



INVESTIGATE



REMEDIATE



REGENERATE



GROUND INVESTIGATION REPORT

**FOR
LAND AT
BILLBERRY CLOSE
AND ALBERT ROAD,
WHITEFIELD,
GREATER MANCHESTER**

**PREPARED FOR
THOMPSON CONTRACTS
(BLACKPOOL) LIMITED**

**REPORT NO. 8130A
MARCH 2025**

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**GROUND INVESTIGATION FOR LAND AT BILLBERRY CLOSE AND ALBERT ROAD,
WHITEFIELD, GREATER MANCHESTER, M45 8BL**

CLIENT: THOMPSON CONTRACTS (BLACKPOOL) LIMITED

ENGINEER: KEYSTONE DESIGN ASSOCIATES LIMITED

1. INTRODUCTION

This report has been prepared in accordance with an email, dated 14th February 2025 from the Engineer on behalf of the Client and emails, dated 19th February 2025 and 11th March 2025 from the Client.

The brief was set out in our estimate, ref. E7564A dated 27th January 2025, with amendments as the investigation proceeded and includes:

- 6 No. mini percussive boreholes.
- 1 No. hand dug trial pit.
- In-situ testing.
- Geotechnical laboratory testing.
- Contamination analysis.
- Provision of an interpretative report on the above.

It should be noted that we have previously issued a Phase I Desk Study Report for this site, ref. 8130 and dated March 2025, which should be read in conjunction with this Phase II Ground Investigation Report.

1.1 Site Location and Description

The site is located at the junction of Billberry Close and Albert Road, Whitefield, Greater Manchester, M45 8BL, as indicated in Figure 1. The approximate National Grid Reference of the centre of the site is 381696, 405920.

As shown in Figure 2, the site comprises an irregular shaped plot of land of 0.3ha. At the time of the walkover carried out for the Phase I Report (27th November 2024), the site comprised a predominantly grassed area with overgrown areas in the north, east and west and a bituminous macadam surfaced footpath running from northwest to southeast. The site is bound by 8-16 and 38 Regal Close to the north, 31-35 Brook Drive to the northeast, 17-19 Billberry Close to the southeast, Billberry Close to the south, and Albert Road to the west.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand that it is proposed to erect seven residential bungalows (three pairs of semi-detached and one detached), with driveways, gardens and landscaped areas, as shown in Figure 3.

The purpose of the investigation was to determine the ground conditions at the positions of the exploratory holes, to assess the likelihood of a general pattern of strata being present below the site and to establish the load bearing characteristics of the strata deriving, if possible, an assessment of the suitability of appropriate founding techniques.

In addition contamination analysis and assessment was required in order to determine necessary precautions and/or remedial measures required for the proposed development and to ascertain the need for any further sampling and analysis.

2. INVESTIGATION

2.1 Investigation Details

Six mini boreholes were put down to depths of between 1.42m and 5.45m using a Dart Mini Sampling Rig fitted with windowless sample tubes of 87mm, 77mm, 67mm and 57mm diameter at the positions determined by the Client's Engineer and set out by Sub Surface North West Ltd, as shown on Figure 2. The samples were subsequently logged in accordance with BS.5930:2015+A1:2020 and the resulting Mini Borehole Records are appended. On completion, M1, M5 and M5A were backfilled with gravel as no installations were required.

One hand dug trial pit was taken out at the positions determined by the Client's Engineer and set out by Sub Surface North West Ltd, as shown on Figure 2. The hand dug trial pit was excavated to a depth of 1.20m. Samples were taken for logging, in accordance with BS.5930:2015+A1:2020, and testing. The resulting Hand Dug Trial Pit Records are appended. On completion the hand dug trial pit was backfilled with arisings.

2.2 Sub Surface Detail

Details of the strata encountered in the ground investigation are given on the appended Borehole Records. The exploratory holes found Made Ground and granular and cohesive drift deposits. The depths of strata found were as follows:

TABLE 1 STRATA

Exploratory Hole Number	Depth of Made Ground (m)	Depth of Cohesive Drift Deposits (m)	Depth of Granular Drift Deposits (m)	Depth of Hole (m)
M1	1.45	1.45 – 2.50 3.75 – >4.45	2.50 – 3.75	4.45
M2	1.20	1.20 – 2.40 3.50 – >4.45	2.40 – 3.50	4.45
M3	1.20	1.20 – 2.60 4.00 – >4.45 *	2.60 – 4.00	5.45
M4	1.50	1.50 – >2.40	-	2.40
M5	>1.42	-	-	1.42
M5A	>2.50 *	-	-	4.45
HD1	>1.20	-	-	1.20

M = Mini Borehole, HD = Hand Dug Trial Pit

* No Recovery below this depth.

A general summary of the strata found is as follows:

2.2.1 Made Ground

The initial Made Ground was found to be friable brown and dark brown slightly gravelly sandy silty clays with occasional roots and many rootlets, the gravel sized fragments comprising stone, to depths of 0.20m in M1, M2, M3, M4, M5 and M5A, and 0.65m in HD1.

Underlying the above in HD1 were brown sandy gravel and cobble sized fragments of stone to the base of the trial pit at a depth of 1.20m.

Underlying the above in the boreholes were firm, friable in places, dark brown, brown, grey and dark grey mottled slightly gravelly sandy silty clays with occasional roots and rootlets, the gravel sized fragments comprising stone, brick, ceramic, clinker, glass, coal and wire, to depths of 1.45m in M1, 1.20m in M2, M3 and M5A, and 1.50m in M4 respectively and to the base of M5 at a depth of 1.42m.

In M5A, this was underlain by a soft dark brown slightly gravelly sandy silty clay with many pockets of sand, the gravel sized fragments comprising stone, brick, plastic and concrete, to a depth of at least 2.50m. No further samples were recovered to the base of the borehole at a depth of 4.45m due to a boulder being pushed down by the drilling rig.

2.2.2 Drift Deposits

The initial cohesive drift deposits were found to be a soft to firm brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy silty clay with low sandstone cobble content, the gravel comprising sandstone and siltstone, to depths of 2.50m, 2.40m, and 2.60m in M1, M2, and M3 respectively and to the base of M4 at a depth of 2.40m. This was found to be low strength, locally high strength at 1.85m, becoming medium strength below 2.15m in M1, low strength, locally medium strength at 1.85m, in M2, and low strength, locally high strength at 1.85m, becoming very low strength below 2.15m, in M3.

The above was underlain by granular drift deposits, which were found to be loose, becoming medium dense below 3.15m in M2, dark brown silty fine to medium sands, clayey in places, to depths of 3.75m, 3.50m, and 4.00m in M1, M2, and M3 respectively.

This was underlain by soft to firm brown and dark brown slightly gravelly slightly sandy silty clay with occasional pockets of sand, the gravel comprising sandstone and siltstone, to the base of M1 and M2 at a depth of 4.45m and to a depth of 4.45m in M3. This was found to be high strength in M1, low strength becoming high strength below 4.15m in M2, and low strength in M3. No further samples were recovered to the base of M3 at a depth of 5.45m due to the borehole continually collapsing.

2.2.3 Groundwater

Groundwater inflows were encountered at a depth of 2.00m in M1, M2, M3, M4, and M5A.

No groundwater was encountered in the remainder of the exploratory holes although it should be noted that they were only left open for a short period of time and groundwater levels and rates of inflow may be subject to seasonal and/ or climatic variations.

Monitoring of standpipes installed in M2 and M4 on 13th March 2025 found groundwater to be at 2.75m and 1.85m respectively.

3. SAMPLING AND TESTING

3.1 Sampling

Continuous core, small disturbed and bulk disturbed samples were obtained for the strata encountered and were subjected to careful examination and hand shear vane tests, where appropriate.

The samples will be retained for a period of one month after the issue of this report, for reference purposes, and then disposed of unless otherwise instructed.

3.2 Field Testing

Nineteen Standard Penetration Tests (SPTs) and one Standard Cone Penetration Test (CPT) were performed in the mini boreholes, the results of which are recorded on the appended Standard Penetration Test Results Sheet with 'N' values and indicative relative density and shear strength, where appropriate, given on the Mini Borehole Records.

3.3 Installations and Monitoring

On completion of M2, M3 and M4, HDPE standpipes were installed to depths of 3.40m, 3.00m and 2.00m respectively. The standpipes are slotted from 1.00m depth, have an internal diameter of 50mm and have removable quick release gas valves to enable both ground gas and groundwater monitoring and sampling to be undertaken. Details of the installations are given on the Mini Borehole Records.

Monitoring of the standpipes for ground gas and groundwater has been undertaken on one of six scheduled occasions to date using portable equipment. A Gas Data GFM 435 was used for monitoring methane, carbon dioxide, oxygen, gas flows and atmospheric pressure. The results of the monitoring is given on the appended Ground Gas and Groundwater Monitoring Results sheet.

It should be noted that prior to the first monitoring visit, the standpipes had been damaged by local residents or vandals. The standpipes have since been damaged further and can no longer be used, therefore new standpipes will need to be installed and secured prior to the monitoring continuing.

3.4 Laboratory Testing

The following laboratory tests were carried out in accordance with BS.1377: 1990, where applicable, and the results are appended.

- Moisture content, plastic limit and liquid limit tests.
- Soluble sulphate content and pH value tests.

Contamination analyses have been performed on eight soil samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, speciated total petroleum hydrocarbons (TPHs), the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. In addition, the soil samples were subjected to an asbestos screen. Where asbestos was detected by the screen, asbestos type and quantification was undertaken for two soil samples.

4. APPRAISAL AND RECOMMENDATIONS

4.1 Comments on the Profile

At the outset it should be appreciated that only a small proportion of the area to be developed has been investigated and consequently the recommendations made and opinions expressed in this report can only be applied to such conditions as were encountered in the exploratory holes.

The exploratory holes indicate a nature and degree of similarity to the extent that we consider them likely to be representative of the natural ground conditions. However, no guarantee can be given.

Due to the site having been previously developed, and the nature of Made Ground, localised variations in thickness and composition should be anticipated and hence interpolation or extrapolation from the exploratory holes to adjoining areas should only be undertaken with caution.

Details of the findings of the investigation are given on the appended Mini Borehole Records and Hand Dug Trial Pit Records and a summary of the ground conditions is given in Section 2.2.

4.2 Foundations

We understand that it is proposed to erect seven residential bungalows (three pairs of semi-detached and one detached), with driveways, gardens and landscaped areas, as shown in Figure 3. However, at the time of writing this report no specific details regarding any design loadings were available and consequently the recommendations given are in general terms only.

The ground investigation found Made Ground to depths of between 1.20m and greater than 2.50m.

The initial cohesive drift deposits were found to be very low to low strength, locally medium and high strength, slightly gravelly slightly sandy silty clays to depths of 2.50m, 2.40m, and 2.60m in M1, M2, and M3 respectively and to the base of M4 at a depth of 2.40m.

The above was underlain by granular drift deposits, which were found to be loose, locally medium dense, silty fine to medium sands, clayey in places, to depths of 3.75m, 3.50m, and 4.00m in M1, M2, and M3 respectively.

This was underlain by low to high strength slightly gravelly slightly sandy silty clays with occasional pockets of sand to the base of M1 and M2 at a depth of 4.45m and to a depth of 4.45m in M3. No further samples were recovered to the base of M3 at a depth of 5.45m due to the borehole continually collapsing.

We would not recommend founding in the Made Ground in its present condition because of its inherent variability in consistency and compaction, and in parts the nature of its constituents.

Atterberg limit tests on the cohesive strata indicate clays of low to intermediate plasticity which are considered to have a low to medium susceptibility to shrinkage and swelling with varying moisture content. Given the above, any foundations should be taken down to a minimum 0.90m below finished ground level to avoid the zone which is subject to seasonal moisture content variation and frost action. If buildings are to be constructed adjacent to existing trees, trees are to be removed and/or trees are to be planted then the guidelines given in the National House Building Council (NHBC) Standards Chapter 4.2, 'Building Near Trees', should be followed for clays of medium shrinkage and swelling potential.

It should be noted that the natural strata is at a depth of in excess of 0.90m and in these areas foundations should be taken down to a minimum 0.10m below the base of the Made Ground unless the NHBC guidelines indicate a greater depth.

Taking the results of the field tests we have determined the safe bearing capacity of the natural strata, as follows:

TABLE 2 SAFE BEARING CAPACITY

Expl Hole No.	Depth (m)	SPT 'N' Value	Shear Strength (kN/m ²)	Safe Bearing Pressure (kN/m ²)		Recommended Minimum Foundation Depth (m)
				Strip Footing	Square Pad	
M1	1.45	8 ^a	32	60	70	-
	1.85	-	88 ^b	165 ^c	200 ^c	
	2.15	11	44	80 ^c	100 ^c	
	3.15	4	-	30 ^d	30 ^d	
	4.15	25	100	190	225	
M2	1.35	8	32	60	70	-
	1.85	-	62 ^b	115 ^c	140 ^c	
	1.95	-	38 ^b	70	85	
	2.15	10 ^a	40	75	90 ^c	
	2.40	8 ^a	-	75 ^d	75 ^d	
	3.15	21	-	225 ^{c d}	225 ^{c d}	
	3.85	-	32 ^b	60	70	
	4.15	20	80	150	180	
M3	1.35	9	36	65	80	-
	1.85	-	104 ^b	195 ^c	235 ^c	
	2.15	3	12	20	25	
	3.15	4	-	30 ^d	30 ^d	
	4.15	10	40	75	90	
	5.15	19	76	140	170	

^a Partial SPT 'N' Value used

^b Shear strength determined by hand shear vane test.

^c Consideration must be given to weaker underlying strata which might be overstressed if loading is not reduced.

^d For footings on granular strata, the safe bearing capacity given is based upon a footing width of less than 1.50m. For wider footings a reduction would be necessary.

It should be noted that the safe bearing pressures given for the cohesive strata do not take into consideration settlement. Settlement is dependent upon loading intensity, the width of the foundation and the coefficient of volume compressibility (M_v) of the compressible strata. In our opinion variable and significant total and differential settlements are likely to be experienced.

In view of the variable upper strata and the low to very low strength clays and loose sands encountered at depth in M1, M2 and M3 and the depth of Made Ground encountered in M5, shallow foundations in natural ground are not feasible and hence piled foundations need to be considered. For piled foundations, we would recommend cable percussive boreholes are carried out to assess the ground conditions at depth and obtain parameters for a pile design.

With regard to the choice of pile type, consideration could be given to driven piles, continuous flight auger (CFA) piles or cast in-situ bored piles with the driven pile option probably being the most economical. However, in considering piles driven to a pre-determined set in the more competent strata at depth, it is essential to ensure that any vibrations set up during the driving process are not transmitted to adjacent/ nearby buildings, structures, services and/or slopes/ retaining walls as they may be detrimentally affected. Consequently, in respect of driven piles, we recommend that any tendering Specialist Piling Contractor confirm that vibrations will not detrimentally affect adjacent/ nearby buildings, structures, services and/or slopes/ retaining walls. If such confirmation cannot be given then we would recommend using either CFA or cast in-situ bored piles.

Care must be taken to space the piles in any group to ensure the adequate utilisation of skin friction where this has been assumed in the calculation of the load bearing capacity of an individual pile. Checks must also be undertaken to confirm that the underlying ground supporting the pile group is not overstressed.

To formulate the most satisfactory and economic scheme we recommend that competitive tenders and designs from Specialist Piling Contractors should be sought using the exploratory hole information obtained.

4.3 Floor Slab Construction

With regard to the design and construction of normal ground bearing floor slabs, it should be noted that due to the thickness of Made Ground there will be a risk of significant total and differential settlements, the extent of which will be a matter of chance rather than being assessable by calculation.

To obviate any significant damaging settlements we would recommend using a suspended floor slab with intermediate support designed on the same basis as the main foundations where the spans are too large for economical single suspended slab design.

4.4 Excavations and Groundwater

There should be no particular difficulties in excavating the strata indicated in the exploratory holes utilising an appropriate and suitably sized mechanical excavator.

Groundwater inflows were encountered at a depth of 2.00m in M1, M2, M3, M4, and M5A. No groundwater was encountered in the remainder of the exploratory holes although it should be noted that they were only left open for a short period of time and groundwater levels and rates of inflow may be subject to seasonal and/ or climatic variations.

Monitoring of standpipes installed in M2 and M4 on 13th March 2025 found groundwater to be at 2.75m and 1.85m respectively.

It is recommended that all excavations to greater than 1.20m depth, or for shallower excavations where groundwater is encountered above this level, are closely supported, especially where man entry is required. Alternatively, where space permits, the excavations might be battered back to an appropriate angle.

Where groundwater is encountered to about 2.00m depth and accumulates in open excavations it is considered that it should be able to be removed by pumping from a filtered sump. Below 2.00m metres depth more sophisticated dewatering measures are likely to be required.

4.5 Buried Concrete

For the design of buried concrete the recommendations given in Building Research Establishment (BRE) Special Digest 1 (February 2017 revision), "Concrete in Aggressive Ground", should be followed.

Determination of pH on fifteen soil samples gave values in the range of 7.1 to 10.9. Soluble sulphate concentrations were also determined for eight soil samples and the results ranged from 0.02 to 0.07 g/l. The results indicate that the Design Sulphate Class for the site should be DS-1.

Our knowledge of the site and ground conditions indicates that the site is "brownfield" with potentially mobile groundwater. Consequently, in accordance with the Design Sulphate Class for the site together with the site and groundwater conditions an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1 should be used as detailed on the appended extract.

4.6 Contamination Considerations

We have previously undertaken a Phase I Report, ref. 8130 and dated March 2025 and this Phase II ground investigation has been undertaken to provide an initial contamination risk assessment in accordance with the Phase I Conceptual Ground Model. Based upon the findings of the above, additional sampling, analysis and assessment may be required.

It should be appreciated that the suite of determinants analysed for consists of a range of contaminants identified in the Conceptual Ground Model. However, the absence of any other specific contaminants cannot be guaranteed.

4.6.1 Assessment (Soil)

In order to provide an assessment of the presence of contamination eight soil samples have been analysed for a suite of determinants by a UKAS and MCERTS accredited laboratory and the results are appended.

The concentrations of the determinants have been compared against published generic assessment criteria (GACs). The Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency published soil guideline values (SGVs) for mercury, selenium, benzene, toluene, ethylbenzene and xylene on 31st March 2009, arsenic and nickel on 12th May 2009 and cadmium and phenols in June 2009. Contaminated Land: Applications in Real Environments (CL:AIRE) guideline values were also published in December 2009 to supplement the above. DEFRA published in March 2014 Category 4 Screening Levels (C4SLs) for arsenic, cadmium, lead, hexavalent chromium, benzo(a)pyrene and benzene. In November 2014 Suitable for Use Levels (S4ULs) were then published by LQM/ CIEH and updated S4ULs values for cadmium and phenols were published in July 2015 and for nickel in August 2015.

The assessment criteria (SGVs, S4ULs, CL:AIRE and C4SLs) vary dependent upon the land use; allotment and residential use being the most sensitive and commercial/ industrial use being the least sensitive.

For the purposes of assessment, as the proposed development is residential properties with gardens, contamination analyses have been compared with the guideline values for residential with plant uptake (with homegrown produce).

When compared with published guideline values for a standard land use of residential with plant uptake (with homegrown produce) the contamination analysis determined elevated levels of lead with varying distribution, as tabulated below:

TABLE 3 ASSESSMENT OF SOIL CONTAMINATION

Determinant	Expl. Hole No.	Depth (m)	Recorded Level (mg/kg)	Published Guideline Value (mg/kg)
Lead	M3	0.00 – 0.20	210	200

GACs used for the assessment can be supplied directly to the Regulator, if requested.

An asbestos screen was undertaken on the soil samples and asbestos was detected as tabulated below:

TABLE 4 ASBESTOS CONTAMINATION

Exploratory Hole Number	Depth (m)	Asbestos Type	Recorded Level (% of soil mass)
M3	0.00 – 0.20	White (chrysotile)	< 0.001
M4	0.20 – 1.20	White (chrysotile)	0.004

In addition to the above, an assessment of risk to personnel who will come into contact with on-site materials throughout the site has been undertaken.

4.6.2 Conclusions and Recommendations

Section 78a(2) of the Environmental Protection Act: 1990 as amended by the Contaminated Land (England) (Amendment) regulations 2012, and Section 86 of the Water Act 2003, defines CONTAMINATED LAND for the purposes of Part IIA as:

“any land which appears to the LOCAL AUTHORITY in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

- (a) SIGNIFICANT HARM is being caused or there is a SIGNIFICANT POSSIBILITY of such harm being caused; or
- (b) SIGNIFICANT POLLUTION OF CONTROLLED WATERS is being, or is likely to be, caused”

Before a LOCAL AUTHORITY can make the judgement that land appears to be CONTAMINATED LAND on the basis that SIGNIFICANT HARM is being caused, or that there is a SIGNIFICANT POSSIBILITY of such harm being caused, the LOCAL AUTHORITY must identify a SIGNIFICANT POLLUTANT LINKAGE. This means that each of the following has to be identified:

- (a) a CONTAMINANT;
- (b) a relevant RECEPTOR (defined as living organisms, ecological systems, controlled waters or property); and
- (c) a PATHWAY by means of which either:
 - (i) the CONTAMINANT is causing SIGNIFICANT HARM to that RECEPTOR, or
 - (ii) there is a SIGNIFICANT POSSIBILITY of such harm being caused by that CONTAMINANT to that RECEPTOR

It should be noted that the words in capitals have a legal definition within the legislation.

Without a clear identification of all three elements of the pollutant linkage, land cannot be identified as contaminated under the regime.

The National Planning Policy Framework states that, “after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990”. Therefore, the general principles detailed above apply to this assessment.

Our assessment, based on eight soil samples, indicates a single elevated level of lead is present in the near surface Made Ground in M3. This level is only marginally above the GAC and the mean concentration of lead across the eight samples is 89mg/kg, well below the GAC of 200mg/kg.

Our assessment, based on eight soil samples, indicates that low levels of asbestos fibres are present in the near surface Made Ground in M3 and M4 and an elevated level of lead is present in the near surface Made Ground in M3. We recommend further sampling and contamination analysis in the areas of M3 and M4 in order to determine the extent of the contamination and therefore determine which areas of the site will require remediation. Should no further sampling and contamination analysis be carried out, all gardens and soft landscaping areas would require remediation as detailed below.

Where the contaminated materials are covered by buildings or a hard surface cover of concrete or bituminous macadam no clean cover will be required. However, in gardens and other open space areas the end users should be protected from the contaminated materials and plants should be provided with a medium in which they can safely grow.

We recommend a 600mm blanket of clean topsoil/ subsoil (equivalent to two spade depths) is provided in back gardens as fruit and vegetables may be grown and a 450mm blanket of imported clean topsoil/ subsoil is provided in front and side gardens and other open spaces. In addition deeper rooted bushes and trees should be pit planted on and in clean topsoil. A geotextile membrane should also be placed at the base of the cover system to prevent any upward migration of asbestos fibres.

During any groundworks, careful observations should be maintained and if any significant pieces of asbestos are found work should be stopped and the advice of a specialist asbestos removal company sought.

Contaminated materials should, where possible, be retained on site. However, it should be appreciated that contaminated material left on site is the legal responsibility of the landowner, unless the person who created the contamination can be identified.

If waste materials are to be removed from the site, classification of the waste should be undertaken to determine the most appropriate tip to use and the associated costs. It should be noted that significant cost savings can sometimes be made on waste disposal by correct classification of the waste, a service that we can provide.

S4ULs, C4SLs and CL:AIRE assume long term contact with contamination and assess chronic health risk. The risk of short term acute exposure to site personnel is dealt with in the remit of the Health and Safety Executive under the Health and Safety at Work Act: 1974 and Regulations made under the Act, including the Control of Substances Hazardous to Health (COSHH) Regulations. The levels of contamination and risk to site personnel should be considered under the Construction Design and Management (CDM) Regulations at the planning stage and in the development of the designers and contractors Health and Safety Plans and Method Statements. The risk of contact with on-site soils should be minimised and the following precautions should be taken as a minimum requirement.

Site personnel involved in earthworks and excavations should wear gloves, overalls and boots, and smoking should be prohibited. Asbestos grade dust masks should be provided, as a precaution.

4.7 Ground Gas Considerations

Ground gas monitoring has been undertaken on one of six scheduled occasions to date and the results of the monitoring visits are appended.

It should be noted that prior to the first monitoring visit, the standpipes had been damaged by local residents or vandals. The standpipes have since been damaged further and can no longer be used, therefore new standpipes will need to be installed and secured prior to the monitoring continuing.

The ground gases methane, carbon dioxide and oxygen, and flow rate have been monitored and the ranges of ground gases and flow rate during the monitoring period are as follows:

TABLE 5 GROUND GAS CONCENTRATIONS AND FLOW RATE

Methane (% vol. In air)	Carbon Dioxide (% vol. in air)	Oxygen (% vol. in air)	Gas Flow Rate (litres/ hour)
0.0	4.9	17.1	< 0.1

To date, it can be seen from the monitoring that no elevated levels of methane or gas flows have been detected. However, elevated levels of carbon dioxide and depleted levels of associated oxygen have been detected.

Methane gas when present between 5% volume in air (Lower Explosive Limit - L.E.L.) and 15% volume in air (Upper Explosive Limit - U.E.L.) is potentially explosive and inflammable whilst carbon dioxide in conjunction with depleted oxygen is an asphyxiant. Both methane and carbon dioxide are a by-product of the anaerobic and aerobic decomposition of biodegradable materials.

The levels of gas have been assessed in accordance with British Standard 8485, "Code of practice for the design of protective measures for methane and carbon dioxide gasses for new buildings", published in June 2015 and updated in January 2019 (BS.8485:2015+A1:2019).

The characteristic hazardous gas flow rate (Q_{hg}) is calculated by dividing the maximum gas (methane or carbon dioxide) concentration by 100 and multiplying by the maximum flow rate in litres per hour (minimum 0.1 l/hr for Sub Surface monitoring equipment). For this site $Q_{hg} = [4.9/100] \times 0.1 = 0.0049$ l/hr.

Based on the monitoring to date, BS.8485:2015+A1:2019, Table 2, indicates that the site falls into Characteristic Situation 1 (CS1).

BS.8485:2015+A1:2019, Table 4, indicates that for a CS1 and the type of development proposed a score of zero gives no protection and remedial measures required. However, if carbon dioxide levels are found to be typically >5% (the first reading was 4.9%) the CS1 will be increased by one to CS2, which would require remedial measures incorporating into the building construction.

It should be noted that it is our intention to update this section of the report on completion of the full ground gas monitoring programme of six visits.

4.8 General

It should be noted that when developing a "brownfield site" a phased investigation should be undertaken in order that each phase informs the next. A typical phased investigation comprises the following:

- Phase I: desk study report
- Phase II: ground investigation with report
- Phase III: remediation statement report
- Phase IV: validation with report.

In the preparation of this report no consideration has been given to flora and fauna as this was outside our brief.

We recommend that consultation should be undertaken with, and the written approval obtained from, the Local Authority Environmental Health Officer and the Local Authority Building Control Officer prior to commencing development.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr Ben Osborne at our Preston office.

SUB SURFACE CONSULTANTS LIMITED

REPORT No. 8130A

MARCH 2025



M. S. Banwell B.Sc.(Hons.)

Geotechnical Engineer

For and on behalf of

Sub Surface Consultants Limited



C. A. Marsden B.Sc.(Hons.), C.Eng., M.I.C.E.

Director

For and on behalf of

Sub Surface Consultants Limited.

8130A – Billberry Close/Albert Road, Whitefield

Sub Surface North West Limited

3 Peel Street, Preston, Lancashire, PR2 2QS

Tel: 01772 561135 Fax: 01772 204907 Email: preston@subsurface.co.uk

INSITU TEST RESULTS

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907							Standard Penetration Test Results						
Site : LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER											Job Number 8130A		
Client : THOMPSON CONTRACTS (BLACKPOOL) LIMITED											Sheet 1 / 1		
Engineer: KEYSTONE DESIGN ASSOCIATES LIMITED													
Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments	
					1	2	1	2	3	4			
M1	1.20	1.35	1.65	SPT	2	2	2	2	2	2	N=8		
M1	2.00	2.15	2.45	SPT	1	1	2	3	3	3	N=11		
M1	3.00	3.15	3.45	SPT	1	1	1	1	1	1	N=4		
M1	4.00	4.15	4.45	SPT	3	3	4	6	8	7	N=25		
M2	1.20	1.35	1.65	SPT	2	2	2	2	2	2	N=8		
M2	2.00	2.15	2.45	SPT	1	2	2	3	3	2	N=10		
M2	3.00	3.15	3.45	SPT	1	1	2	3	7	9	N=21		
M2	4.00	4.15	4.45	SPT	2	3	5	5	5	5	N=20		
M3	1.20	1.35	1.65	SPT	2	2	2	2	2	3	N=9		
M3	2.00	2.15	2.45	SPT	1	0	0	1	1	1	N=3		
M3	3.00	3.15	3.45	SPT	1	1	1	1	1	1	N=4		
M3	4.00	4.15	4.45	SPT	1	2	3	2	2	3	N=10		
M3	5.00	5.15	5.45	CPT	3	3	3	5	5	6	N=19		
M4	1.20	1.35	1.65	SPT	1	3	2	2	3	3	N=10	No Recovery	
M4	2.00	2.15	2.40	SPT	7	11	15	15	15	5	50/245mm		
M5	1.20	1.35	1.42	SPT	9	18	50				50/65mm		
M5A	1.20	1.35	1.65	SPT	0	0	2	2	2	2	N=8	No Recovery No Recovery	
M5A	2.00	2.15	2.45	SPT	1	1	1	1	1	1	N=4		
M5A	3.00	3.15	3.45	SPT	3	4	4	5	5	6	N=20		
M5A	4.00	4.15	4.45	SPT	3	3	4	4	4	4	N=16		

LABORATORY TEST RESULTS

Site : LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER

Job Number
8130A

Client : THOMPSON CONTRACTS (BLACKPOOL) LIMITED

Engineer: KEYSTONE DESIGN ASSOCIATES LIMITED

Sheet

1 / 1

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX

Borehole/ Trial Pit	Depth (m)	Sample	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Group Symbol	Laboratory Description
				Percentage %	Moisture Content %						
M1	1.50	C	28	94	30	44	20	24	0.41	CI	Firm brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY with low sandstone cobble content. Gravel is subangular to subrounded fine to medium sandstone and siltstone
M2	2.00	D	25	99	25	28	14	14	0.81	CL	Soft thinly laminated dark brown and occasional grey mottled slightly sandy silty CLAY
M3	1.20	D	23	96	24	39	18	21	0.29	CI	Firm brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium sandstone and siltstone
M3	4.00	D	14	92	15	21	11	10	0.42	CL	Soft dark brown slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to medium sandstone and siltstone
M4	1.50	C	21	99	21	24	16	8	0.65	CL	Soft dark brown and brownish grey mottled slightly gravelly sandy silty CLAY with many pockets of sand. Gravel is subangular fine to medium sanstone and coal

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index

Remarks :

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907							Laboratory Test Results							
Site : LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER Client : THOMPSON CONTRACTS (BLACKPOOL) LIMITED Engineer: KEYSTONE DESIGN ASSOCIATES LIMITED													Job Number 8130A	
													Sheet 1 / 1	
DETERMINATION OF pH, SULPHATE CONTENT AND TOTAL SULPHUR OF SOIL AND GROUNDWATER AND MAGNESIUM, CHLORIDE, AMMONIA AND NITRATE CONTENT														
Borehole/ Trial Pit	Depth (m)	Sample	Concentration of Sulphate			Total Sulphur %	Magnesium mg/l	Ammonium NH4 mg/l	Water Soluble Chloride mg/l	Water Soluble Nitrate mg/l	pH	Design Class	Laboratory Description	
			Soil		Ground Water g /l									
			Total S03 %	S04 in 2:1 water:soil g /l										
M1	1.50	B		0.03							7.6	DS-1	Firm brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY with low sandstone cobble content. Gravel is subangular to subrounded fine to medium sandstone and siltstone.	
M2	0.20	B		0.03							7.2	DS-1	MADE GROUND: firm, friable in places, brown slightly gravelly sandy silty clay with low cobble sized fragments of brick. Gravel sized fragments are fine to coarse stone, brick, glass and coal.	
M2	2.00	D		0.02							7.6	DS-1	Soft thinly laminated dark brown and occasional grey mottled slightly sandy silty CLAY	
M3	1.20	D		0.07							7.2	DS-1	Firm brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium sandstone and siltstone	
M3	3.00	D		0.03							7.8	DS-1	Dark brown silty fine to medium SAND.	
M4	0.20	B		0.02							7.1	DS-1	MADE GROUND: firm, friable in places, dark brown slightly gravelly sandy silty clay with occasional rootlets. Gravel sized fragments are fine to coarse stone, brick and wire.	
M5A	1.20	D		0.02							7.2	DS-1	MADE GROUND: soft dark brown slightly gravelly sandy silty clay with many pockets of sand. Gravel sized fragments are fine to coarse stone, brick, plastic and concrete.	
M5A	3.00	B		0.03							7.8	DS-1	MADE GROUND: soft dark brown slightly gravelly slightly sandy silty clay with many pockets of sand. Gravel sized fragments are fine to coarse stone, brick, plastic and concrete	
Method of Preparation : BS 1377:PART 1:1990:7.5 Preparation of soil for chemical tests BS 1377:PART 3:1990:5.2, 5.3, 5.4 & 9.4														
Method of Test : Lab in-house methods based on BS1377: Part 3 for contents of water sol sulphate, pH, chloride and magnesium. Lab in-house method based on MEWAM (EA, 2006) for total sulphur														
Remarks : Classification relates to Design Sulphate Class of BRE Special Digest 1 (2005)														

**SUB SURFACE**

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

BRE Special Digest 1

AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION.**Table C1 Aggressive Chemical Environment for Concrete (ACEC) classification for natural ground locations^a**

Sulfate Design Sulfate Class for location	2:1 water/soil extract ^b	Groundwater	Total potential sulfate ^c	Groundwater Static water	Mobile water	ACEC Class for location
1	2 (SO ₄ mg/l)	3 (SO ₄ mg/l)	4 (SO ₄ %)	5 (pH)	6 (pH)	7
DS-1	< 500	< 400	< 0.24	≥ 2.5	> 5.5 ^d 2.5–5.5	AC-1s AC-1 ^d AC-2z
DS-2	500–1500	400–1400	0.24–0.6	> 3.5 2.5–3.5	> 5.5 2.5–5.5	AC-1s AC-2 AC-2s AC-3z
DS-3	1600–3000	1500–3000	0.7–1.2	> 3.5 2.5–3.5	> 5.5 2.5–5.5	AC-2s AC-3 AC-3s AC-4
DS-4	3100–6000	3100–6000	1.3–2.4	> 3.5 2.5–3.5	> 5.5 2.5–5.5	AC-3s AC-4 AC-4s AC-5
DS-5	> 6000	> 6000	> 2.4	> 3.5 2.5–3.5	≥ 2.5	AC-4s AC-5

Notes

- a** Applies to locations on sites that comprise either undisturbed ground that is in its natural state (ie is not brownfield – Table C2) or clean fill derived from such ground.
b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).
c Applies only to locations where concrete will be exposed to sulfate ions (SO₄) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).
d For flowing water that is potentially aggressive to concrete owing to high purity or an aggressive carbon dioxide level greater than 15 mg/l (Section C2.2.3), increase the ACEC Class to AC-2z.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that include the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.

Table C2 Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations^a

Sulfate and magnesium					Groundwater			ACEC
Design Sulfate Class for location	2:1 water/soil extract ^b		Groundwater		Total potential sulfate ^c	Static water	Mobile water	Class for location
1	2 (SO ₄ mg/l)	3 (Mg mg/l)	4 (SO ₄ mg/l)	5 (Mg mg/l)	6 (SO ₄ %)	7 (pH) ^d	8 (pH) ^d	9
DS-1	< 500		< 400		< 0.24	≥ 2.5	> 6.5 ^d 5.5–6.5 4.5–5.5 2.5–4.5	AC-1s AC-1 AC-2z AC-3z AC-4z
DS-2	500–1500		400–1400		0.24–0.6	> 5.5 2.5–5.5	> 6.5 5.5–6.5 4.5–5.5 2.5–4.5	AC-1s AC-2 AC-2s AC-3z AC-4z AC-5z
DS-3	1600–3000		1500–3000		0.7–1.2	> 5.5 2.5–5.5	> 6.5 5.5–6.5 2.5–5.5	AC-2s AC-3 AC-3s AC-4 AC-5
DS-4	3100–6000	≤ 1200	3100–6000	≤ 1000	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4 AC-4s AC-5
DS-4m	3100–6000	> 1200 ^e	3100–6000	> 1000 ^e	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4m AC-4ms AC-5m
DS-5	> 6000	≤ 1200	> 6000	≤ 1000	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4s AC-5
DS-5m	> 6000	> 1200 ^e	> 6000	> 1000 ^e	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4ms AC-5m

Notes

- a** Brownfield locations are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).
b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered from previous Digests (Box C7).
c Applies only to locations where concrete will be exposed to sulfate ions (SO₄), which may result from the oxidation of sulfides such as pyrite, following ground disturbance (Appendix A1 and Box C8).
d An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).
e The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000 mg/l and 17 000 mg/l). This allows 'm' to be omitted from the relevant ACEC classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that include the suffix 'z' have primarily to resist acid conditions and may be made with any of the cements in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

CONTAMINATION ANALYSIS RESULTS

Certificate of Analysis

Certificate Number 25-05522

Issued: 24-Mar-25

Client Sub Surface Laboratories Ltd
3 Peel Street
Preston
Lancashire
PR2 2QS

Our Reference 25-05522

Client Reference ~ 8130A

Order No ~ (not supplied)

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Manchester

Description 15 Soil samples.

Date Received 13-Mar-25

Date Started 13-Mar-25

Date Completed 24-Mar-25

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



John Coffey
Quality Manager



Normec DETS Limited

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Summary of Chemical Analysis

Soil Samples

Our Ref 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Manchester

Lab No	2477962	2477963	2477964	2477965	2477966	2477967
Sample ID ~	M1	M1	M2	M2	M2	M3
Depth ~	0.20-1.20	1.50-2.00	0.00-0.20	0.20-1.20	2.00-2.45	0.00-0.20
Other ID ~	134	136	145	146	149	167
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification (Gravimetric)	DETSC 1102	0.001	%						< 0.001
Preparation									
Moisture Content	DETSC 1004	0.1	%	20		23			17
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	6.2		11			15
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3		0.3			0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.2		0.6			1.1
Chromium	DETSC 2301#	0.15	mg/kg	14		22			33
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0			< 1.0
Copper	DETSC 2301#	0.2	mg/kg	240		53			42
Lead	DETSC 2301#	0.3	mg/kg	100		75			210
Mercury	DETSC 2325#	0.05	mg/kg	0.22		0.11			0.19
Molybdenum	DETSC 2301#	0.4	mg/kg	1.4		1.5			1.7
Nickel	DETSC 2301#	1	mg/kg	30		13			16
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5		< 0.5			< 0.5
Zinc	DETSC 2301#	1	mg/kg	110		77			120
Inorganics									
pH	DETSC 2008#		pH	10.9	7.6	7.1	7.2	7.6	8.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3		0.4			0.1
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		29		27	22	
Sulphide	DETSC 2024*	10	mg/kg	28		37			130
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.05		0.37			0.06
Petroleum Hydrocarbons									
C5-C10 Gasoline Range Organics (GRO): HS_1D_Total	DETSC 3321*	0.1	mg/kg	< 0.1		< 0.1			< 0.1
EPH >C10-C24: EH_2D_Total	DETSC 3521#	10	mg/kg	< 10.00		< 10.00			< 10.00
EPH >C10-C40: EH_2D_Total	DETSC 3521#	10	mg/kg	< 10.00		< 10.00			14.99
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01			< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01			< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01			< 0.01
m+p Xylene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01			< 0.01
o Xylene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01			< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01		< 0.01			< 0.01
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg	< 10		< 10			240
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1			0.6
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1			0.3
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1			0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1			< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.3		0.3			1.0
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1			0.2

Summary of Chemical Analysis Soil Samples

Our Ref 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Manchester

Lab No	2477962	2477963	2477964	2477965	2477966	2477967
Sample ID ~	M1	M1	M2	M2	M2	M3
Depth ~	0.20-1.20	1.50-2.00	0.00-0.20	0.20-1.20	2.00-2.45	0.00-0.20
Other ID ~	134	136	145	146	149	167
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Fluoranthene	DETSC 3301	0.1	mg/kg	0.5		0.5			1.6
Pyrene	DETSC 3301	0.1	mg/kg	0.6		0.5			1.5
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.3		0.3			0.9
Chrysene	DETSC 3301	0.1	mg/kg	0.3		0.2			0.8
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.3		0.3			0.7
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2		0.2			0.4
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.3		0.4			0.9
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.2		0.3			0.7
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.1		< 0.1			0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.3		0.3			0.6
PAH 16 Total	DETSC 3301	1.6	mg/kg	3.4		3.3			10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.8		1.1			3.4

Summary of Chemical Analysis

Soil Samples

Our Ref 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Ma

Lab No	2477968	2477969	2477970	2477971	2477972	2477973
Sample ID ~	M3	M3	M3	M4	M5A	M5A
Depth ~	0.20-1.20	1.20-1.65	3.00-3.45	0.20-1.20	0.00-0.20	0.20-1.20
Other ID ~	168	169	173	157	160	161
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification (Gravimetric)	DETSC 1102	0.001	%				0.004		
Preparation									
Moisture Content	DETSC 1004	0.1	%	18			17	24	17
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	7.2			7.9	6.3	12
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.6			0.3	0.3	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.3			0.5	0.3	1.1
Chromium	DETSC 2301#	0.15	mg/kg	23			100	20	34
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0			< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	29			69	32	1700
Lead	DETSC 2301#	0.3	mg/kg	37			65	51	120
Mercury	DETSC 2325#	0.05	mg/kg	0.06			0.09	0.07	0.15
Molybdenum	DETSC 2301#	0.4	mg/kg	1.4			7.5	1.8	1.4
Nickel	DETSC 2301#	1	mg/kg	20			45	14	13
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5			0.6	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	60			100	74	85
Inorganics									
pH	DETSC 2008#		pH	7.9	7.2	7.8	7.1	7.6	8.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2			< 0.1	0.3	< 0.1
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		73	31	24		
Sulphide	DETSC 2024*	10	mg/kg	57			24	45	49
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07			0.06	0.06	0.06
Petroleum Hydrocarbons									
C5-C10 Gasoline Range Organics (GRO): HS_1D_Total	DETSC 3321*	0.1	mg/kg	< 0.1			< 0.1	< 0.1	< 0.1
EPH >C10-C24: EH_2D_Total	DETSC 3521#	10	mg/kg	< 10.00			< 10.00	< 10.00	< 10.00
EPH >C10-C40: EH_2D_Total	DETSC 3521#	10	mg/kg	11.42			< 10.00	< 10.00	< 10.00
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01	< 0.01	< 0.01
m+p Xylene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01	< 0.01	< 0.01
o Xylene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01			< 0.01	< 0.01	< 0.01
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg	73			< 10	< 10	< 10
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1			< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1			< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	0.2			< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	0.3			< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	1.4			0.6	0.4	0.4
Anthracene	DETSC 3301	0.1	mg/kg	0.4			0.2	0.1	< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Ma

Lab No	2477968	2477969	2477970	2477971	2477972	2477973
Sample ID ~	M3	M3	M3	M4	M5A	M5A
Depth ~	0.20-1.20	1.20-1.65	3.00-3.45	0.20-1.20	0.00-0.20	0.20-1.20
Other ID ~	168	169	173	157	160	161
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025	28/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Fluoranthene	DETSC 3301	0.1	mg/kg	2.1			0.9	0.9	0.6
Pyrene	DETSC 3301	0.1	mg/kg	1.8			0.8	0.8	0.5
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.8			0.4	0.4	0.3
Chrysene	DETSC 3301	0.1	mg/kg	0.9			0.5	0.5	0.2
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.6			0.3	0.4	0.2
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.3			0.2	0.2	0.2
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.9			0.5	0.5	0.4
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.5			0.3	0.4	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.2			< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.5			0.4	0.3	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	11			5.0	4.8	2.8
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5			0.7	1.0	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Ma

Lab No	2477974	2477975	2477976
Sample ID ~	M5A	M5A	HD1
Depth ~	1.20-1.65	3.00-3.45	0.30-0.65
Other ID ~	162	166	143
Sample Type ~	SOIL	SOIL	SOIL
Sampling Date ~	28/02/2025	28/02/2025	28/02/2025
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
Asbestos Quantification (Gravimetric)	DETSC 1102	0.001	%			
Preparation						
Moisture Content	DETSC 1004	0.1	%			13
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg			7.0
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg			< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg			0.9
Chromium	DETSC 2301#	0.15	mg/kg			28
Chromium, Hexavalent	DETSC 2204*	1	mg/kg			< 1.0
Copper	DETSC 2301#	0.2	mg/kg			32
Lead	DETSC 2301#	0.3	mg/kg			52
Mercury	DETSC 2325#	0.05	mg/kg			0.09
Molybdenum	DETSC 2301#	0.4	mg/kg			1.2
Nickel	DETSC 2301#	1	mg/kg			11
Selenium	DETSC 2301#	0.5	mg/kg			< 0.5
Zinc	DETSC 2301#	1	mg/kg			47
Inorganics						
pH	DETSC 2008#		pH	7.2	7.8	7.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg			0.2
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	21	34	
Sulphide	DETSC 2024*	10	mg/kg			24
Sulphate as SO4, Total	DETSC 2321#	0.01	%			0.04
Petroleum Hydrocarbons						
C5-C10 Gasoline Range Organics (GRO): HS_1D_Total	DETSC 3321*	0.1	mg/kg			< 0.1
EPH >C10-C24: EH_2D_Total	DETSC 3521#	10	mg/kg			< 10.00
EPH >C10-C40: EH_2D_Total	DETSC 3521#	10	mg/kg			< 10.00
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
m+p Xylene	DETSC 3321#	0.01	mg/kg			< 0.01
o Xylene	DETSC 3321#	0.01	mg/kg			< 0.01
MTBE	DETSC 3321	0.01	mg/kg			< 0.01
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg			< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg			< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg			< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg			< 0.1
Fluorene	DETSC 3301	0.1	mg/kg			< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg			0.3
Anthracene	DETSC 3301	0.1	mg/kg			< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Ma

Lab No	2477974	2477975	2477976
Sample ID ~	M5A	M5A	HD1
Depth ~	1.20-1.65	3.00-3.45	0.30-0.65
Other ID ~	162	166	143
Sample Type ~	SOIL	SOIL	SOIL
Sampling Date ~	28/02/2025	28/02/2025	28/02/2025
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
Fluoranthene	DETSC 3301	0.1	mg/kg			0.5
Pyrene	DETSC 3301	0.1	mg/kg			0.5
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg			0.3
Chrysene	DETSC 3301	0.1	mg/kg			0.3
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg			0.3
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg			0.2
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg			0.3
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg			0.3
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg			< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg			0.3
PAH 16 Total	DETSC 3301	1.6	mg/kg			3.2
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg			0.9

Summary of Asbestos Analysis Soil Samples

Our Ref 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Manchester

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2477962	M1 134 0.20-1.20	SOIL	NAD	none	D Wilkinson
2477964	M2 145 0.00-0.20	SOIL	NAD	none	D Wilkinson
2477967	M3 167 0.00-0.20	SOIL	Amosite	Amosite present as fibre bundles	D Wilkinson
2477968	M3 168 0.20-1.20	SOIL	NAD	none	D Wilkinson
2477971	M4 157 0.20-1.20	SOIL	Amosite	Amosite present in microscopic insulation debris	D Wilkinson
2477972	M5A 160 0.00-0.20	SOIL	NAD	none	D Wilkinson
2477973	M5A 161 0.20-1.20	SOIL	NAD	none	D Wilkinson
2477976	HD1 143 0.30-0.65	SOIL	NAD	none	D Wilkinson

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 25-05522

Client Ref ~ 8130A

Contract Title ~ Land at Bilberry Close & Albert Road, Whitfield, Manchester

Lab No	2477967	2477971
Sample ID ~	M3	M4
Depth ~	0.00-0.20	0.20-1.20
Other ID ~	167	157
Sample Type ~		
Sampling Date ~	28/02/2025	28/02/2025
Sampling Time ~		

Test	Method	Units			
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %		< 0.001	0.004
Gravimetric Quantification (a)	DETSC 1102	Mass %		na	0.004
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %		<0.001	na
Quantification by PCOM (c)	DETSC 1102	Mass %		na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g		na	na
Breakdown of Gravimetric Analysis (a)					
Mass of Sample		g		847.17	775.08
ACMs present*		type			Insulation
Mass of ACM in sample		g			0.0381
% ACM by mass		%			0.005
% asbestos in ACM		%			85
% asbestos in sample		%			0.004
Breakdown of Detailed Gravimetric Analysis (b)					
% Amphibole bundles in sample		Mass %		<0.001	na
% Chrysotile bundles in sample		Mass %		na	na
Breakdown of PCOM Analysis (c)					
% Amphibole fibres in sample		Mass %		na	na
% Chrysotile fibres in sample		Mass %		na	na
Breakdown of Potentially Respirable Fibre Analysis (d)					
Amphibole fibres		Fibres/g		na	na
Chrysotile fibres		Fibres/g		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 25-05522

Client Ref ~ 8130A

Contract ~ Land at Bilberry Close & Albert Road, Whitfield, Manchester

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled ~			
2477962	M1 0.20-1.20 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2477963	M1 1.50-2.00 SOIL	28/02/25	PT 1L	pH + Conductivity (7 days)	
2477964	M2 0.00-0.20 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2477965	M2 0.20-1.20 SOIL	28/02/25	PT 1L	pH + Conductivity (7 days)	
2477966	M2 2.00-2.45 SOIL	28/02/25	PT 1L	pH + Conductivity (7 days)	
2477967	M3 0.00-0.20 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2477968	M3 0.20-1.20 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2477969	M3 1.20-1.65 SOIL	28/02/25	PT 1L	pH + Conductivity (7 days)	
2477970	M3 3.00-3.45 SOIL	28/02/25	PT 1L	pH + Conductivity (7 days)	
2477971	M4 0.20-1.20 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2477972	M5A 0.00-0.20 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2477973	M5A 0.20-1.20 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2477974	M5A 1.20-1.65 SOIL	28/02/25	PT 1L	pH + Conductivity (7 days)	
2477975	M5A 3.00-3.45 SOIL	28/02/25	PT 1L	pH + Conductivity (7 days)	
2477976	HD1 0.30-0.65 SOIL	28/02/25	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

Normec 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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
C5-C10 Gasoline Range Organics (GR)	HS_1D_Total
EPH >C10-C24	EH_2D_Total
EPH >C10-C40	EH_2D_Total
C24-C40 Lube Oil Range Organics (LO)	EH_1D_Total

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report

MINI BOREHOLE RECORD SHEETS

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907						Site LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER		Borehole Number M1	
Boring Method MINI PERCUSSIVE		Casing Diameter 115mm cased to 3.00m		Ground Level (mOD)		Client THOMPSON CONTRACTS (BLACKPOOL) LIMITED		Job Number 8130A	
		Location AS PLAN		Dates 28/02/2025		Engineer KEYSTONE DESIGN ASSOCIATES LIMITED		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	B					(0.20)	MADE GROUND: friable brown slightly gravelly sandy silty clay with occasional roots and many rootlets. Gravel sized fragments are fine to coarse stone (topsoil).		
0.20-1.20	B					0.20	MADE GROUND: firm, friable in places, dark brown and dark grey mottled slightly gravelly sandy silty clay with occasional roots. Gravel sized fragments are fine to coarse stone, brick, ceramic and clinker.		
						(1.25)			
1.20-1.65	D			1.20m to 2.00m -					
1.20-2.00	C			100% Recovery					
1.20-1.65	SPT N=8			2,2/2,2,2,2		1.45	Firm low strength, locally high strength, brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY with low sandstone cobble content. Gravel is subangular to subrounded fine to medium sandstone and siltstone.		
						(0.70)	...at 1.85m : high strength.		
2.00-2.45	D			HV at 1.85m					
2.00-3.00	C			c=88kPa		2.15	Soft medium strength thinly laminated dark brown and occasional grey mottled slightly sandy silty CLAY.		
				Water inflow(1) at 2.00m.		(0.35)			
2.00-2.45	SPT N=11			2.00m to 3.00m -		2.50	Loose dark brown clayey silty fine to medium SAND with some bands of clay.		
				85% Recovery					
				1,1/2,3,3,3					
3.00-3.45	D			3.00m to 4.00m -		(1.25)			
3.00-4.00	C			100% Recovery					
3.00-3.45	SPT N=4			1,1/1,1,1,1		3.75	Soft to firm high strength brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium siltstone.		
						(0.70)			
4.00-4.45	SPT N=25			3,3/4,6,8,7		4.45	Complete at 4.45m		
4.00-4.45	D								
				28/02/2025:2.00m					
Remarks Hand dug inspection pit from GL to 1.20m to check for services. Core diameter: 87mm to 2.00m, 67mm to 4.00m. Borehole collapsed back to 3.00m on completion. On completion backfilled with gravel. HV = Hand Shear Vane test result.								Scale (approx) 1:25	Logged By MSB/HB
								Figure No. 8130A.M1	



LAND AT BILLBERRY CLOSE AND ALBERT ROAD,
WHITEFIELD, GREATER MANCHESTER

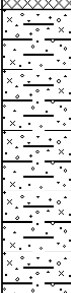
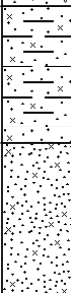
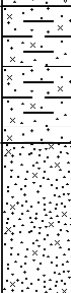
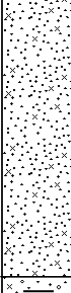
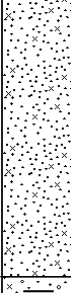
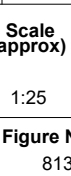
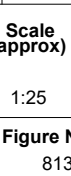
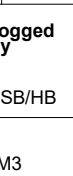
**Job
Number**
8130A

**Job
Number**
8130A

Sheet
1/1

Remarks Hand dug inspection pit from GL to 1.20m to check for services. Core diameter: 87mm to 3.00m, 77mm to 4.00m. Wet sand collapsing into borehole below 2.40m. On completion installed a 50mm diameter HDPE gas monitoring standpipe with a gas valve and gravel surround to 3.40m, a bentonite seal from 1.00m to 0.20m, and a concreted in lockable metal cover from 0.20m to 0.00m. HV = Hand Shear Vane test result.	Scale (approx) 1:25	Logged By MSB/HB
	Figure No. 8130A.M2	

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S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907							Site LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER			Borehole Number M3	
Boring Method MINI PERCUSSIVE		Casing Diameter 115mm cased to 3.00m			Ground Level (mOD)		Client THOMPSON CONTRACTS (BLACKPOOL) LIMITED			Job Number 8130A	
		Location AS PLAN			Dates 28/02/2025		Engineer KEYSTONE DESIGN ASSOCIATES LIMITED			Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
0.00-0.20	B					(0.20)	MADE GROUND: friable dark brown slightly gravelly sandy silty clay with occasional roots and many rootlets. Gravel sized fragments are fine to coarse stone (topsoil). MADE GROUND: firm to stiff dark brown, brown, grey and occasional dark grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse stone, brick and coal.				
0.20-1.20	B					0.20					
						(1.00)					
1.20-1.65 1.20-2.00 1.20-1.65	D C SPT N=9			1.20m to 2.00m - 100% Recovery 2,2/2,2,2,3		1.20	Firm low strength locally high strength brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium sandstone and siltstone. ...at 1.85m : high strength.				
						(0.95)					
2.00-2.45 2.00-3.00	D C			HV at 1.85m c=104kPa Water inflow(1) at 2.00m. 2.00m to 3.00m - 100% Recovery 1,0/0,1,1,1		2.15	Soft very low strength thinly laminated dark brown and occasional grey mottled slightly sandy silty CLAY.				
2.00-2.45	SPT N=3										(0.45)
						2.60	Loose dark brown silty fine to medium SAND.				
						(1.40)					
3.00-3.45 3.00-4.00 3.00-3.45	D C SPT N=4			3.00m to 4.00m - 100% Recovery 1,1/1,1,1,1		4.00	Soft low strength dark brown slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to medium sandstone and siltstone				
						(0.45)					
4.00-4.45 4.00-4.45	SPT N=10 D			1,2/3,2,2,3		4.45	Unable to drill, hole collapsed to 3.00m, pushed CPT rods through to take a reading at 5.00m.				
5.00-5.45	SPT(C) N=19			3,3/3,5,5,6							
Remarks Hand dug inspection pit from GL to 1.20m to check for services. Core diameter: 87mm to 3.00m, 57mm to 4.00m. Wet sand collapsing into borehole below 2.60m. On completion installed a 50mm diameter HDPE gas monitoring standpipe with a gas valve and gravel surround to 3.00m, a bentonite seal from 1.00m to 0.20m, and a concreted in lockable metal cover from 0.20m to 0.00m. HV = Hand Shear Vane test result.								Scale (approx)	Logged By		
								1:25	MSB/HB		
								Figure No. 8130A.M3			

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907							Site LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER			Borehole Number M3	
Boring Method MINI PERCUSSIVE		Casing Diameter 115mm cased to 3.00m		Ground Level (mOD)		Client THOMPSON CONTRACTS (BLACKPOOL) LIMITED		Job Number 8130A			
		Location AS PLAN		Dates 28/02/2025		Engineer KEYSTONE DESIGN ASSOCIATES LIMITED		Sheet 2/2			
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness) (1.00)	Description	Legend	Water	Instr	
				28/02/2025:2.00m		5.45	Unable to drill, hole collapsed to 3.00m, pushed CPT rods through to take a reading at 5.00m.				
							Complete at 5.45m				
Remarks								Scale (approx)	Logged By		
								1:25	MSB/HB		
								Figure No. 8130A.M3			



LAND AT BILLBERRY CLOSE AND ALBERT ROAD,
WHITEFIELD, GREATER MANCHESTER

M4

Job
Number
8130A

Sheet
1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.20	B					(0.20)	MADE GROUND: friable dark brown slightly gravelly sandy silty clay with occasional roots and many rootlets. Gravel sized fragments are fine to coarse stone (topsoil).			
0.20-1.20	B					0.20	MADE GROUND: firm, friable in places, dark brown slightly gravelly sandy silty clay with occasional rootlets. Gravel sized fragments are fine to coarse stone, brick and wire.			
1.20-1.65	D			1.20m to 2.00m - 100% Recovery						
1.20-2.00	C			1,3/2,2,3,3						
1.20-1.65	SPT N=10									
						1.50	Soft dark brown and brownish grey mottled slightly gravelly sandy silty CLAY with many pockets of sand. Gravel is subangular fine to medium sandstone and coal.			
						(0.90)				
2.00-2.40	SPT 50/245			Water inflow(1) at 2.00m. 7,11/15,15,15,5						
				28/02/2025:2.00m		2.40	...at 2.40m : cobble obstruction, unable to continue.			
							Complete at 2.40m			

Figure No.
8130A.M4



LAND AT BILLBERRY CLOSE AND ALBERT ROAD,
WHITEFIELD, GREATER MANCHESTER

M5

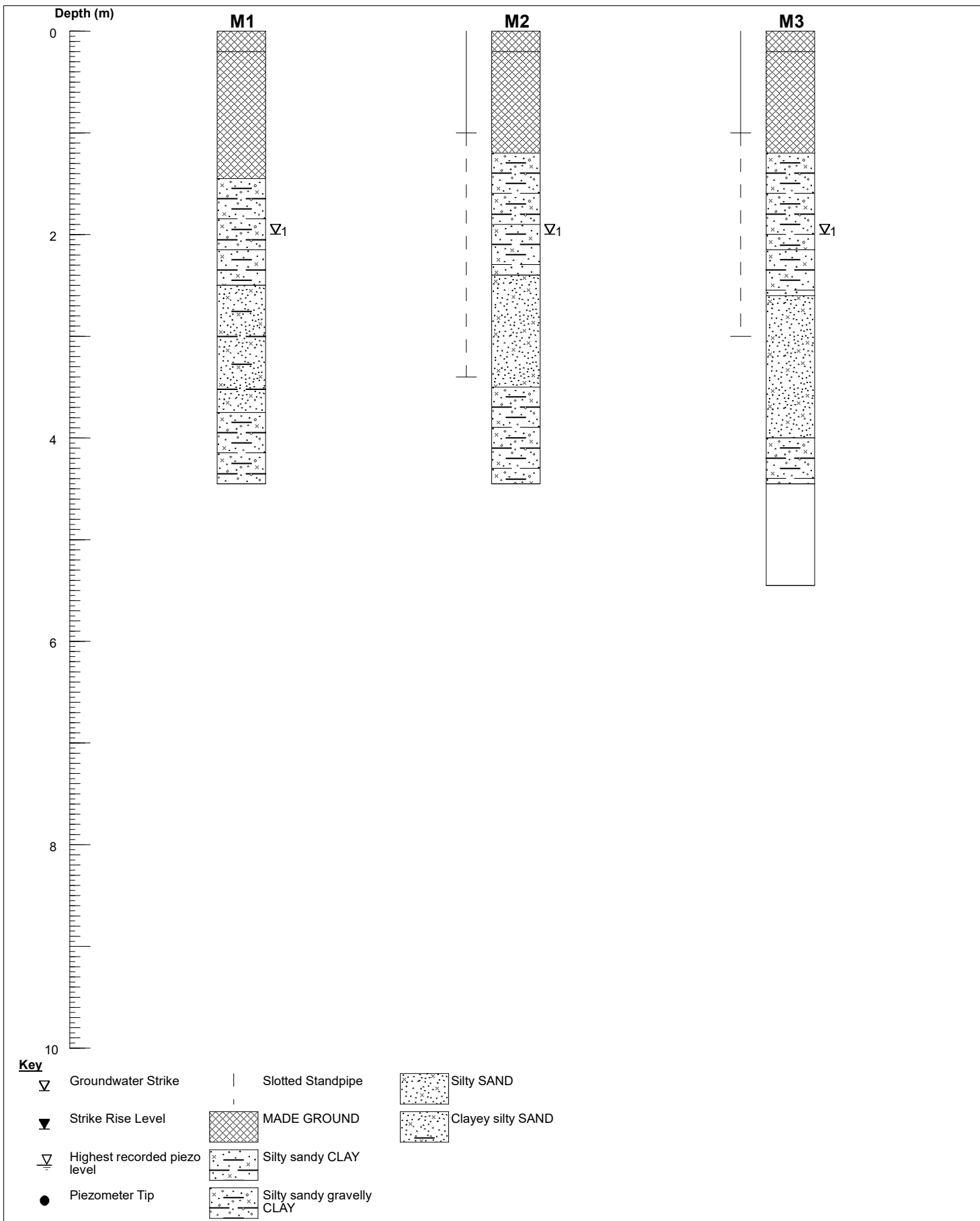
**Job
Number**
8130A

Sheet
1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.20-1.42	SPT 50/65			9,18/50		(0.20)	MADE GROUND: friable dark brown slightly gravelly sandy silty clay with occasional roots and many rootlets. Gravel sized fragments are fine to coarse stone and metal (topsoil).		
						0.20	MADE GROUND: firm, friable in places, dark brown slightly gravelly sandy silty clay with occasional rootlets. Gravel sized fragments are fine to coarse stone, brick and glass.		
				28/02/2025:DRY		(1.22)	...at 1.42m : cobble obstruction, unable to continue.		
						1.42	Complete at 1.42m		

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S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907					Site LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER			Borehole Number M5A	
Boring Method MINI PERCUSSIVE		Casing Diameter 115mm cased to 3.00m		Ground Level (mOD)	Client THOMPSON CONTRACTS (BLACKPOOL) LIMITED		Job Number 8130A		
		Location AS PLAN		Dates 28/02/2025	Engineer KEYSTONE DESIGN ASSOCIATES LIMITED		Sheet 1/1		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	B					(0.20)	MADE GROUND: friable dark brown slightly gravelly sandy silty clay with occasional roots and many rootlets. Gravel sized fragments are fine to coarse stone and metal (topsoil).		
0.20-1.20	B					0.20	MADE GROUND: firm, friable in places, dark brown slightly gravelly sandy silty clay with occasional rootlets. Gravel sized fragments are fine to coarse stone, brick and glass.		
						(1.00)			
1.20-1.65 1.20-2.00 1.20-1.65	D C SPT N=8			1.20m to 2.00m - 94% Recovery 0,0/2,2,2,2		1.20	MADE GROUND: Soft dark brown slightly gravelly sandy silty clay with many pockets of sand. Gravel sized fragments are fine to coarse stone, brick, plastic and concrete.		
						(1.30)			
2.00-2.45 2.00-3.00	D C			Water inflow(1) at 2.00m. 2.00m to 3.00m - 50% Recovery 1,1/1,1,1,1					▽1
2.00-2.45	SPT N=4					2.50	Boulder pushed down, no samples recovered.		
3.00-4.00 3.00-3.45	C SPT N=20			3.00m to 4.00m - No Recovery 3,4/4,5,5,6		(1.95)			
4.00-4.45	SPT N=16			3,3/4,4,4,4					
				28/02/2025:2.00m		4.45	Complete at 4.45m		
Remarks Hand dug inspection pit from GL to 1.20m to check for services. Core diameter: 87mm to 3.00m. Wet sand collapsing into borehole below 2.50m. On completion backfilled with gravel.								Scale (approx) 1:25	Logged By MSB/HB
								Figure No. 8130A.M5A	



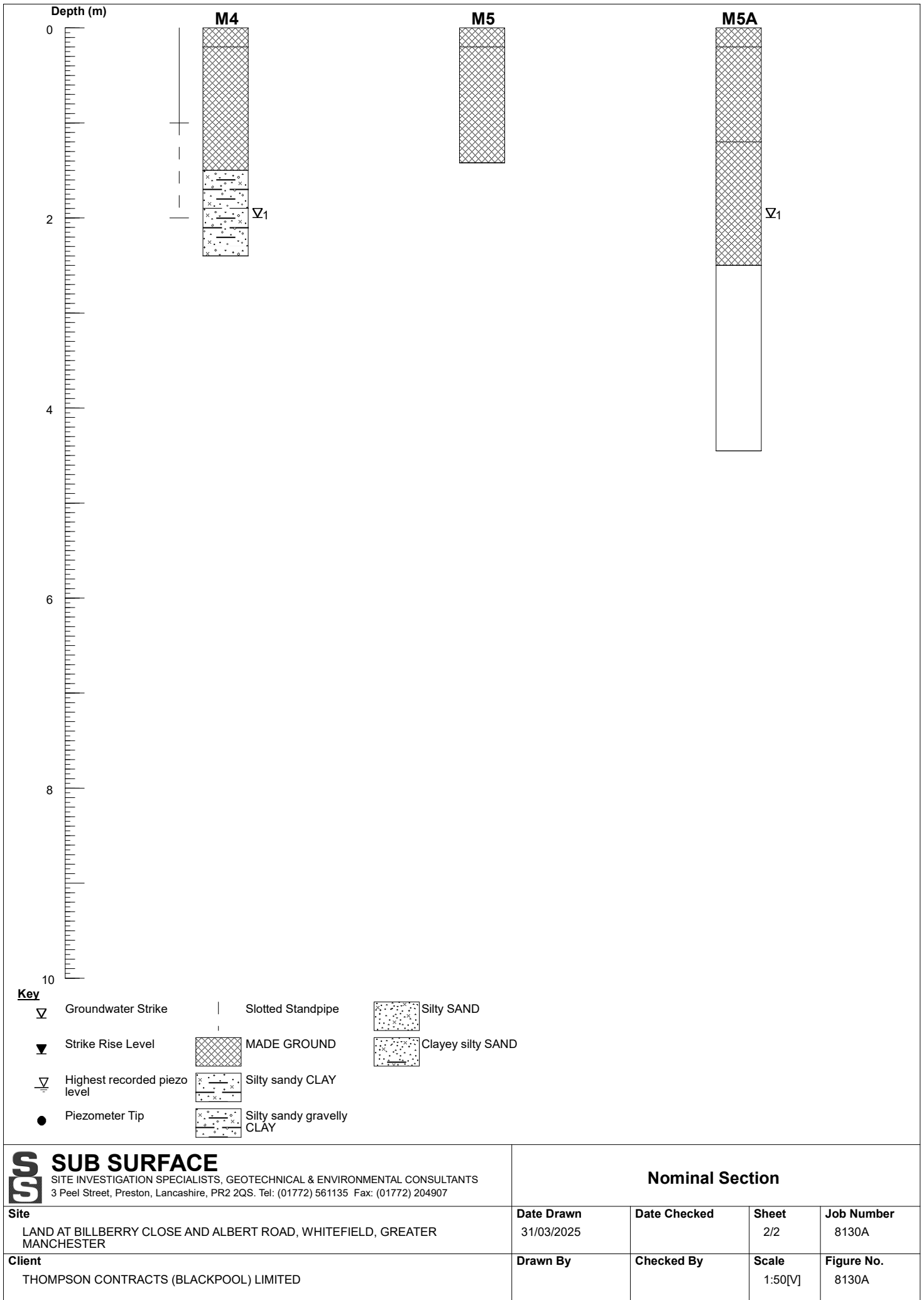
S SUB SURFACE
 SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907

Site
 LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER

Client
 THOMPSON CONTRACTS (BLACKPOOL) LIMITED

Nominal Section

Date Drawn 31/03/2025	Date Checked	Sheet 1/2	Job Number 8130A
Drawn By	Checked By	Scale 1:50[V]	Figure No. 8130A



HAND DUG TRIAL PIT RECORD SHEETS



LAND AT BILLBERRY CLOSE AND ALBERT ROAD,
WHITEFIELD. GREATER MANCHESTER

**Trial Pit
Number
HD1**

HAND DUG

Location

AS PLAN

Dates

28/02/2025

THOMPSON CONTRACTS (BLACKPOOL) LIMITED

KEYSTONE DESIGN ASSOCIATES | LIMITED

Number
8130A

1/1

Sample / Tests

Field Records

Level
(mOD)Depth
(m)
(Thickness)

Description

Legend

Water

0.00-0.30

B

0.30-0.65

B

0 65-1 20

B

28/02/2025:DRY

MADE GROUND: friable dark brown slightly gravelly sandy silty clay with occasional roots, many rootlets and low cobbles sized fragments of stone. Gravel sized fragments are fine to coarse stone (topsoil).

MADE GROUND: brown sandy gravel and cobble sized fragments of stone.

Complete at 1.20m

Plan

Remarks

Pit sides remained vertical and stable.
No groundwater encountered.
On completion backfilled with arisings.

Scale (approx)

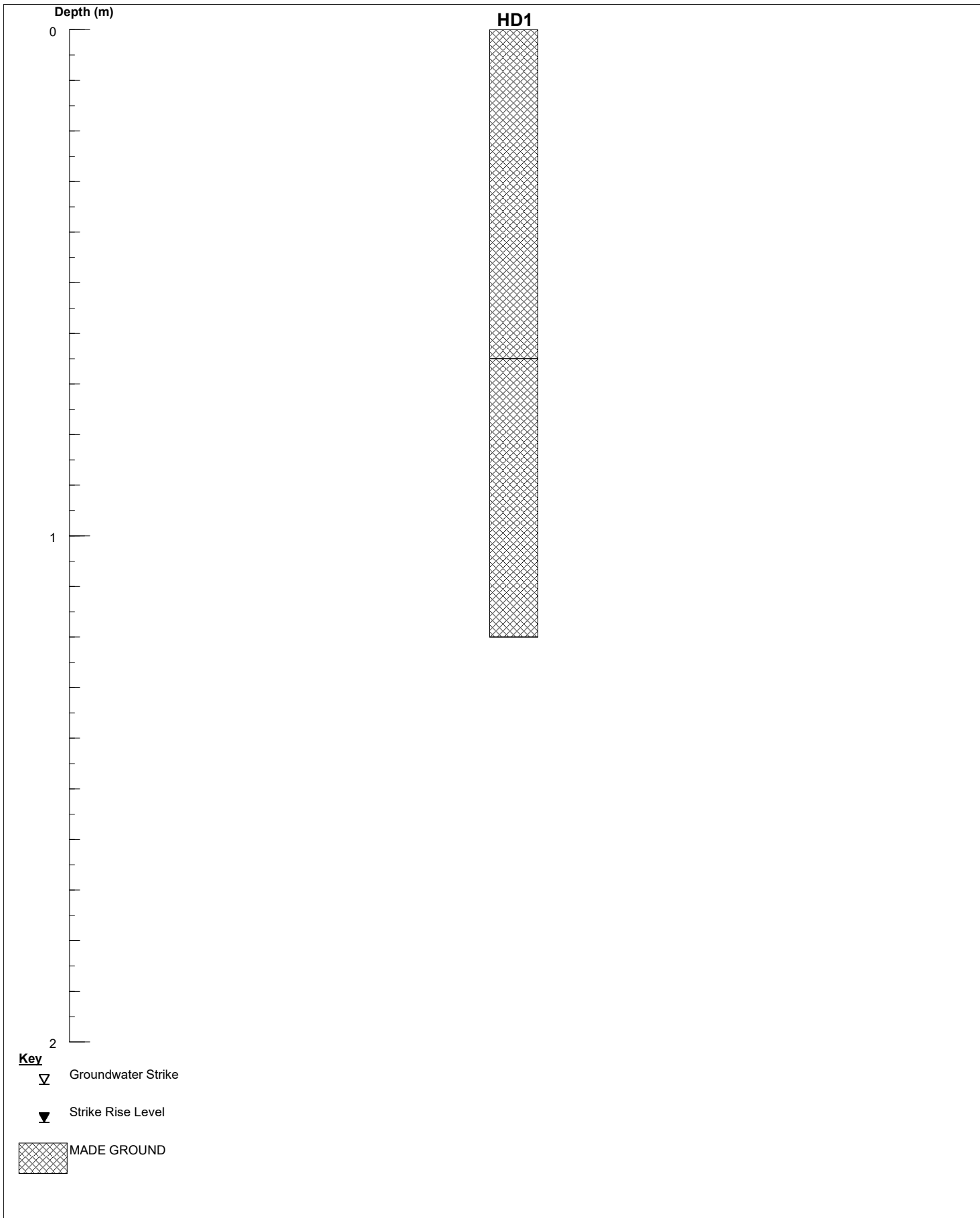
1:25

Logged By

MSB/HB

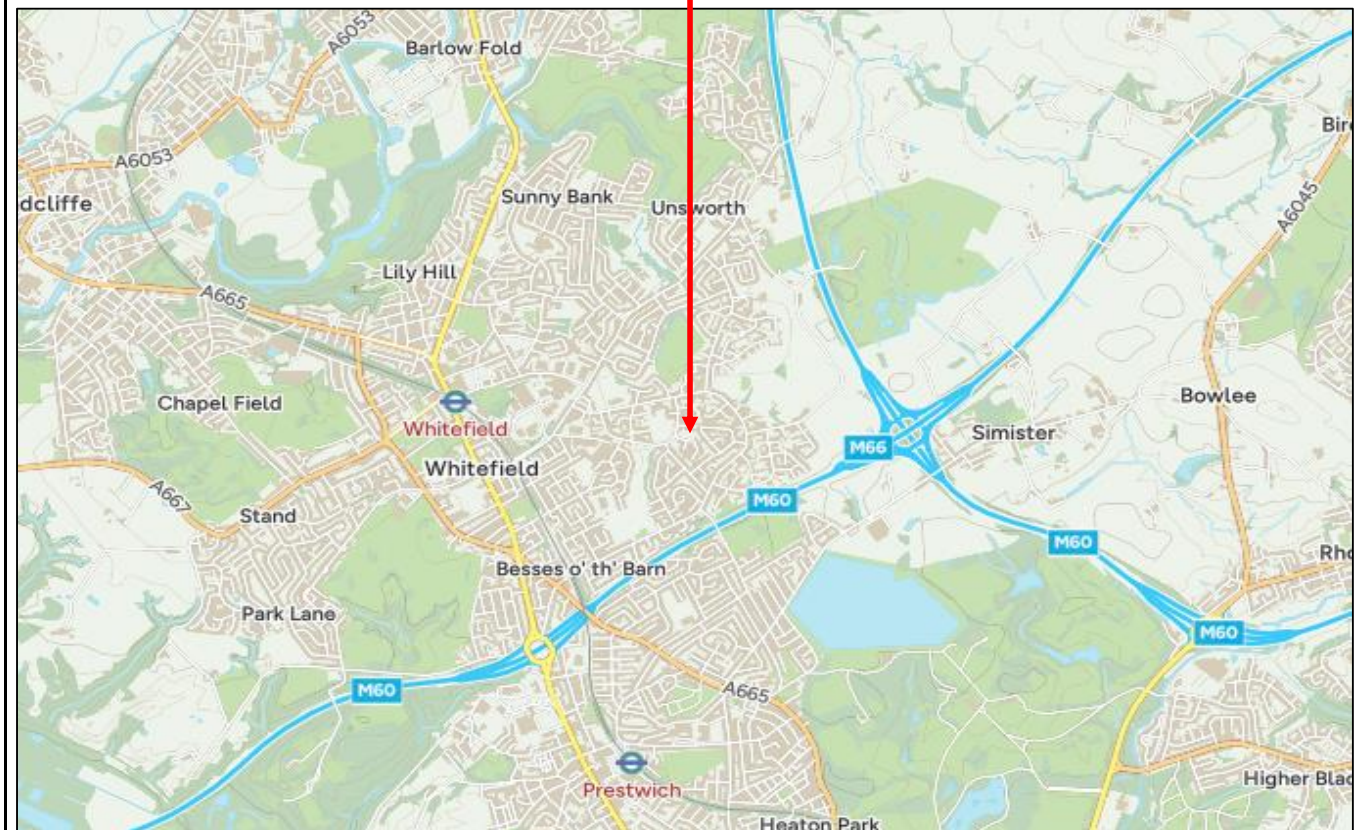
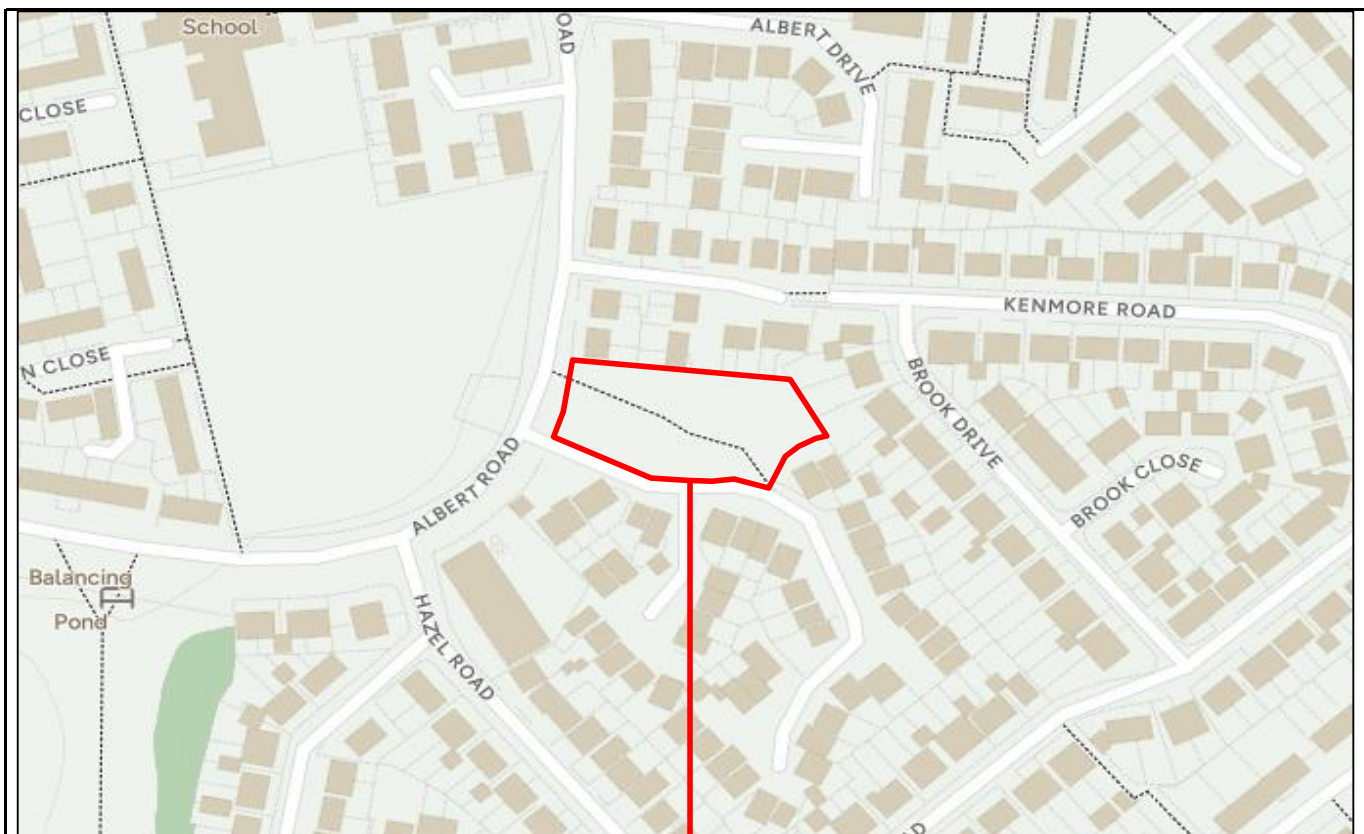
Figure No.

8130A.HD1



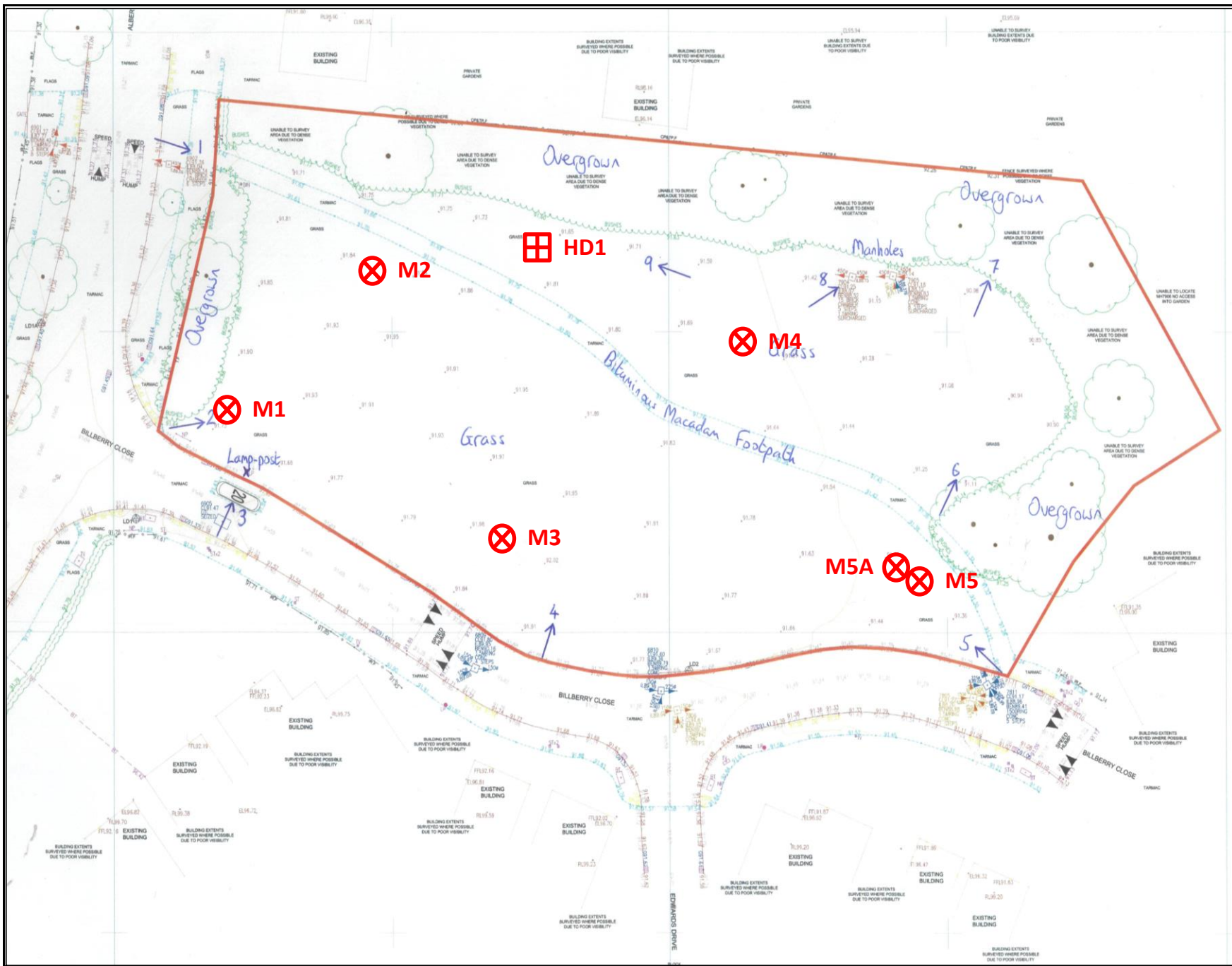
SS SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907		Nominal Section		
Site LAND AT BILLBERRY CLOSE AND ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER	Date Drawn 31/03/2025	Date Checked	Sheet 1/1	Job Number 8130A
Client THOMPSON CONTRACTS (BLACKPOOL) LIMITED	Drawn By	Checked By	Scale 1:10[V]	Figure No. 8130A

FIGURES



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Site: LAND AT BILLBERRY CLOSE & ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER	Date Drawn: 25-Mar-25	Date Checked: 31-Mar-25	Orientation: 	Job Number: 8130A
Client: THOMPSON CONTRACTS (BLACKPOOL) LIMITED	Drawn By: MSB	Checked By: CAM	Scale: NTS	Figure Number: 1



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 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907

Site Plan / Walkover Photo Locations

Date Drawn: 25-Mar-25	Date Checked: 31-Mar-25	Job Number: 8130A
Drawn By: MSB	Checked By: CAM	Figure Number: 2
Orientation: 		
Scale: NTS		

Site:
 LAND AT BILLBERRY CLOSE & ALBERT ROAD, WHITEFIELD,
 GREATER MANCHESTER

Client:
 THOMPSON CONTRACTS (BLACKPOOL) LIMITED



Street Scene Elevation Along Billberry Close
(Scale 1:100)



Street Scene Elevation Along Albert Road
(Scale 1:100)

SS SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907	Proposed Development				
	Date Drawn: 25-Mar-25	Date Checked: 31-Mar-25	Orientation: 	Job Number: 8130A	
	Site: LAND AT BILLBERRY CLOSE & ALBERT ROAD, WHITEFIELD, GREATER MANCHESTER	Client: THOMPSON CONTRACTS (BLACKPOOL) LIMITED	Drawn By: MSB	Checked By: CAM	Scale: NTS