TP324	D	3	MS - CL - Sample Preparation	A
318522	-	TP324	D	3	MS - CL - pH in Soils	A
318523	-	TP326	D&B	4	MS - CL - Anions by Aquakem (2:1Extract)	A
318523	-	TP326	D&B	4	MS - CL - Sample Preparation	A
318523	-	TP326	D&B	4	MS - CL - pH in Soils	A
318524	-	TP332	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318524	-	TP332	D&B	3	MS - CL - Sample Preparation	A
318524	-	TP332	D&B	3	MS - CL - pH in Soils	A
318525	-	TP335	D	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318525	-	TP335	D	2	MS - CL - Sample Preparation	A
318525	-	TP335	D	2	MS - CL - pH in Soils	A
318526	-	TP357	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318526	-	TP357	D&B	2	MS - CL - Sample Preparation	A
318526	-	TP357	D&B	2	MS - CL - pH in Soils	A
318527	-	TP380	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318527	-	TP380	D&B	3	MS - CL - Sample Preparation	A
318527	-	TP380	D&B	3	MS - CL - pH in Soils	A

7 - 11 Harding Street
Leicester
LE1 4DH

L23/05838/PSL - 23-37958

Project Reference - PSL23/8167 - Black Cats

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
318528	-	TP382	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318528	-	TP382	D&B	3	MS - CL - Sample Preparation	A
318528	-	TP382	D&B	3	MS - CL - pH in Soils	A
318529	-	TP385	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318529	-	TP385	D&B	2	MS - CL - Sample Preparation	A
318529	-	TP385	D&B	2	MS - CL - pH in Soils	A
318530	-	TP388	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318530	-	TP388	D&B	3	MS - CL - Sample Preparation	A
318530	-	TP388	D&B	3	MS - CL - pH in Soils	A
318531	-	TP389	D&B	-	MS - CL - Anions by Aquakem (2:1Extract)	A
318531	-	TP389	D&B	-	MS - CL - Sample Preparation	A
318531	-	TP389	D&B	-	MS - CL - pH in Soils	A
318532	-	TP389	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318532	-	TP389	D&B	3	MS - CL - Sample Preparation	A
318532	-	TP389	D&B	3	MS - CL - pH in Soils	A
318533	-	TP401	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318533	-	TP401	D&B	3	MS - CL - Sample Preparation	A
318533	-	TP401	D&B	3	MS - CL - pH in Soils	A
318534	-	TP402	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318534	-	TP402	D&B	2	MS - CL - Sample Preparation	A
318534	-	TP402	D&B	2	MS - CL - pH in Soils	A
318535	-	TP408	D&B	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318535	-	TP408	D&B	3	MS - CL - Sample Preparation	A
318535	-	TP408	D&B	3	MS - CL - pH in Soils	A
318536	-	TP368	D	3	MS - CL - Anions by Aquakem (2:1Extract)	A
318536	-	TP368	D	3	MS - CL - Sample Preparation	A
318536	-	TP368	D	3	MS - CL - pH in Soils	A
318537	-	TP398	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318537	-	TP398	D&B	2	MS - CL - Sample Preparation	A
318537	-	TP398	D&B	2	MS - CL - pH in Soils	A
318538	-	TP399	D&B	2	MS - CL - Anions by Aquakem (2:1Extract)	A
318538	-	TP399	D&B	2	MS - CL - Sample Preparation	A
318538	-	TP399	D&B	2	MS - CL - pH in Soils	A
318539	-	TP381	D	4	MS - CL - Anions by Aquakem (2:1Extract)	A
318539	-	TP381	D	4	MS - CL - Sample Preparation	A
318539	-	TP381	D	4	MS - CL - pH in Soils	A

9462

LABORATORY REPORT

Contract Number: PSL23/9447

Report Date: 24 November 2023

Client's Reference: 4486

Client Name: Lithos Consulting

Parkhill
Walton Road
Wetherby
North Yorkshire
LS22 5DZ

For the attention of: James Brown/Charlotte Copley

Project Name: Black Cats

Date Received: 8/11/2023
Date Commenced: 8/11/2023
Date Completed: 23/11/2023

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

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

Checked and Approved Signatories:

A Watkins (Director)
R Berriman (Quality Manager)
S Royle (Laboratory Manager)

L Knight (Assistant Laboratory Manager)
S Eyre (Senior Technician)
M Fennell (Senior Technician)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP504	1	B	0.20		Brown TOPSOIL.
TP513	2	B	0.20		Brown TOPSOIL.
TP514	1	B	0.20		Brown TOPSOIL.
TP515	2	B	0.20		Brown TOPSOIL.
TP516	1	B	0.20		Brown TOPSOIL.
TP528	1	B	0.20		Brown TOPSOIL.
TP538	1	B	0.10		MADE GROUND brown topsoil.
TP611	1	B	0.10		Brown TOPSOIL.
TP612	1	B	0.20		Brown TOPSOIL.
TP613	1	B	0.10		Brown TOPSOIL.
TP503	2	D	1.60		Brown slightly gravelly sandy silty CLAY.
TP515	3	D	1.10		Brown slightly gravelly sandy silty CLAY.
TP518	1	D	1.00		Brown slightly gravelly sandy silty CLAY.
TP525	2	D	1.20		Brown slightly gravelly sandy silty CLAY.
TP526	2	D	1.00		Brown slightly gravelly sandy silty CLAY.
TP528	3	D	1.30		Brown slightly gravelly sandy silty CLAY.
TP604	4	D	2.30		Brown silty CLAY.
TP508	1	D	1.00		Brown slightly gravelly very sandy silty CLAY.
TP525	3	D	1.80		Brown very gravelly clayey SILT.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP528	2	D	0.70		Brown clayey silty SAND.
TP530	1	D	1.00		Brown very sandy silty GRAVEL.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:

PSL23/9447

Client Ref:

4486

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP503	2	D	1.60		17			52	24	28	98	High Plasticity CH
TP515	3	D	1.10		19			58	25	33	95	High Plasticity CH
TP518	1	D	1.00		25			46	23	23	97	Intermediate Plasticity CI
TP525	2	D	1.20		21			38	22	16	98	Intermediate Plasticity CI
TP526	2	D	1.00		25			44	24	20	99	Intermediate Plasticity CI
TP528	3	D	1.30		20			38	21	17	95	Intermediate Plasticity CI
TP604	4	D	2.30		39			74	32	42	100	Very High Plasticity CV
TP508	1	D	1.00		16			34	16	18	93	Low Plasticity CL
TP525	3	D	1.80		16				NP			
TP528	2	D	0.70		21				NP			
TP530	1	D	1.00		15				NP			

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

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

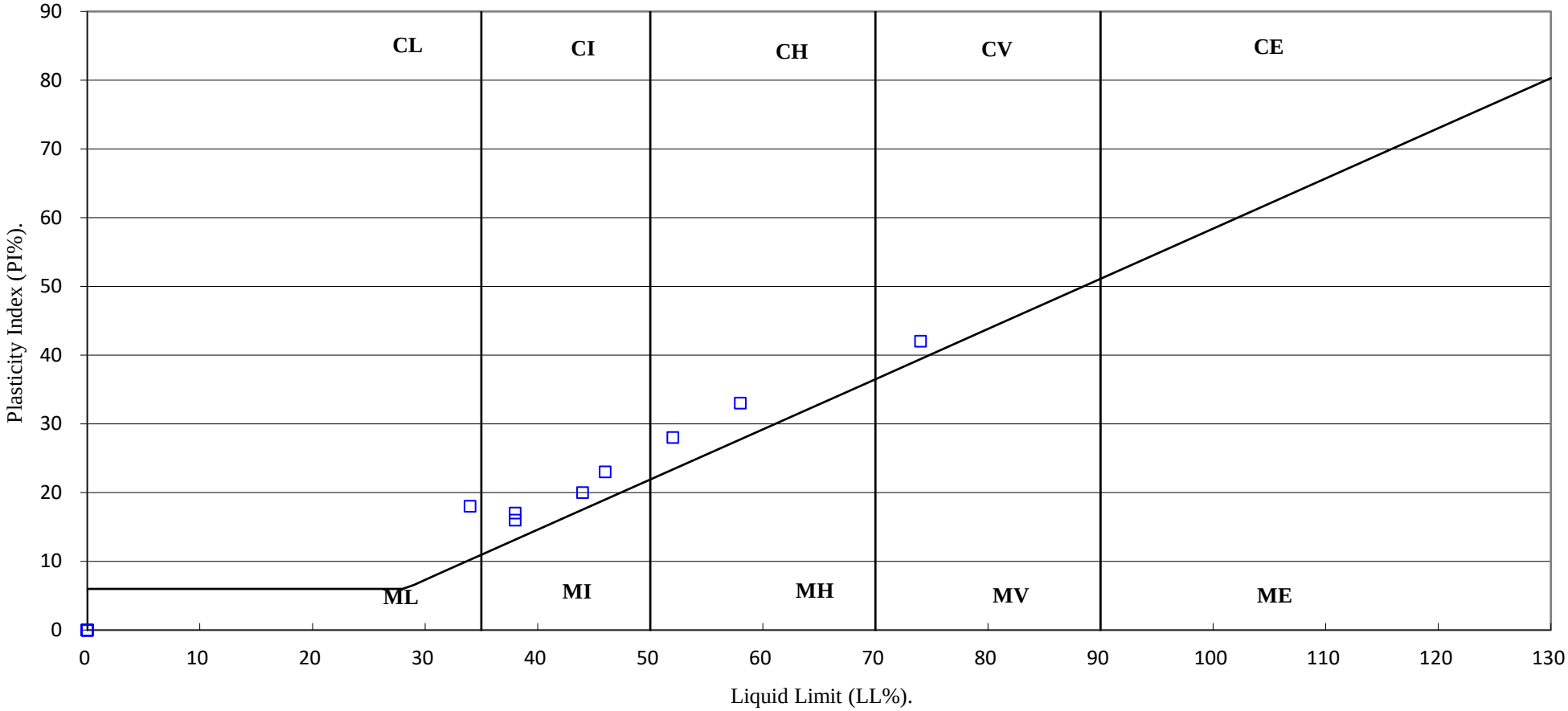
Contract No:

PSL23/9447

Client Ref:

4486

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Black Cats**

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

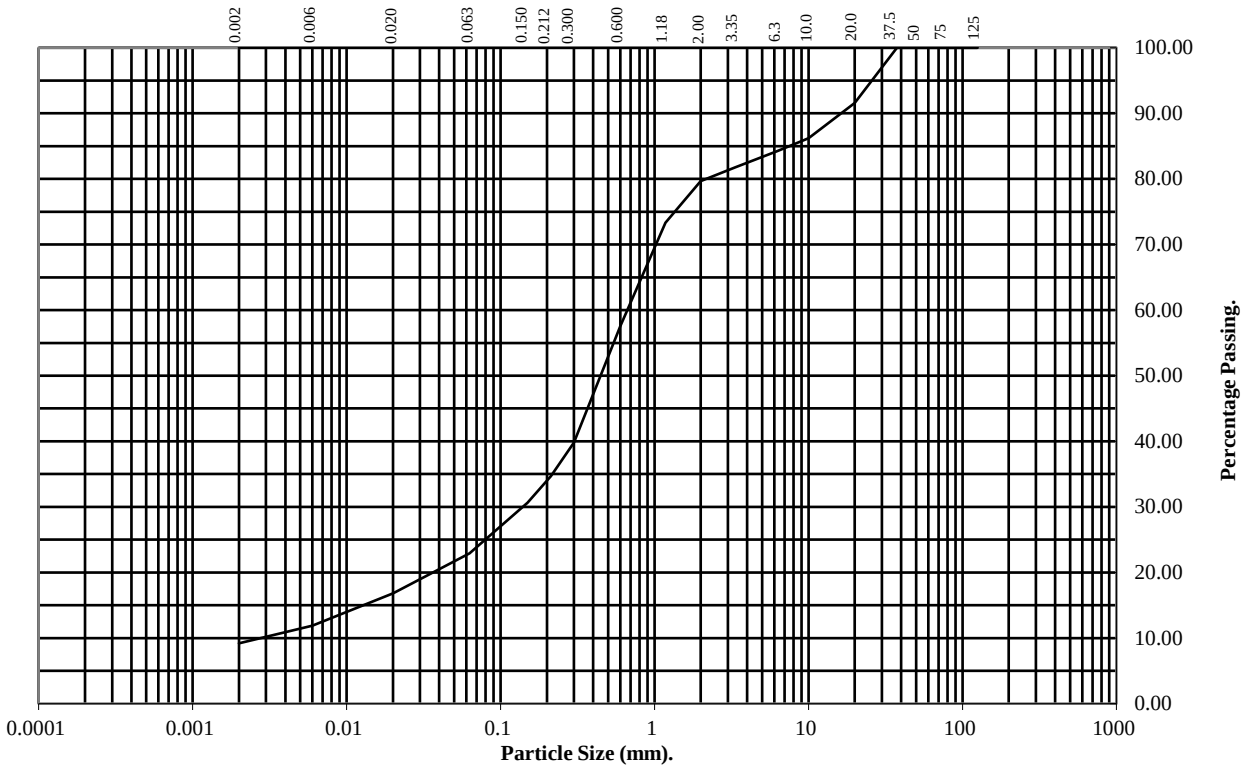
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP504** **Top Depth (m):** **0.20**

Sample Number: **1** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	92
10	86
6.3	84
3.35	82
2	80
1.18	73
0.6	58
0.3	40
0.212	35
0.15	31
0.063	23

Particle Diameter	Percentage Passing
0.02	17
0.006	12
0.002	9

Soil Fraction	Total Percentage
Cobbles	0
Gravel	20
Sand	57
Silt	14
Clay	9

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

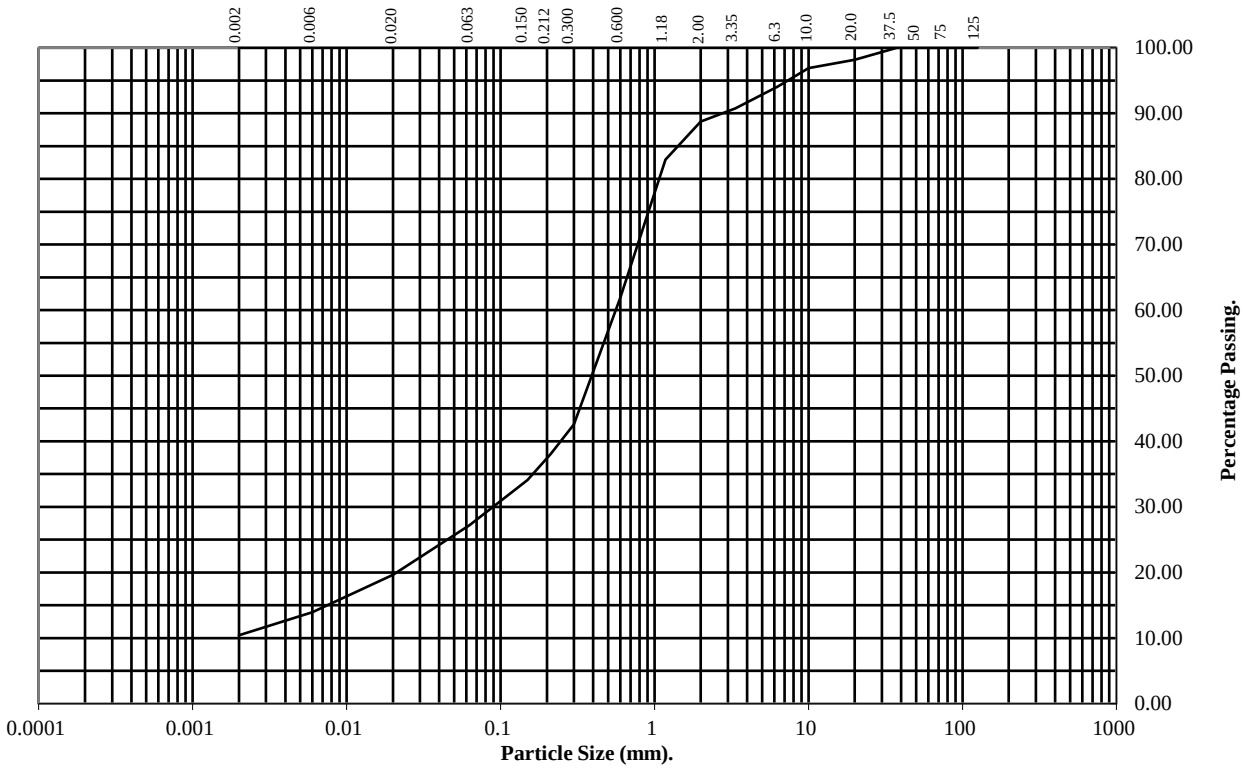
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP513 **Top Depth (m):** 0.20

Sample Number: 2 **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	98
10	97
6.3	94
3.35	91
2	89
1.18	83
0.6	62
0.3	43
0.212	38
0.15	34
0.063	27

Particle Diameter	Percentage Passing
0.02	20
0.006	14
0.002	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	62
Silt	17
Clay	10

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

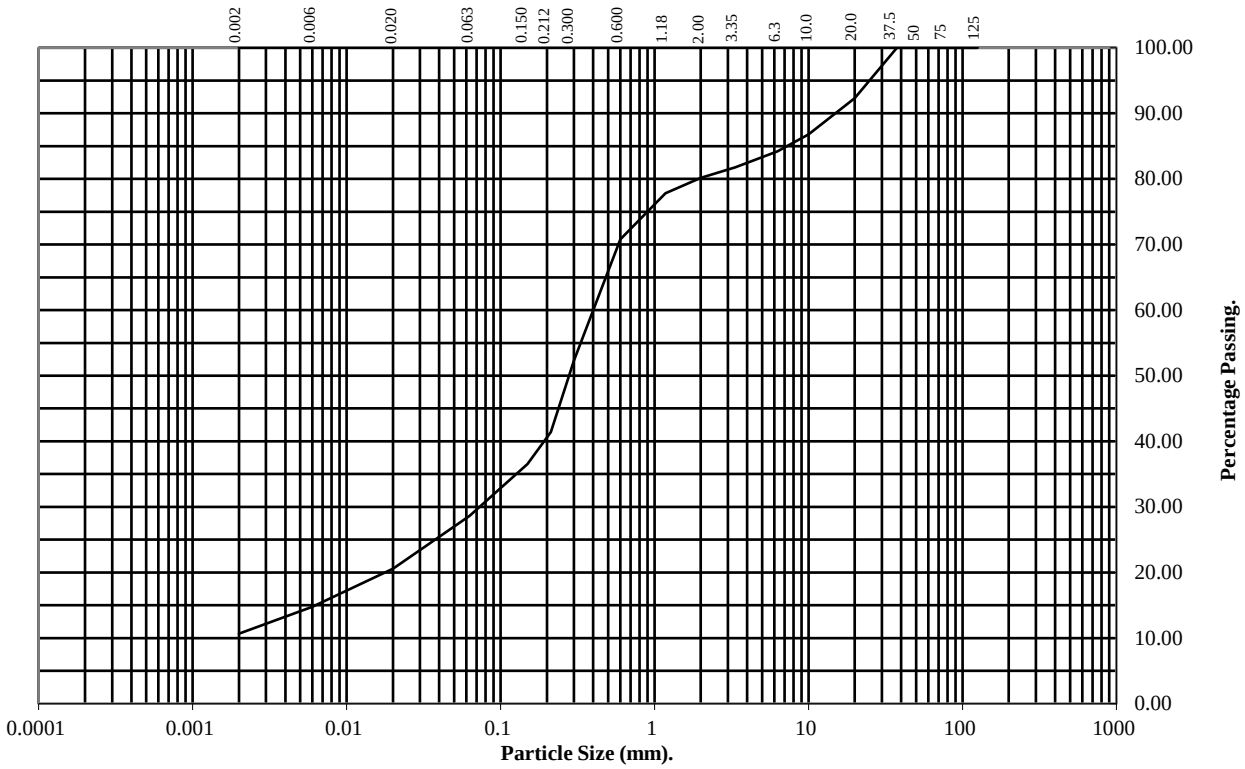
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP514 **Top Depth (m):** 0.20

Sample Number: 1 **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	92
10	87
6.3	84
3.35	82
2	80
1.18	78
0.6	71
0.3	52
0.212	41
0.15	37
0.063	29

Particle Diameter	Percentage Passing
0.02	21
0.006	15
0.002	11

Soil Fraction	Total Percentage
Cobbles	0
Gravel	20
Sand	51
Silt	18
Clay	11

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

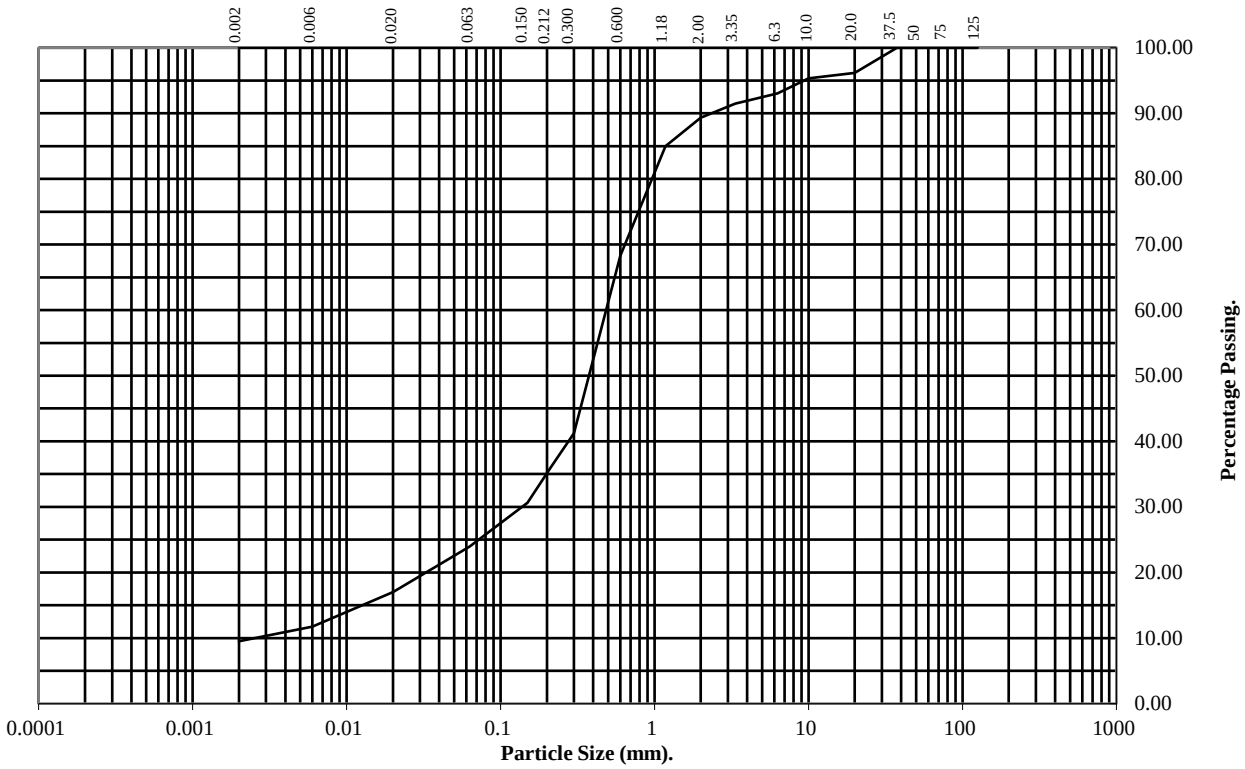
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP515 **Top Depth (m):** 0.20

Sample Number: 2 **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	96
10	95
6.3	93
3.35	92
2	89
1.18	85
0.6	68
0.3	41
0.212	36
0.15	31
0.063	24

Particle Diameter	Percentage Passing
0.02	17
0.006	12
0.002	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	65
Silt	14
Clay	10

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

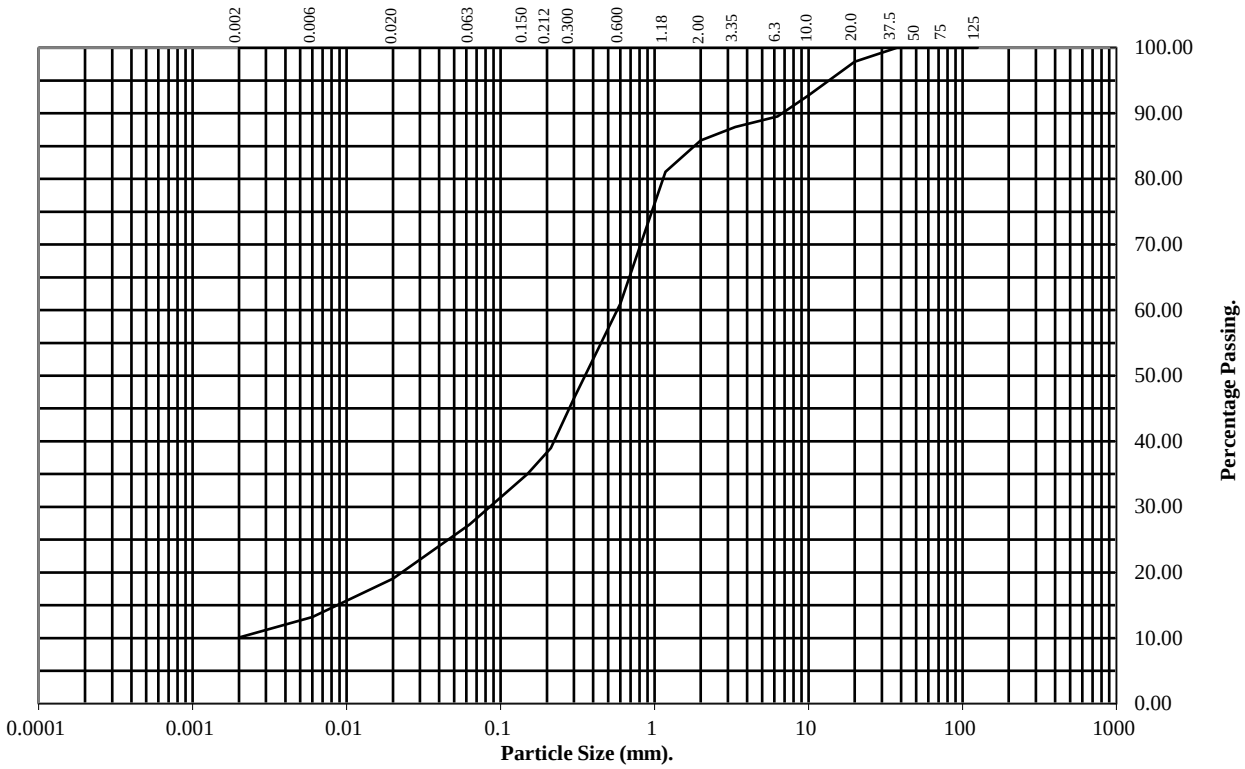
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP516 **Top Depth (m):** 0.20

Sample Number: 1 **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	98
10	93
6.3	90
3.35	88
2	86
1.18	81
0.6	61
0.3	47
0.212	39
0.15	35
0.063	27

Particle Diameter	Percentage Passing
0.02	19
0.006	13
0.002	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	14
Sand	59
Silt	17
Clay	10

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

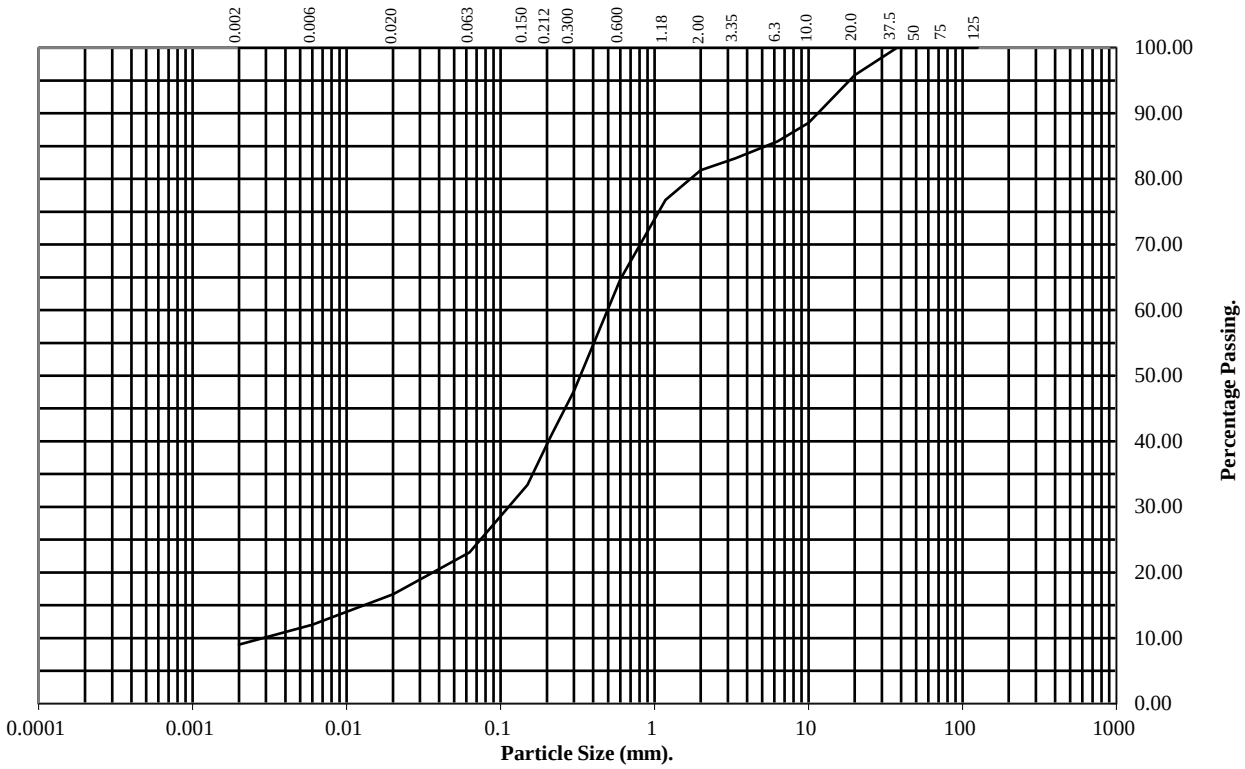
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP528** **Top Depth (m):** **0.20**

Sample Number: **1** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	96
10	89
6.3	86
3.35	83
2	81
1.18	77
0.6	65
0.3	48
0.212	41
0.15	33
0.063	23

Particle Diameter	Percentage Passing
0.02	17
0.006	12
0.002	9

Soil Fraction	Total Percentage
Cobbles	0
Gravel	19
Sand	58
Silt	14
Clay	9

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

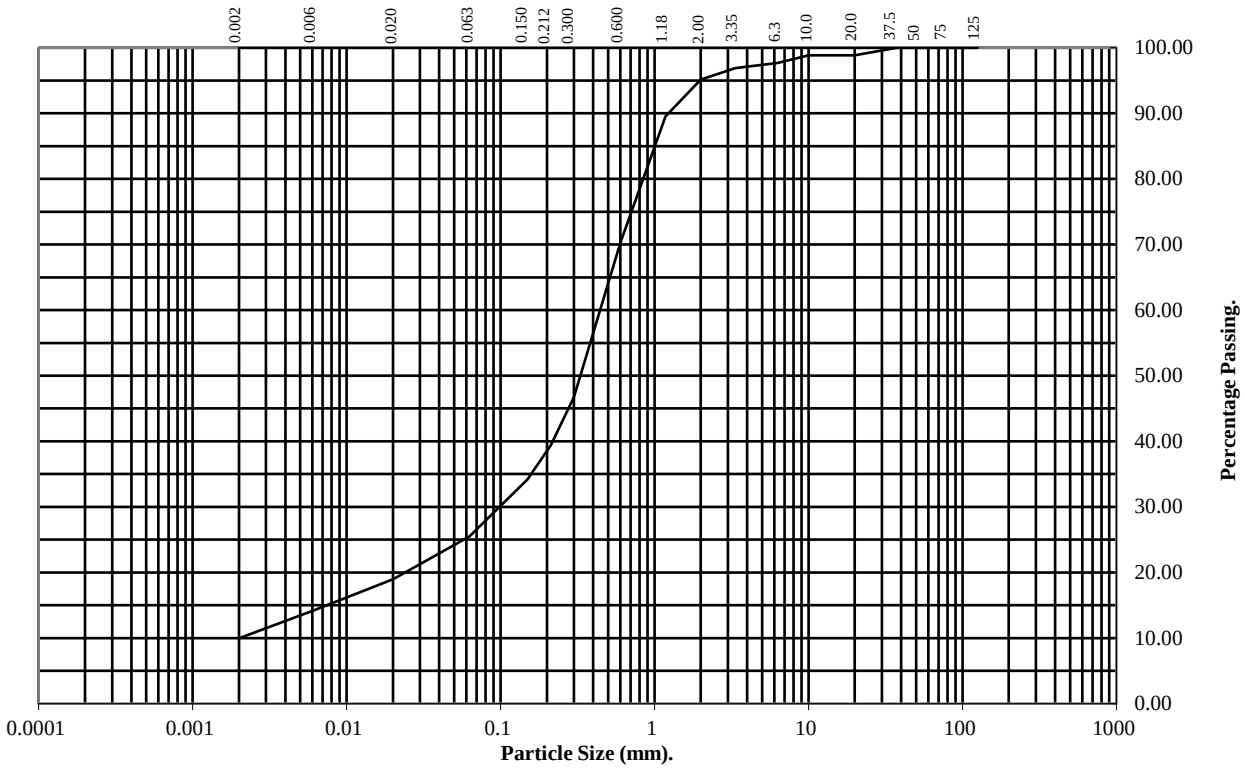
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP538** **Top Depth (m):** **0.10**

Sample Number: **1** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	99
10	99
6.3	98
3.35	97
2	95
1.18	90
0.6	70
0.3	47
0.212	39
0.15	34
0.063	26

Particle Diameter	Percentage Passing
0.02	19
0.006	14
0.002	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	69
Silt	16
Clay	10

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

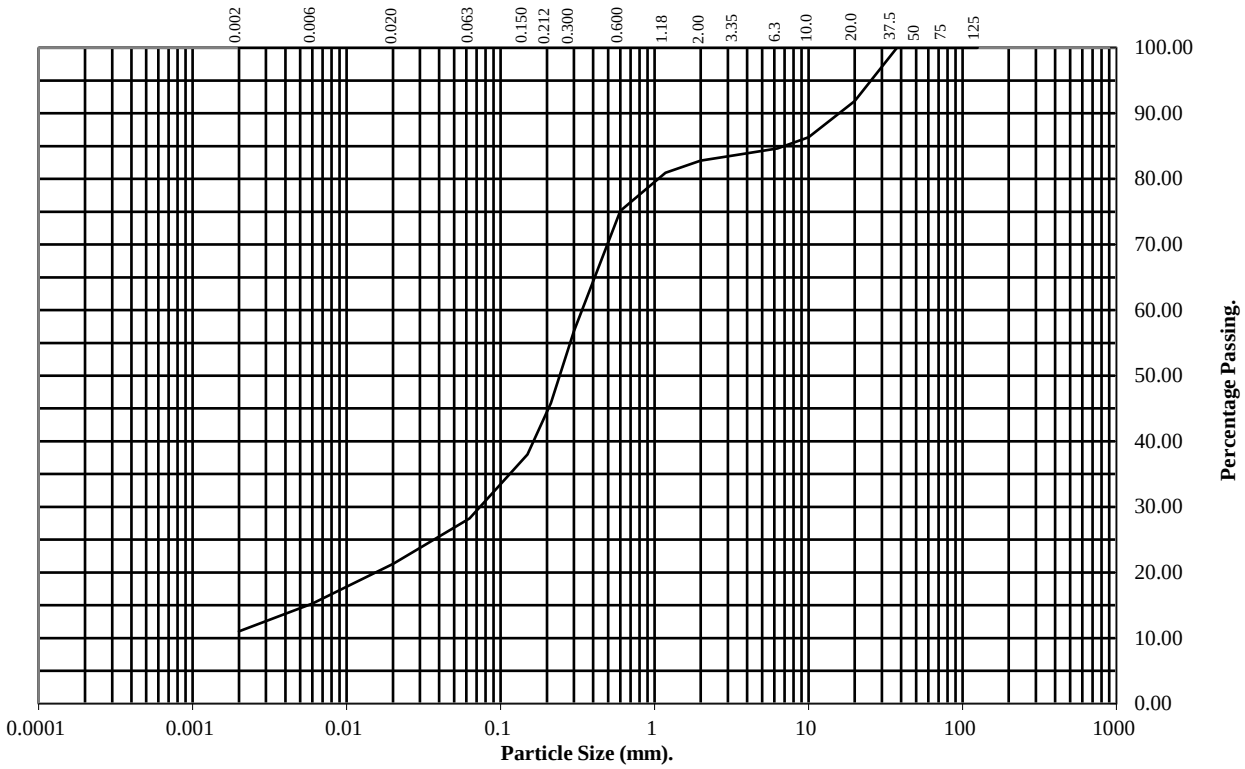
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP611 **Top Depth (m):** 0.10

Sample Number: 1 **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	100
20	92
10	86
6.3	85
3.35	84
2	83
1.18	81
0.6	75
0.3	57
0.212	46
0.15	38
0.063	28

Particle Diameter	Percentage Passing
0.02	21
0.006	15
0.002	11

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	55
Silt	17
Clay	11

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

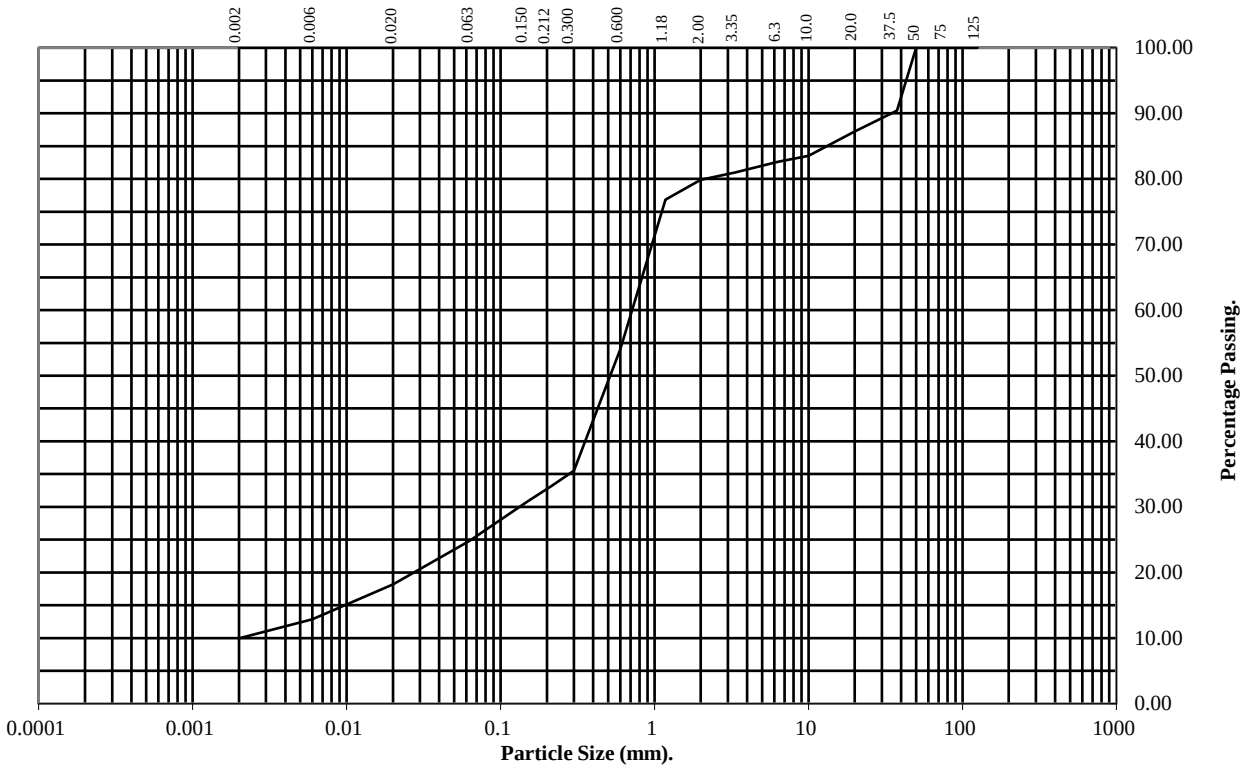
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP612 **Top Depth (m):** 0.20

Sample Number: 1 **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	90
20	87
10	84
6.3	83
3.35	81
2	80
1.18	77
0.6	54
0.3	36
0.212	33
0.15	31
0.063	25

Particle Diameter	Percentage Passing
0.02	18
0.006	13
0.002	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	20
Sand	55
Silt	15
Clay	10

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

PARTICLE SIZE DISTRIBUTION TEST

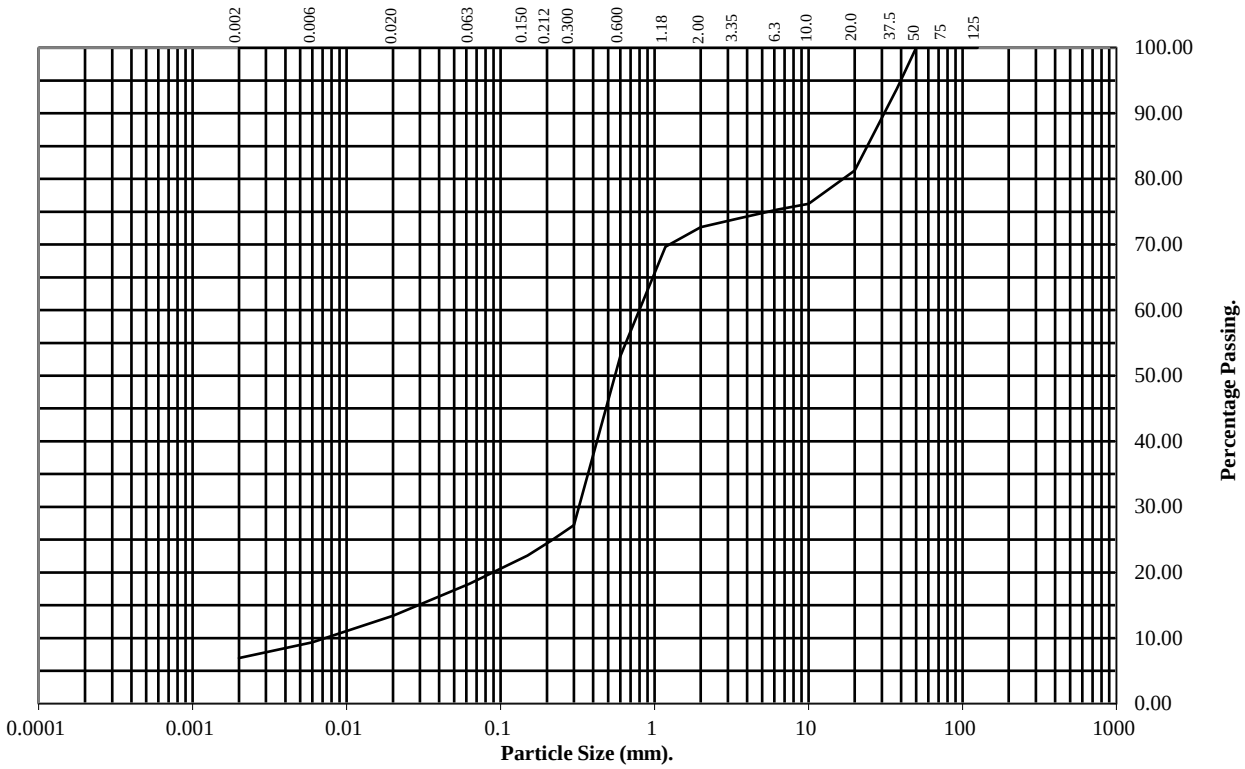
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP613** **Top Depth (m):** **0.10**

Sample Number: **1** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
50	100
37.5	94
20	81
10	76
6.3	75
3.35	74
2	73
1.18	70
0.6	53
0.3	27
0.212	25
0.15	23
0.063	18

Particle Diameter	Percentage Passing
0.02	13
0.006	9
0.002	7

Soil Fraction	Total Percentage
Cobbles	0
Gravel	27
Sand	55
Silt	11
Clay	7

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Black Cats

Contract No:
PSL23/9447
Client Ref:
4486

7 - 11 Harding Street
Leicester
LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L23/07106/PSL - 23-39345

Your Project Reference:	**PSL23/9447 Black Cats PO21490/4486-002/JBR**		
Your Order Number:	PSL23/9447	Samples Received / Instructed:	17/11/2023 / 17/11/2023
Report Issue Number:	1	Sample Tested:	17/11 to 23/11/2023
Samples Analysed:	7 soil samples	Report issued:	23/11/2023

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 30.10.2023

Issued by: J. Gane

Issue No: 4

Rev No: 5

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/07106/PSL - 23-39345

Project Reference - PSL23/9447 Black Cats
PO21490/4486-002/JBR

Analytical Test Results - Chemical Analysis

Lab Reference			327398	327399	327400	327401	327402	327403	327404
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP503	TP515	TP518	TP525	TP526	TP528	TP604
Client Sample Type			D	D	D	D	D	D	D
Client Sample Number			2	3	1	2	2	3	4
Depth - Top (m)			1.60	1.10	1.00	1.20	1.00	1.30	2.30
Depth - Bottom (m)			1.60	1.10	1.00	1.20	1.00	1.30	2.30
Date of Sampling			03/11/2023	03/11/2023	03/11/2023	03/11/2023	03/11/2023	03/11/2023	03/11/2023
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	< 10	11	< 10	< 10	< 10	< 10	< 10
pH Value	pH Units	MCERTS	5.5	5.7	6.5	6.9	6.5	6.7	5.8

7 - 11 Harding Street
Leicester
LE1 4DH

L23/07106/PSL - 23-39345

Project Reference - PSL23/9447 Black Cats PO21490/4486-002/JBR

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
327398	-	TP503	D	2	Brown slightly gravelly sandy silty clay	-	-	73
327399	-	TP515	D	3	Brown slightly gravelly sandy silty clay	-	-	81
327400	-	TP518	D	1	Brown slightly gravelly sandy silty clay	-	-	69
327401	-	TP525	D	2	Brown slightly gravelly sandy silty clay	-	-	71
327402	-	TP526	D	2	Brown slightly gravelly sandy silty clay	-	-	65
327403	-	TP528	D	3	Brown slightly gravelly sandy silty clay	-	-	69
327404	-	TP604	D	4	Brown slightly gravelly sandy silty clay	-	-	77

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L23/07106/PSL - 23-39345

Project Reference - PSL23/9447 Black Cats PO21490/4486-002/JBR

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
327398	-	TP503	D	2	
327399	-	TP515	D	3	
327400	-	TP518	D	1	
327401	-	TP525	D	2	
327402	-	TP526	D	2	
327403	-	TP528	D	3	
327404	-	TP604	D	4	

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L23/07106/PSL - 23-39345

Project Reference - PSL23/9447 Black Cats PO21490/4486-002/JBR

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis

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LE1 4DH

L23/07106/PSL - 23-39345

Project Reference - PSL23/9447 Black Cats PO21490/4486-002/JBR

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
327398	-	TP503	D	2	MS - CL - pH in Soils	RX
327399	-	TP515	D	3	MS - CL - pH in Soils	RX
327400	-	TP518	D	1	MS - CL - pH in Soils	RX
327401	-	TP525	D	2	MS - CL - pH in Soils	RX
327402	-	TP526	D	2	MS - CL - pH in Soils	RX
327403	-	TP528	D	3	MS - CL - pH in Soils	RX
327404	-	TP604	D	4	MS - CL - pH in Soils	RX

Appendix Q
Gas Monitoring Results

Visit 1						
Job Title:					**Job No:**	
Black Cats, Huddersfield					**4486**	
Client:					**Sheet :**	
Vistry Homes, Countryside Partnerships and Miller Homes					1 of 2	
Date:	**Arrival Time:**	**Depart Time:**	**Operator:**			
03/10/2023	08:30	13:30	Erin Waddilove and Charlotte Copley			

Gas Monitoring Results:

Ambient Concentration (% Volume):	**CH_4:**	ND	**CO_2:**	ND	**O_2:**	20.6

Monitoring Point	Groundwater level	Concentrations					Gas Flow Rates			Bottom of well	Remarks
		Initial / Highest		Steady concentrations		Lowest concn	Initial / Maximum	Steady	Time to fall from highest to steady		
		CH_4	CO_2	CH_4	CO_2	O_2					
	(m) bgl	% v/v	(%)	% v/v	(%)	(%)	litre/hr	litre/hr	secs	m	
PH101	3.58	ND	1.7	ND	1.7	17.8	ND	ND	30.0	5.66	
PH102	5.25	ND	1.9	ND	1.9	18.0	ND	ND	30.0	5.46	
PH103	ND	ND	0.1	ND	0.1	19.7	ND	ND	30.0	5.73	10ppm CO detected
PH104	ND	ND	ND	ND	ND	19.8	ND	ND	30.0	5.66	10ppm CO detected
PH105	4.65	ND	ND	ND	ND	16.6	1.2	ND	60.0	5.63	10ppm CO detected
PH106	3.03	ND	4.6	ND	4.6	**14.4**	ND	ND	30.0	5.67	
PH107	ND	ND	ND	ND	ND	18.3	ND	ND	30.0	5.37	
PH108	ND	ND	0.3	ND	0.3	20.3	ND	ND	30.0	5.53	
PH109	ND	ND	0.5	ND	0.5	20.0	ND	ND	30.0	5.65	
PH110	ND	ND	0.3	ND	0.3	20.3	ND	ND	30.0	4.70	
PH111	5.13	ND	0.5	ND	0.5	20.2	ND	ND	30.0	5.16	
PH112	ND	ND	0.3	ND	0.3	20.2	ND	ND	30.0	1.90	
PH113	ND	ND	ND	ND	ND	19.0	ND	ND	30.0	5.71	
PH114	ND	ND	0.7	ND	0.7	18.5	1.2	ND	60.0	5.73	
PH115	5.48	ND	ND	ND	ND	20.6	ND	ND	30.0	5.72	
PH116	ND	ND	0.3	ND	0.3	20.4	ND	ND	30.0	5.35	
PH117	4.99	ND	1.2	ND	1.2	19.8	ND	ND	30.0	5.75	
PH118	ND	ND	0.3	ND	0.3	19.3	ND	ND	30.0	5.73	
PH119	ND	ND	0.4	ND	0.4	20.4	0.4	ND	60.0	3.84	
PH120	ND	ND	0.4	ND	0.4	20.3	ND	ND	30.0	5.60	
PH121	ND	ND	ND	ND	ND	19.5	-3.0	ND	60.0	5.74	
PH122	ND	ND	0.2	ND	0.2	20.3	1.5	ND	60.0	4.15	
PH123	2.75	ND	0.2	ND	0.2	20.3	ND	ND	30.0	5.75	
PH124	3.49	ND	0.8	ND	0.8	28.7	ND	ND	30.0	5.70	
PH125	ND	ND	0.8	ND	0.8	19.6	0.9	ND	60.0	5.68	
PH126	4.85	ND	0.6	ND	0.6	20.0	ND	ND	30.0	5.66	
PH127	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Well destroyed - bung and monitoring pipe stolen and pipe in ground backfilled and blocked.
PH128	5.44	ND	ND	ND	ND	20.0	ND	ND	30.0	5.71	
PH129	5.55	ND	0.3	ND	0.3	19.8	2.2	ND	60.0	5.78	
PH130	5.52	ND	ND	ND	ND	19.3	ND	ND	30.0	5.78	

Equipment Used:	**Next Calibration Date**
Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter	22/03/2024

Key

ND	None Detected
NR	Not Recorded
1.0	Recorded value does not breach trigger levels
5.0	Recorded value breaches trigger level 1
10.0	Recorded value breaches trigger level 2

	Site Data:			**Weather Station Data (Slaithwaite Station)**							CH_4	CO_2	O_2
	Temp (°C):	9 to 11		**Barometric Pressure Trend:**			Rising						
Time:	08:40	11:15	13:15	01:01	06:40	08:40	11:15	13:15	15:15	Trigger level 1	1.0	5.0	16.0
Pressure (mb):	990	987	985	1011	1010	1012	1014	1015	1016	Trigger level 2	5.0	10.0	10.0
	Weather Conditions:	Heavy rain, strong breeze											
	Surface Ground Conditions:	Wet											

Remarks:	Slaithwaite weather station 4 miles south west from the site (Black Cats, Huddersfield).

Visit 2

Job Title:	Job No:
Black Cats, Huddersfield	4486
Client:	**Sheet :**
Vistry Homes, Countryside Partnerships and Miller Homes	2 of 2

Date:	Arrival Time:	Depart Time:	Operator:
24/10/2023	09:00	13:30	Erin Waddilove

Gas Monitoring Results:

Ambient Concentration (% Volume):	CH_4:	ND	CO_2:	ND	O_2:	20.6

Monitoring Point	Groundwater level	Concentrations					Gas Flow Rates			Bottom of well	Remarks
		Initial / Highest		Steady concentrations		Lowest concn	Initial / Maximum	Steady	Time to fall from highest to steady		
		CH_4	CO_2	CH_4	CO_2	O_2					
	(m) bgl	% v/v	(%)	% v/v	(%)	(%)	litre/hr	litre/hr	secs	m	
PH101	ND	ND	4.6	ND	4.6	**14.3**	ND	ND	30.0	5.66	
PH102	ND	ND	1.3	ND	1.3	18.1	0.4	ND	45.0	5.46	
PH103	ND	ND	0.3	ND	0.3	19.4	0.2	ND	45.0	5.79	
PH104	ND	ND	ND	ND	ND	19.9	-0.3	ND	45.0	5.66	
PH105	ND	ND	0.1	ND	0.1	**14.9**	0.1	ND	40.0	5.60	
PH106	3.20	ND	3.4	ND	3.4	16.3	ND	ND	30.0	5.67	
PH107	ND	ND	ND	ND	ND	18.9	0.1	ND	40.0	5.40	
PH108	ND	ND	0.1	ND	0.1	20.5	0.1	ND	40.0	5.52	
PH109	ND	ND	0.5	ND	0.5	20.2	ND	ND	30.0	5.66	
PH110	ND	ND	0.1	ND	0.1	20.5	0.7	ND	45.0	4.70	
PH111	ND	ND	0.4	ND	0.4	20.2	0.8	ND	45.0	5.12	
PH112	ND	ND	0.2	ND	0.2	20.0	-1.2	ND	45.0	1.90	
PH113	ND	ND	ND	ND	ND	17.2	0.6	ND	45.0	5.71	
PH114	ND	ND	0.6	ND	0.6	18.7	ND	ND	30.0	5.73	
PH115	ND	ND	ND	ND	ND	20.2	ND	ND	30.0	5.66	
PH116	ND	ND	0.3	ND	0.3	20.2	ND	ND	30.0	5.35	
PH117	ND	ND	1.3	ND	1.3	18.4	ND	ND	30.0	5.13	
PH118	ND	ND	0.4	ND	0.4	19.2	ND	ND	30.0	5.73	
PH119	ND	ND	0.3	ND	0.3	20.3	0.3	0.1	60.0	3.85	
PH120	ND	ND	0.5	ND	0.5	20.1	ND	ND	30.0	5.60	
PH121	ND	ND	0.1	ND	0.1	18.9	0.1	ND	40.0	5.77	
PH122	ND	ND	0.2	ND	0.2	20.5	0.4	0.2	60.0	4.16	
PH123	ND	ND	3.0	ND	3.0	**15.0**	0.3	0.1	45.0	5.77	
PH124	3.55	ND	1.5	ND	1.5	18.4	ND	ND	30.0	5.72	
PH125	ND	ND	0.6	ND	0.6	20.0	ND	ND	30.0	5.74	
PH126	4.44	ND	1.0	ND	1.0	19.5	ND	ND	30.0	5.70	
PH127	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
PH128	4.35	ND	0.5	ND	0.5	19.0	ND	ND	30.0	5.71	
PH129	ND	ND	0.7	ND	0.7	18.1	ND	ND	30.0	5.77	
PH130	4.53	ND	1.4	ND	1.4	17.4	ND	ND	30.0	5.80	

Equipment Used:	Next Calibration Date
Gas Data GFM436 Infrared Gas Analyser Geotechnical Instruments Dipmeter	22/03/2024

Key

ND	None Detected
NR	Not Recorded
1.0	Recorded value does not breach trigger levels
5.0	Recorded value breaches trigger level 1
10.0	Recorded value breaches trigger level 2

	Site Data:			Weather Station Data (Hade Edge Station)					
	Temp (°C):			Barometric Pressure Trend:			Gradually falling		
Time:	09:00	11:00	13:00	01:02	07:02	09:02	11:00	13:02	13:02
Pressure (mb):	980	974	977	1009	1007	1007	1007	1006	1006
	Weather Conditions:		Heavy rain, heavy cloud, foggy - poor visibility						
	Surface Ground Conditions:		Very wet - high surface water runoff and flooding						

	CH_4	CO_2	O_2
Trigger level 1	1.0	5.0	16.0
Trigger level 2	5.0	10.0	10.0

Remarks:

Slaithwaite weather station 4 miles south west from the site (Black Cats, Huddersfield).

Visit 3

Job Title:	Job No:
Black Cats, Huddersfield	4486
Client:	**Sheet :**
Vistry Homes, Countryside Partnerships and Miller Homes	3 of 3

Date:	Arrival Time:	Depart Time:	Operator:
14/11/2023	09:15	13:00	Erin Waddilove

Gas Monitoring Results:

Ambient Concentration (% Volume):	CH_4:	ND	CO_2:	ND	O_2:	20.6

Monitoring Point	Groundwater level	Concentrations: Initial / Highest		Concentrations: Steady concentrations		Concentrations: Lowest concn	Gas Flow Rates: Initial / Maximum	Gas Flow Rates: Steady	Gas Flow Rates: Time to fall from highest to steady	Bottom of well	Remarks
		CH_4	CO_2	CH_4	CO_2	O_2					
	(m) bgl	% v/v	(%)	% v/v	(%)	(%)	litre/hr	litre/hr	secs	m	
PH101	2.50	ND	1.2	ND	1.2	19.0	0.1	0.1	45.0	5.64	
PH102	5.16	ND	1.4	ND	1.4	17.5	0.5	0.1	60.0	5.44	
PH103	5.46	ND	0.2	ND	0.2	18.7	0.4	0.2	60.0	5.76	
PH104	5.67	ND	ND	ND	ND	18.8	0.5	0.1	60.0	5.69	
PH105	4.18	ND	0.2	ND	0.2	**14.0**	-0.2	ND	45.0	5.60	
PH106	3.09	ND	2.9	ND	2.9	17.7	0.1	ND	30.0	5.67	
PH107	ND	ND	ND	ND	ND	19.4	0.6	0.1	45.0	5.37	
PH108	ND	ND	0.1	ND	0.1	20.4	-0.2	ND	40.0	5.53	
PH109	ND	ND	0.5	ND	0.5	20.0	0.1	ND	40.0	5.66	
PH110	ND	ND	0.1	ND	0.1	20.3	0.1	ND	40.0	5.70	
PH111	5.16	ND	0.6	ND	0.6	20.0	0.4	ND	40.0	5.17	
PH112	ND	ND	0.2	ND	0.2	20.3	ND	ND	30.0	1.90	
PH113	ND	ND	ND	ND	ND	16.9	ND	ND	30.0	5.70	
PH114	ND	ND	0.5	ND	0.5	19.1	ND	ND	30.0	5.70	
PH115	5.52	ND	0.5	ND	0.5	20.0	0.2	ND	40.0	5.68	
PH116	ND	ND	0.4	ND	0.4	20.1	0.4	ND	40.0	5.36	
PH117	5.07	ND	0.9	ND	0.9	19.7	0.6	ND	40.0	5.76	
PH118	ND	ND	0.4	ND	0.4	19.3	-0.1	ND	40.0	5.73	
PH119	3.89	ND	0.3	ND	0.3	20.0	0.4	0.2	60.0	3.90	
PH120	ND	ND	0.4	ND	0.4	20.1	0.1	ND	40.0	5.59	
PH121	ND	ND	0.2	ND	0.2	18.9	0.1	ND	40.0	5.76	
PH122	ND	ND	0.1	ND	0.1	20.5	ND	ND	30.0	4.41	
PH123	2.15	ND	ND	ND	ND	20.5	0.1	ND	40.0	5.77	
PH124	3.62	ND	1.4	ND	1.4	18.7	0.1	ND	40.0	5.72	
PH125	ND	ND	2.1	ND	2.1	20.4	ND	ND	30.0	5.74	
PH126	4.00	ND	1.7	ND	1.7	18.8	ND	ND	30.0	5.72	
PH127	ND	ND	ND	ND	ND	20.4	ND	ND	30.0	5.75	
PH128	4.50	ND	0.7	ND	0.7	18.4	ND	ND	30.0	5.70	
PH129	5.63	ND	0.8	ND	0.8	**15.0**	0.1	0.1	45.0	5.76	
PH130	4.60	ND	2.3	ND	2.3	17.0	0.2	ND	40.0	5.76	
PH131piezo	ND	ND	1.3	ND	1.3	18.6	-0.1	ND	40.0	NR	
PH132piezo	ND	ND	3.4	ND	3.4	17.0	0.3	0.1	45.0	NR	
PH133piezo	ND	ND	1.8	ND	1.8	17.2	0.1	0.1	45.0	NR	

Equipment Used:

Gas Data GFM436 Infrared Gas Analyser
Geotechnical Instruments Dipmeter

Next Calibration Date

22/03/2024

Key

ND	None Detected
NR	Not Recorded
1.0	Recorded value does not breach trigger levels
5.0	Recorded value breaches trigger level 1
10.0	Recorded value breaches trigger level 2

	Site Data:			Weather Station Data (Slaithwaite Station)					
	Temp (°C):	8 to 10		Barometric Pressure Trend:			Rising/steady		
Time:	09:15	11:30	13:00	00:00	07:15	09:15	11:30	13:00	15:00
Pressure (mb):	976	974	973	995	997	997	998	998	999
	Weather Conditions:	Light rain spells, overcast, heavy breeze							
	Surface Ground Conditions:	Damp							

	CH_4	CO_2	O_2
Trigger level 1	1.0	5.0	16.0
Trigger level 2	5.0	10.0	10.0

Remarks:

Slaithwaite weather station 4 miles south west from the site (Black Cats, Huddersfield).

Appendix R

Soakaway Test Results

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP513**
Test No.	**1**

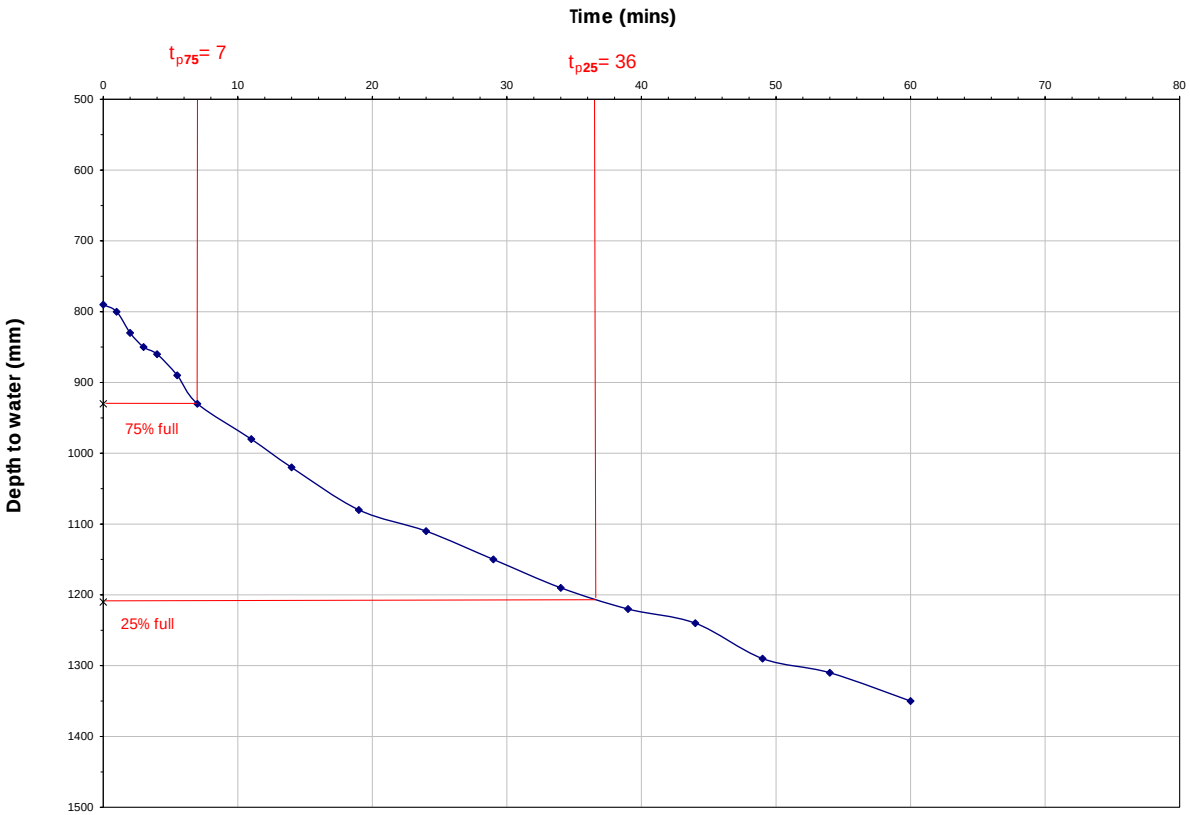
Time	Elapsed Time	Depth to water from ground level		
	(min)	(m)	(mm)	
09:01	0	0.79	790	
09:02	1	0.80	800	
09:03	2	0.83	830	
09:04	3	0.85	850	
09:05	4	0.86	860	
09:06:30	5.5	0.89	890	
09:08	7	0.93	930	
09:12	11	0.98	980	
09:15	14	1.02	1020	
09:20	19	1.08	1080	
09:25	24	1.11	1110	
09:30	29	1.15	1150	
09:35	34	1.19	1190	
09:40	39	1.22	1220	
09:45	44	1.24	1240	
09:50	49	1.29	1290	
09:55	54	1.31	1310	
10:01	60	1.35	1350	DRY

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.60	2600
Width	=	0.70	700
Depth	=	1.35	1350

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1210	1.21
0.50	=	1070	1.07
0.75	=	930	0.93

Depth at start of test (mm)	=	790
Depth at end of test (mm)	=	1350
Base area of pit	=	1.82
a_{p50} - 50% internal surface area inc. base	=	3.668
V_{p75-25} - Volume 75 - 25%	=	0.5096

Read from the graph:		
$t_{p\ 75}$ (min)	=	7
$t_{p\ 25}$ (min)	=	36



Soil infiltration rate, f, (m/s) = 7.98E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP513**
Test No.	**2**

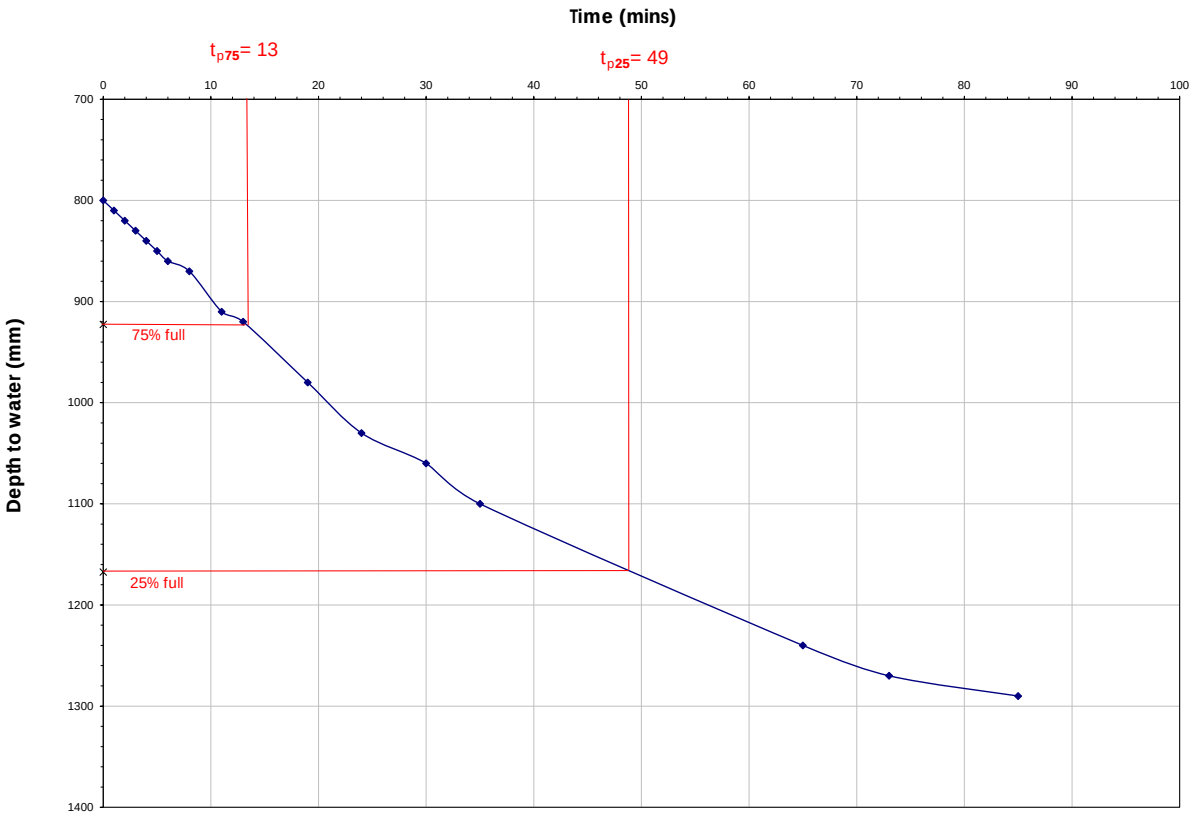
Time	Elapsed Time	Depth to water from ground level		
	(min)	(m)	(mm)	
10:05	0	0.80	800	
10:06	1	0.81	810	
10:07	2	0.82	820	
10:08	3	0.83	830	
10:09	4	0.84	840	
10:10	5	0.85	850	
10:11	6	0.86	860	
10:13	8	0.87	870	
10:16	11	0.91	910	
10:18	13	0.92	920	
10:24	19	0.98	980	
10:29	24	1.03	1030	
10:35	30	1.06	1060	
10:40	35	1.10	1100	
11:10	65	1.24	1240	
11:18	73	1.27	1270	
11:25	85	1.29	1290	DRY

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.60	2600
Width	=	0.70	700
Depth	=	1.29	1290

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1167.5	1.17
0.50	=	1045	1.05
0.75	=	922.5	0.92

Depth at start of test (mm)	=	800
Depth at end of test (mm)	=	1290
Base area of pit	=	1.82
a_{p50} - 50% internal surface area inc. base	=	3.437
V_{p75-25} - Volume 75 - 25%	=	0.4459

Read from the graph:		
$t_{p\ 75}$ (min)	=	13
$t_{p\ 25}$ (min)	=	49



Soil infiltration rate, f, (m/s) = 6.01E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP513**
Test No.	**3**

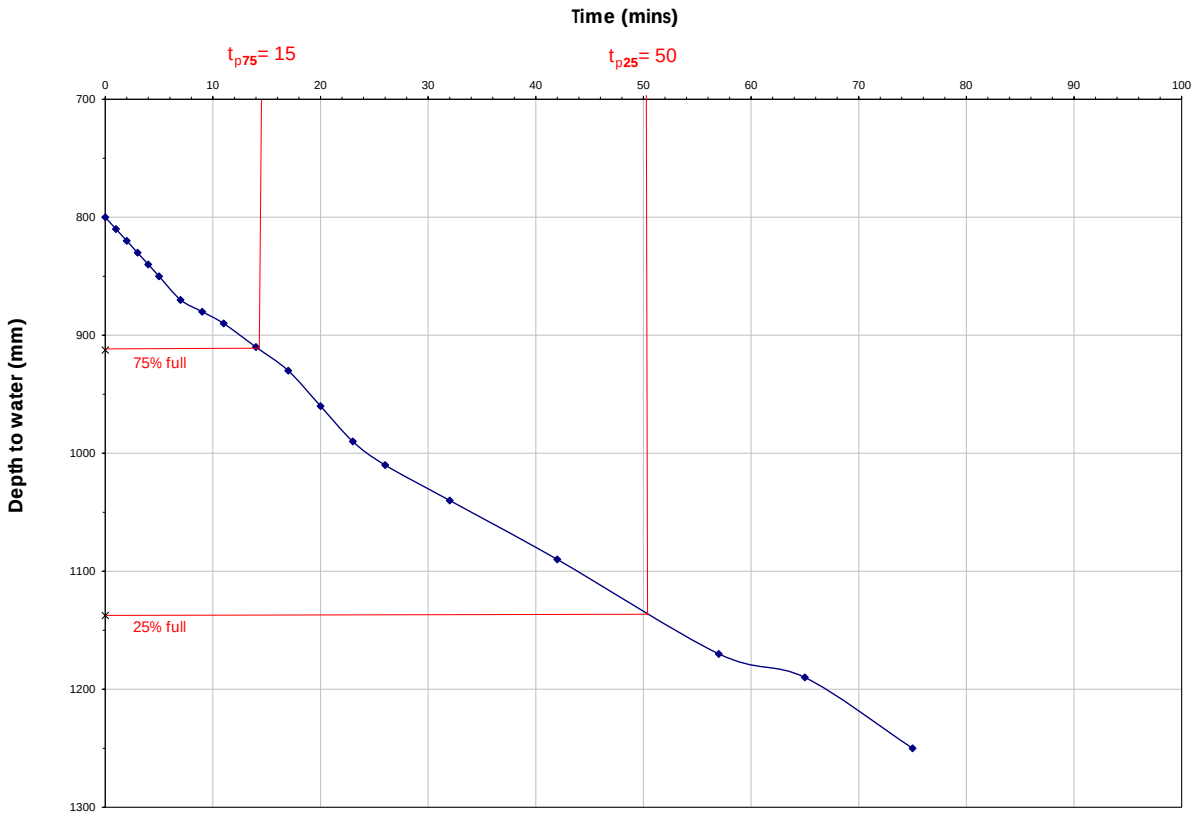
Time	Elapsed Time	Depth to water from ground level		
	(min)	(m)	(mm)	
13:20	0	0.80	800	
13:21	1	0.81	810	
13:22	2	0.82	820	
13:23	3	0.83	830	
13:24	4	0.84	840	
13:25	5	0.85	850	
13:27	7	0.87	870	
13:29	9	0.88	880	
13:31	11	0.89	890	
13:34	14	0.91	910	
13:37	17	0.93	930	
13:40	20	0.96	960	
13:43	23	0.99	990	
13:46	26	1.01	1010	
13:52	32	1.04	1040	
14:02	42	1.09	1090	
14:17	57	1.17	1170	
14:25	65	1.19	1190	
13:47	75	1.25	1250	DRY

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.60	2600
Width	=	0.70	700
Depth	=	1.25	1250

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1137.5	1.14
0.50	=	1025	1.03
0.75	=	912.5	0.91

Depth at start of test (mm)	=	800
Depth at end of test (mm)	=	1250
Base area of pit	=	1.82
a_{p50} - 50% internal surface area inc. base	=	3.305
V_{p75-25} - Volume 75 - 25%	=	0.4095

Read from the graph:		
$t_{p\ 75}$ (min)	=	15
$t_{p\ 25}$ (min)	=	50



Soil infiltration rate, f, (m/s) = 5.90E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP514**
Test No.	**1**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
09:26:30	0	1.05	1050
09:27	0.5	1.26	1260
09:27:30	1	1.31	1310
09:29	2.5	1.38	1380
09:30	3.5	1.41	1410
09:31	4.5	1.42	1420
09:32	5.5	1.44	1440
09:33	6.5	1.47	1470
09:34	7.5	1.48	1480
09:37	10.5	1.52	1520
09:39	12.5	1.54	1540
09:43	16.5	1.59	1590
09:45	18.5	1.62	1620
09:47	20.5	1.64	1640
09:49	22.5	1.68	1680

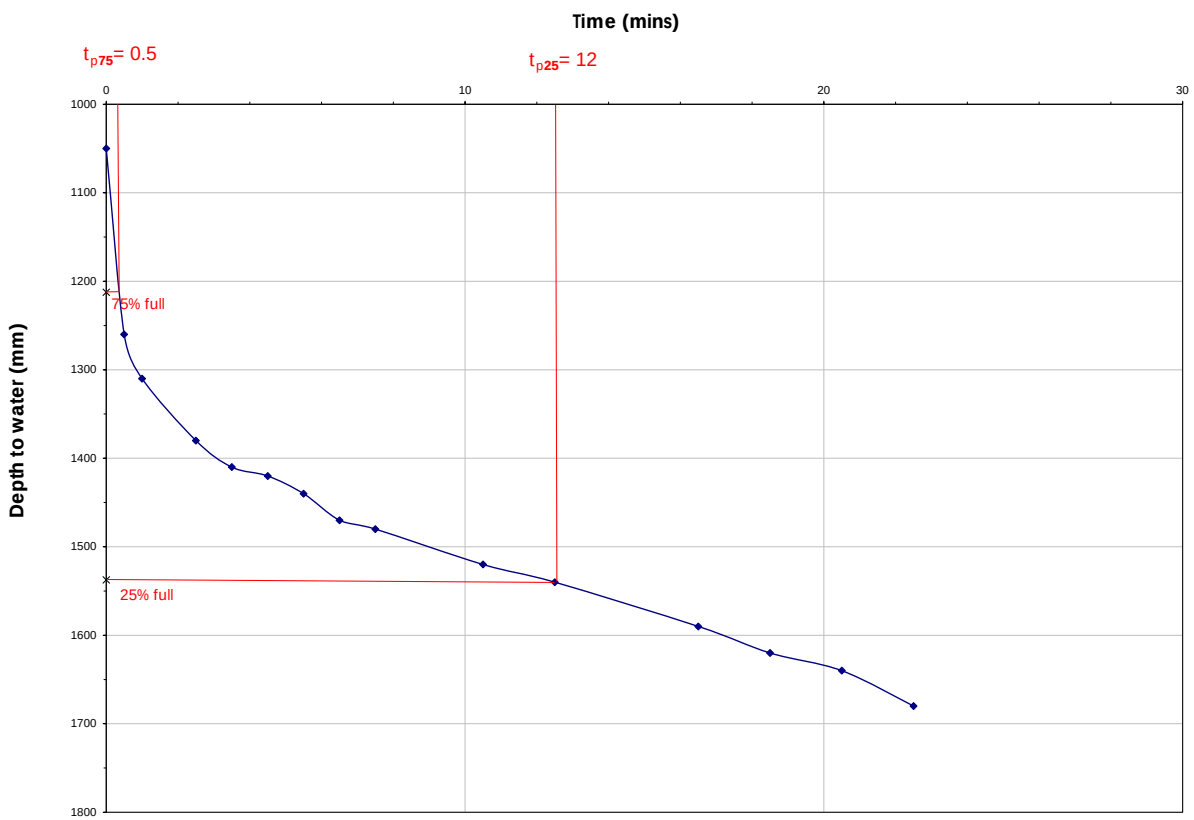
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.30	2300
Width	=	0.65	650
Depth	=	1.70	1700

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1537.5	1.54
0.50	=	1375	1.38
0.75	=	1212.5	1.21

Depth at start of test (mm)	=	1050
Depth at end of test (mm)	=	1680

Base area of pit	=	1.495
a_{p50} - 50% internal surface area inc. base	=	3.4125
V_{p75-25} - Volume 75 - 25%	=	0.485875

Read from the graph:		
$t_{p\ 75}$ (min)	=	0.5
$t_{p\ 25}$ (min)	=	12



Soil infiltration rate, f, (m/s) = 2.06E-04

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP514**
Test No.	**2**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
09:52	0	0.95	950
09:52:30	0.5	1.16	1160
09:53	1	1.24	1240
09:53:30	1.5	1.27	1270
09:54:00	2	1.29	1290
09:55	3	1.32	1320
09:56	4	1.34	1340
09:57	5	1.37	1370
09:59	7	1.42	1420
10:00	8	1.44	1440
10:02	10	1.46	1460
10:04	12	1.49	1490
10:07	15	1.54	1540
10:10	18	1.57	1570
10:12	20	1.59	1590
10:15	23	1.68	1680

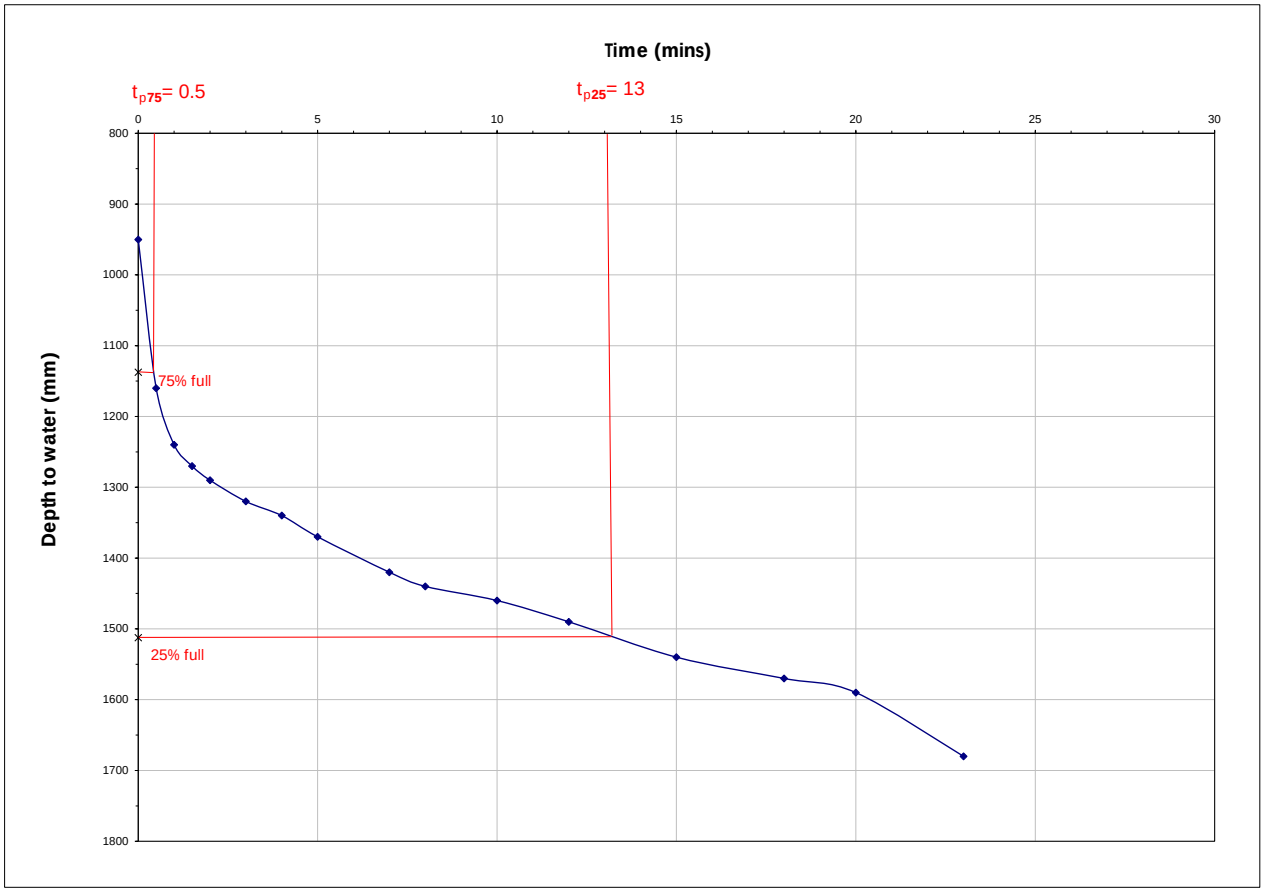
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.30	2300
Width	=	0.65	650
Depth	=	1.70	1700

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1512.5	1.51
0.50	=	1325	1.33
0.75	=	1137.5	1.14

Depth at start of test (mm)	=	950
Depth at end of test (mm)	=	1680

Base area of pit	=	1.495
a_{p50} - 50% internal surface area inc. base	=	3.7075
V_{p75-25} - Volume 75 - 25%	=	0.560625

Read from the graph:		
$t_{p\ 75}$ (min)	=	0.5
$t_{p\ 25}$ (min)	=	13



Soil infiltration rate, f, (m/s) = 2.02E-04

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP514**
Test No.	**3**

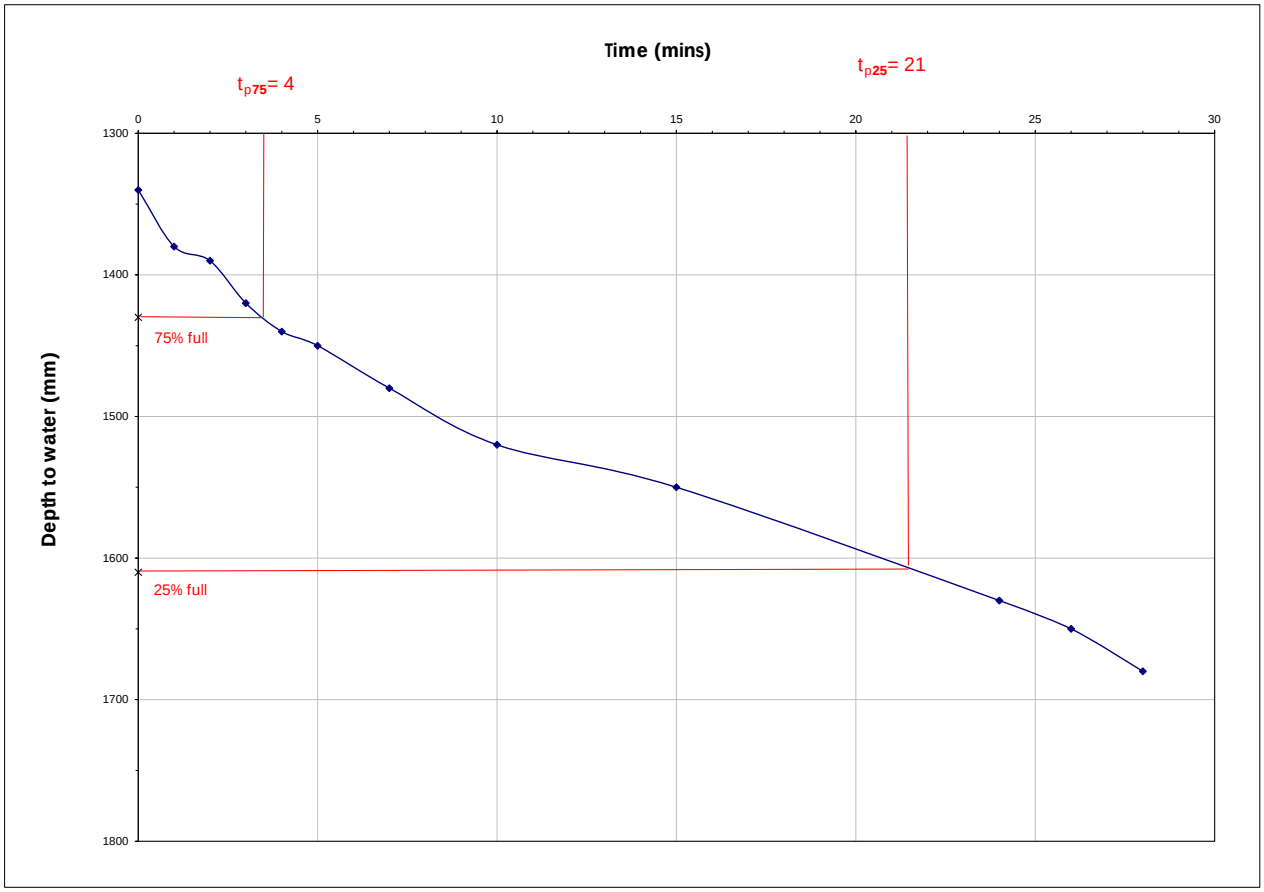
Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
11:08	0	1.34	1340
11:09	1	1.38	1380
11:10	2	1.39	1390
11:11	3	1.42	1420
11:12	4	1.44	1440
11:13	5	1.45	1450
11:15	7	1.48	1480
11:18	10	1.52	1520
11:23	15	1.55	1550
11:32	24	1.63	1630
11:34	26	1.65	1650
11:36	28	1.68	1680

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.30	2300
Width	=	0.65	650
Depth	=	1.70	1700

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1610	1.61
0.50	=	1520	1.52
0.75	=	1430	1.43

Depth at start of test (mm)	=	1340
Depth at end of test (mm)	=	1680
Base area of pit	=	1.495
a_{p50} - 50% internal surface area inc. base	=	2.557
V_{p75-25} - Volume 75 - 25%	=	0.2691

Read from the graph:		
$t_{p\ 75}$ (min)	=	4
$t_{p\ 25}$ (min)	=	21



Soil infiltration rate, f, (m/s) = 1.03E-04

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP516**
Test No.	**1**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
12:08	0	0.88	880
12:09	1	0.88	880
12:10	2	0.89	890
12:11	3	0.90	900
12:12	4	0.91	910
12:13	5	0.92	920
12:15	7	0.94	940
12:17	9	0.96	960
12:19	11	0.98	980
12:22	14	1.03	1030
12:31	23	1.07	1070
12:46	38	1.18	1180
12:52	44	1.22	1220
12:54	46	1.25	1250
12:59	51	1.28	1280
13:04	56	1.32	1320
13:08	60	1.38	1380
13:17	69	1.42	1420
13:25	77	1.47	1470
13:32	84	1.50	1500
13:42	94	1.55	1550
13:48	100	1.58	1580
13:56	108	1.62	1620
13:58	110	1.63	1630

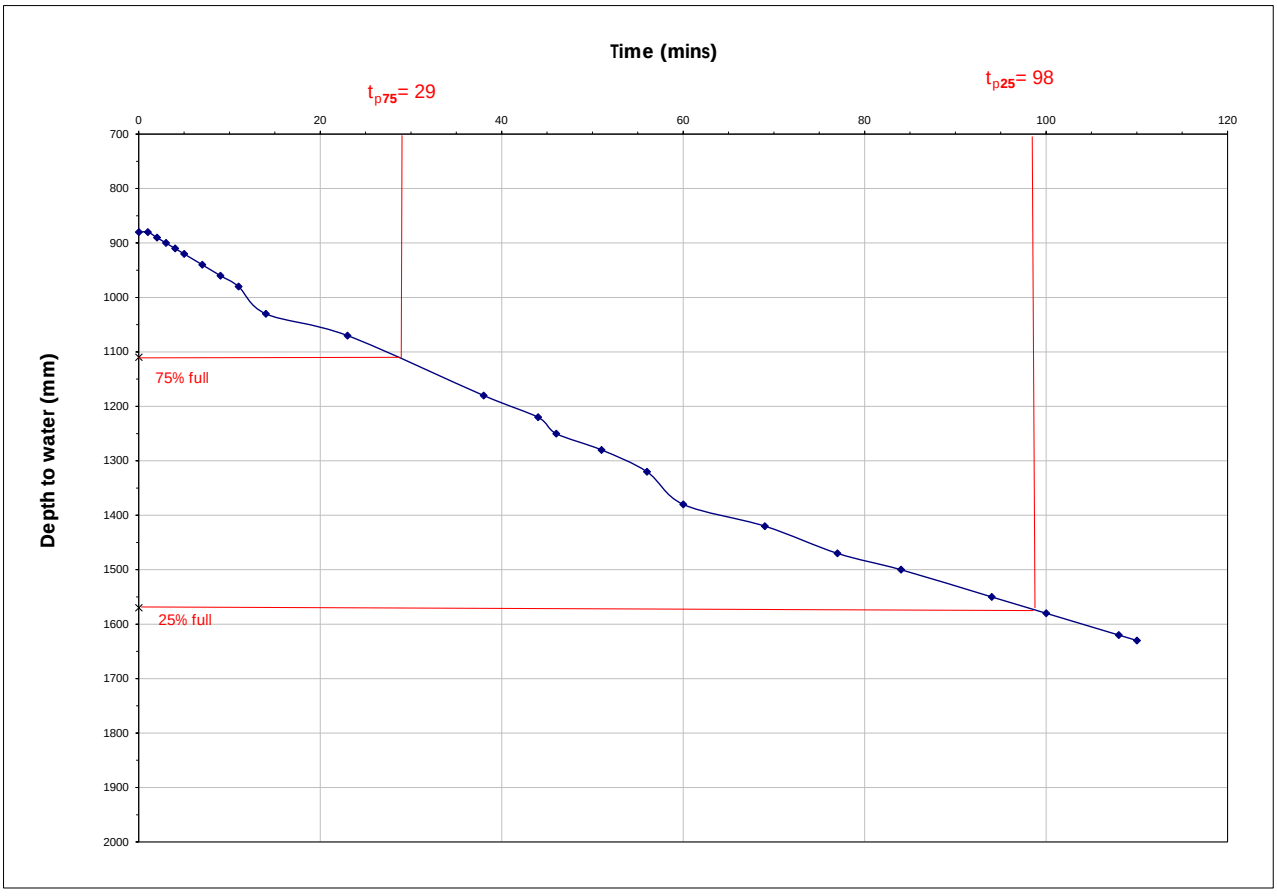
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.00	2000
Width	=	0.75	750
Depth	=	1.80	1800

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1570	1.57
0.50	=	1340	1.34
0.75	=	1110	1.11

Depth at start of test (mm)	=	880
Depth at end of test (mm)	=	1630

Base area of pit	=	1.5
a_{p50} - 50% internal surface area inc. base	=	4.03
V_{p75-25} - Volume 75 - 25%	=	0.69

Read from the graph:		
$t_{p\ 75}$ (min)	=	29
$t_{p\ 25}$ (min)	=	98



Soil infiltration rate, f, (m/s) = 4.14E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP516**
Test No.	**2**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
14:01	0	0.78	780
14:02	1	0.78	780
14:03	2	0.80	800
14:04	3	0.80	800
14:05	4	0.81	810
14:06	5	0.81	810
14:11	10	0.85	850
14:25	24	0.96	960
14:30	29	1.00	1000
14:46	45	1.09	1090
14:51	50	1.12	1120
15:07	66	1.20	1200
15:21	80	1.28	1280
15:26	85	1.31	1310
15:30	89	1.34	1340
15:33	92	1.35	1350
15:37	96	1.36	1360
15:45	104	1.38	1380

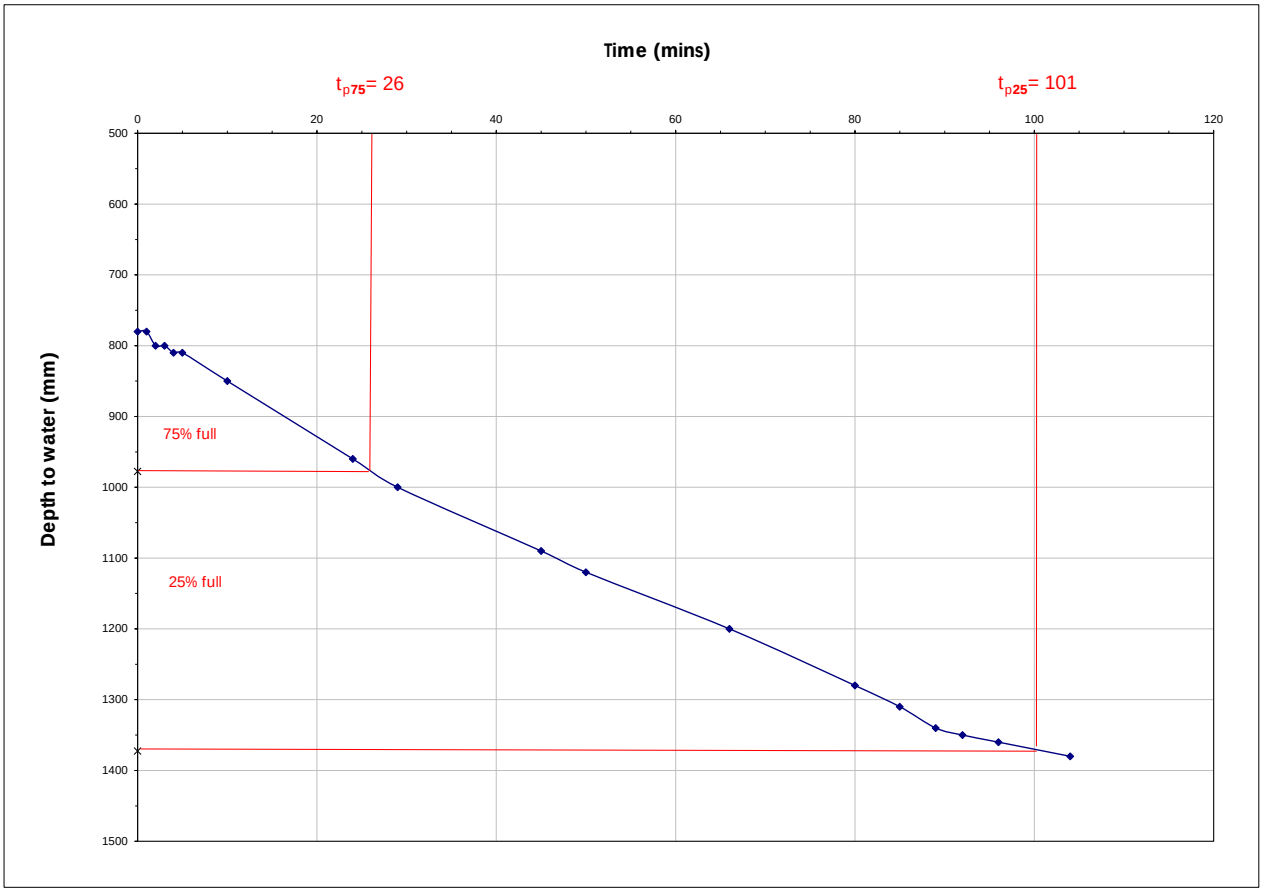
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.00	2000
Width	=	0.75	750
Depth	=	1.57	1570

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1372.5	1.37
0.50	=	1175	1.18
0.75	=	977.5	0.98

Depth at start of test (mm)	=	780
Depth at end of test (mm)	=	1380

Base area of pit	=	1.5
a_{p50} - 50% internal surface area inc. base	=	3.6725
V_{p75-25} - Volume 75 - 25%	=	0.5925

Read from the graph:		
$t_{p\ 75}$ (min)	=	26
$t_{p\ 25}$ (min)	=	101



Soil infiltration rate, f, (m/s) = 3.59E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP518**
Test No.	**1**

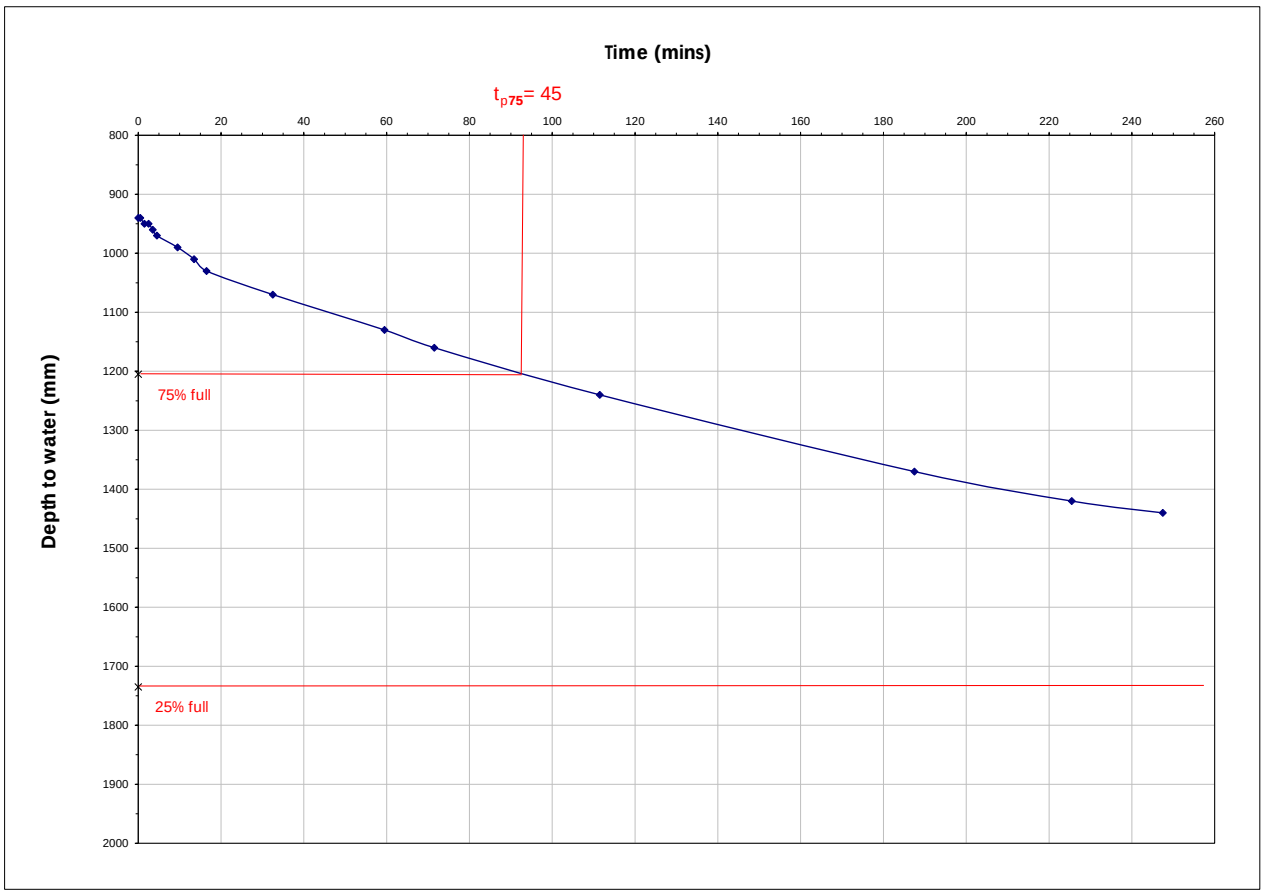
Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
10:29:30	0	0.94	940
10:30	0.5	0.94	940
10:31	1.5	0.95	950
10:32	2.5	0.95	950
10:33	3.5	0.96	960
10:34	4.5	0.97	970
10:39	9.5	0.99	990
10:43	13.5	1.01	1010
10:46	16.5	1.03	1030
11:02	32.5	1.07	1070
11:29	59.5	1.13	1130
11:41	71.5	1.16	1160
12:21	111.5	1.24	1240
13:37	187.5	1.37	1370
14:15	225.5	1.42	1420
14:37	247.5	1.44	1440

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.20	2200
Width	=	0.70	700
Depth	=	2.00	2000

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1735	1.74
0.50	=	1470	1.47
0.75	=	1205	1.21

Depth at start of test (mm)	=	940
Depth at end of test (mm)	=	1440
Base area of pit	=	1.54
a_{p50} - 50% internal surface area inc. base	=	4.614
V_{p75-25} - Volume 75 - 25%	=	0.8162

Read from the graph:		
$t_{p\ 75}$ (min)	=	45
$t_{p\ 25}$ (min)	=	n/a



Test did not attain 25% Effective depth. Unable to calculate soil infiltration rate

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP519**
Test No.	**1**

Time	Elapsed Time	Depth to water from ground level		
	(min)	(m)	(mm)	
10:51	0	0.95	950	
10:52	1	0.96	960	
10:53	2	0.96	960	
10:54	3	0.97	970	
10:55	4	0.97	970	
10:56	5	0.98	980	
10:58	7	0.99	990	
11:01	10	1.01	1010	
11:06	15	1.05	1050	
11:25	34	1.15	1150	
11:35	44	1.19	1190	
11:47	56	1.25	1250	
12:00	69	1.30	1300	
12:15	84	1.35	1350	
12:26	95	1.40	1400	DRY

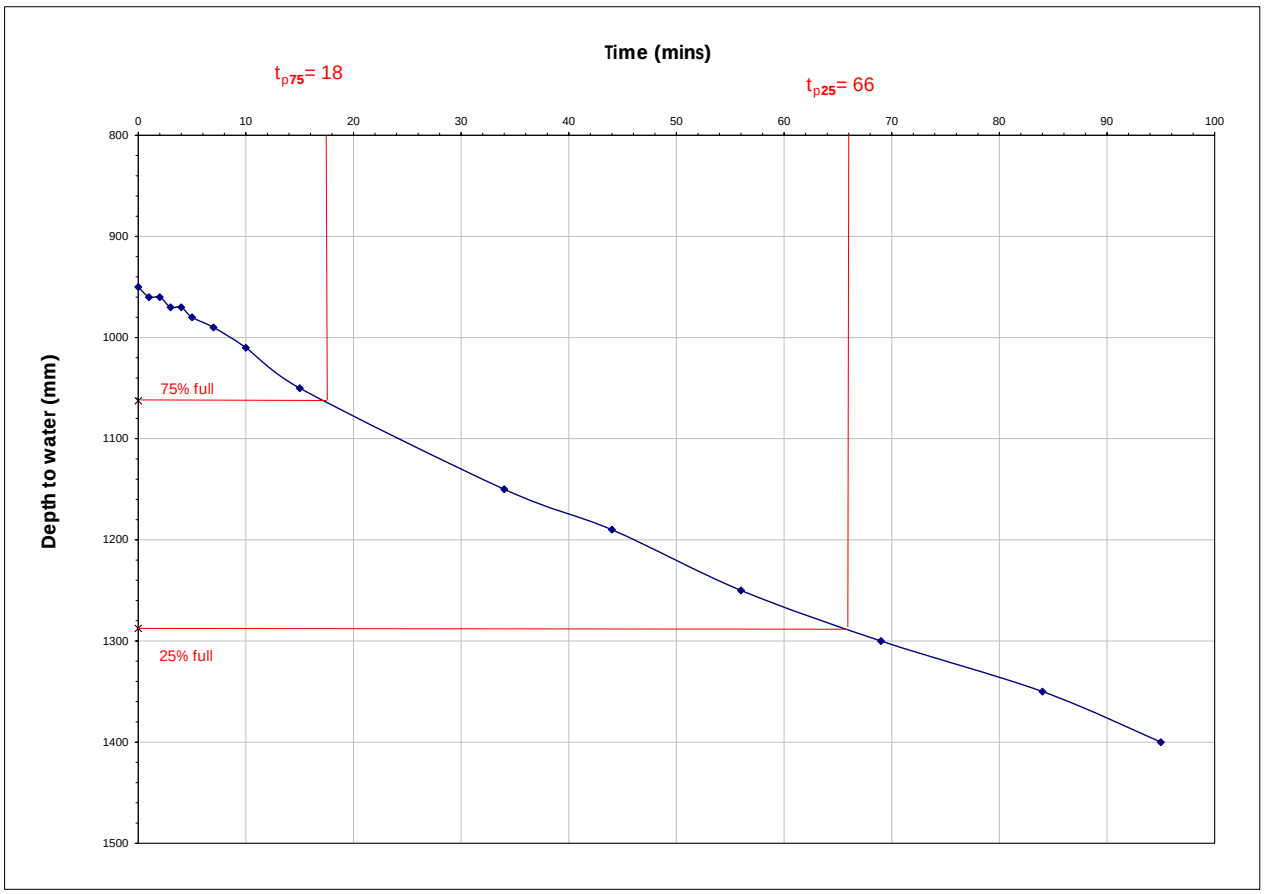
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.50	2500
Width	=	0.65	650
Depth	=	1.40	1400

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1287.5	1.29
0.50	=	1175	1.18
0.75	=	1062.5	1.06

Depth at start of test (mm)	=	950
Depth at end of test (mm)	=	1400

Base area of pit	=	1.625
a_{p50} - 50% internal surface area inc. base	=	3.0425
V_{p75-25} - Volume 75 - 25%	=	0.365625

Read from the graph:		
$t_{p\ 75}$ (min)	=	18
$t_{p\ 25}$ (min)	=	66



Soil infiltration rate, f, (m/s) = 4.17E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP519**
Test No.	**2**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
12:39	0	0.98	980
12:40	1	0.99	990
12:41	2	0.99	990
12:42	3	0.99	990
12:43	4	0.99	990
12:44	5	1.00	1000
12:50	10	1.02	1020
13:12	20	1.09	1090
13:29	30	1.15	1150
13:51	40	1.20	1200
14:08	50	1.23	1230
14:28	60	1.29	1290
14:49	90	1.34	1340
14:54	120	1.35	1350

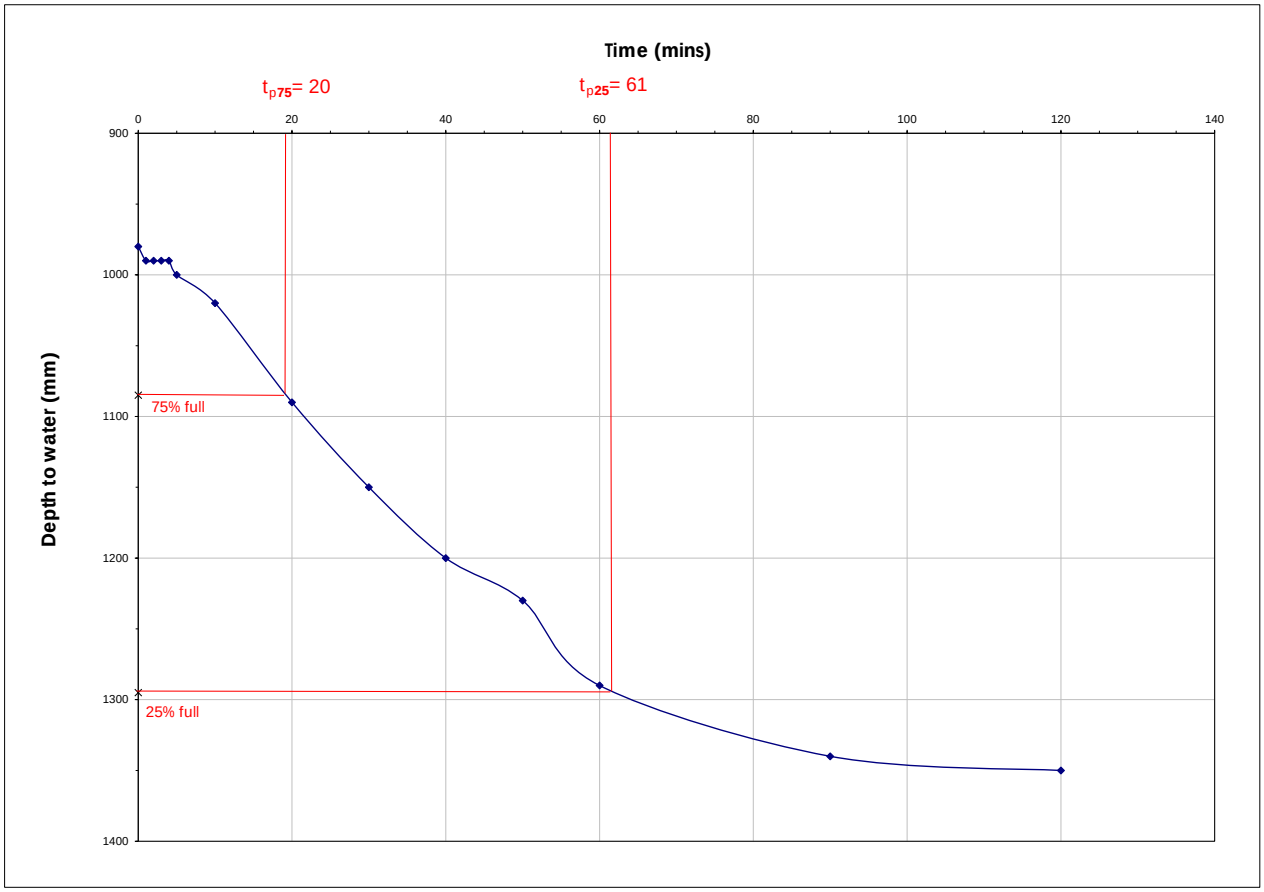
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.50	2500
Width	=	0.65	650
Depth	=	1.40	1400

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1295	1.30
0.50	=	1190	1.19
0.75	=	1085	1.09

Depth at start of test (mm)	=	980
Depth at end of test (mm)	=	1350

Base area of pit	=	1.625
a_{p50} - 50% internal surface area inc. base	=	2.948
V_{p75-25} - Volume 75 - 25%	=	0.34125

Read from the graph:		
$t_{p\ 75}$ (min)	=	20
$t_{p\ 25}$ (min)	=	61



Soil infiltration rate, f, (m/s) = 4.71E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**31/10/2023**
Trial Pit No.	**TP611**
Test No.	**1**

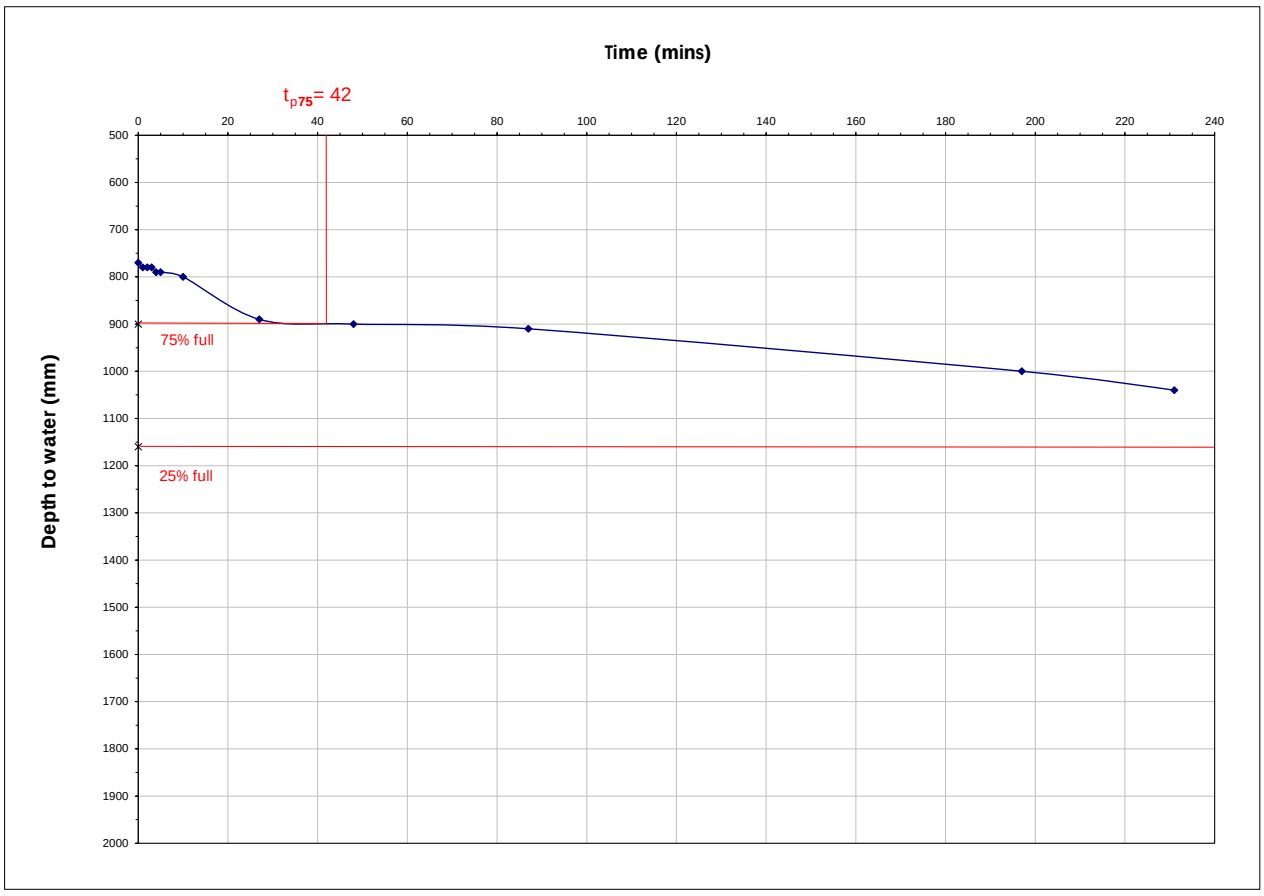
Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
10:33	0	0.77	770
10:34	1	0.78	780
10:35	2	0.78	780
10:36	3	0.78	780
10:37	4	0.79	790
10:38	5	0.79	790
10:43	10	0.80	800
11:00	27	0.89	890
11:21	48	0.90	900
12:00	87	0.91	910
13:50	197	1.00	1000
14:24	231	1.04	1040

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	1.90	1900
Width	=	0.88	880
Depth	=	1.29	1290

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1160	1.16
0.50	=	1030	1.03
0.75	=	900	0.90

Depth at start of test (mm)	=	770
Depth at end of test (mm)	=	1040
Base area of pit	=	1.672
a_{p50} - 50% internal surface area inc. base	=	3.1176
V_{p75-25} - Volume 75 - 25%	=	0.43472

Read from the graph:		
$t_{p\ 75}$ (min)	=	42
$t_{p\ 25}$ (min)	=	n/a



Test did not attain 25% Effective depth. Unable to calculate soil infiltration rate

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**31/10/2023**
Trial Pit No.	**TP612**
Test No.	**1**

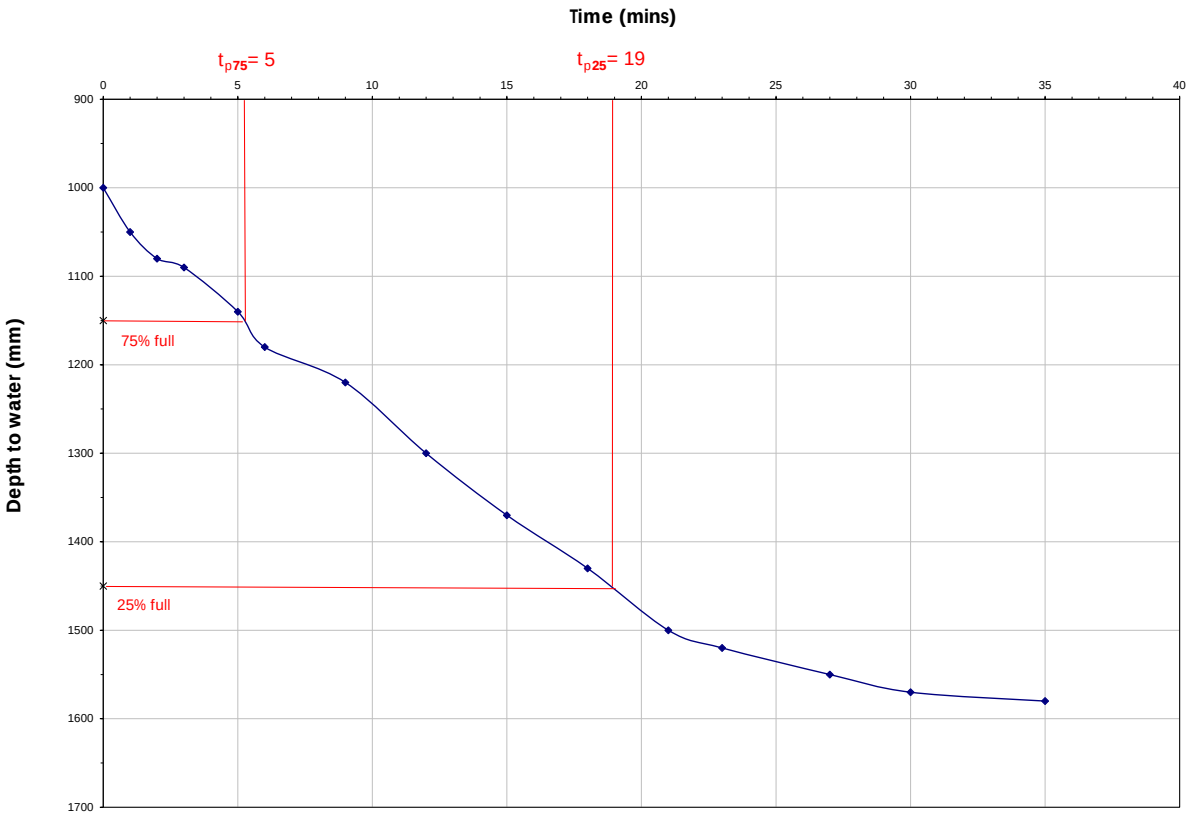
Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
09:52	0	1.00	1000
09:53	1	1.05	1050
09:54	2	1.08	1080
09:55	3	1.09	1090
09:57	5	1.14	1140
09:58	6	1.18	1180
10:01	9	1.22	1220
10:04	12	1.30	1300
10:07	15	1.37	1370
10:10	18	1.43	1430
10:13	21	1.50	1500
10:15	23	1.52	1520
10:19	27	1.55	1550
10:22	30	1.57	1570
10:27	35	1.58	1580

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.30	2300
Width	=	0.70	700
Depth	=	1.60	1600

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1450	1.45
0.50	=	1300	1.30
0.75	=	1150	1.15

Depth at start of test (mm)	=	1000
Depth at end of test (mm)	=	1580
Base area of pit	=	1.61
a_{p50} - 50% internal surface area inc. base	=	3.41
V_{p75-25} - Volume 75 - 25%	=	0.483

Read from the graph:		
$t_{p\ 75}$ (min)	=	5
$t_{p\ 25}$ (min)	=	19



Soil infiltration rate, f, (m/s) = 1.69E-04

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**31/10/2023**
Trial Pit No.	**TP612**
Test No.	**2**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
10:48	0	1.00	1000
10:49	1	1.02	1020
10:50	2	1.03	1030
10:52	4	1.06	1060
10:53	5	1.08	1080
10:54	6	1.10	1100
10:57	9	1.14	1140
11:03	15	1.20	1200
11:12	24	1.30	1300
11:17	29	1.37	1370
11:24	36	1.43	1430
11:40	52	1.56	1560
11:57	69	1.59	1590

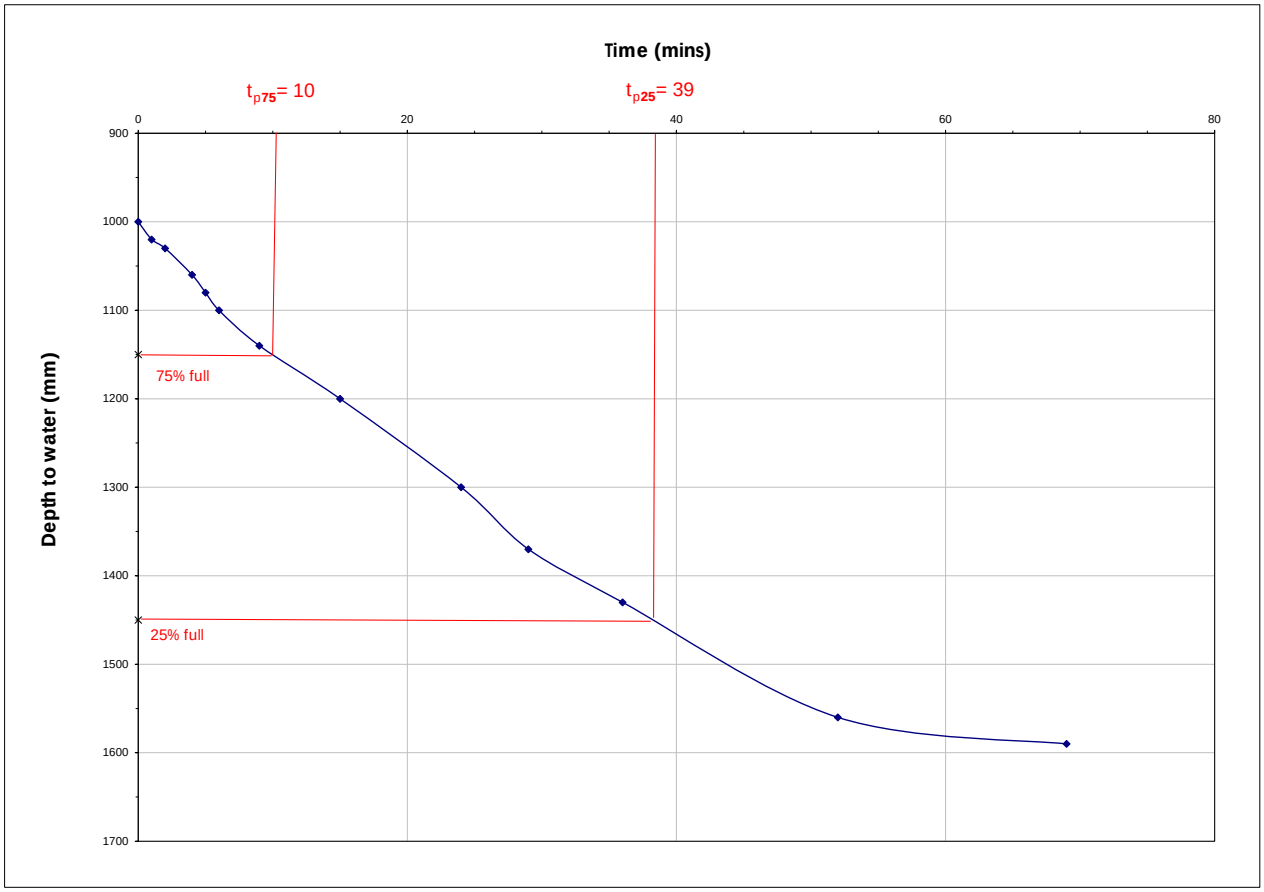
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.30	2300
Width	=	0.70	700
Depth	=	1.60	1600

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1450	1.45
0.50	=	1300	1.30
0.75	=	1150	1.15

Depth at start of test (mm)	=	1000
Depth at end of test (mm)	=	1590

Base area of pit	=	1.61
a_{p50} - 50% internal surface area inc. base	=	3.41
V_{p75-25} - Volume 75 - 25%	=	0.483

Read from the graph:		
$t_{p\ 75}$ (min)	=	10
$t_{p\ 25}$ (min)	=	39



Soil infiltration rate, f, (m/s) = 8.14E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**31/10/2023**
Trial Pit No.	**TP612**
Test No.	**3**

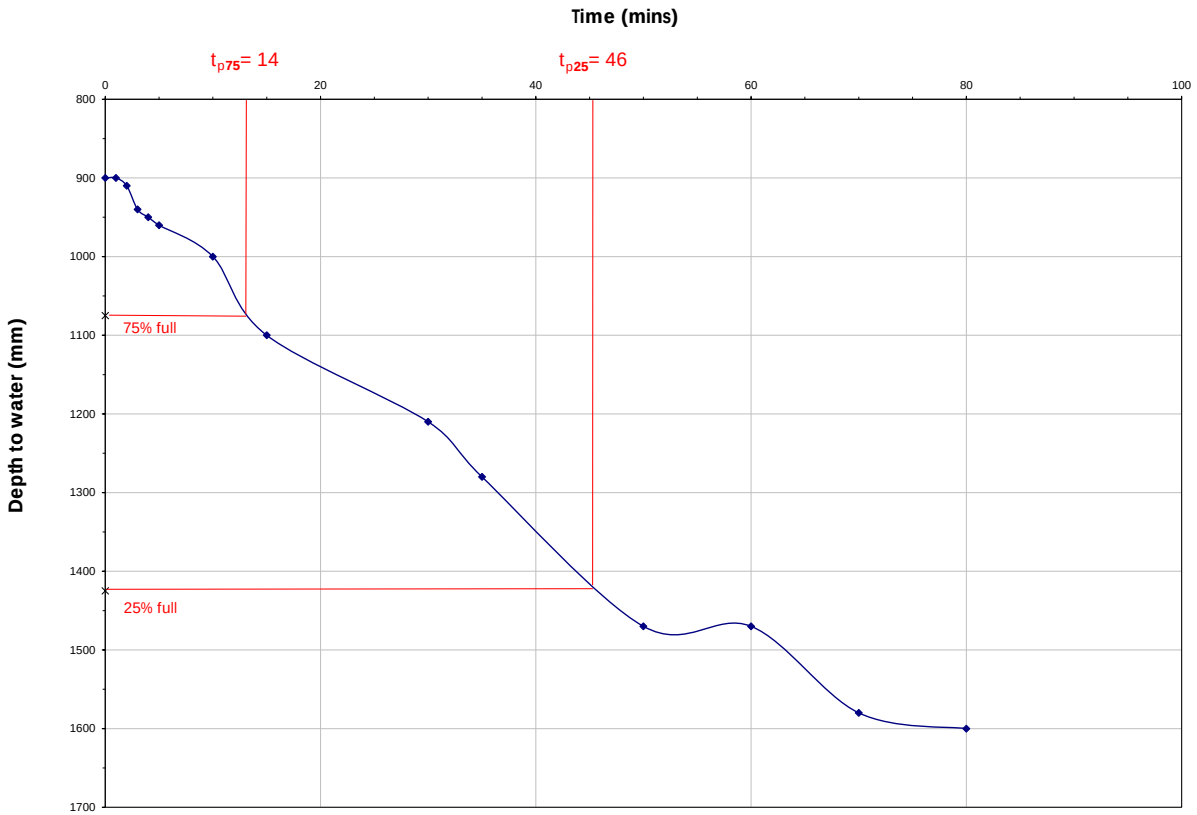
Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
12:45	0	0.90	900
12:46	1	0.90	900
12:47	2	0.91	910
12:48	3	0.94	940
12:49	4	0.95	950
12:50	5	0.96	960
12:55	10	1.00	1000
13:00	15	1.10	1100
13:15	30	1.21	1210
13:20	35	1.28	1280
13:35	50	1.47	1470
13:45	60	1.47	1470
13:55	70	1.58	1580
14:05	80	1.60	1600

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.30	2300
Width	=	0.70	700
Depth	=	1.60	1600

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1425	1.43
0.50	=	1250	1.25
0.75	=	1075	1.08

Depth at start of test (mm)	=	900
Depth at end of test (mm)	=	1600
Base area of pit	=	1.61
a_{p50} - 50% internal surface area inc. base	=	3.71
V_{p75-25} - Volume 75 - 25%	=	0.5635

Read from the graph:		
$t_{p\ 75}$ (min)	=	14
$t_{p\ 25}$ (min)	=	46



Soil infiltration rate, f, (m/s) = 7.91E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**31/10/2023**
Trial Pit No.	**TP613**
Test No.	**1**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
08:49	0	1.14	1140
08:50	1	1.16	1160
08:51	2	1.18	1180
08:52	3	1.22	1220
08:53	4	1.23	1230
08:54	5	1.26	1260
08:55	6	1.30	1300
08:57	8	1.34	1340
09:00	11	1.39	1390
09:02	13	1.43	1430
09:05	16	1.46	1460
09:08	19	1.50	1500
09:10	21	1.54	1540
09:21	32	1.60	1600
09:29	40	1.71	1710
09:34	45	1.71	1710
09:41	52	1.80	1800

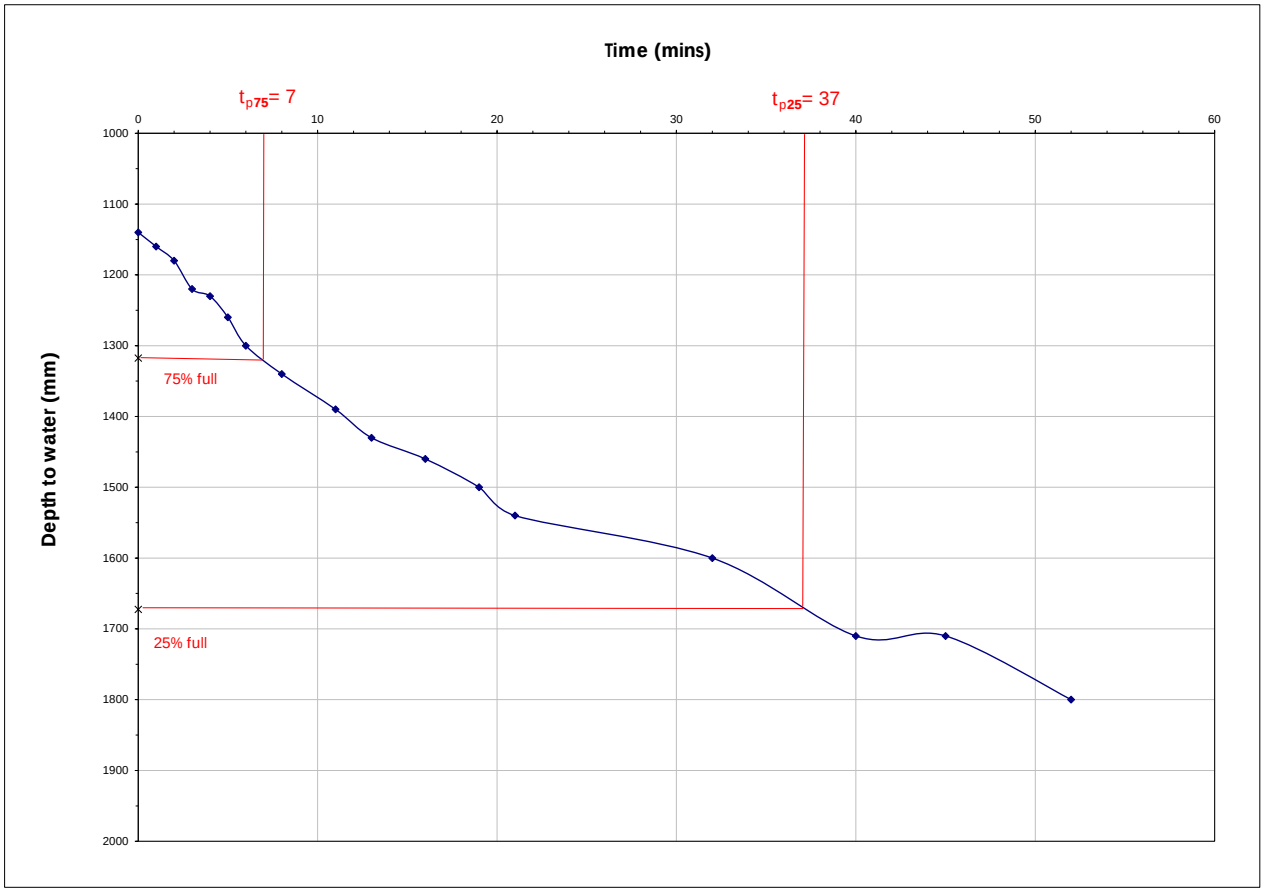
SOAKAWAY TRIAL PIT			
Dimensions		(m)	(mm)
Length	=	2.20	2200
Width	=	0.77	770
Depth	=	1.85	1850

Effective Depth (% full)		(mm)	(m)
0.25	=	1672.5	1.67
0.50	=	1495	1.50
0.75	=	1317.5	1.32

Depth at start of test (mm)	=	1140
Depth at end of test (mm)	=	1800

Base area of pit	=	1.694
a_{p50} - 50% internal surface area inc. base	=	3.8027
V_{p75-25} - Volume 75 - 25%	=	0.60137

Read from the graph:		
$t_{p\ 75}$ (min)	=	7
$t_{p\ 25}$ (min)	=	37



Soil infiltration rate, f, (m/s) = 8.79E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**31/10/2023**
Trial Pit No.	**TP613**
Test No.	**2**

Time	Elapsed Time	Depth to water from ground level		
	(min)	(m)	(mm)	
11:31	0	1.00	1000	
11:32	1	1.01	1010	
11:33	2	1.04	1040	
11:34	3	1.05	1050	
11:35	4	1.07	1070	
11:36	5	1.09	1090	
11:46	15	1.23	1230	
11:52	21	1.37	1370	
12:06	35	1.66	1660	
12:11	40	1.68	1680	DRY

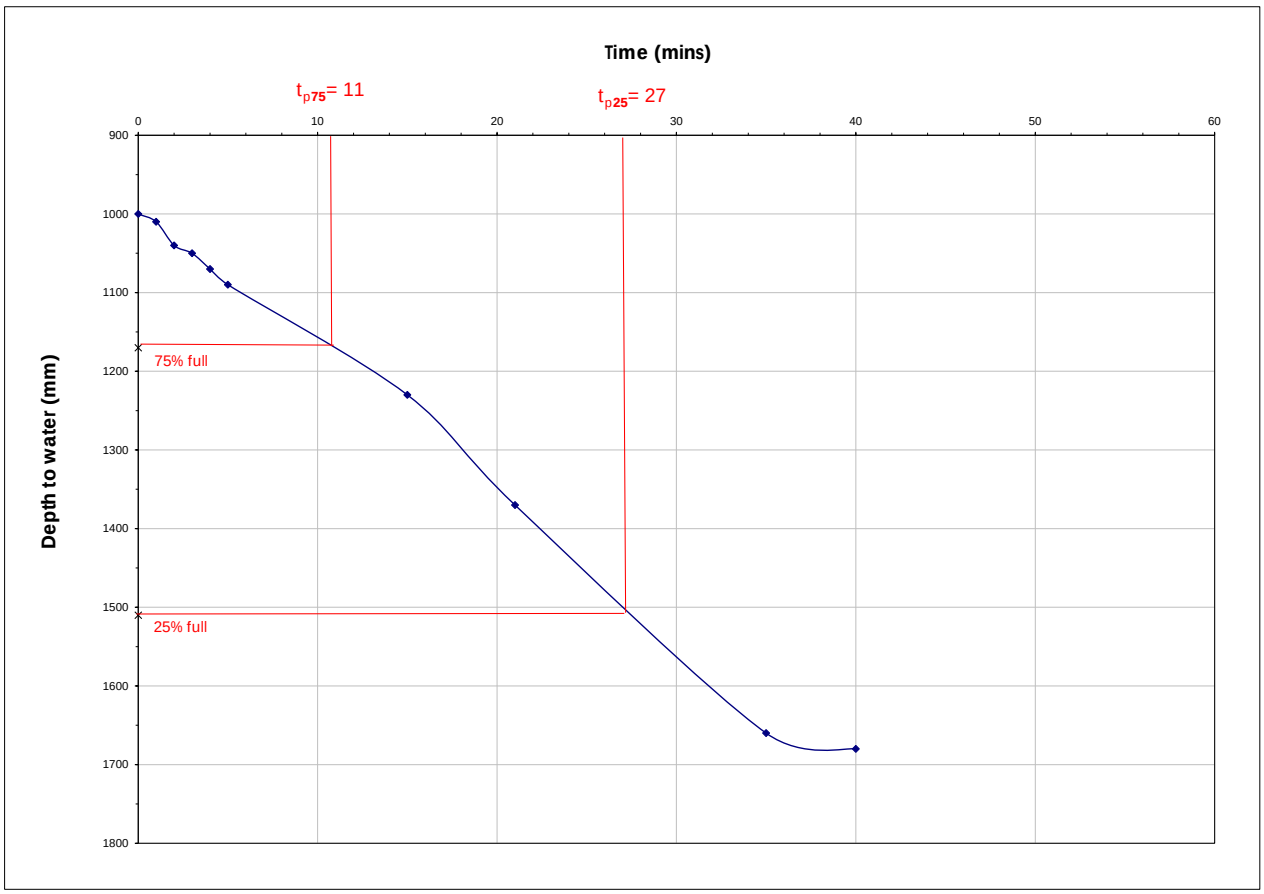
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.20	2200
Width	=	0.77	770
Depth	=	1.68	1680

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1510	1.51
0.50	=	1340	1.34
0.75	=	1170	1.17

Depth at start of test (mm)	=	1000
Depth at end of test (mm)	=	1680

Base area of pit	=	1.694
a_{p50} - 50% internal surface area inc. base	=	3.7136
V_{p75-25} - Volume 75 - 25%	=	0.57596

Read from the graph:		
$t_{p\ 75}$ (min)	=	11
$t_{p\ 25}$ (min)	=	27



Soil infiltration rate, f, (m/s) = 1.62E-04

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**31/10/2023**
Trial Pit No.	**TP613**
Test No.	**3**

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
12:17	0	0.93	930
12:18	1	0.93	930
12:19	2	0.96	960
12:20	3	0.97	970
12:21	4	0.99	990
12:22	5	1.00	1000
12:30	13	1.11	1110
12:35	18	1.17	1170
12:38	21	1.20	1200
13:05	48	1.50	1500
13:30	73	1.67	1670

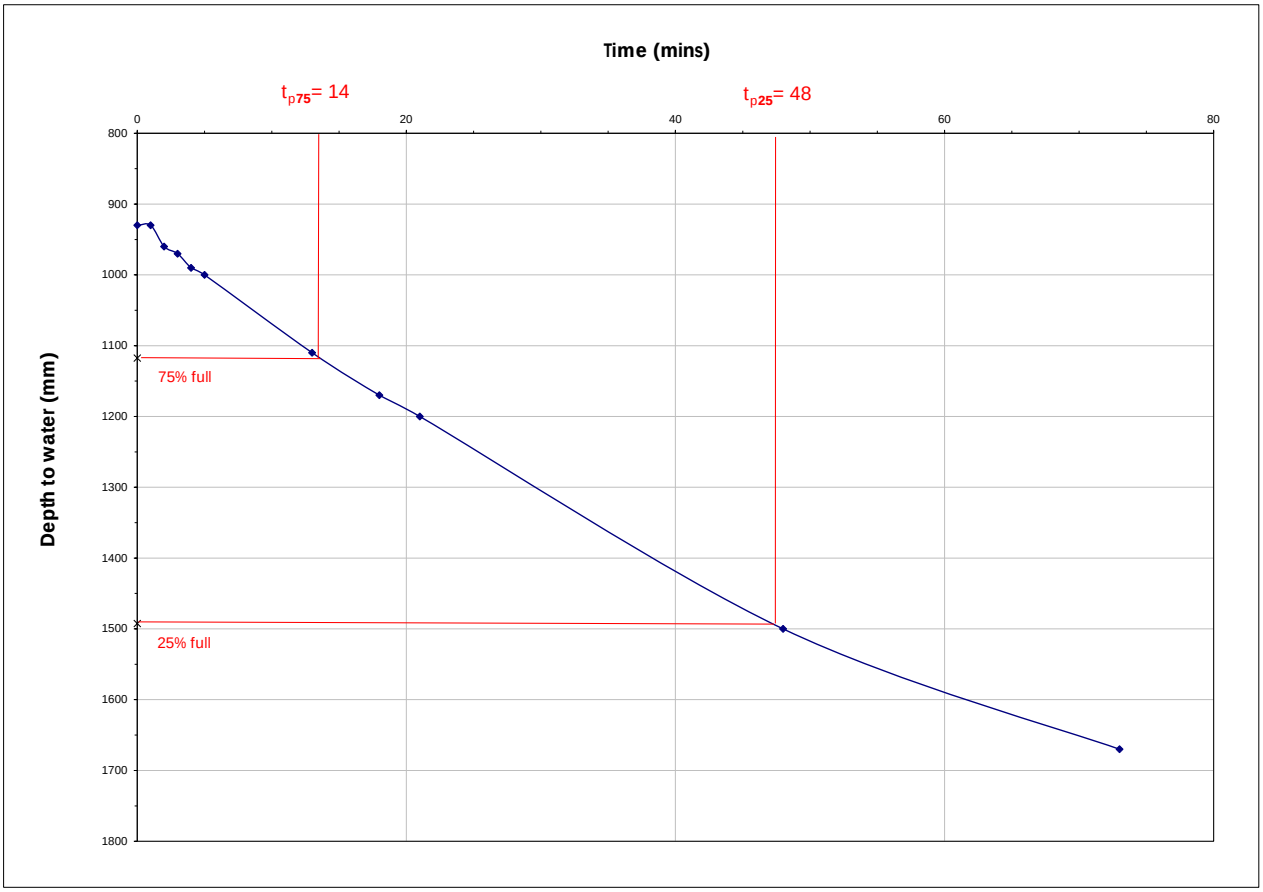
SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.20	2200
Width	=	0.77	770
Depth	=	1.68	1680

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1492.5	1.49
0.50	=	1305	1.31
0.75	=	1117.5	1.12

Depth at start of test (mm)	=	930
Depth at end of test (mm)	=	1670

Base area of pit	=	1.694
a_{p50} - 50% internal surface area inc. base	=	3.9215
V_{p75-25} - Volume 75 - 25%	=	0.63525

Read from the graph:		
$t_{p\ 75}$ (min)	=	14
$t_{p\ 25}$ (min)	=	48



Soil infiltration rate, f, (m/s) = 7.94E-05