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## **GROUND INVESTIGATION REPORT**

**FOR  
PHOENIX PARK,  
BARROWFIELD ROAD,  
THURNSCOE,  
ROTHERHAM,  
SOUTH YORKSHIRE**

**PREPARED FOR  
GROUNDWORK YORKSHIRE**

**REPORT NO. NE4303B  
FEBRUARY 2024**

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**GROUND INVESTIGATION FOR PHOENIX PARK, BARROWFIELD ROAD,  
THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE, S63 0BD**

**CLIENT: GROUNDWORK YORKSHIRE**

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## **1. INTRODUCTION**

This report has been prepared in accordance with Purchase Order No. 1103/23, dated 29<sup>th</sup> September 2023, from the Client. The brief was set out in our estimate, ref. E8051A and dated 24<sup>th</sup> June 2023, with amendments as the investigation proceeded and includes:

- 8 No. mini boreholes
- 4 No. dynamic probe holes
- In-situ testing
- Geotechnical laboratory testing
- Contamination analysis
- Installation of standpipes followed by groundwater and ground gas monitoring
- Provision of an interpretative report on the above.

It should be noted that we have previously issued a Geological and Mining Appraisal Report for this site, ref. NE4303 and dated October 2023, which should be read in conjunction with this Ground Investigation Report.

### **1.1 Site Location and Description**

The site is located in Phoenix Park, accessed via Barrowfield Road, Thurnscoe, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is E446174 N405237.

As shown in Figure 2, the site comprises part of an existing park with vegetation at the northern and eastern peripheries and uneven but generally level grassed areas elsewhere. The west of the site is bisected by an access road and pathways with a centrally located parking area. The site is bound by open parkland to the south and west, Barrowfield Road to the north, and dense vegetation to the east with works premises beyond.

### **1.2 Proposed Development and Purpose of the Ground Investigation**

We understand that it is proposed to develop the site with a community hub building/café, a play area and associated car parking, as shown on 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.

Ground gas monitoring and assessment was also required to determine necessary precautions and/or remedial measures.

## **2. INVESTIGATION**

### **2.1 Investigation Details**

Eight mini boreholes (M1-M8) were put down to depths of between 5.45m and 6.45m using a Dart Mini Sampling Rig fitted with windowless sample tubes of varying diameters at the positions determined by the Client and set out by Sub Surface North East Ltd, as shown on Figure 4. An additional borehole (M7A) was terminated at 1.00m. The samples were subsequently logged in accordance with BS.5930:2015+A1:2020 and the resulting Mini Borehole Records are appended. On completion M1, M2, M3, M6, M7, and M7A were backfilled with gravel and grout as no installations were required.

Four dynamic probe holes were put down to depths of between 7.60m and 8.00m using a dynamic probing rig at the positions determined and set out by Sub Surface North East Ltd, as shown on Figure 3. One of the dynamic probe holes (DP7) followed on from mini borehole M7. The equipment conforms with BS.1377: 1990 and SRS15 Apparatus of the German Standard DIN4094 and comprises a 63.5kg rammer dropped through 750mm using 35mm diameter rods and a 20cm<sup>2</sup> area cone (50mm diameter and 90 degrees). The penetration rate, in blows/100mm, is given on the appended Dynamic Probe Hole Records.

### **2.2 Sub Surface Detail**

Details of the strata encountered in the ground investigation are given on the appended Mini Borehole Records. The exploratory holes found made ground largely comprising colliery spoil, overlying natural cohesive strata mainly derived from complete weathering of the underlying mudstone bedrock. A general summary of the strata found is as follows:

#### **2.2.1 Made Ground**

Boreholes M1 to M8 encountered made ground to depths of 5.00m, 4.90m, 5.20m, 4.35m, 5.10m, 4.85m, 4.30m and 4.50m, respectively. Borehole M7A was terminated in made ground at 1.00m.

The boreholes initially encountered grass overlying a cohesive topsoil layer to depths of between 0.10m and 0.50m, generally comprising soft to firm dark brown slightly organic gravelly sandy silty clay with pockets of sand and occasional brick cobbles. Gravel sized fragments consisted of stone, coal, brick and occasional plastic.

Underlying the superficial layers the boreholes encountered colliery spoil generally comprising soft to firm, locally very soft, grey, light grey, dark grey locally speckled black and dark orangish brown gravelly slightly sandy silty clay with some bands of dark grey ashy very sandy gravel sized fragments of coal. Gravel sized fragments consisted of fine to coarse mudstone, coal, sandstone and occasional brick and glass.

Underlying the colliery spoil at respective depths of 4.80m, 4.60m, 3.85m, 3.95m and 4.30m, M1, M2, M6, M7 and M8 encountered slightly organic cohesive material with an organic odour, considered likely to be part of an infilled former pond. This material comprised soft to firm brownish grey speckled black slightly organic silty clay with occasional plant material.

From 4.10m to 4.85m, M6 encountered probable made ground comprising firm greyish brown slightly sandy silty clay with an organic odour noted.

#### 2.2.2 Natural Cohesive Strata/ Completely Weathered Bedrock

Underlying the made ground at respective depths of 4.35m, 4.85m, 4.30m and 4.50m, M4, M6, M7 and M8 encountered residual clays likely to be derived from weathering of the underlying bedrock and generally comprising firm medium strength, brown, orangish brown and light greyish brown slightly gravelly sandy silty clay with occasional sand pockets. The strata was firm medium strength in M4, M6 and M7, and soft low strength in M8. Gravel consisted of angular to subangular sandstone and coal.

Underlying the made ground or residual clays at respective depths of 5.00m, 4.90m, 5.20m, 5.50m, 5.10m, 5.85m, 5.00m and 5.50m, M1, M2, M3, M4, M5, M6, M7 and M8 encountered completely weathered bedrock generally comprising firm to stiff medium strength to high strength thinly laminated brown, brownish grey, orangish brown and grey locally slightly gravelly silty clay, becoming locally very stiff very high strength below 5.70m in M7. Gravel sized fragments consisted of subangular fine to medium mudstone lithorelicts.

The dynamic probe holes showed a marked increase in strength in strata below depths of 7.40m to 7.80m, indicating this to possibly be the depths of competent bedrock, possibly a change from completely to highly weathered mudstones to stronger sandstone or siltstone. However, this cannot be guaranteed from probe holes only.

#### 2.2.4 Groundwater

Groundwater inflows were recorded at 3.00m in M2, 2.50m in M3, 3.20m in M5, 3.50m in M7, and 5.00m in M8. Intermittent groundwater seepages were recorded throughout M6 and intermittently damp strata was recorded below 2.00m in M1.

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 M4, M5 and M8 found groundwater to be at minimum depths of 1.90m, 2.00m and 0.15m, respectively.

### **3. SAMPLING, TESTING AND MONITORING**

#### **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**

Forty-six Standard Penetration Tests (SPTs) were performed in the 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 appended Mini Borehole Records.

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### 3.3 Installations and Monitoring

On completion of M4, M5 and M8, hdpe standpipes were installed to depths of 4.00m, 3.50m and 4.00m, 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 appended Mini Borehole Records.

Monitoring of the standpipes for ground gas and groundwater has been undertaken on six scheduled occasions 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.

### 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
- California Bearing Ratio tests on samples remoulded at natural moisture content
- Soluble sulphate content and pH value tests (including pyritic ground testing).

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 eight soil samples were subjected to an asbestos screen.

Waste Acceptance Criteria (WAC) analysis has also been undertaken on one soil sample.

The results of the above analyses are appended.

## 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 a summary of the ground conditions is given in Section 2.2.

## 4.2 Foundations

We understand that it is proposed to construct a community hub/ café building on the site. However, at the time of writing this report no specific details regarding the proposed foundations and design loadings were available and consequently the recommendations given are in general terms only.

The ground investigation found made ground, largely comprising colliery spoil, to depths of between 4.30m and 5.20m underlain by natural cohesive strata. In M4, M6, M7 and M8 these initially comprised soft to firm low to medium strength residual clays. Underlying the made ground in M1, M2, M3, M4 and M5 and below depths of 5.00m in M6 and M7, and 5.50m in M4 and M8, was encountered completely weathered mudstone comprising firm to stiff medium to high strength clays, generally found to become stiff high strength, locally very high strength, with increasing depth. Based on the dynamic probing results, competent bedrock is anticipated to be at depths of 7.40m to 7.80m. However, this cannot be guaranteed from probe holes only.

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.

In view of the depth of Made Ground shallow foundations in natural ground are not feasible and hence alternative foundations need to be considered. These might include ground improvement by vibroflotation with shallow reinforced foundations or piled foundations transferring the structural loads down to the underlying bedrock indicated by the dynamic probing to possibly be at depths of 7.40m to 7.80m.

When considering whether to use vibroflotation or piles consideration should be given to the carbon footprint. It has been shown in 2021 that by using vibroflotation, as opposed to using standard concrete piles with steel reinforcement, there is an about 92% reduction in the carbon footprint.

The most common form of the vibroflotation treatment technique is vibro replacement whereby dense stone columns are formed through the full depth of any Made Ground that is present and variable near surface strata, utilising the passive resistance of cohesive soils and compacting granular soils to improve the bearing capacity and minimise differential settlements of the composite mass of near surface materials and compacted stone columns.

Due to the varying types, sizes and power of vibroflotation machines currently in use, the advice of a Specialist Contractor should be sought to ascertain the feasibility of applying the particular technique, the allowable bearing capacity and expected differential settlements each machine will achieve and in formulating the most economic scheme.

Care must be taken when undertaking vibroflotation ground treatment to prevent vibrations being transmitted to adjacent/ nearby buildings, structures, services and/or slopes/ retaining walls as they may be detrimentally affected. Consequently, we recommend that any tendering Specialist Vibroflotation Contractor confirm that vibrations will not detrimentally affect adjacent/ nearby buildings, structures, services and/or slopes/ retaining walls.

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.

In determining the final pile design it should be noted that up to 5.20m of the piles will be in made ground and due regard should be paid to the lack of lateral restraint over this length in cases where significant lateral forces are to be catered for.

There is a possibility that for piles installed through a significant thickness of made ground some continuing self-weight and consolidation settlement might take place and exert negative skin friction. Due allowance should be made for this in any pile design.

We recommend that for piles taken down to rockhead, the piles are socketed by at least three pile diameters below rockhead level and the length of adjacent piles should be carefully checked to ensure that piles are not founded on a steeply sloping rock interface or on rock ledges.

If a piled foundation is to be considered, we recommend further investigation is undertaken using cable percussive boreholes to obtain strength parameters for the deeper strata. To formulate the most satisfactory and economic scheme we suggest that competitive tenders and designs from Specialist Piling Contractors should be sought using the additional borehole 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.

Should vibroflotation ground treatment be proposed for the main foundations consideration could be given to extending the ground treatment in a grid pattern beneath the whole of the building followed by the construction of a suitably reinforced concrete ground bearing floor slab cast on a granular base layer.



#### 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.

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.

Groundwater inflows were recorded at 3.00m in M2, 2.50m in M3, 3.20m in M5, 3.50m in M7, and 5.00m in M8. Intermittent groundwater seepages were recorded throughout M6 and intermittently damp strata was recorded below 2.00m in M1.

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 M4, M5 and M8 found groundwater to be at minimum depths of 1.90m, 2.00m and 0.15m, respectively.

Should groundwater seepages occur and water accumulate in the excavation it should be able to be removed by pumping from a filtered sump.

#### 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 the soil samples gave values in the range of 3.7 to 7.4. Soluble sulphate concentrations were also determined for the soil samples and the results ranged from 0.21g/l to 1.5g/l.

In view of the natural strata being potentially pyritic ground, total sulphate, total sulphur, magnesium, chloride, nitrate and ammonia have been determined for one soil sample and the results were 0.1%, 0.04%, 0.02g/l, 0.07g/l, <0.01g/l and <0.01g/l respectively. Our calculations have determined that pyrite (sulphides), which might weather and produce higher levels of sulphates, are not present.

The results indicate that the Design Sulphate Class for the site should be DS-2.

Our knowledge of the site and ground conditions indicates that the site is "brownfield" and acidic with 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-5z should be used as detailed on the appended extract.

#### 4.6 Roads, Hardstandings and Car Parks

Laboratory California Bearing Ratio (CBR) tests have been undertaken on three samples of cohesive made ground recompacted at their natural moisture content and the results of the tests are appended. A summary of the laboratory CBR test results is as follows:

TABLE 1 CBR RESULTS

| Expl. Hole No. | Depth (m) | Dry Density (Mg/m <sup>3</sup> ) | Moisture Content (%) | CBR Value (%) | Sample                                           |
|----------------|-----------|----------------------------------|----------------------|---------------|--------------------------------------------------|
| M1             | 0.50      | 1.78                             | 13                   | 11            | MADE GROUND: slightly sandy gravelly silty clay. |
| M2             | 0.40      | 1.74                             | 14                   | 12            | MADE GROUND: slightly sandy gravelly silty clay. |
| M3             | 0.40      | 1.78                             | 14                   | 6.9           | MADE GROUND: gravelly sandy silty clay.          |

It should be noted that the above values are moisture dependent and it is possible that the CBR values would reduce with increased moisture content; this being particularly so for cohesive strata.

Given the above it would be advisable to design on a CBR value of 6.9% for the cohesive made ground where found at formation level. If there is to be a delay before construction, to prevent water softening, loosening and disturbance, the formation strata should not be exposed.

We recommend that following earthworks to form the final formation levels for the proposed road and car park, proof rolling and additional insitu CBRs should be undertaken. A review of the design CBR values should then be undertaken before finalising the pavement design.

#### 4.7 Contamination Considerations

At the outset it should be noted that this contamination investigation is a baseline survey in order to provide a contamination risk assessment. Based upon the findings additional sampling, analysis and assessment may be required.

Analysis of a suite of common determinants has been undertaken in the absence of historical evidence of the source of the Made Ground. However, the absence of other specific contaminants cannot be guaranteed.

##### 4.7.1 Assessment

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

Levels of the determinants have been compared against the most recently published guideline values. Contaminated Land: Applications in Real Environments (CL:AIRE) published guideline values in December 2009 to supplement previous guideline values. The Department for Environment, Food and Rural Affairs (DEFRA) published in March 2014 Category 4 Screening Levels (C4SLs) for arsenic, cadmium, lead, hexavalent chromium, benzo(a)pyrene and benzene. Land Quality Management Limited (LQM)/ Chartered Institute of Environmental Health (CIEH) then published Suitable for Use Levels (S4ULs) in November 2014, which largely superseded the previous guideline values. Updated S4ULs values for cadmium and phenols were published in July 2015 and for nickel in August 2015. The guideline values (S4ULs and occasionally C4SLs and CL:AIRE) are derived using the Environment Agency's CLEA

Model and 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 a community hub/ café with play area, contamination analyses have been compared with the guideline values for a standard land use of residential with plant uptake (with homegrown produce). Guideline values for the assessment can be supplied directly to the Regulator, if requested.

Contamination levels that exceeded the guideline values are as follows:

TABLE 2 CONTAMINANTS IN SOIL

| Determinant | Location | Depth<br>(m) | Determined<br>Level<br>(mg/kg) | Guideline<br>Value<br>(mg/kg) |
|-------------|----------|--------------|--------------------------------|-------------------------------|
| Arsenic     | M1       | 0.50         | 49                             | 37*                           |
|             | M2       | 0.40         | 53                             |                               |
|             | M3       | 0.40         | 80                             |                               |
|             | M4       | 0.80         | 73                             |                               |
|             | M6       | 0.50         | 38                             |                               |
|             | M7       | 4.60         | 53                             |                               |
|             |          |              |                                |                               |

\*S4UL values are copyright Land Quality Management Limited, data reproduced with permission; Publication Number S4UL3114. All Rights Reserved.

An asbestos screen was undertaken on eight soil samples and no asbestos was detected.

The results of the Waste Acceptance Criteria (WAC) analysis is also appended.

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.

#### 4.8.2 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 the contamination analyses, indicates elevated arsenic concentrations are present in the made ground (source). The pathway from the source to site operatives during earthworks, end users of the development and any proposed planting (receptors) need to be removed by precautions and/ or remedial measures.

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 proposed areas of soft landscaping, such as within the play area depending on the proposed design, 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 450mm blanket of imported clean topsoil/ subsoil is provided in proposed areas of soft landscaping. If there is a potential for fruit and/or vegetables to be grown the thickness of topsoil/ subsoil should be increased to 600mm. In addition deeper rooted bushes and trees should be pit planted on and in clean topsoil.

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.

It should be noted that all vehicles carrying contaminated material should be securely sheeted and the wheels and undercarriages cleaned before leaving site to ensure that hazardous materials are not dropped onto public roads

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.

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Site personnel involved in earthworks and excavations should be made aware of the hazards of working with contaminated materials found on the site. Strict personal hygiene should be observed and gloves, overalls and boots should be worn. In addition smoking should be prohibited to minimise the potential for transfer of contaminants from hand to mouth.

#### 4.8 Ground Gas Considerations

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

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 3 GROUND GAS CONCENTRATIONS AND FLOW RATE

| Methane<br>(% vol. In air) | Carbon Dioxide<br>(% vol. in air) | Oxygen<br>(% vol. in air) | Gas Flow Rate<br>(litres/ hour) |
|----------------------------|-----------------------------------|---------------------------|---------------------------------|
| 0.0                        | 7.7 – 14.2                        | 0.7 – 15.5                | <0.1 – 0.2                      |

It can be seen from the monitoring that elevated levels of carbon dioxide and depleted levels of associated oxygen have been consistently detected in all three of the standpipes. In addition occasional very low gas flow has been detected in M4. However, no methane was detected over the six monitoring visits.

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  $Q_{hg} = [14.2/ 100] \times 0.2 = 0.028$  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). However, as on this site the levels of carbon dioxide are >5%, the CS1 is increased by one to CS2.

BS.8485:2015+A1:2019, Table 4, indicates that for a CS2 and the type of development proposed a score of 3.5 gives the level of protection and remedial measures required.

BS.8485:2015+A1:2019 Tables 5, 6 and 7 indicate that a combination of the following protection and remedial measures should be considered to achieve the required score:



|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Table 5.1 | precast suspended segmental sub-floor slab (block and beam).<br>(Score 0.0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Table 5.3 | reinforced cast in-situ suspended floor slab with minimal penetrations.<br>(Score 1.0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Table 5.4 | additionally reinforced cast in-situ suspended floor slab with minimal penetrations – slab of minimum 150mm thickness with reinforcement at the bottom and the top<br>(Score 1.5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| .....     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Table 6.1 | pressure relief pathway (low fines gravel blanket/ thin geocomposite blanket/ strips terminating in gravel trench external to the building)<br>(Score 0.5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Table 6.3 | passive sub floor ventilation/ dispersal layer (clear void/ polystyrene void former/ geocomposite void former/ no fines gravel layer with gas drains/ no fines gravel layer) of good performance.<br>(Score 1.5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| .....     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Table 7   | <p>gas resistant membrane meeting the following criteria:</p> <ul style="list-style-type: none"> <li>• sufficiently impervious to gases with a methane gas transmission rate of &lt;40.0 ml/day/m<sup>2</sup>/atm (average) for sheets and joints (tested in accordance with BS.ISO.15105-1 manometric method).</li> <li>• sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions.</li> <li>• sufficiently strong to withstand in-service stresses due to say settlement if placed below a floor slab.</li> <li>• sufficiently strong to withstand the installation process and following trades (penetration from steel fibres in fibre reinforced concrete/ penetration from reinforcement ties/ tearing due to working above it or dropped tools) until covered.</li> <li>• after installation being capable of providing a complete barrier to the entry of the relevant gas.</li> <li>• verified in accordance with CIRIA C735 [N1].</li> </ul> <p>(Score 2.0)</p> |
| .....     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

All excavations of greater than 1.20m depth should be routinely checked for air quality prior to man entry and appropriate precautions taken.

#### 4.9 General

In the preparation of this report no consideration has been given to flora and fauna.

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 and the Coal Authority prior to commencing development.

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.

Following completion of the Phase II ground investigation and monitoring a Phase III remediation statement should be compiled and submitted to the Regulator for written approval 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 David Simpson at our Ossett office.

SUB SURFACE CONSULTANTS LIMITED  
REPORT No. NE4303B  
FEBRUARY 2024



T. Plum B.Sc.(Hons.), M.Sc., F.G.S.  
Principal 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.

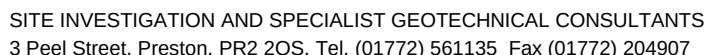
## **INSITU TEST RESULTS**

| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                      |                          |                       |           |                        |   | Standard Penetration Test Results |    |    |    |        |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|-----------------------|-----------|------------------------|---|-----------------------------------|----|----|----|--------|------------------------------------------|
| <div>Site : PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div> <div>Client : GROUNDWORK YORKSHIRE</div> <div>Engineer:</div>                                                                                                                 |                      |                          |                       |           |                        |   |                                   |    |    |    |        | <div>Job Number</div> <div>NE4303A</div> |
|                                                                                                                                                                                                                                                                       |                      |                          |                       |           |                        |   |                                   |    |    |    |        | <div>Sheet</div> <div>1 / 2</div>        |
| 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                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 2                      | 2 | 3                                 | 4  | 3  | 3  | N=13   |                                          |
| M1                                                                                                                                                                                                                                                                    | 2.00                 | 2.15                     | 2.45                  | SPT       | 2                      | 2 | 2                                 | 2  | 2  | 3  | N=9    |                                          |
| M1                                                                                                                                                                                                                                                                    | 3.00                 | 3.15                     | 3.45                  | SPT       | 3                      | 4 | 4                                 | 5  | 5  | 5  | N=19   |                                          |
| M1                                                                                                                                                                                                                                                                    | 4.00                 | 4.15                     | 4.45                  | SPT       | 2                      | 3 | 4                                 | 6  | 7  | 4  | N=21   |                                          |
| M1                                                                                                                                                                                                                                                                    | 5.00                 | 5.15                     | 5.45                  | SPT       | 2                      | 2 | 2                                 | 3  | 4  | 4  | N=13   |                                          |
| M1                                                                                                                                                                                                                                                                    | 6.00                 | 6.15                     | 6.45                  | SPT       | 2                      | 3 | 3                                 | 4  | 6  | 7  | N=20   |                                          |
| M2                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 3                      | 4 | 5                                 | 4  | 4  | 4  | N=17   |                                          |
| M2                                                                                                                                                                                                                                                                    | 2.00                 | 2.15                     | 2.45                  | SPT       | 2                      | 2 | 2                                 | 3  | 2  | 2  | N=9    |                                          |
| M2                                                                                                                                                                                                                                                                    | 3.00                 | 3.15                     | 3.45                  | SPT       | 4                      | 4 | 5                                 | 5  | 6  | 7  | N=23   |                                          |
| M2                                                                                                                                                                                                                                                                    | 4.00                 | 4.15                     | 4.45                  | SPT       | 2                      | 1 | 1                                 | 2  | 2  | 3  | N=8    |                                          |
| M2                                                                                                                                                                                                                                                                    | 5.00                 | 5.15                     | 5.45                  | SPT       | 2                      | 2 | 1                                 | 3  | 3  | 3  | N=10   |                                          |
| M2                                                                                                                                                                                                                                                                    | 6.00                 | 6.15                     | 6.45                  | SPT       | 3                      | 2 | 2                                 | 3  | 5  | 6  | N=16   |                                          |
| M3                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 3                      | 4 | 5                                 | 4  | 4  | 5  | N=18   |                                          |
| M3                                                                                                                                                                                                                                                                    | 2.00                 | 2.15                     | 2.45                  | SPT       | 0                      | 0 | 1                                 | 1  | 0  | 0  | N=2    |                                          |
| M3                                                                                                                                                                                                                                                                    | 3.00                 | 3.15                     | 3.45                  | SPT       | 5                      | 9 | 8                                 | 8  | 8  | 8  | N=32   |                                          |
| M3                                                                                                                                                                                                                                                                    | 4.00                 | 4.15                     | 4.45                  | SPT       | 2                      | 2 | 3                                 | 4  | 11 | 7  | N=25   |                                          |
| M3                                                                                                                                                                                                                                                                    | 5.00                 | 5.15                     | 5.45                  | SPT       | 2                      | 3 | 3                                 | 4  | 4  | 4  | N=15   |                                          |
| M4                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 3                      | 4 | 6                                 | 5  | 4  | 4  | N=19   |                                          |
| M4                                                                                                                                                                                                                                                                    | 2.00                 | 2.15                     | 2.45                  | SPT       | 3                      | 3 | 3                                 | 3  | 6  | 8  | N=20   |                                          |
| M4                                                                                                                                                                                                                                                                    | 3.00                 | 3.15                     | 3.45                  | SPT       | 3                      | 6 | 4                                 | 4  | 4  | 4  | N=16   |                                          |
| M4                                                                                                                                                                                                                                                                    | 4.00                 | 4.15                     | 4.45                  | SPT       | 3                      | 3 | 4                                 | 4  | 4  | 5  | N=17   |                                          |
| M4                                                                                                                                                                                                                                                                    | 5.00                 | 5.15                     | 5.45                  | SPT       | 2                      | 2 | 2                                 | 2  | 4  | 4  | N=12   |                                          |
| M4                                                                                                                                                                                                                                                                    | 6.00                 | 6.15                     | 6.45                  | SPT       | 3                      | 4 | 6                                 | 6  | 8  | 11 | N=31   |                                          |
| M5                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 2                      | 4 | 4                                 | 3  | 4  | 4  | N=15   |                                          |
| M5                                                                                                                                                                                                                                                                    | 2.00                 | 2.15                     | 2.45                  | SPT       | 5                      | 7 | 6                                 | 6  | 7  | 10 | N=29   |                                          |
| M5                                                                                                                                                                                                                                                                    | 3.00                 | 3.15                     | 3.45                  | SPT       | 3                      | 3 | 3                                 | 2  | 2  | 1  | N=8    |                                          |
| M5                                                                                                                                                                                                                                                                    | 3.90                 | 4.05                     | 4.35                  | SPT       | 8                      | 4 | 4                                 | 5  | 6  | 7  | N=22   |                                          |
| M5                                                                                                                                                                                                                                                                    | 5.00                 | 5.15                     | 5.45                  | SPT       | 5                      | 4 | 6                                 | 7  | 9  | 10 | N=32   |                                          |
| M6                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 2                      | 2 | 2                                 | 3  | 5  | 2  | N=12   |                                          |
| M6                                                                                                                                                                                                                                                                    | 2.00                 | 2.15                     | 2.45                  | SPT       | 1                      | 1 | 2                                 | 7  | 14 | 14 | N=37   |                                          |
| M6                                                                                                                                                                                                                                                                    | 3.00                 | 3.15                     | 3.45                  | SPT       | 3                      | 3 | 2                                 | 3  | 3  | 3  | N=11   |                                          |
| M6                                                                                                                                                                                                                                                                    | 4.00                 | 4.15                     | 4.45                  | SPT       | 3                      | 3 | 3                                 | 4  | 4  | 5  | N=16   |                                          |
| M6                                                                                                                                                                                                                                                                    | 5.00                 | 5.15                     | 5.45                  | SPT       | 2                      | 2 | 2                                 | 2  | 3  | 4  | N=11   |                                          |
| M6                                                                                                                                                                                                                                                                    | 5.90                 | 6.05                     | 6.35                  | SPT       | 4                      | 5 | 6                                 | 7  | 9  | 11 | N=33   |                                          |
| M7                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 4                      | 5 | 5                                 | 7  | 8  | 8  | N=28   |                                          |
| M7                                                                                                                                                                                                                                                                    | 2.00                 | 2.15                     | 2.45                  | SPT       | 2                      | 7 | 7                                 | 10 | 10 | 12 | N=39   |                                          |
| M7                                                                                                                                                                                                                                                                    | 3.00                 | 3.15                     | 3.45                  | SPT       | 3                      | 3 | 2                                 | 2  | 3  | 3  | N=10   |                                          |
| M7                                                                                                                                                                                                                                                                    | 4.00                 | 4.15                     | 4.45                  | SPT       | 3                      | 4 | 4                                 | 4  | 5  | 5  | N=18   |                                          |
| M7                                                                                                                                                                                                                                                                    | 5.00                 | 5.15                     | 5.45                  | SPT       | 3                      | 3 | 5                                 | 7  | 8  | 12 | N=32   |                                          |
| M7                                                                                                                                                                                                                                                                    | 5.70                 | 5.85                     | 6.15                  | SPT       | 5                      | 7 | 9                                 | 10 | 11 | 13 | N=43   |                                          |
| M8                                                                                                                                                                                                                                                                    | 1.00                 | 1.15                     | 1.45                  | SPT       | 3                      | 3 | 3                                 | 5  | 5  | 5  | N=18   |                                          |



|                                                                                                                                                         |                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Site</b> : PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE<br><br><b>Client</b> : GROUNDWORK YORKSHIRE<br><br><b>Engineer:</b> | <b>Job Number</b><br><b>NE4303A</b> |
|                                                                                                                                                         | <b>Sheet</b><br>2 / 2               |

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|           |                                                                |
|-----------|----------------------------------------------------------------|
| Site:     | PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, S. YORKS |
| Client:   | GROUNDWORK YORKSHIRE                                           |
| Engineer: |                                                                |

Job Number  
NE4303B

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[illegible]

Remarks: Elevated levels of methane and carbon dioxide and depleted levels of oxygen are shown in ***bold/italics***.

\* No gas reading possible due to flooding of monitoring standpipe.



## **LABORATORY TEST RESULTS**

**Site** : PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE

**Job Number**  
NE4303A

**Client** : GROUNDWORK YORKSHIRE

**Engineer :**

Sheet

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

| Borehole/<br>Trial Pit | Depth<br>(m) | Sample | Natural<br>Moisture<br>Content<br>% | Sample Passing<br>425µm Sieve |                          | Liquid<br>Limit<br>% | Plastic<br>Limit<br>% | Plasticity<br>Index<br>% | Liquidity<br>Index | Group<br>Symbol | Laboratory Description                                                                                                                                 |
|------------------------|--------------|--------|-------------------------------------|-------------------------------|--------------------------|----------------------|-----------------------|--------------------------|--------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |              |        |                                     | Percentage<br>%               | Moisture<br>Content<br>% |                      |                       |                          |                    |                 |                                                                                                                                                        |
| M4                     | 1.00         | D      | 9                                   | 36                            | 25                       | 34                   | 20                    | 14                       | 0.36               | CL              | MADE GROUND: grey and dark grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium coal.                                    |
| M4                     | 2.00         | D      | 9                                   | 38                            | 25                       | 31                   | 19                    | 12                       | 0.50               | CL              | MADE GROUND: grey and dark grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone.            |
| M4                     | 4.50         | C      | 21                                  | 98                            | 21                       | 33                   | 20                    | 13                       | 0.08               | CL              | Orangish brown and greyish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to rounded fine to coarse sandstone.        |
| M5                     | 2.00         | D      | 17                                  | 50                            | 34                       | 34                   | 22                    | 12                       | 1.00               | CL              | MADE GROUND: grey and dark grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone.            |
| M5                     | 3.00         | D      | 11                                  | 46                            | 24                       | 35                   | 20                    | 15                       | 0.27               | CL/CI           | MADE GROUND: grey and dark grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone.            |
| M7                     | 4.60         | C      | 22                                  | 98                            | 22                       | 36                   | 20                    | 16                       | 0.13               | CI              | Orangish brown and light greyish brown slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to coarse sandstone and coal. |
| M8                     | 5.00         | D      | 21                                  | 99                            | 21                       | 29                   | 18                    | 11                       | 0.27               | CL              | Brownish grey slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium sandstone 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 :



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

## Laboratory Test Results

Site: PHOENIX PARK, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE

Client: GROUNDWORK YORKSHIRE

Engineer:

Job Number

NE4303A

Sheet:

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### CALIFORNIA BEARING RATIO

Position: M1

Sample No: 475

Depth: 0.50-1.50 m

Description:

MADE GROUND: grey and light grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone and coal.

Preparation of sample: 4.5 Kg Rammer Method

| Penetration of Plunger mm | Force on Plunger |        |        |           |
|---------------------------|------------------|--------|--------|-----------|
|                           | Top              | kN Top | Bottom | kN Bottom |
| 0.0                       | 0.0              | 0.00   | 0.0    | 0.00      |
| 0.5                       | 63.0             | 0.25   | 64.0   | 0.26      |
| 1.0                       | 129.5            | 0.52   | 141.0  | 0.57      |
| 1.5                       | 191.5            | 0.77   | 199.0  | 0.80      |
| 2.0                       | 252.0            | 1.01   | 268.0  | 1.07      |
| 2.5                       | 295.0            | 1.18   | 329.0  | 1.32      |
| 3.0                       | 346.0            | 1.39   | 381.0  | 1.53      |
| 3.5                       | 390.0            | 1.56   | 428.0  | 1.72      |
| 4.0                       | 437.5            | 1.75   | 477.5  | 1.91      |
| 4.5                       | 474.0            | 1.90   | 517.5  | 2.07      |
| 5.0                       | 512.5            | 2.05   | 557.5  | 2.23      |
| 5.5                       | 549.5            | 2.20   | 597.5  | 2.39      |
| 6.0                       | 583.0            | 2.34   | 622.0  | 2.49      |
| 6.5                       | 613.0            | 2.46   | 652.0  | 2.61      |
| 7.0                       | 637.5            | 2.55   | 676.5  | 2.71      |
| 7.5                       | 656.5            | 2.63   | 698.0  | 2.80      |

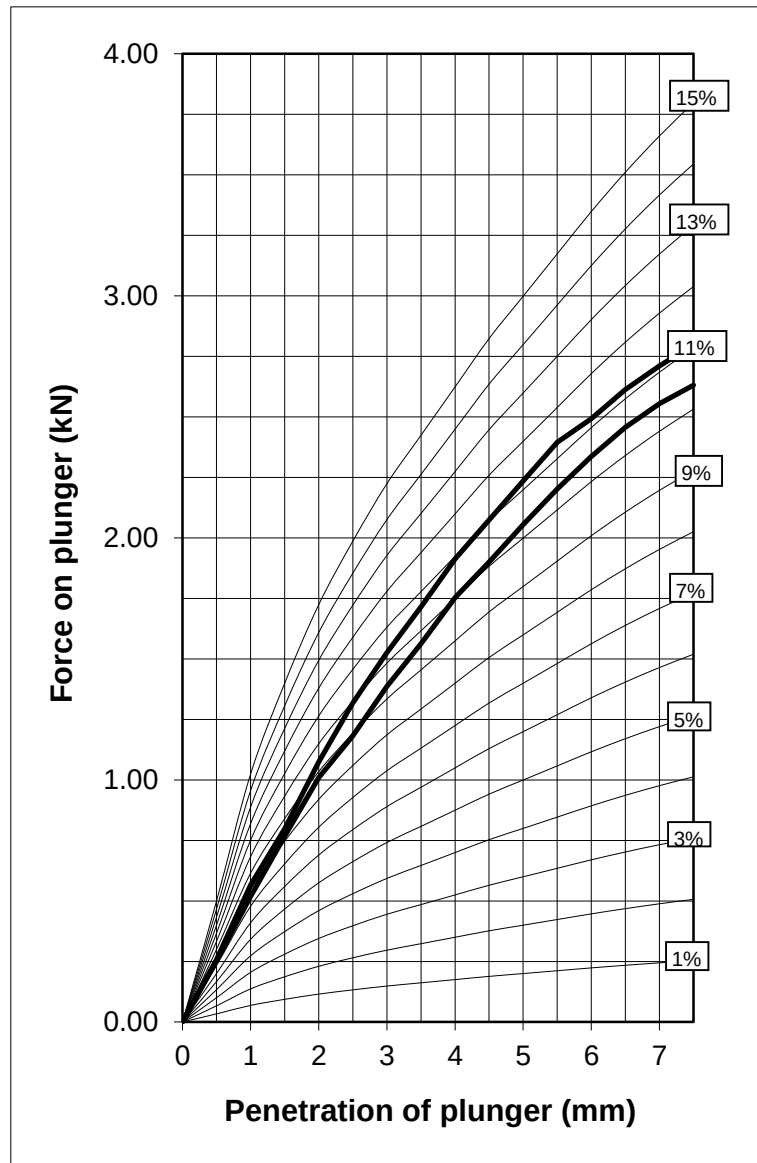
|              | CBR % Value at: |       |
|--------------|-----------------|-------|
|              | 2.5mm           | 5.0mm |
| Top          | 9.0%            | 10.3% |
| Bottom       | 10.0%           | 11.2% |
| <b>CBR %</b> | <b>11%</b>      |       |

Passing 20mm Sieve = 88 %

Moisture Content = 13 %

Bulk Density = 2.02 Mg/m<sup>3</sup>

Dry Density = 1.78 Mg/m<sup>3</sup>



Comments:

Operator

Checked

Approved

GDR & SJG

TP

CAM



# SUB SURFACE

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## Laboratory Test Results

Site: PHOENIX PARK, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE

Client: GROUNDWORK YORKSHIRE

Engineer:

Job Number  
NE4303A

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### CALIFORNIA BEARING RATIO

Position: M2

Sample No: 487

Depth: 0.40-1.50 m

Description:

MADE GROUND: grey and light grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone.

Preparation of sample: 4.5 Kg Rammer Method

| Penetration of Plunger mm | Force on Plunger |        |        |           |
|---------------------------|------------------|--------|--------|-----------|
|                           | Top              | kN Top | Bottom | kN Bottom |
| 0.0                       | 0.0              | 0.00   | 0.0    | 0.00      |
| 0.5                       | 62.5             | 0.25   | 78.5   | 0.31      |
| 1.0                       | 138.0            | 0.55   | 172.0  | 0.69      |
| 1.5                       | 201.0            | 0.81   | 260.0  | 1.04      |
| 2.0                       | 251.0            | 1.01   | 340.0  | 1.36      |
| 2.5                       | 306.0            | 1.23   | 398.0  | 1.59      |
| 3.0                       | 361.0            | 1.45   | 452.0  | 1.81      |
| 3.5                       | 417.0            | 1.67   | 507.5  | 2.03      |
| 4.0                       | 464.0            | 1.86   | 559.0  | 2.24      |
| 4.5                       | 507.0            | 2.03   | 602.0  | 2.41      |
| 5.0                       | 542.5            | 2.17   | 648.0  | 2.60      |
| 5.5                       | 576.0            | 2.31   | 688.0  | 2.76      |
| 6.0                       | 611.5            | 2.45   | 731.0  | 2.93      |
| 6.5                       | 647.5            | 2.59   | 759.5  | 3.04      |
| 7.0                       | 669.0            | 2.68   | 789.0  | 3.16      |
| 7.5                       | 689.5            | 2.76   | 831.5  | 3.33      |

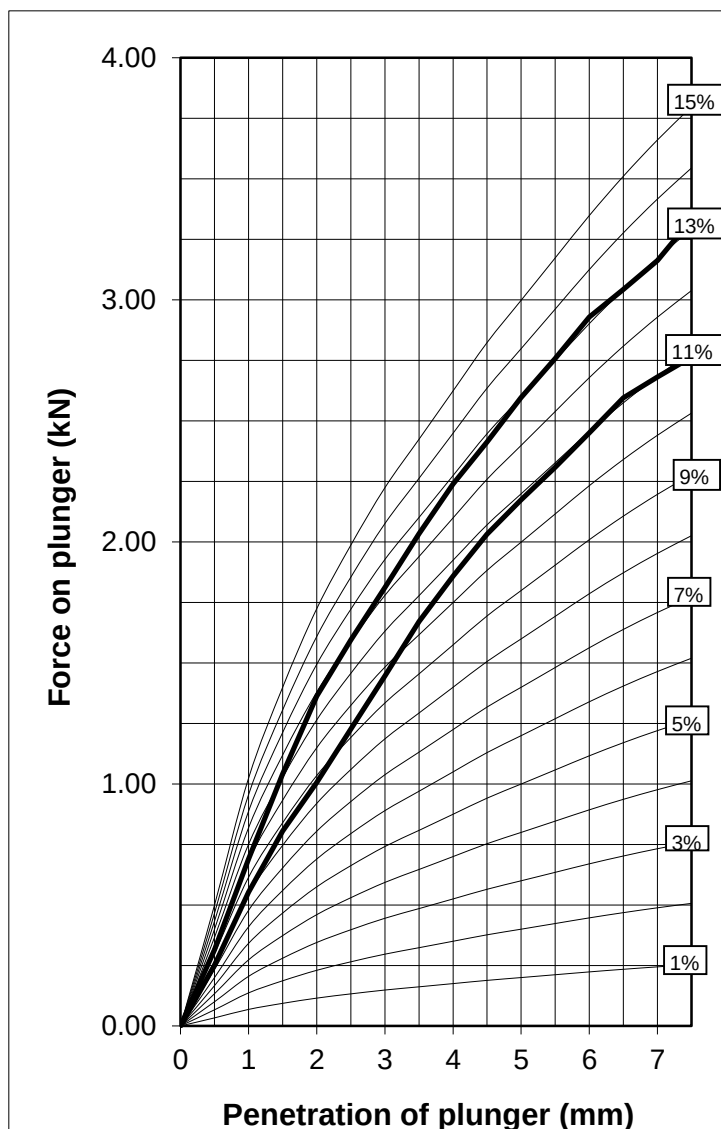
|              | CBR % Value at: |       |
|--------------|-----------------|-------|
|              | 2.5mm           | 5.0mm |
| Top          | 9.3%            | 10.9% |
| Bottom       | 12.1%           | 13.0% |
| <b>CBR %</b> | <b>12%</b>      |       |

Passing 20mm Sieve = 96 %

Moisture Content = 14 %

Bulk Density = 1.99 Mg/m<sup>3</sup>

Dry Density = 1.74 Mg/m<sup>3</sup>



Comments:

Operator

Checked

Approved

GDR & SJG

TP

CAM



# SUB SURFACE

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## Laboratory Test Results

Site: PHOENIX PARK, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE

Client: GROUNDWORK YORKSHIRE

Engineer:

Job Number  
NE4303A

Sheet:  
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### CALIFORNIA BEARING RATIO

Position: M3

Sample No: 499

Depth: 0.40-1.20 m

#### Description:

MADE GROUND: greyish brown and grey gravelly sandy silty clay. Gravel sized fragments are fine to coarse mudstone and sandstone.

Preparation of sample: 4.5 Kg Rammer Method

| Penetration of Plunger mm | Force on Plunger |        |        |           |
|---------------------------|------------------|--------|--------|-----------|
|                           | Top              | kN Top | Bottom | kN Bottom |
| 0.0                       | 0.0              | 0.00   | 0.0    | 0.00      |
| 0.5                       | 43.5             | 0.17   | 47.5   | 0.19      |
| 1.0                       | 86.0             | 0.34   | 86.5   | 0.35      |
| 1.5                       | 122.0            | 0.49   | 132.0  | 0.53      |
| 2.0                       | 151.5            | 0.61   | 176.0  | 0.71      |
| 2.5                       | 181.0            | 0.73   | 222.0  | 0.89      |
| 3.0                       | 211.0            | 0.85   | 257.5  | 1.03      |
| 3.5                       | 241.5            | 0.97   | 289.5  | 1.16      |
| 4.0                       | 270.0            | 1.08   | 325.0  | 1.30      |
| 4.5                       | 294.5            | 1.18   | 352.0  | 1.41      |
| 5.0                       | 319.0            | 1.28   | 371.0  | 1.49      |
| 5.5                       | 339.5            | 1.36   | 393.0  | 1.57      |
| 6.0                       | 353.0            | 1.41   | 416.0  | 1.67      |
| 6.5                       | 366.0            | 1.47   | 432.5  | 1.73      |
| 7.0                       | 381.5            | 1.53   | 447.0  | 1.79      |
| 7.5                       | 397.0            | 1.59   | 464.5  | 1.86      |

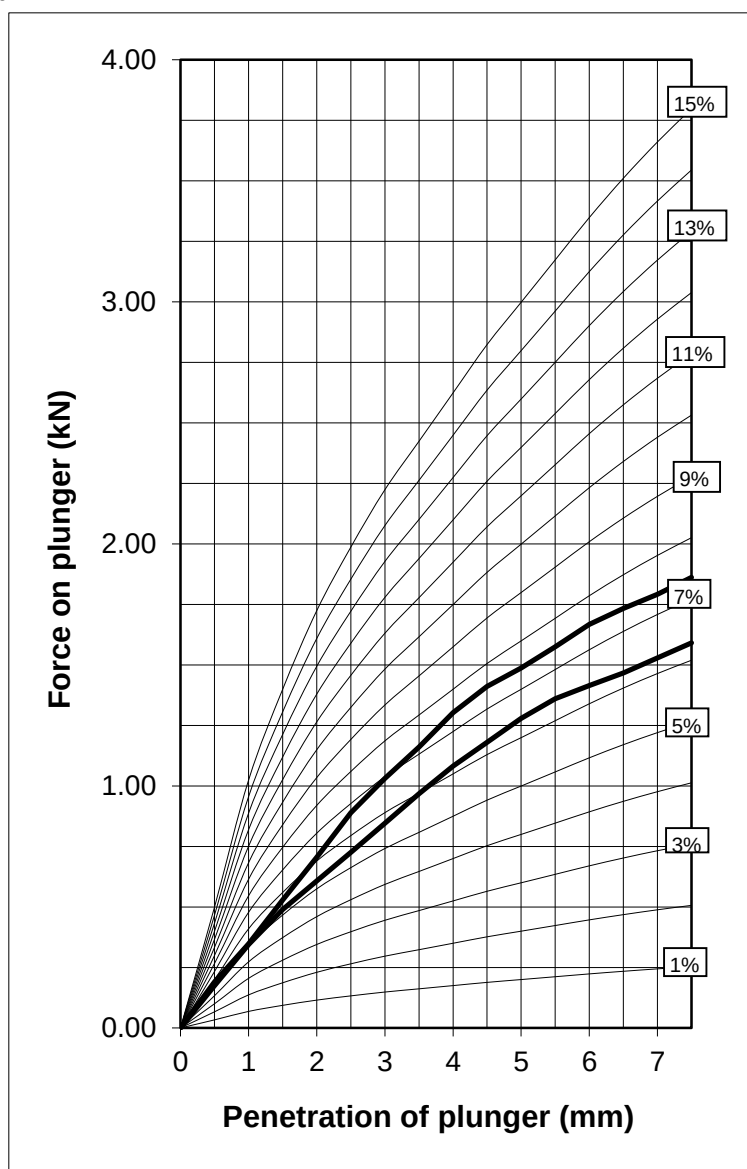
|              | CBR % Value at: |       |
|--------------|-----------------|-------|
|              | 2.5mm           | 5.0mm |
| Top          | 5.5%            | 6.4%  |
| Bottom       | 6.7%            | 7.4%  |
| <b>CBR %</b> | <b>6.9%</b>     |       |

Passing 20mm Sieve = 96 %

Moisture Content = 14 %

Bulk Density = 2.03 Mg/m<sup>3</sup>

Dry Density = 1.78 Mg/m<sup>3</sup>



Comments:

Operator

Checked

Approved

GDR & SJG

TP

CAM



|                                                                                                                                                         |                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Site</b> : PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE<br><br><b>Client</b> : GROUNDWORK YORKSHIRE<br><br><b>Engineer:</b> | <b>Job Number</b> |
|                                                                                                                                                         | NE4303A           |
|                                                                                                                                                         | <b>Sheet</b>      |
|                                                                                                                                                         | 1 / 1             |

**DETERMINATION OF pH, SULPHATE CONTENT AND TOTAL SULPHUR OF SOIL AND GROUNDWATER AND MAGNESIUM, CHLORIDE, AMMONIA AND NITRATE CONTENT**

Remarks :

**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<sup>a</sup>**

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

| Sulfate and magnesium             |                                     |                     |                             |                     |                                      | Groundwater            |                                                     | ACEC                                              |
|-----------------------------------|-------------------------------------|---------------------|-----------------------------|---------------------|--------------------------------------|------------------------|-----------------------------------------------------|---------------------------------------------------|
| Design Sulfate Class for location | 2:1 water/soil extract <sup>b</sup> |                     | Groundwater                 |                     | Total potential sulfate <sup>c</sup> | Static water           | Mobile water                                        | Class for location                                |
| 1                                 | 2<br>(SO <sub>4</sub> mg/l)         | 3<br>(Mg mg/l)      | 4<br>(SO <sub>4</sub> mg/l) | 5<br>(Mg mg/l)      | 6<br>(SO <sub>4</sub> %)             | 7<br>(pH) <sup>d</sup> | 8<br>(pH) <sup>d</sup>                              | 9                                                 |
| DS-1                              | < 500                               |                     | < 400                       |                     | < 0.24                               | ≥ 2.5                  | > 6.5 <sup>d</sup><br>5.5–6.5<br>4.5–5.5<br>2.5–4.5 | AC-1s<br>AC-1<br>AC-2z<br>AC-3z<br>AC-4z          |
| DS-2                              | 500–1500                            |                     | 400–1400                    |                     | 0.24–0.6                             | > 5.5<br><br>2.5–5.5   | > 6.5<br><br>5.5–6.5<br>4.5–5.5<br>2.5–4.5          | AC-1s<br>AC-2<br>AC-2s<br>AC-3z<br>AC-4z<br>AC-5z |
| DS-3                              | 1600–3000                           |                     | 1500–3000                   |                     | 0.7–1.2                              | > 5.5<br><br>2.5–5.5   | > 6.5<br><br>5.5–6.5<br>2.5–5.5                     | AC-2s<br>AC-3<br>AC-3s<br>AC-4<br>AC-5            |
| DS-4                              | 3100–6000                           | ≤ 1200              | 3100–6000                   | ≤ 1000              | 1.3–2.4                              | > 5.5<br><br>2.5–5.5   | > 6.5<br><br>2.5–6.5                                | AC-3s<br>AC-4<br>AC-4s<br>AC-5                    |
| DS-4m                             | 3100–6000                           | > 1200 <sup>a</sup> | 3100–6000                   | > 1000 <sup>a</sup> | 1.3–2.4                              | > 5.5<br><br>2.5–5.5   | > 6.5<br><br>2.5–6.5                                | AC-3s<br>AC-4m<br>AC-4ms<br>AC-5m                 |
| DS-5                              | > 6000                              | ≤ 1200              | > 6000                      | ≤ 1000              | > 2.4                                | > 5.5<br>2.5–5.5       | ≥ 2.5                                               | AC-4s<br>AC-5                                     |
| DS-5m                             | > 6000                              | > 1200 <sup>a</sup> | > 6000                      | > 1000 <sup>a</sup> | > 2.4                                | > 5.5<br>2.5–5.5       | ≥ 2.5                                               | AC-4ms<br>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 (SO<sub>4</sub>), 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** 23-24640

**Issued:** 26-Oct-23

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

**Our Reference** 23-24640

**Client Reference** NE4303A

**Order No** (not supplied)

**Contract Title** PHEONIX PARK, THURNSCOE

**Description** 13 Soil samples, 1 Leachate sample.

**Date Received** 18-Oct-23

**Date Started** 18-Oct-23

**Date Completed** 26-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 Samples

Our Ref 23-24640

Client Ref NE4303A

Contract Title PHEONIX PARK, THURNSCOE

| Lab No        | 2249141 | 2249142 | 2249143 | 2249144 | 2249145 | 2249146 | 2249147 |
|---------------|---------|---------|---------|---------|---------|---------|---------|
| Sample ID     | M1      | M2      | M3      | M4      | M4      | M4      | M5      |
| Depth         | 0.50    | 0.40    | 0.40    | 0.80    | 4.50    | 6.45    | 0.70    |
| Other ID      |         |         |         |         |         |         |         |
| Sample Type   | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    |
| Sampling Date | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |
| Sampling Time | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |

| Test                                                | Method      | LOD  | Units |        |        |        |        |     |       |      |
|-----------------------------------------------------|-------------|------|-------|--------|--------|--------|--------|-----|-------|------|
| <b>Preparation</b>                                  |             |      |       |        |        |        |        |     |       |      |
| Moisture Content                                    | DETSC 1004  | 0.1  | %     | 13     | 13     | 15     | 14     |     |       |      |
| <b>Metals</b>                                       |             |      |       |        |        |        |        |     |       |      |
| Arsenic                                             | DETSC 2301# | 0.2  | mg/kg | 49     | 53     | 80     | 73     |     |       |      |
| Boron, Water Soluble (2.5:1)                        | DETSC 2311# | 0.2  | mg/kg | 2.5    | 0.6    | 0.7    | 1.6    |     |       |      |
| Cadmium                                             | DETSC 2301# | 0.1  | mg/kg | 0.4    | < 0.1  | < 0.1  | < 0.1  |     |       |      |
| Chromium                                            | DETSC 2301# | 0.15 | mg/kg | 16     | 12     | 14     | 10     |     |       |      |
| Chromium, Hexavalent                                | DETSC 2204* | 1    | mg/kg | < 1.0  | < 1.0  | < 1.0  | < 1.0  |     |       |      |
| Copper                                              | DETSC 2301# | 0.2  | mg/kg | 45     | 39     | 33     | 37     |     |       |      |
| Lead                                                | DETSC 2301# | 0.3  | mg/kg | 27     | 27     | 34     | 24     |     |       |      |
| Magnesium Aqueous Extract (2:1)                     | DETSC 2076* | 10   | mg/l  |        |        |        |        |     | 19    |      |
| Mercury                                             | DETSC 2325# | 0.05 | mg/kg | 0.13   | 0.18   | 0.60   | 0.29   |     |       |      |
| Molybdenum                                          | DETSC 2301# | 0.4  | mg/kg | 2.4    | 2.3    | 5.9    | 4.5    |     |       |      |
| Nickel                                              | DETSC 2301# | 1    | mg/kg | 35     | 17     | 21     | 19     |     |       |      |
| Selenium                                            | DETSC 2301# | 0.5  | mg/kg | 1.2    | 1.0    | 1.3    | 0.9    |     |       |      |
| Zinc                                                | DETSC 2301# | 1    | mg/kg | 75     | 42     | 60     | 35     |     |       |      |
| <b>Inorganics</b>                                   |             |      |       |        |        |        |        |     |       |      |
| pH                                                  | DETSC 2008# |      | pH    | 6.8    | 4.6    | 6.9    | 4.2    | 7.3 | 6.5   | 3.7  |
| Cyanide, Total                                      | DETSC 2130# | 0.1  | mg/kg | < 0.1  | < 0.1  | 0.3    | < 0.1  |     |       |      |
| Ammonia Aqueous Extract as N                        | DETSC 2119  | 10   | mg/l  |        |        |        |        |     | < 10  |      |
| Chloride Aqueous Extract (2:1)                      | DETSC 2055  | 1    | mg/l  |        |        |        |        |     | 69    |      |
| 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  |        |        |        |        | 300 | 210   | 1500 |
| Sulphide                                            | DETSC 2024* | 10   | mg/kg | 16     | < 10   | 24     | 110    |     |       |      |
| Sulphur as S, Total                                 | DETSC 2320  | 0.01 | %     |        |        |        |        |     | 0.04  |      |
| Sulphate as SO4, Total                              | DETSC 2321# | 0.01 | %     | 3.0    | 2.2    | 0.76   | 1.8    |     | 0.10  |      |
| <b>Petroleum Hydrocarbons</b>                       |             |      |       |        |        |        |        |     |       |      |
| C5-C10 Gasoline Range Organics (GRO): HS_1D_Total   | DETSC 3321* | 0.1  | mg/kg | < 0.1  | < 0.1  | < 0.1  | < 0.1  |     |       |      |
| C10-C24 Diesel Range Organics (DRO): EH_1D_Total    | DETSC 3311# | 10   | mg/kg | < 10   | < 10   | 12     | < 10   |     |       |      |
| EPH (C10-C40): EH_1D_Total                          | DETSC 3311# | 10   | mg/kg | < 10   | < 10   | 14     | < 10   |     |       |      |
| 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 | < 10   | < 10   | < 10   | < 10   |     |       |      |
| <b>PAHs</b>                                         |             |      |       |        |        |        |        |     |       |      |
| Naphthalene                                         | DETSC 3301  | 0.1  | mg/kg | 0.4    | 0.4    | 1.2    | 0.2    |     |       |      |



# Summary of Chemical Analysis

## Soil Samples

Our Ref 23-24640

Client Ref NE4303A

Contract Title PHEONIX PARK, THURNSCOE

| Lab No        | 2249141 | 2249142 | 2249143 | 2249144 | 2249145 | 2249146 | 2249147 |
|---------------|---------|---------|---------|---------|---------|---------|---------|
| Sample ID     | M1      | M2      | M3      | M4      | M4      | M4      | M5      |
| Depth         | 0.50    | 0.40    | 0.40    | 0.80    | 4.50    | 6.45    | 0.70    |
| Other ID      |         |         |         |         |         |         |         |
| Sample Type   | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    |
| Sampling Date | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |
| Sampling Time | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |

| Test                    | Method      | LOD | Units |       |       |       |       |  |  |
|-------------------------|-------------|-----|-------|-------|-------|-------|-------|--|--|
| Acenaphthylene          | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Acenaphthene            | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Fluorene                | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | 0.2   | < 0.1 |  |  |
| Phenanthrene            | DETSC 3301  | 0.1 | mg/kg | 0.1   | 0.1   | 0.2   | < 0.1 |  |  |
| Anthracene              | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Fluoranthene            | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Pyrene                  | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Benzo(a)anthracene      | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Chrysene                | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Benzo(b)fluoranthene    | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Benzo(k)fluoranthene    | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Benzo(a)pyrene          | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Indeno(1,2,3-c,d)pyrene | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Dibenzo(a,h)anthracene  | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| Benzo(g,h,i)perylene    | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 | < 0.1 |  |  |
| PAH 16 Total            | DETSC 3301  | 1.6 | mg/kg | < 1.6 | < 1.6 | 1.6   | < 1.6 |  |  |
| <b>Phenols</b>          |             |     |       |       |       |       |       |  |  |
| Phenol - Monohydric     | DETSC 2130# | 0.3 | mg/kg | 0.4   | 0.5   | 0.6   | < 0.3 |  |  |

## Summary of Chemical Analysis

### Soil Samples

Our Ref 23-24640

Client Ref NE4303A

Contract Title PHEONIX PARK, THURNSCOE

| Lab No        | 2249148 | 2249149 | 2249150 | 2249151 | 2249152 | 2249153 |
|---------------|---------|---------|---------|---------|---------|---------|
| Sample ID     | M5      | M6      | M7      | M7      | M7      | M8      |
| Depth         | 1.50    | 0.50    | 1.80    | 3.00    | 4.60    | 0.50    |
| Other ID      |         |         |         |         |         |         |
| Sample Type   | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    |
| Sampling Date | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |
| Sampling Time | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |

| Test                                                | Method     | LOD  | Units |        |        |        |     |        |     |
|-----------------------------------------------------|------------|------|-------|--------|--------|--------|-----|--------|-----|
| <b>Preparation</b>                                  |            |      |       |        |        |        |     |        |     |
| Moisture Content                                    | DETS 1004  | 0.1  | %     | 12     | 14     | 7.7    |     | 23     |     |
| <b>Metals</b>                                       |            |      |       |        |        |        |     |        |     |
| Arsenic                                             | DETS 2301# | 0.2  | mg/kg | 18     | 38     | 29     |     | 53     |     |
| Boron, Water Soluble (2.5:1)                        | DETS 2311# | 0.2  | mg/kg | 0.8    | 0.5    | 0.5    |     | 0.3    |     |
| Cadmium                                             | DETS 2301# | 0.1  | mg/kg | < 0.1  | < 0.1  | < 0.1  |     | 0.4    |     |
| Chromium                                            | DETS 2301# | 0.15 | mg/kg | 13     | 14     | 12     |     | 24     |     |
| Chromium, Hexavalent                                | DETS 2204* | 1    | mg/kg | < 1.0  | < 1.0  | < 1.0  |     | < 1.0  |     |
| Copper                                              | DETS 2301# | 0.2  | mg/kg | 44     | 47     | 52     |     | 41     |     |
| Lead                                                | DETS 2301# | 0.3  | mg/kg | 15     | 25     | 20     |     | 51     |     |
| Magnesium Aqueous Extract (2:1)                     | DETS 2076* | 10   | mg/l  |        |        |        |     |        |     |
| Mercury                                             | DETS 2325# | 0.05 | mg/kg | 0.11   | 0.18   | 0.18   |     | 0.44   |     |
| Molybdenum                                          | DETS 2301# | 0.4  | mg/kg | 2.1    | 2.8    | 2.7    |     | 1.6    |     |
| Nickel                                              | DETS 2301# | 1    | mg/kg | 28     | 36     | 33     |     | 43     |     |
| Selenium                                            | DETS 2301# | 0.5  | mg/kg | 0.7    | 1.3    | 0.9    |     | < 0.5  |     |
| Zinc                                                | DETS 2301# | 1    | mg/kg | 61     | 78     | 65     |     | 40     |     |
| <b>Inorganics</b>                                   |            |      |       |        |        |        |     |        |     |
| pH                                                  | DETS 2008# |      | pH    | 7.6    | 5.4    | 8.7    | 7.4 | 5.9    | 7.0 |
| Cyanide, Total                                      | DETS 2130# | 0.1  | mg/kg | < 0.1  | < 0.1  | < 0.1  |     | 0.1    |     |
| Ammonia Aqueous Extract as N                        | DETS 2119  | 10   | mg/l  |        |        |        |     |        |     |
| Chloride Aqueous Extract (2:1)                      | DETS 2055  | 1    | mg/l  |        |        |        |     |        |     |
| Nitrate Aqueous Extract as NO3 (2:1)                | DETS 2055  | 1    | mg/l  |        |        |        |     |        |     |
| Sulphate Aqueous Extract as SO4 (2:1)               | DETS 2076# | 10   | mg/l  |        |        |        | 900 |        | 310 |
| Sulphide                                            | DETS 2024* | 10   | mg/kg | 36     | 36     | 56     |     | 24     |     |
| Sulphur as S, Total                                 | DETS 2320  | 0.01 | %     |        |        |        |     |        |     |
| Sulphate as SO4, Total                              | DETS 2321# | 0.01 | %     | 0.09   | 1.1    | 0.06   |     | 0.17   |     |
| <b>Petroleum Hydrocarbons</b>                       |            |      |       |        |        |        |     |        |     |
| C5-C10 Gasoline Range Organics (GRO): HS_1D_Total   | DETS 3321* | 0.1  | mg/kg | < 0.1  | < 0.1  | < 0.1  |     | < 0.1  |     |
| C10-C24 Diesel Range Organics (DRO): EH_1D_Total    | DETS 3311# | 10   | mg/kg | < 10   | < 10   | < 10   |     | < 10   |     |
| EPH (C10-C40): EH_1D_Total                          | DETS 3311# | 10   | mg/kg | < 10   | < 10   | < 10   |     | < 10   |     |
| Benzene                                             | DETS 3321# | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |     | < 0.01 |     |
| Ethylbenzene                                        | DETS 3321# | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |     | < 0.01 |     |
| Toluene                                             | DETS 3321# | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |     | < 0.01 |     |
| m+p Xylene                                          | DETS 3321# | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |     | < 0.01 |     |
| o Xylene                                            | DETS 3321# | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |     | < 0.01 |     |
| MTBE                                                | DETS 3321  | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |     | < 0.01 |     |
| C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total | DETS 3311# | 10   | mg/kg | < 10   | < 10   | < 10   |     | < 10   |     |
| <b>PAHs</b>                                         |            |      |       |        |        |        |     |        |     |
| Naphthalene                                         | DETS 3301  | 0.1  | mg/kg | < 0.1  | 0.2    | 0.5    |     | < 0.1  |     |

## Summary of Chemical Analysis

### Soil Samples

Our Ref 23-24640

Client Ref NE4303A

Contract Title PHEONIX PARK, THURNSCOE

|               |         |         |         |         |         |         |
|---------------|---------|---------|---------|---------|---------|---------|
| Lab No        | 2249148 | 2249149 | 2249150 | 2249151 | 2249152 | 2249153 |
| Sample ID     | M5      | M6      | M7      | M7      | M7      | M8      |
| Depth         | 1.50    | 0.50    | 1.80    | 3.00    | 4.60    | 0.50    |
| Other ID      |         |         |         |         |         |         |
| Sample Type   | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    | SOIL    |
| Sampling Date | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |
| Sampling Time | n/s     | n/s     | n/s     | n/s     | n/s     | n/s     |

| Test                    | Method      | LOD | Units |       |       |       |  |       |  |
|-------------------------|-------------|-----|-------|-------|-------|-------|--|-------|--|
| Acenaphthylene          | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Acenaphthene            | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Fluorene                | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Phenanthrene            | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | 0.1   |  | < 0.1 |  |
| Anthracene              | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Fluoranthene            | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Pyrene                  | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Benzo(a)anthracene      | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Chrysene                | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Benzo(b)fluoranthene    | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Benzo(k)fluoranthene    | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Benzo(a)pyrene          | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Indeno(1,2,3-c,d)pyrene | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Dibenzo(a,h)anthracene  | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| Benzo(g,h,i)perylene    | DETSC 3301  | 0.1 | mg/kg | < 0.1 | < 0.1 | < 0.1 |  | < 0.1 |  |
| PAH 16 Total            | DETSC 3301  | 1.6 | mg/kg | < 1.6 | < 1.6 | < 1.6 |  | < 1.6 |  |
| <b>Phenols</b>          |             |     |       |       |       |       |  |       |  |
| Phenol - Monohydric     | DETSC 2130# | 0.3 | mg/kg | 0.4   | < 0.3 | < 0.3 |  | < 0.3 |  |

# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-24640

Client Ref NE4303A

Contract Title PHEONIX PARK, THURNSCOE

Sample Id M6 0.50

Sample Numbers 2249149 2249154

Date Analysed 26/10/2023

| Test Results On Waste                          |          |        | WAC Limit Values |       |                 |
|------------------------------------------------|----------|--------|------------------|-------|-----------------|
| Determinand and Method Reference               | Units    | Result | Inert Waste      | SNRHW | Hazardous Waste |
| DETSC 2084# Total Organic Carbon               | %        | 11.0   | 3                | 5     | 6               |
| DETSC 2003# Loss On Ignition                   | %        | 16.0   | n/a              | n/a   | 10              |
| DETSC 3321# BTEX                               | mg/kg    | < 0.04 | 6                | n/a   | n/a             |
| DETSC 3401# PCBs (7 congeners)                 | mg/kg    | < 0.01 | 1                | n/a   | n/a             |
| DETSC 3311# EPH (C10 - C40): EH_1D_Total       | mg/kg    | < 10   | 500              | n/a   | n/a             |
| DETSC 3301 PAHs                                | mg/kg    | < 1.6  | 100              | n/a   | n/a             |
| DETSC 2008# pH                                 | pH Units | 5.4    | n/a              | >6    | n/a             |
| DETSC 2073* Acid Neutralisation Capacity (pH4) | mol/kg   | < 1.0  | n/a              | TBE   | TBE             |
| DETSC 2073* Acid Neutralisation Capacity (pH7) | mol/kg   | < 1.0  | n/a              | TBE   | TBE             |

| Test Results On Leachate            |                     |                       | WAC Limit Values               |        |                 |
|-------------------------------------|---------------------|-----------------------|--------------------------------|--------|-----------------|
| Determinand and Method Reference    | Conc in Eluate ug/l | Amount Leached* mg/kg | Limit values for LS10 Leachate |        |                 |
|                                     | 10:1                | LS10                  | Inert Waste                    | SNRHW  | Hazardous Waste |
| DETSC 2306 Arsenic as As            | 0.26                | < 0.01                | 0.5                            | 2      | 25              |
| DETSC 2306 Barium as Ba             | 46                  | 0.46                  | 20                             | 100    | 300             |
| DETSC 2306 Cadmium as Cd            | 0.98                | < 0.02                | 0.04                           | 1      | 5               |
| DETSC 2306 Chromium as Cr           | < 0.25              | < 0.1                 | 0.5                            | 10     | 70              |
| DETSC 2306 Copper as Cu             | 16                  | 0.16                  | 2                              | 50     | 100             |
| DETSC 2306 Mercury as Hg            | < 0.010             | < 0.002               | 0.01                           | 0.2    | 2               |
| DETSC 2306 Molybdenum as Mo         | < 1.1               | < 0.1                 | 0.5                            | 10     | 30              |
| DETSC 2306 Nickel as Ni             | 150                 | 1.5                   | 0.4                            | 10     | 40              |
| DETSC 2306 Lead as Pb               | 30                  | 0.3                   | 0.5                            | 10     | 50              |
| DETSC 2306 Antimony as Sb           | < 0.17              | < 0.05                | 0.06                           | 0.7    | 5               |
| DETSC 2306 Selenium as Se           | 1.3                 | < 0.03                | 0.1                            | 0.5    | 7               |
| DETSC 2306 Zinc as Zn               | 220                 | 2.2                   | 4                              | 50     | 200             |
| DETSC 2055 Chloride as Cl           | 640                 | < 100                 | 800                            | 15,000 | 25,000          |
| DETSC 2055* Fluoride as F           | 550                 | 5.5                   | 10                             | 150    | 500             |
| DETSC 2055 Sulphate as SO4          | 330000              | 3300                  | 1000                           | 20,000 | 50,000          |
| DETSC 2009* Total Dissolved Solids  | 350000              | 3500                  | 4000                           | 60,000 | 100,000         |
| DETSC 2130 Phenol Index             | < 100               | < 1                   | 1                              | n/a    | n/a             |
| DETSC 2085 Dissolved Organic Carbon | < 2000              | < 50                  | 500                            | 800    | 1000            |

| Additional Information        |       |
|-------------------------------|-------|
| DETSC 2008 pH                 | 4.9   |
| DETSC 2009 Conductivity uS/cm | 493.0 |
| * Temperature*                | 17.0  |
| Mass of Sample Kg*            | 0.110 |
| Mass of dry Sample Kg*        | 0.094 |
| Stage 1                       |       |
| Volume of Leachant L2*        | 0.926 |
| Volume of Eluate VE1*         | 0.88  |

|                             |
|-----------------------------|
| TBE - To Be Evaluated       |
| SNRHW - Stable Non-Reactive |
| Hazardous Waste             |

**Disclaimer:** The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

\* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

## Summary of Asbestos Analysis Soil Samples

*Our Ref* 23-24640

*Client Ref* NE4303A

*Contract Title* PHEONIX PARK, THURNSCOE

| Lab No  | Sample ID | Material Type | Result | Comment* | Analyst     |
|---------|-----------|---------------|--------|----------|-------------|
| 2249141 | M1 0.50   | SOIL          | NAD    | none     | Michael Kay |
| 2249142 | M2 0.40   | SOIL          | NAD    | none     | Michael Kay |
| 2249143 | M3 0.40   | SOIL          | NAD    | none     | Michael Kay |
| 2249144 | M4 0.80   | SOIL          | NAD    | none     | Michael Kay |
| 2249148 | M5 1.50   | SOIL          | NAD    | none     | Michael Kay |
| 2249149 | M6 0.50   | SOIL          | NAD    | none     | Michael Kay |
| 2249150 | M7 1.80   | SOIL          | NAD    | none     | Michael Kay |
| 2249152 | M7 4.60   | SOIL          | NAD    | none     | Michael Kay |

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 23-24640  
 Client Ref NE4303A  
 Contract PHEONIX PARK, THURNSCOE

### Containers Received & Deviating Samples

| Lab No  | Sample ID    | Date Sampled | Containers Received      | Holding time exceeded for tests                                                                                                                                                                                                                                                                                                                                             | Inappropriate container for tests |
|---------|--------------|--------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 2249141 | M1 0.50 SOIL |              | GJ 250ml, GJ 60ml, PT 1L | Sample date not supplied, Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days) |                                   |
| 2249142 | M2 0.40 SOIL |              | GJ 250ml, GJ 60ml, PT 1L | Sample date not supplied, Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days) |                                   |
| 2249143 | M3 0.40 SOIL |              | GJ 250ml, GJ 60ml, PT 1L | Sample date not supplied, Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days) |                                   |
| 2249144 | M4 0.80 SOIL |              | GJ 250ml, GJ 60ml, PT 1L | Sample date not supplied, Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days) |                                   |
| 2249145 | M4 4.50 SOIL |              | PT 1L                    | Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)                                                                                                                                                                                                                                                                                                  |                                   |
| 2249146 | M4 6.45 SOIL |              | PT 1L                    | Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)                                                                                                                                                                          |                                   |
| 2249147 | M5 0.70 SOIL |              | PT 1L                    | Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)                                                                                                                                                                                                                                                                                                  |                                   |

## Information in Support of the Analytical Results

Our Ref 23-24640  
 Client Ref NE4303A  
 Contract PHEONIX PARK, THURNSCOE

| Lab No  | Sample ID        | Date Sampled | Containers Received               | Holding time exceeded for tests                                                                                                                                                                                                                                                                                                                                                                                                                                           | Inappropriate container for tests |
|---------|------------------|--------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 2249148 | M5 1.50 SOIL     |              | GJ 250ml, GJ 60ml, PT 1L          | Sample date not supplied, Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days)                                                                                               |                                   |
| 2249149 | M6 0.50 SOIL     |              | GJ 250ml x2, GJ 60ml x2, PT 1L x2 | Sample date not supplied, ANC (1095 days), Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Loss on Ignition (730 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days) |                                   |
| 2249150 | M7 1.80 SOIL     |              | GJ 250ml, GJ 60ml, PT 1L          | Sample date not supplied, Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days)                                                                                               |                                   |
| 2249151 | M7 3.00 SOIL     |              | PT 1L                             | Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)                                                                                                                                                                                                                                                                                                                                                                                                |                                   |
| 2249152 | M7 4.60 SOIL     |              | GJ 250ml, GJ 60ml, PT 1L          | Sample date not supplied, Boron (365 days), BTEX / C5-C10 (14 days), Chromium, Hexavalent (365 days), Mercury (28 days), Total Sulphate ICP (30 days), ICP WS Boron (182 days), Metals ICP (182 days), Metals ICP Prep (182 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), EPH/TPH (14 days)                                                                                               |                                   |
| 2249153 | M8 0.50 SOIL     |              | PT 1L                             | Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)                                                                                                                                                                                                                                                                                                                                                                                                |                                   |
| 2249154 | M6 0.50 LEACHATE |              | GJ 250ml x2, GJ 60ml x2, PT 1L x2 | Sample date not supplied                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |

## Information in Support of the Analytical Results

*Our Ref* 23-24640

*Client Ref* NE4303A

*Contract* PHEONIX PARK, THURNSCOE

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

## 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 (GRO) | HS_1D_Total |
| C10-C24 Diesel Range Organics (DRO)  | EH_1D_Total |
| EPH (C10-C40)                        | EH_1D_Total |
| TPH (C10-C40)                        | EH_1D_Total |
| C24-C40 Lube Oil Range Organics (LO) | EH_1D_Total |

End of Report

## **MINI BOREHOLE RECORD SHEETS**

|  <b>SUB SURFACE</b><br>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS<br>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907 |                    |                            |                 |                                               |             |                                       | <b>Site</b><br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,<br>ROTHERHAM, SOUTH YORKSHIRE                                                                                                                                                    |                                 | <b>Borehole Number</b><br><b>M1</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-----------------|-----------------------------------------------|-------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------|
| <b>Boring Method</b><br>MINI PERCUSSIVE                                                                                                                                                                                                                                |                    | <b>Casing Diameter</b>     |                 | <b>Ground Level (mOD)</b>                     |             | <b>Client</b><br>GROUNDWORK YORKSHIRE |                                                                                                                                                                                                                                            | <b>Job Number</b><br>NE4303A    |                                     |
|                                                                                                                                                                                                                                                                        |                    | <b>Location</b><br>AS PLAN |                 | <b>Dates</b><br>06/10/2023                    |             | <b>Engineer</b>                       |                                                                                                                                                                                                                                            | <b>Sheet</b><br>1/2             |                                     |
| Depth (m)                                                                                                                                                                                                                                                              | Sample / Tests     | Casing Depth (m)           | Water Depth (m) | Field Records                                 | Level (mOD) | Depth (m) (Thickness)                 | Description                                                                                                                                                                                                                                | Legend                          | Water                               |
| 0.00-1.00                                                                                                                                                                                                                                                              | C                  |                            |                 | 0.00m to 1.00m - 100% Recovery                |             | (0.50)                                | MADE GROUND: grass over soft to firm dark brown gravelly sandy silty clay. Gravel sized fragments are angular to subrounded fine to coarse sandstone.                                                                                      |                                 |                                     |
|                                                                                                                                                                                                                                                                        |                    |                            |                 |                                               |             | 0.50                                  | MADE GROUND: soft to firm grey and light grey speckled black and dark orangish brown gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and occasional sandstone and ironstone (colliery spoil). |                                 |                                     |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=13 |                            |                 | 1.00m to 2.00m - 100% Recovery<br>2,2/3,4,3,3 |             |                                       | ...below 1.00m: grey and dark grey                                                                                                                                                                                                         |                                 |                                     |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=9  |                            |                 | 2.00m to 3.00m - 95% Recovery<br>2,2/2,2,2,3  |             |                                       | ...below 2.00m: with occasional pockets of sand.                                                                                                                                                                                           |                                 |                                     |
| 3.00-3.45<br>3.00-4.00<br>3.00-3.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=19 |                            |                 | 3.00m to 4.00m - 100% Recovery<br>3,4/4,5,5,5 |             | (3.75)                                |                                                                                                                                                                                                                                            |                                 |                                     |
| 4.00-4.45<br>4.00-5.00<br>4.00-4.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=21 |                            |                 | 4.00m to 5.00m - 80% Recovery<br>2,3/4,6,7,4  |             | 4.25                                  | MADE GROUND: dark grey ashy very sandy fine to medium gravel sized fragments of coal (colliery spoil).                                                                                                                                     |                                 |                                     |
|                                                                                                                                                                                                                                                                        |                    |                            |                 |                                               |             | (0.55)                                |                                                                                                                                                                                                                                            |                                 |                                     |
|                                                                                                                                                                                                                                                                        |                    |                            |                 | 5.00m to 6.00m - 85% Recovery                 |             | 4.80<br>(0.20)                        | MADE GROUND: soft to firm brownish grey speckled black slightly organic silty clay with occasional plant material. (Organic odour).                                                                                                        |                                 |                                     |
| <b>Remarks</b><br>C = Plastic lined core sample<br>Core diameters: 86mm to 1.00m, 76mm to 2.00m, 66mm to 4.00m and 56mm to 6.00m<br>HV = Hand Shear Vane Test<br>Ground intermittently damp below 2.00m<br>Backfilled with gravel and grout                            |                    |                            |                 |                                               |             |                                       |                                                                                                                                                                                                                                            | <b>Scale (approx)</b><br>1:25   | <b>Logged By</b><br>JMH/DB          |
|                                                                                                                                                                                                                                                                        |                    |                            |                 |                                               |             |                                       |                                                                                                                                                                                                                                            | <b>Figure No.</b><br>NE4303A.M1 |                                     |



PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,  
ROTHERHAM. SOUTH YORKSHIRE

**Borehole  
Number**  
**M1**

**Job  
Number**  
NE4303A

Sheet  
2/2

|         |                |                          |
|---------|----------------|--------------------------|
| Remarks | Scale (approx) | Logged By                |
|         | 1:25           | JMH/DB                   |
|         |                | Figure No.<br>NE4303A.M1 |

|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                                                            |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                      |                                             |                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|----------------------------|----------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                           |                                        |                            |                                                                            |                        | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div> |                                                                                                                                                                                                                                                                                                                                      | <div>Borehole Number</div> <div>M2</div>    |                                        |
| <div>Boring Method</div> <div>MINI PERCUSSIVE</div>                                                                                                                                                                                                                   |                           | <div>Casing Diameter</div>             |                            | <div>Ground Level (mOD)</div>                                              |                        | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div>                                                |                                                                                                                                                                                                                                                                                                                                      | <div>Job Number</div> <div>NE4303A</div>    |                                        |
|                                                                                                                                                                                                                                                                       |                           | <div>Location</div> <div>AS PLAN</div> |                            | <div>Dates</div> <div>06/10/2023</div>                                     |                        | <div>Engineer</div>                                                                              |                                                                                                                                                                                                                                                                                                                                      | <div>Sheet</div> <div>1/2</div>             |                                        |
| <div>Depth (m)</div>                                                                                                                                                                                                                                                  | <div>Sample / Tests</div> | <div>Casing Depth (m)</div>            | <div>Water Depth (m)</div> | <div>Field Records</div>                                                   | <div>Level (mOD)</div> | <div>Depth (m) (Thickness)</div>                                                                 | <div>Description</div>                                                                                                                                                                                                                                                                                                               | <div>Legend</div>                           | <div>Water</div>                       |
| 0.00-1.00                                                                                                                                                                                                                                                             | C                         |                                        |                            | 0.00m to 1.00m - 90% Recovery                                              |                        | <div><div></div><div>(0.40)</div><div>0.40</div></div>                                           | <div>MADE GROUND: grass over brown and dark brown gravelly sandy silty clay with pockets of sand , occasional brick cobbles and many rootlets.</div>                                                                                                                                                                                 | <div></div>                                 |                                        |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=17        |                                        |                            | 1.00m to 2.00m - 100% Recovery<br>3,4/5,4,4,4                              |                        |                                                                                                  | <div>MADE GROUND: soft to firm grey, light grey and occasional black and dark orangish brown speckled gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone. (Colliery spoil)</div>                                                                                             | <div></div>                                 |                                        |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=9         |                                        |                            | 2.00m to 3.00m - 100% Recovery<br>2,2/2,3,2,2                              |                        | <div><div></div><div>(4.05)</div></div>                                                          | <div>...below 1.00m: grey and dark grey</div>                                                                                                                                                                                                                                                                                        | <div></div>                                 |                                        |
| 3.00-3.45<br>3.00-4.00                                                                                                                                                                                                                                                | D<br>C                    |                                        |                            | Water inflow(1) at 3.00m.<br>3.00m to 4.00m - 100% Recovery<br>4,4/5,5,6,7 |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                      | <div></div>                                 | ▽1                                     |
| 3.00-3.45                                                                                                                                                                                                                                                             | SPT N=23                  |                                        |                            |                                                                            |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                      | <div></div>                                 |                                        |
| 4.00-4.45<br>4.00-5.00<br>4.00-4.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=8         |                                        |                            | 4.00m to 5.00m - 90% Recovery<br>2,1/1,2,2,3                               |                        | <div><div></div><div>4.45 (0.15)<br/>4.60</div><div>(0.30)</div><div>4.90</div></div>            | <div>MADE GROUND: dark grey ashy very sandy fine to coarse gravel sized fragments of coal and sandstone. (Colliery spoil).</div> <div>MADE GROUND: firm brownish grey speckled black slightly organic silty clay with occasional plant material. (Organic odour).</div> <div>Firm medium strength greyish brown and occasional</div> | <div></div>                                 |                                        |
| <div>Remarks</div> <div>C= Plastic lined core sample.<br/>Core diameters: 86mm to 1.00m, 76mm to 2.00m, 66mm to 4.00m and 56mm to 6.00m<br/>On completion backfilled with gravel and grout</div>                                                                      |                           |                                        |                            |                                                                            |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                      | <div>Scale (approx)</div> <div>1:25</div>   | <div>Logged By</div> <div>JMH/DB</div> |
|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                                                            |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                      | <div>Figure No.</div> <div>NE4303A.M2</div> |                                        |





PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,  
ROTHERHAM. SOUTH YORKSHIRE

M2

**Job  
Number**  
NE4303A

Sheet  
2/2

| Depth (m)                           | Sample / Tests     | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description                                                                                                                                        | Legend                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Water |
|-------------------------------------|--------------------|------------------|-----------------|---------------|-------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 5.00-5.45<br>5.00-5.45<br>5.00-6.00 | SPT N=10<br>D<br>C |                  |                 | 2,2/1,3,3,3   |             | (1.55)                | orangish brown mottled silty CLAY (completely weathered mudstone).<br>...below 5.00m: thinly laminated in places, orangish brown and grey mottled. | <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> |       |
| 6.00-6.45                           | SPT N=16           |                  |                 | 3,2/2,3,5,6   |             | 6.45                  | ...below 6.00m: greyish brown and occasional orangish brown mottled.                                                                               | <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div> <div><div>x</div><div>—</div><div>x</div></div>                                                                                                                                                                                                                                                 |       |
|                                     |                    |                  |                 | 06/10/2023:   |             |                       | Complete at 6.45m                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |

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By  
  
JMH/DB

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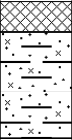
|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                                    |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|----------------------------|----------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                           |                                        |                            |                                                    |                        | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div> |                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div>Borehole Number</div> <div>M3</div>    |                                        |
| <div>Boring Method</div> <div>MINI PERCUSSIVE</div>                                                                                                                                                                                                                   |                           | <div>Casing Diameter</div>             |                            | <div>Ground Level (mOD)</div>                      |                        | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div>                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div>Job Number</div> <div>NE4303A</div>    |                                        |
|                                                                                                                                                                                                                                                                       |                           | <div>Location</div> <div>AS PLAN</div> |                            | <div>Dates</div> <div>06/10/2023</div>             |                        | <div>Engineer</div>                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div>Sheet</div> <div>1/2</div>             |                                        |
| <div>Depth (m)</div>                                                                                                                                                                                                                                                  | <div>Sample / Tests</div> | <div>Casing Depth (m)</div>            | <div>Water Depth (m)</div> | <div>Field Records</div>                           | <div>Level (mOD)</div> | <div>Depth (m) (Thickness)</div>                                                                 | <div>Description</div>                                                                                                                                                                                                                                                                                                                                                                                                                    | <div>Legend</div>                           | <div>Water</div>                       |
| 0.00-1.00                                                                                                                                                                                                                                                             | C                         |                                        |                            | 0.00m to 1.00m - 100% Recovery                     |                        | (0.10)<br>0.10                                                                                   | MADE GROUND: grass over dark brown slightly gravelly sandy silty clay with many rootlets.Gravel sized fragments are fine to medium sandstone and siltstone.<br><br>MADE GROUND: soft to firm greyish brown, grey, speckled black and orangish brown, gravelly sandy silty clay. Gravel sized fragments are subangular to subrounded fine to coarse sandstone and mudstone (Colliery spoil).<br>...between 0.10m and 0.35m: very gravelly. |                                             |                                        |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=18        |                                        |                            | 1.00m to 2.00m - 100% Recovery<br>3,4/5,4,4,5      |                        |                                                                                                  | ...below 1.00m: locally firm, grey and dark grey, slightly sandy.                                                                                                                                                                                                                                                                                                                                                                         |                                             |                                        |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=2         |                                        |                            | 2.00m to 3.00m - 65% Recovery<br>0,0/1,1,0,0       |                        |                                                                                                  | ...below 2.00m: locally very soft.                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                        |
|                                                                                                                                                                                                                                                                       |                           |                                        |                            | Water inflow(1) at 2.50m.                          |                        | (4.90)                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             | ▽1                                     |
| 3.00-3.45<br>3.00-4.00<br>3.00-3.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=32        |                                        |                            | 3.00m to 4.00m - 70% Recovery<br>5,9/8,8,8,8       |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                        |
| 4.00-4.45<br>4.00-5.00<br>4.00-4.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=25        |                                        |                            | 4.00m to 5.00m - Recovered as Bulk<br>2,2/3,4,11,7 |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                        |
| 5.00-5.45                                                                                                                                                                                                                                                             | SPT N=15                  |                                        |                            | 2,3/3,4,4,4                                        |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                        |
| <div>Remarks</div> <div>C= Plastic lined core sample</div> <div>Core diameters: 86mm to 1.00m, 76mm to 2.00m and 66mm to 4.00m.</div> <div>Borehole collapsed below 2.50m.</div> <div>On completion backfilled with gravel and grout.</div>                           |                           |                                        |                            |                                                    |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div>Scale (approx)</div> <div>1:25</div>   | <div>Logged By</div> <div>JMH/DB</div> |
|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                                    |                        |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div>Figure No.</div> <div>NE4303A.M3</div> |                                        |

|                                                                                                                                                                                                                                                                       |                |                        |                       |                     |                |                                          |                                                                                                                                                                                                                                                                                                                                                             |                                                                        |                                 |  |
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| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                |                        |                       |                     |                |                                          | Site<br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,<br>ROTHERHAM, SOUTH YORKSHIRE                                                                                                                                                                                                                                                                            |                                                                        | Borehole<br>Number<br><b>M3</b> |  |
| Boring Method<br>MINI PERCUSSIVE                                                                                                                                                                                                                                      |                | Casing Diameter        |                       | Ground Level (mOD)  |                | Client<br>GROUNDWORK YORKSHIRE           |                                                                                                                                                                                                                                                                                                                                                             | Job<br>Number<br>NE4303A                                               |                                 |  |
|                                                                                                                                                                                                                                                                       |                | Location<br>AS PLAN    |                       | Dates<br>06/10/2023 |                | Engineer                                 |                                                                                                                                                                                                                                                                                                                                                             | Sheet<br>2/2                                                           |                                 |  |
| Depth<br>(m)                                                                                                                                                                                                                                                          | Sample / Tests | Casing<br>Depth<br>(m) | Water<br>Depth<br>(m) | Field Records       | Level<br>(mOD) | Depth<br>(m)<br>(Thickness)              | Description                                                                                                                                                                                                                                                                                                                                                 | Legend                                                                 | Water                           |  |
| 5.00-5.45                                                                                                                                                                                                                                                             | D              |                        |                       | 06/10/2023:         |                | 5.00<br>(0.20)<br>5.20<br>(0.25)<br>5.45 | MADE GROUND: firm thinly laminated dark grey slightly organic slightly gravelly slightly sandy silty clay with occasional plant material. Gravel sized fragments are fine to medium coal. (Organic odour).<br><br>Firm medium strength thinly laminated greyish brown with black specks silty CLAY (completely weathered mudstone)<br><br>Complete at 5.45m | <div><div></div><div>x — x</div><div>x — x</div><div>x — x</div></div> |                                 |  |
| Remarks                                                                                                                                                                                                                                                               |                |                        |                       |                     |                |                                          | Scale<br>(approx)<br><br>1:25                                                                                                                                                                                                                                                                                                                               | Logged<br>By<br><br>JMH/DB                                             |                                 |  |
|                                                                                                                                                                                                                                                                       |                |                        |                       |                     |                |                                          | Figure No.<br>NE4303A.M3                                                                                                                                                                                                                                                                                                                                    |                                                                        |                                 |  |

|                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                     |                 |                                               |                     |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                       |                       |  |
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| Boring Method<br>MINI PERCUSSIVE                                                                                                                                                                                                                                                                                                                                                                          |                    | Casing Diameter     |                 |                                               | Ground Level (mOD)  |                                                                               | Client<br>GROUNDWORK YORKSHIRE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                          |                       | Job Number<br>NE4303A |  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                    | Location<br>AS PLAN |                 |                                               | Dates<br>06/10/2023 |                                                                               | Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |                       | Sheet<br>1/2          |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                 | Sample / Tests     | Casing Depth (m)    | Water Depth (m) | Field Records                                 | Level (mOD)         | Depth (m) (Thickness)                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Legend                   | Water                 | Instr                 |  |
| 0.00-1.00                                                                                                                                                                                                                                                                                                                                                                                                 | C                  |                     |                 | 0.00m to 1.00m - 100% Recovery                |                     | (0.20)<br>0.20<br>(0.30)<br>0.50                                              | MADE GROUND: grass over soft dark brown slightly sandy slightly gravelly silty clay with abundant rootlets. Gravel sized fragments are fine stone.<br><br>MADE GROUND: soft to firm brown speckled orangish brown slightly gravelly sandy silty clay with occasional lenses and pockets of fine to medium sand. Gravel sized fragments are fine to medium sandstone and siltstone.<br><br>MADE GROUND: soft to firm grey speckled orangish brown and black gravelly slightly sandy silty clay with some bands of gravel. Gravel sized fragments are fine to coarse mudstone, coal and sandstone (Colliery spoil).<br>...below 1.00m: firm to stiff grey and dark grey. |                          |                       |                       |  |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                                                                                                                                                       | D<br>C<br>SPT N=19 |                     |                 | 1.00m to 2.00m - 100% Recovery<br>3,4/6,5,4,4 |                     |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                       |                       |  |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                                                                                                                                                       | D<br>C<br>SPT N=20 |                     |                 | 2.00m to 3.00m - 100% Recovery<br>3,3/3,3,6,8 |                     | (3.50)                                                                        | ...between 2.55m and 2.80m: band of dark grey slightly ashy sandy fine to medium gravel sized fragments of coal.<br><br>...below 3.00m: no bands of gravel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |                       |                       |  |
| 3.00-3.45<br>3.00-4.00<br>3.00-3.45                                                                                                                                                                                                                                                                                                                                                                       | D<br>C<br>SPT N=16 |                     |                 | 3.00m to 4.00m - 100% Recovery<br>3,6/4,4,4,4 |                     |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                       |                       |  |
| 4.00-4.45<br>4.00-5.00<br>4.00-4.45                                                                                                                                                                                                                                                                                                                                                                       | D<br>C<br>SPT N=17 |                     |                 | 4.00m to 5.00m - 85% Recovery<br>3,3/4,4,4,5  |                     | 4.00<br>(0.35)<br>4.35<br>(0.65)                                              | MADE GROUND: firm grey and dark grey gravelly silty clay. Gravel sized fragments are fine to medium coal (Colliery spoil).<br><br>Firm medium strength orangish brown and occasional grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is angular to subangular fine to medium sandstone.                                                                                                                                                                                                                                                                                                                                                               |                          |                       |                       |  |
| 5.00-5.45                                                                                                                                                                                                                                                                                                                                                                                                 | SPT N=12           |                     |                 | HV at 4.90m<br>c=40kPa<br>2,2/2,2,4,4         |                     |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                       |                       |  |
| Remarks<br>HV = Hand Shear Vane Test<br>C = Plastic lined core sample<br>Core diameters: 86mm to 1.00m, 76mm to 2.00m, 66mm to 4.00m and 56mm to 6.00m<br>On completion backfilled with gravel and installed a 50mm diameter hdpe gas monitoring pipe with a gas valve and a gravel surround to 4.00m, a Bentonite seal from 1.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m |                    |                     |                 |                                               |                     |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Scale (approx)<br>1:25   | Logged By<br>JMH/DB   |                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                     |                 |                                               |                     |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Figure No.<br>NE4303A.M4 |                       |                       |  |

|                                                                                                                                                                                                                                                                       |                |                        |                       |                                                                    |                |                                |                                                                                                                                                                        |                          |              |                                 |  |
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| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                |                        |                       |                                                                    |                |                                | Site<br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,<br>ROTHERHAM, SOUTH YORKSHIRE                                                                                       |                          |              | Borehole<br>Number<br><b>M4</b> |  |
| Boring Method<br>MINI PERCUSSIVE                                                                                                                                                                                                                                      |                | Casing Diameter        |                       | Ground Level (mOD)                                                 |                | Client<br>GROUNDWORK YORKSHIRE |                                                                                                                                                                        | Job<br>Number<br>NE4303A |              |                                 |  |
|                                                                                                                                                                                                                                                                       |                | Location<br>AS PLAN    |                       | Dates<br>06/10/2023                                                |                | Engineer                       |                                                                                                                                                                        | Sheet<br>2/2             |              |                                 |  |
| Depth<br>(m)                                                                                                                                                                                                                                                          | Sample / Tests | Casing<br>Depth<br>(m) | Water<br>Depth<br>(m) | Field Records                                                      | Level<br>(mOD) | Depth<br>(m)<br>(Thickness)    | Description                                                                                                                                                            | Legend                   | Water        | Instr                           |  |
| 5.00-5.45<br>5.00-6.00                                                                                                                                                                                                                                                | D<br>C         |                        |                       | 5.00m to 6.00m -<br>100% Recovery                                  |                | 5.00<br><br>(0.50)             | Firm medium strength orangish brown and occasional grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is angular to subangular fine to medium sandstone. |                          |              |                                 |  |
| 6.00-6.45<br>6.00-6.45                                                                                                                                                                                                                                                | SPT N=31<br>D  |                        |                       | HV at 5.70m<br>c= 118kPa<br><br>3,4/6,6,8,11<br><br>06/10/2023:DRY |                | 5.50<br><br>(0.95)<br><br>6.45 | Stiff high strength light orangish brown and light grey silty CLAY (completely weathered mudstone).<br><br>Complete at 6.45m                                           |                          |              |                                 |  |
| Remarks                                                                                                                                                                                                                                                               |                |                        |                       |                                                                    |                |                                |                                                                                                                                                                        | Scale<br>(approx)        | Logged<br>By |                                 |  |
|                                                                                                                                                                                                                                                                       |                |                        |                       |                                                                    |                |                                |                                                                                                                                                                        | 1:25                     | JMH/DB       |                                 |  |
|                                                                                                                                                                                                                                                                       |                |                        |                       |                                                                    |                |                                |                                                                                                                                                                        | Figure No.<br>NE4303A.M4 |              |                                 |  |

| SUB SURFACE<br>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS<br>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907                                                                                                                                                                                                                                     |                    |                        |                       |                                                                              |                     |                                  | Site<br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,<br>ROTHERHAM, SOUTH YORKSHIRE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          | Borehole<br>Number<br>M5 |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------|-----------------------|------------------------------------------------------------------------------|---------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-------|
| Boring Method<br>MINI PERCUSSIVE                                                                                                                                                                                                                                                                                                                                                                                    |                    | Casing Diameter        |                       |                                                                              | Ground Level (mOD)  |                                  | Client<br>GROUNDWORK YORKSHIRE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                          | Job<br>Number<br>NE4303A |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                     |                    | Location<br>AS PLAN    |                       |                                                                              | Dates<br>06/10/2023 |                                  | Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          | Sheet<br>1/2             |       |
| Depth<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                        | Sample / Tests     | Casing<br>Depth<br>(m) | Water<br>Depth<br>(m) | Field Records                                                                | Level<br>(mOD)      | Depth<br>(m)<br>(Thickness)      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Legend                   | Water                    | Instr |
| 0.00-1.00                                                                                                                                                                                                                                                                                                                                                                                                           | C                  |                        |                       | 0.00m to 1.00m -<br>100% Recovery                                            |                     | (0.15)<br>0.15<br>(0.25)<br>0.40 | MADE GROUND: grass over soft dark brown slightly gravelly slightly sandy silty clay with many rootlets. Gravel sized fragments are fine to medium stone.<br><br>MADE GROUND: soft light orangish brown and light grey slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone and siltstone.<br><br>MADE GROUND: soft to firm grey, light grey and occasional mottled black and dark orangish brown gravelly slightly sandy silty clay with occasional bands of gravel. Gravel sized fragments are fine to coarse mudstone, coal and sandstone (Colliery spoil).<br>...below 1.00m: grey and dark grey |                          |                          |       |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                                                                                                                                                                 | D<br>C<br>SPT N=15 |                        |                       | 1.00m to 2.00m -<br>100% Recovery<br>2,4/4,3,4,4                             |                     |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |                          |       |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                                                                                                                                                                 | D<br>C<br>SPT N=29 |                        |                       | 2.00m to 3.00m -<br>95% Recovery<br>5,7/6,6,7,10                             |                     | (3.60)                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |                          |       |
| 3.00-3.45<br>3.00-4.00<br>3.00-3.45                                                                                                                                                                                                                                                                                                                                                                                 | D<br>C<br>SPT N=8  |                        |                       | 3.00m to 4.00m -<br>65% Recovery<br>3,3/3,2,2,1<br>Water inflow(1) at 3.20m. |                     |                                  | ...between 2.75m and 2.80m: band of fine to medium gravel sized fragments of coal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                          |                          |       |
| 3.90-4.35<br>4.00-4.45<br>4.00-5.00                                                                                                                                                                                                                                                                                                                                                                                 | SPT N=22<br>D<br>C |                        |                       | 8,4/4,5,6,7<br>4.00m to 5.00m -<br>55% Recovery                              |                     | 4.00<br>(0.60)<br>4.60<br>(0.50) | ...below 3.80m: dark grey, ashy, very sandy. Gravel sized fragments are fine to coarse coal.<br><br>MADE GROUND: grey very silty clayey slightly sandy fine to coarse gravel sized fragments of mudstone, brick and sandstone (Colliery spoil).<br><br>MADE GROUND: soft to firm greyish brown and grey mottled gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and brick (Colliery spoil).                                                                                                                                                                                                        |                          |                          |       |
| 5.00-5.45                                                                                                                                                                                                                                                                                                                                                                                                           | SPT N=32           |                        |                       | 5,4/6,7,9,10                                                                 |                     |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |                          |       |
| Remarks<br>C = Plastic lined core sample.<br>Core diameters: 86mm to 1.00m, 76mm to 2.00m, 66mm to 4.00m and 56mm to 5.00m.<br>Borehole collapsed below 3.50m.<br>On completion backfilled with gravel and installed a 50mm diameter hdpe gas monitoring standpipe with a gas valve and a gravel surround to 3.50m, a Bentonite seal from 1.00m to 0.20m and a concrete lockable steel protective cover from 0.20m. |                    |                        |                       |                                                                              |                     |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Scale<br>(approx)        | Logged<br>By             |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                        |                       |                                                                              |                     |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1:25                     | JMH/DB                   |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                        |                       |                                                                              |                     |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Figure No.<br>NE4303A.M5 |                          |       |

|                                                                                                                                                                                                                                                                       |                |                        |                       |                     |                |                                |                                                                                                                |                                                                                     |           |                                                                                     |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------|-----------------------|---------------------|----------------|--------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|--|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                |                        |                       |                     |                |                                | Site<br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,<br>ROTHERHAM, SOUTH YORKSHIRE                               |                                                                                     |           | Borehole<br>Number<br><b>M5</b>                                                     |  |
| Boring Method<br>MINI PERCUSSIVE                                                                                                                                                                                                                                      |                | Casing Diameter        |                       | Ground Level (mOD)  |                | Client<br>GROUNDWORK YORKSHIRE |                                                                                                                | Job<br>Number<br>NE4303A                                                            |           |                                                                                     |  |
|                                                                                                                                                                                                                                                                       |                | Location<br>AS PLAN    |                       | Dates<br>06/10/2023 |                | Engineer                       |                                                                                                                | Sheet<br>2/2                                                                        |           |                                                                                     |  |
| Depth<br>(m)                                                                                                                                                                                                                                                          | Sample / Tests | Casing<br>Depth<br>(m) | Water<br>Depth<br>(m) | Field Records       | Level<br>(mOD) | Depth<br>(m)<br>(Thickness)    | Description                                                                                                    | Legend                                                                              | Water     | Instr                                                                               |  |
| 5.00-5.45                                                                                                                                                                                                                                                             | D              |                        |                       | 06/10/2023:         |                | 5.10                           | Stiff high strength orangish brown and grey mottled slightly sandy silty CLAY (completely weathered mudstone). |  |           |  |  |
|                                                                                                                                                                                                                                                                       |                |                        |                       |                     |                | (0.35)                         |                                                                                                                |                                                                                     |           |                                                                                     |  |
|                                                                                                                                                                                                                                                                       |                |                        |                       |                     |                | 5.45                           | Complete at 5.45m                                                                                              |                                                                                     |           |                                                                                     |  |
| Remarks                                                                                                                                                                                                                                                               |                |                        |                       |                     |                |                                |                                                                                                                | Scale (approx)                                                                      | Logged By |                                                                                     |  |
|                                                                                                                                                                                                                                                                       |                |                        |                       |                     |                |                                |                                                                                                                | 1:25                                                                                | JMH/DB    |                                                                                     |  |
|                                                                                                                                                                                                                                                                       |                |                        |                       |                     |                |                                |                                                                                                                | Figure No.<br>NE4303A.M5                                                            |           |                                                                                     |  |

|  <b>SUB SURFACE</b><br>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS<br>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907 |                    |                            |                 |                                                 |             |                                          | <b>Site</b><br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                 | <b>Borehole Number</b><br><b>M6</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-----------------|-------------------------------------------------|-------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------|
| <b>Boring Method</b><br>MINI PERCUSSIVE                                                                                                                                                                                                                                |                    | <b>Casing Diameter</b>     |                 | <b>Ground Level (mOD)</b>                       |             | <b>Client</b><br>GROUNDWORK YORKSHIRE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Job Number</b><br>NE4303A    |                                     |
|                                                                                                                                                                                                                                                                        |                    | <b>Location</b><br>AS PLAN |                 | <b>Dates</b><br>09/10/2023                      |             | <b>Engineer</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Sheet</b><br>1/2             |                                     |
| Depth (m)                                                                                                                                                                                                                                                              | Sample / Tests     | Casing Depth (m)           | Water Depth (m) | Field Records                                   | Level (mOD) | Depth (m) (Thickness)                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Legend                          | Water                               |
| 0.00-1.00                                                                                                                                                                                                                                                              | C                  |                            |                 | 0.00m to 1.00m - 100% Recovery                  |             | (0.10)<br>0.10<br>(0.30)<br>0.40         | MADE GROUND: grass over brown slightly sandy silty clay with many rootlets.<br>MADE GROUND: Soft light orangish brown and light grey slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone.<br>MADE GROUND: soft to firm grey light grey speckled black and light brown gravelly slightly sandy silty clay with occasional bands of gravel. Gravel sized fragments are fine to coarse mudstone, coal and rare sandstone (Colliery spoil).<br>...at 0.75m: sandstone cobble. |                                 |                                     |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=12 |                            |                 | 1.00m to 2.00m - 100% Recovery<br>2,2/2,3,5,2   |             |                                          | ...below 1.00m: grey and dark grey.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                 |                                     |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=37 |                            |                 | 2.00m to 3.00m - 100% Recovery<br>1,1/2,7,14,14 |             | (3.35)                                   | ...below 2.00m: locally stiff                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                 |                                     |
| 3.00-3.45<br>3.00-4.00<br>3.00-3.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=11 |                            |                 | 3.00m to 4.00m - 100% Recovery<br>3,3/2,3,3,3   |             |                                          | ...between 2.35m and 2.65m: dark grey slightly ashy sandy fine to medium gravel sized fragments of coal.                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                                     |
| 4.00-4.45<br>4.00-5.00<br>4.00-4.45                                                                                                                                                                                                                                    | D<br>C<br>SPT N=16 |                            |                 | 4.00m to 5.00m - 80% Recovery<br>3,3/3,4,4,5    |             | 3.75<br>(0.10)<br>3.85<br>(0.25)<br>4.10 | MADE GROUND: dark grey ashy sandy fine to medium gravel sized fragments of coal.<br>MADE GROUND: stiff brownish grey speckled black slightly organic slightly gravelly slightly sandy silty clay with occasional plant material. Gravel sized fragments are fine to medium coal. (Organic odour).                                                                                                                                                                                                                      |                                 |                                     |
|                                                                                                                                                                                                                                                                        |                    |                            |                 |                                                 |             | (0.75)                                   | MADE GROUND: firm greyish brown and occasionally speckled black slightly sandy silty clay (organic odour) (Possible natural).                                                                                                                                                                                                                                                                                                                                                                                          |                                 |                                     |
|                                                                                                                                                                                                                                                                        |                    |                            |                 | 5.00m to 5.90m - 100% Recovery                  |             | 4.85                                     | Firm medium strength brown, orangish brown and occasional grey mottled slightly gravelly slightly sandy silty                                                                                                                                                                                                                                                                                                                                                                                                          |                                 |                                     |
| <b>Remarks</b><br>Intermittent groundwater seepage throughout.<br>C = Plastic lined core sample.<br>Core diameters: 86mm to 1.00m, 76mm to 2.00m, 66mm to 4.00m and 56mm to 5.90m.<br>On completion backfilled with gravel and grout.                                  |                    |                            |                 |                                                 |             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Scale (approx)</b><br>1:25   | <b>Logged By</b><br>JMH/DB          |
|                                                                                                                                                                                                                                                                        |                    |                            |                 |                                                 |             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Figure No.</b><br>NE4303A.M6 |                                     |





PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,  
ROTHERHAM, SOUTH YORKSHIRE

**Job  
Number**  
NE4303A

**Job  
Number**  
NE4303A

Sheet  
2/2

| Depth (m)                           | Sample / Tests     | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description                                                                                                                   | Legend | Water |
|-------------------------------------|--------------------|------------------|-----------------|---------------|-------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------|--------|-------|
| 5.00-5.45<br>5.00-5.45<br>5.00-5.90 | SPT N=11<br>D<br>C |                  |                 | 2,2/2,2,3,4   |             | (1.00)                | CLAY with occasional pockets of sand. Gravel is subangular to subrounded fine sandstone.                                      |        |       |
| 5.90-6.35<br>5.90-6.35              | SPT N=33<br>D      |                  |                 | 4,5/6,7,9,11  |             | 5.85<br>(0.50)        | Stiff high strength thinly laminated yellowish brown and occasional grey mottled silty CLAY. (Completely weathered mudstone). |        |       |
|                                     |                    |                  |                 | 09/10/2023:   |             | 6.35                  | Complete at 6.35m                                                                                                             |        |       |

Figure No.  
NE4303A.M6

|                                                                                                                                                                                                                                                                       |                    |                     |                 |                                                  |             |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |                     |                          |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|-----------------|--------------------------------------------------|-------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------|--------------------------|--|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                    |                     |                 |                                                  |             |                                                    | Site<br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |                     | Borehole Number<br>M7    |  |
| Boring Method<br>MINI PERCUSSIVE                                                                                                                                                                                                                                      |                    | Casing Diameter     |                 | Ground Level (mOD)                               |             | Client<br>GROUNDWORK YORKSHIRE                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Job Number<br>NE4303A  |                     |                          |  |
|                                                                                                                                                                                                                                                                       |                    | Location<br>AS PLAN |                 | Dates<br>09/10/2023                              |             | Engineer                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Sheet<br>1/2           |                     |                          |  |
| Depth (m)                                                                                                                                                                                                                                                             | Sample / Tests     | Casing Depth (m)    | Water Depth (m) | Field Records                                    | Level (mOD) | Depth (m) (Thickness)                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Legend                 | Water               | Instr                    |  |
| 0.00-1.00                                                                                                                                                                                                                                                             | C                  |                     |                 | 0.00m to 1.00m - 90% Recovery                    |             | (0.10)<br>0.10<br>(0.25)<br>0.35<br>(0.25)<br>0.60 | MADE GROUND: grass over dark brown slightly gravelly slightly sandy silty clay with many rootlets. Gravel sized fragments are fine to medium stone.<br><br>MADE GROUND: soft grey gravelly slightly sandy silty clay with occasional rootlets. Gravel sized fragments are fine to coarse stone, brick and plastic.<br><br>MADE GROUND: soft brown and grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse stone, brick and occasional coal.<br><br>MADE GROUND: firm to stiff, grey gravelly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone (Colliery spoil). |                        |                     |                          |  |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=28 |                     |                 | 1.00m to 2.00m - 100% Recovery<br>4,5/5,7,8,8    |             | (1.50)                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |                     |                          |  |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=39 |                     |                 | 2.00m to 3.00m - 100% Recovery<br>2,7/7,10,10,12 |             | 2.10<br>(0.10)<br>2.20<br>(0.35)<br>2.55           | MADE GROUND: dark grey slightly ashy sandy fine to medium gravel sized fragments of coal.<br><br>MADE GROUND: grey gravelly sandy silty clay with some bands of gravel and sand. Gravel sized fragments are fine to coarse sandstone, mudstone and coal (Colliery spoil).<br><br>MADE GROUND: dark grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse coal and occasional mudstone and sandstone (Colliery spoil).                                                                                                                                                                                     |                        |                     |                          |  |
| 3.00-3.45<br>3.00-4.00<br>3.00-3.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=10 |                     |                 | 3.00m to 4.00m - 100% Recovery<br>3,3/2,2,3,3    |             | (1.00)                                             | ...below 3.10m: grey and dark grey, with occasional plant material.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |                     |                          |  |
|                                                                                                                                                                                                                                                                       |                    |                     |                 | Water inflow(1) at 3.50m.                        |             | 3.55<br>(0.40)                                     | MADE GROUND: dark grey slightly ashy sandy fine to medium gravel sized fragments of coal with occasional bands of clay (Colliery spoil).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |                     | V1                       |  |
| 4.00-4.45<br>4.00-5.00<br>4.00-4.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=18 |                     |                 | 4.00m to 5.00m - 100% Recovery<br>3,4/4,4,5,5    |             | 3.95<br>(0.35)<br>4.30<br>(0.70)                   | MADE GROUND: brownish grey speckled black slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium coal and sandstone. (Organic odour).<br><br>Firm medium strength orangish brown and light greyish brown slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to coarse sandstone and coal.<br><br>...below 4.75m: dark browish grey and black.                                                                                                                                                                                                                           |                        |                     |                          |  |
| Remarks<br>C= Plastic lined core sample.<br>Core diameters: 86mm to 1.00m, 76mm to 2.00m, 66mm to 4.00m and 56mm to 5.70m.<br>Borehole extended with dynamic probing (se DP7).<br>On completion backfilled with gravel and grout.                                     |                    |                     |                 |                                                  |             |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Scale (approx)<br>1:25 | Logged By<br>JMH/DB | Figure No.<br>NE4303A.M7 |  |
|                                                                                                                                                                                                                                                                       |                    |                     |                 |                                                  |             |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |                     |                          |  |
|                                                                                                                                                                                                                                                                       |                    |                     |                 |                                                  |             |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |                     |                          |  |



PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,  
ROTHERHAM. SOUTH YORKSHIRE

**Borehole  
Number**  
**M7**

Job  
Number  
NE4303A

Sheet  
2/2

| Depth (m)                           | Sample / Tests     | Casing Depth (m) | Water Depth (m) | Field Records  | Level (mOD) | Depth (m) (Thickness) | Description                                                                                                                                                                                                                                               | Legend                                                                              | Water | Instr |
|-------------------------------------|--------------------|------------------|-----------------|----------------|-------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|-------|
| 5.00-5.45<br>5.00-5.45<br>5.00-5.70 | SPT N=32<br>D<br>C |                  |                 | 3,3/5,7,8,12   |             | 5.00                  | Stiff high strength becoming very stiff very high strength thinly laminated grey and occasionally dark grey and yellowish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel is angular fine lithorelicts (completely weathered mudstone). |  |       |       |
| 5.70-6.15<br>5.70-6.15              | SPT N=43<br>D      |                  |                 | 5,7/9,10,11,13 |             | (1.15)                | ...below 5.70m: very stiff very high strength grey and occasional yellowish brown.                                                                                                                                                                        |  |       |       |
|                                     |                    |                  |                 | 09/10/2023:    |             | 6.15                  | Complete at 6.15m                                                                                                                                                                                                                                         |                                                                                     |       |       |

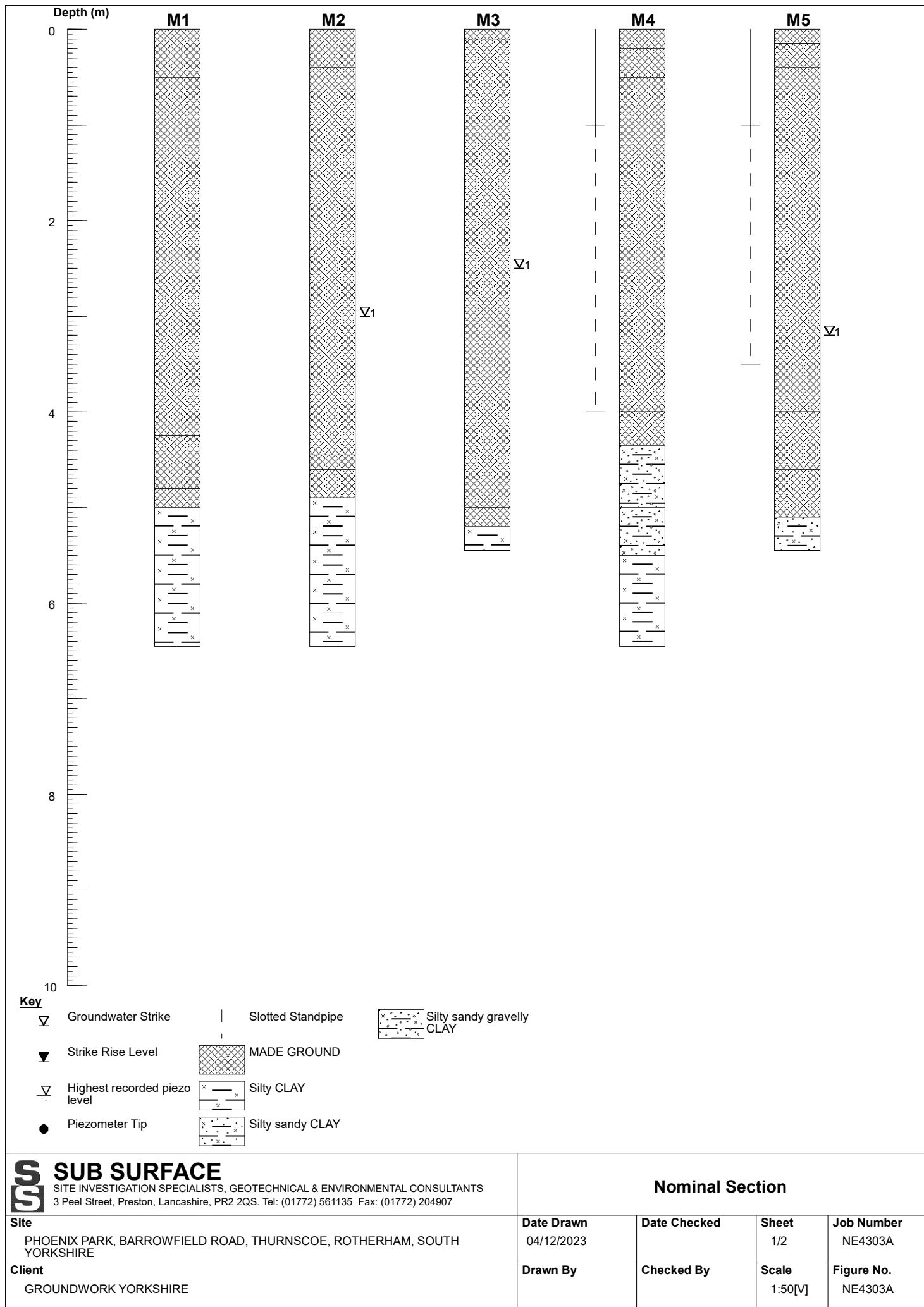
JM/DB

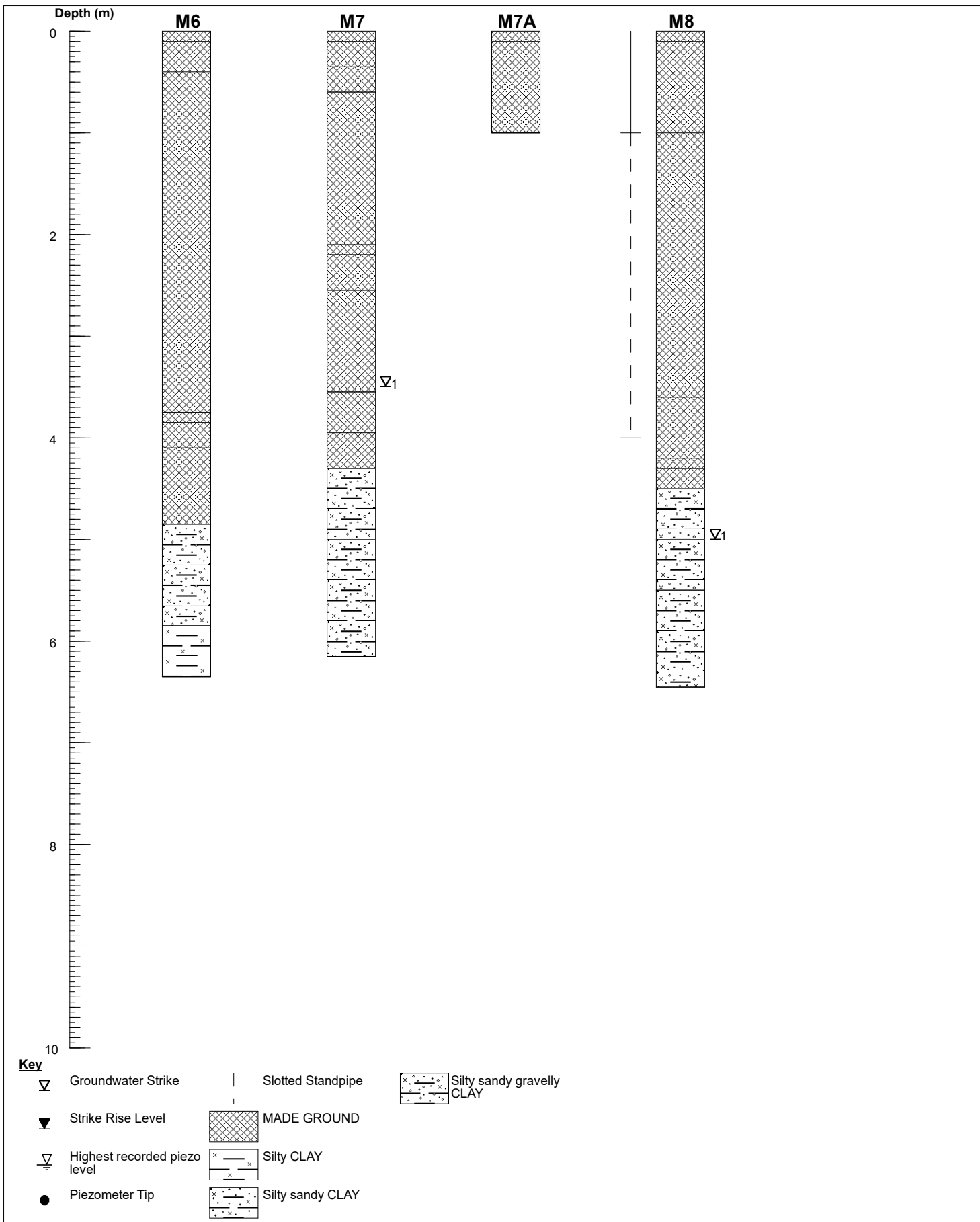
**Figure No.**  
NE4303A.M7

|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                        |                        |                                                   |                                                                                                                                                         |                                              |                                           |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|----------------------------|----------------------------------------|------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------|--|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                           |                                        |                            |                                        |                        |                                                   | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div>                                                        |                                              | <div>Borehole Number</div> <div>M7A</div> |  |
| <div>Boring Method</div> <div>MINI PERCUSSIVE</div>                                                                                                                                                                                                                   |                           | <div>Casing Diameter</div>             |                            | <div>Ground Level (mOD)</div>          |                        | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div> |                                                                                                                                                         | <div>Job Number</div> <div>NE4303A</div>     |                                           |  |
|                                                                                                                                                                                                                                                                       |                           | <div>Location</div> <div>AS PLAN</div> |                            | <div>Dates</div> <div>09/10/2023</div> |                        | <div>Engineer</div>                               |                                                                                                                                                         | <div>Sheet</div> <div>1/1</div>              |                                           |  |
| <div>Depth (m)</div>                                                                                                                                                                                                                                                  | <div>Sample / Tests</div> | <div>Casing Depth (m)</div>            | <div>Water Depth (m)</div> | <div>Field Records</div>               | <div>Level (mOD)</div> | <div>Depth (m) (Thickness)</div>                  | <div>Description</div>                                                                                                                                  | <div>Legend</div>                            | <div>Water</div>                          |  |
| 0.30-0.60                                                                                                                                                                                                                                                             | B                         |                                        |                            | 09/10/2023:DRY                         |                        | 0.10                                              | Grass over MADE GROUND: brown slightly gravelly slightly sandy silty clay with many rootlets. Gravel sized fragments are fine to medium stone.          | <div></div>                                  |                                           |  |
|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                        |                        | 0.10                                              | MADE GROUND: very soft brown gravelly slightly sandy silty clay with occasional roots. Gravel sized fragments are fine to coarse stone, brick and coal. |                                              |                                           |  |
|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                        |                        | 0.90                                              |                                                                                                                                                         |                                              |                                           |  |
|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                        |                        | 1.00                                              | Complete at 1.00m                                                                                                                                       |                                              |                                           |  |
| <div>Remarks</div> <div>On completion backfilled with gravel and grout.</div>                                                                                                                                                                                         |                           |                                        |                            |                                        |                        |                                                   |                                                                                                                                                         | <div>Scale (approx)</div> <div>1:25</div>    | <div>Logged By</div> <div>JMH/DB</div>    |  |
|                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                        |                        |                                                   |                                                                                                                                                         | <div>Figure No.</div> <div>NE4303A.M7A</div> |                                           |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                                        |                            |                                                 |                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                     |                                           |                                          |                                             |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|----------------------------|-------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------|---------------------------------------------|--|
| <div><div><div></div><div></div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS<br/>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div>                                                                                                                                                                         |                           |                                        |                            |                                                 |                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div>                                                                                                    |                                           |                                          | <div>Borehole Number</div> <div>M8</div>    |  |
| <div>Boring Method</div> <div>MINI PERCUSSIVE</div>                                                                                                                                                                                                                                                                                                                                                                                   |                           | <div>Casing Diameter</div>             |                            | <div>Ground Level (mOD)</div>                   |                        | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                     |                                           | <div>Job Number</div> <div>NE4303A</div> |                                             |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           | <div>Location</div> <div>AS PLAN</div> |                            | <div>Dates</div> <div>09/10/2023</div>          |                        | <div>Engineer</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                           | <div>Sheet</div> <div>1/2</div>          |                                             |  |
| <div>Depth (m)</div>                                                                                                                                                                                                                                                                                                                                                                                                                  | <div>Sample / Tests</div> | <div>Casing Depth (m)</div>            | <div>Water Depth (m)</div> | <div>Field Records</div>                        | <div>Level (mOD)</div> | <div>Depth (m) (Thickness)</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <div>Description</div>                                                                                                                                                                              | <div>Legend</div>                         | <div>Water</div>                         | <div>Instr</div>                            |  |
| 0.00-1.00                                                                                                                                                                                                                                                                                                                                                                                                                             | C                         |                                        |                            | 0.00m to 1.00m - 100% Recovery                  |                        | <div><div>(0.10)</div><div>0.10</div></div> <div>MADE GROUND: grass over dark brown sandy silty clay with many rootlets.</div> <div><div>(0.90)</div></div> <div>MADE GROUND: soft to firm dark brownish grey speckled black gravelly sandy silty clay. Gravel sized fragments are fine to coarse sandstone, coal and occasional glass.</div>                                                                                                                                                                                                                                                   | <div><div></div><div></div></div>                                                                                                                                                                   |                                           |                                          |                                             |  |
| 1.00-1.45<br>1.00-2.00<br>1.00-1.45                                                                                                                                                                                                                                                                                                                                                                                                   | D<br>C<br>SPT N=18        |                                        |                            | 1.00m to 2.00m - 100% Recovery<br>3,3/3,5,5,5   |                        | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | MADE GROUND: firm grey and occasional dark grey very gravelly slightly sandy silty clay with some bands of gravel. Gravel sized fragments are shale, mudstone, coal and sandstone (Colliery spoil). | <div><div></div><div></div></div>         |                                          |                                             |  |
| 2.00-2.45<br>2.00-3.00<br>2.00-2.45                                                                                                                                                                                                                                                                                                                                                                                                   | D<br>C<br>SPT N=12        |                                        |                            | 2.00m to 3.00m - 100% Recovery<br>2,2/2,3,3,4   |                        | <div><div>(2.60)</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ...below 3.00m: with occasional bands of fine to medium gravel sized fragments of coal.                                                                                                             | <div><div></div><div></div></div>         |                                          |                                             |  |
| 3.00-3.45<br>3.00-4.00<br>3.00-3.45                                                                                                                                                                                                                                                                                                                                                                                                   | D<br>C<br>SPT N=37        |                                        |                            | 3.00m to 4.00m - 100% Recovery<br>7,7/8,9,10,10 |                        | 3.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | MADE GROUND: firm dark grey ashy gravelly sandy silty clay with some bands of gravel. Gravel sized fragments are fine to coarse coal and rare brick and sandstone (Colliery spoil).                 | <div><div></div><div></div></div>         |                                          |                                             |  |
| 4.00-4.45<br>4.00-5.00<br>4.00-4.45                                                                                                                                                                                                                                                                                                                                                                                                   | D<br>C<br>SPT N=16        |                                        |                            | 4.00m to 5.00m - 90% Recovery<br>3,4/5,4,4,3    |                        | <div><div>4.20</div><div>(0.10)</div><div>4.30</div></div> <div>MADE GROUND: dark grey ashy sandy fine to medium gravel sized fragments of coal.</div> <div><div>(0.20)</div><div>4.50</div></div> <div>MADE GROUND: firm dark brownish grey slightly organic slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine coal. (Organic odour).</div> <div><div>(0.50)</div></div> <div>Soft low strength brownish grey and occasional orangish brown mottled slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to medium sandstone and coal.</div> | <div><div></div><div></div><div></div><div></div><div></div><div></div></div>                                                                                                                       |                                           |                                          |                                             |  |
| <div>Remarks</div> <div>HV = Hand Shear Vane test.<br/>C = Plastic lined core sample.<br/>Core diameters: 86mm to 1.00m, 76mm to 2.00m, 66mm to 4.00m and 56mm to 6.00m.<br/>On completion backfilled with gravel and installed a 50mm diameter Hdpe gas monitoring standpipe with a gas valve and a gravel surround to 4.00m, a Bentonite seal from 1.00m to 0.20m and a concreted lockable steel protective cover from 0.20m.</div> |                           |                                        |                            |                                                 |                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                     | <div>Scale (approx)</div> <div>1:25</div> | <div>Logged By</div> <div>JMH/DB</div>   | <div>Figure No.</div> <div>NE4303A.M8</div> |  |

|                                                                                                                                                                                                                                                                       |                   |                        |                       |                                             |                |                                |                                                                                                                                                                                                                |                          |              |                                 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------|-----------------------|---------------------------------------------|----------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|---------------------------------|--|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                   |                        |                       |                                             |                |                                | Site<br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,<br>ROTHERHAM, SOUTH YORKSHIRE                                                                                                                               |                          |              | Borehole<br>Number<br><b>M8</b> |  |
| Boring Method<br>MINI PERCUSSIVE                                                                                                                                                                                                                                      |                   | Casing Diameter        |                       | Ground Level (mOD)                          |                | Client<br>GROUNDWORK YORKSHIRE |                                                                                                                                                                                                                | Job<br>Number<br>NE4303A |              |                                 |  |
|                                                                                                                                                                                                                                                                       |                   | Location<br>AS PLAN    |                       | Dates<br>09/10/2023                         |                | Engineer                       |                                                                                                                                                                                                                | Sheet<br>2/2             |              |                                 |  |
| Depth<br>(m)                                                                                                                                                                                                                                                          | Sample / Tests    | Casing<br>Depth<br>(m) | Water<br>Depth<br>(m) | Field Records                               | Level<br>(mOD) | Depth<br>(m)<br>(Thickness)    | Description                                                                                                                                                                                                    | Legend                   | Water        | Instr                           |  |
| 5.00-5.45<br>5.00-6.00<br>5.00-5.45                                                                                                                                                                                                                                   | D<br>C<br>SPT N=7 |                        |                       | Water inflow(1) at<br>5.00m.<br>1,1/1,2,2,2 |                | 5.00<br><br>(0.50)             | Soft low strength brownish grey and occasional<br>orangish brown mottled slightly gravelly sandy silty<br>CLAY. Gravel is subangular to subrounded fine to<br>medium sandstone and coal.                       |                          | Σ1           |                                 |  |
| 6.00-6.45<br>6.00-6.45                                                                                                                                                                                                                                                | SPT N=28<br>D     |                        |                       | HV at 5.85m<br>c=88kPa<br>2,4/4,7,7,10      |                | 5.50<br><br>(0.95)             | Stiff high strength thinly laminated brown, light<br>grey and yellowish brown mottled slightly gravelly<br>slightly sandy silty CLAY. Gravel is angular fine<br>lithorelicts. (Completely weathered mudstone). |                          |              |                                 |  |
|                                                                                                                                                                                                                                                                       |                   |                        |                       | 09/10/2023:                                 |                | 6.45                           | Complete at 6.45m                                                                                                                                                                                              |                          |              |                                 |  |
| Remarks                                                                                                                                                                                                                                                               |                   |                        |                       |                                             |                |                                |                                                                                                                                                                                                                | Scale<br>(approx)        | Logged<br>By |                                 |  |
|                                                                                                                                                                                                                                                                       |                   |                        |                       |                                             |                |                                |                                                                                                                                                                                                                | 1:25                     | JMH/DB       |                                 |  |
|                                                                                                                                                                                                                                                                       |                   |                        |                       |                                             |                |                                |                                                                                                                                                                                                                | Figure No.<br>NE4303A.M8 |              |                                 |  |





|                                                                                                                                                                                          |                                 |                     |                         |                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------|-------------------------|------------------------------|
| <b>S SUB SURFACE</b><br>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS<br>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907 | <b>Nominal Section</b>          |                     |                         |                              |
| <b>Site</b><br>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOPE, ROTHERHAM, SOUTH YORKSHIRE                                                                                                    | <b>Date Drawn</b><br>04/12/2023 | <b>Date Checked</b> | <b>Sheet</b><br>2/2     | <b>Job Number</b><br>NE4303A |
| <b>Client</b><br>GROUNDWORK YORKSHIRE                                                                                                                                                    | <b>Drawn By</b>                 | <b>Checked By</b>   | <b>Scale</b><br>1:50[V] | <b>Figure No.</b><br>NE4303A |

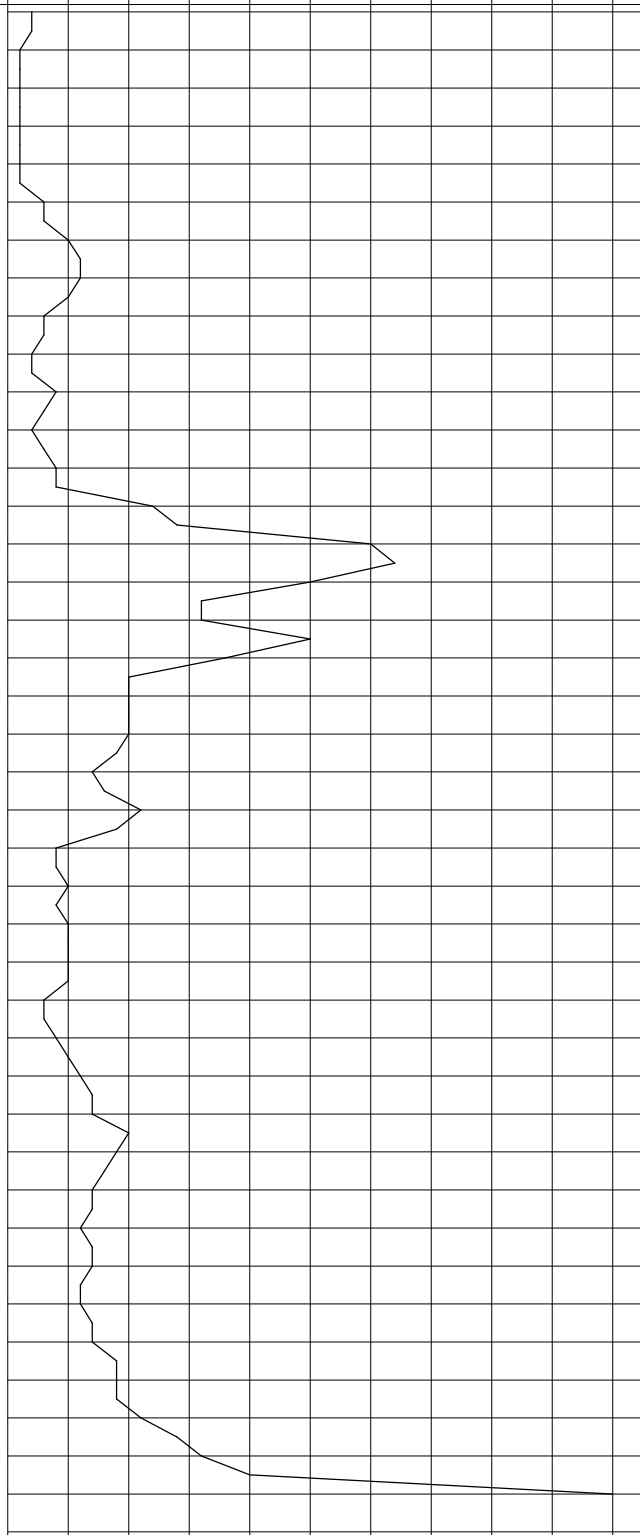


## **DYNAMIC PROBING RECORD SHEETS**

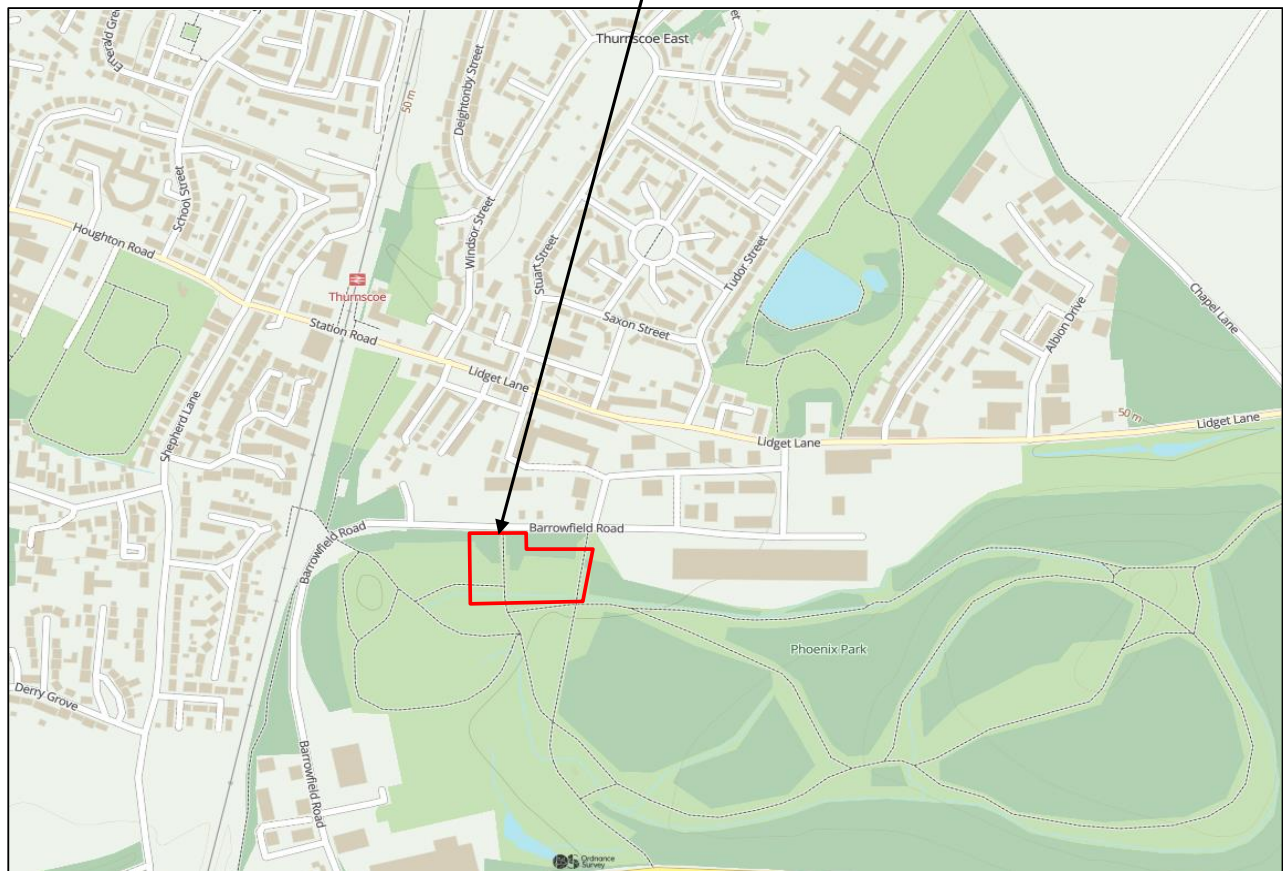
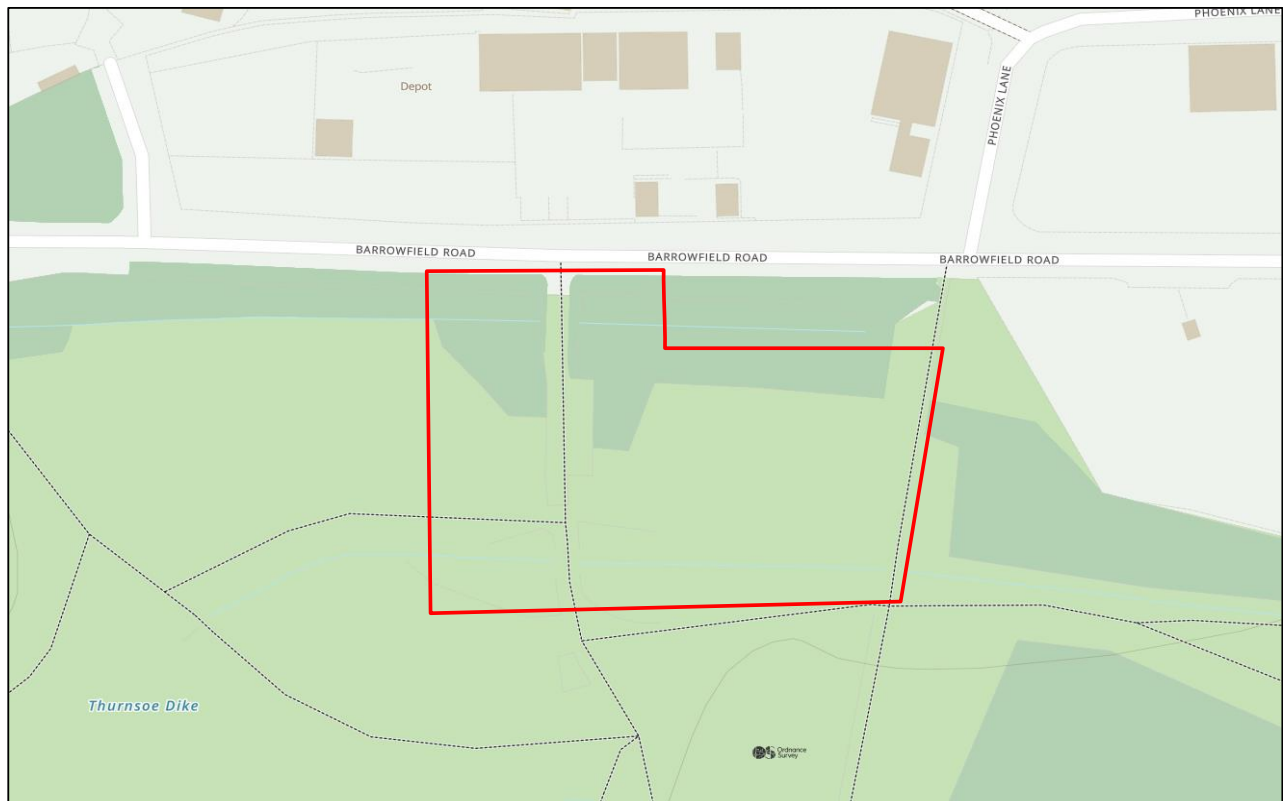
|                                                                                                                                                                                                                                                               |                                      |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------|--|--|--|----------------------------------------------|------------------------------------------|--|--|--|
| <div><div><div></div><div></div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS<br/>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                                      |                                                                |                        |                                        | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div> |                                                   |  |  |  | <div>Probe Number</div> <div>DP4</div>       |                                          |  |  |  |
| <div>Method</div> <div>Dynamic Probing</div>                                                                                                                                                                                                                  |                                      | <div>Cone Dimensions</div> <div>Diameter 50mm, Angle 90°</div> |                        | <div>Ground Level (mOD)</div>          |                                                                                                  | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div> |  |  |  |                                              | <div>Job Number</div> <div>NE4303A</div> |  |  |  |
|                                                                                                                                                                                                                                                               |                                      | <div>Location</div> <div>AS PLAN</div>                         |                        | <div>Dates</div> <div>09/10/2023</div> |                                                                                                  | <div>Engineer</div>                               |  |  |  |                                              | <div>Sheet</div> <div>1/1</div>          |  |  |  |
| <div>Depth (m)</div>                                                                                                                                                                                                                                          | <div>Blows for Depth Increment</div> | <div>Field Records</div>                                       | <div>Level (mOD)</div> | <div>Depth (m)</div>                   | <div>Blows for Depth Increment</div> <div>05101520253035404550</div>                             |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.20-0.30                                                                                                                                                                                                                                                     | 1                                    |                                                                |                        | 0.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.30-0.40                                                                                                                                                                                                                                                     | 1                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.40-0.50                                                                                                                                                                                                                                                     | 1                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.50-0.60                                                                                                                                                                                                                                                     | 1                                    |                                                                |                        | 0.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.60-0.70                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.70-0.80                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.80-0.90                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 0.90-1.00                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        | 1.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.00-1.10                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.10-1.20                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.20-1.30                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.30-1.40                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.40-1.50                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        | 1.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.50-1.60                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.60-1.70                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.70-1.80                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.80-1.90                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 1.90-2.00                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        | 2.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.00-2.10                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.10-2.20                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.20-2.30                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.30-2.40                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.40-2.50                                                                                                                                                                                                                                                     | 6                                    |                                                                |                        | 2.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.50-2.60                                                                                                                                                                                                                                                     | 6                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.60-2.70                                                                                                                                                                                                                                                     | 8                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.70-2.80                                                                                                                                                                                                                                                     | 10                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.80-2.90                                                                                                                                                                                                                                                     | 6                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 2.90-3.00                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        | 3.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.00-3.10                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.10-3.20                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.20-3.30                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.30-3.40                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.40-3.50                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        | 3.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.50-3.60                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.60-3.70                                                                                                                                                                                                                                                     | 2                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.70-3.80                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.80-3.90                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 3.90-4.00                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        | 4.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.00-4.10                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.10-4.20                                                                                                                                                                                                                                                     | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.20-4.30                                                                                                                                                                                                                                                     | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.30-4.40                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        | 4.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.40-4.50                                                                                                                                                                                                                                                     | 3                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.50-4.60                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.60-4.70                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.70-4.80                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.80-4.90                                                                                                                                                                                                                                                     | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 4.90-5.00                                                                                                                                                                                                                                                     | 5                                    |                                                                |                        | 5.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.00-5.10                                                                                                                                                                                                                                                     | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.10-5.20                                                                                                                                                                                                                                                     | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.20-5.30                                                                                                                                                                                                                                                     | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.30-5.40                                                                                                                                                                                                                                                     | 6                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.40-5.50                                                                                                                                                                                                                                                     | 6                                    |                                                                |                        | 5.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.50-5.60                                                                                                                                                                                                                                                     | 6                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.60-5.70                                                                                                                                                                                                                                                     | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.70-5.80                                                                                                                                                                                                                                                     | 8                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.80-5.90                                                                                                                                                                                                                                                     | 8                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 5.90-6.00                                                                                                                                                                                                                                                     | 8                                    |                                                                |                        | 6.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.00-6.10                                                                                                                                                                                                                                                     | 8                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.10-6.20                                                                                                                                                                                                                                                     | 8                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.20-6.30                                                                                                                                                                                                                                                     | 10                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.30-6.40                                                                                                                                                                                                                                                     | 9                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.40-6.50                                                                                                                                                                                                                                                     | 9                                    |                                                                |                        | 6.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.50-6.60                                                                                                                                                                                                                                                     | 10                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.60-6.70                                                                                                                                                                                                                                                     | 12                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.70-6.80                                                                                                                                                                                                                                                     | 12                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.80-6.90                                                                                                                                                                                                                                                     | 12                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 6.90-7.00                                                                                                                                                                                                                                                     | 14                                   |                                                                |                        | 7.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.00-7.10                                                                                                                                                                                                                                                     | 14                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.10-7.20                                                                                                                                                                                                                                                     | 12                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.20-7.30                                                                                                                                                                                                                                                     | 15                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.30-7.40                                                                                                                                                                                                                                                     | 15                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.40-7.50                                                                                                                                                                                                                                                     | 15                                   |                                                                |                        | 7.50                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.50-7.60                                                                                                                                                                                                                                                     | 17                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.60-7.70                                                                                                                                                                                                                                                     | 26                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| 7.70-7.80                                                                                                                                                                                                                                                     | 50                                   |                                                                |                        | 8.00                                   |                                                                                                  |                                                   |  |  |  |                                              |                                          |  |  |  |
| <div>Remarks</div> <div>63.5kg weight, fall of 750mm.</div>                                                                                                                                                                                                   |                                      |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  | <div>Scale (approx)</div> <div>1:40</div>    | <div>Logged By</div> <div>HB</div>       |  |  |  |
|                                                                                                                                                                                                                                                               |                                      |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  | <div>Figure No.</div> <div>NE4303A.DP4</div> |                                          |  |  |  |

|                                                                                                                                                                                                                                                                 |                                      |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|--|----------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|--|--|--|----------------------------------------------|------------------------------------|--|--|--|--|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS<br/>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                                      |                                                                |  |                                        | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div> |                                                                      |  |  |  | <div>Probe Number</div> <div>DP5</div>       |                                    |  |  |  |  |
| <div>Method</div> <div>Dynamic Probing</div>                                                                                                                                                                                                                    |                                      | <div>Cone Dimensions</div> <div>Diameter 50mm, Angle 90°</div> |  | <div>Ground Level (mOD)</div>          | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div>                                                |                                                                      |  |  |  | <div>Job Number</div> <div>NE4303A</div>     |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                 |                                      | <div>Location</div> <div>AS PLAN</div>                         |  | <div>Dates</div> <div>09/10/2023</div> | <div>Engineer</div>                                                                              |                                                                      |  |  |  | <div>Sheet</div> <div>1/1</div>              |                                    |  |  |  |  |
| <div>Depth (m)</div>                                                                                                                                                                                                                                            | <div>Blows for Depth Increment</div> | <div>Field Records</div>                                       |  | <div>Level (mOD)</div>                 | <div>Depth (m)</div>                                                                             | <div>Blows for Depth Increment</div> <div>05101520253035404550</div> |  |  |  |                                              |                                    |  |  |  |  |
| 0.20-0.30                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        | 0.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 0.30-0.40                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 0.40-0.50                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 0.50-0.60                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        | 0.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 0.60-0.70                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 0.70-0.80                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 0.80-0.90                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 0.90-1.00                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.00-1.10                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        | 1.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.10-1.20                                                                                                                                                                                                                                                       | 4                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.20-1.30                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.30-1.40                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.40-1.50                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.50-1.60                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        | 1.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.60-1.70                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.70-1.80                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.80-1.90                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 1.90-2.00                                                                                                                                                                                                                                                       | 1                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.00-2.10                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        | 2.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.10-2.20                                                                                                                                                                                                                                                       | 7                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.20-2.30                                                                                                                                                                                                                                                       | 10                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.30-2.40                                                                                                                                                                                                                                                       | 9                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.40-2.50                                                                                                                                                                                                                                                       | 5                                    |                                                                |  |                                        | 2.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.50-2.60                                                                                                                                                                                                                                                       | 6                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.60-2.70                                                                                                                                                                                                                                                       | 7                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.70-2.80                                                                                                                                                                                                                                                       | 8                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.80-2.90                                                                                                                                                                                                                                                       | 7                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 2.90-3.00                                                                                                                                                                                                                                                       | 7                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.00-3.10                                                                                                                                                                                                                                                       | 6                                    |                                                                |  |                                        | 3.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.10-3.20                                                                                                                                                                                                                                                       | 5                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.20-3.30                                                                                                                                                                                                                                                       | 4                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.30-3.40                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.40-3.50                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        | 3.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.50-3.60                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.60-3.70                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.70-3.80                                                                                                                                                                                                                                                       | 6                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.80-3.90                                                                                                                                                                                                                                                       | 7                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 3.90-4.00                                                                                                                                                                                                                                                       | 6                                    |                                                                |  |                                        | 4.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.00-4.10                                                                                                                                                                                                                                                       | 5                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.10-4.20                                                                                                                                                                                                                                                       | 4                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.20-4.30                                                                                                                                                                                                                                                       | 4                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.30-4.40                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        | 4.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.40-4.50                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.50-4.60                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.60-4.70                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.70-4.80                                                                                                                                                                                                                                                       | 2                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.80-4.90                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 4.90-5.00                                                                                                                                                                                                                                                       | 3                                    |                                                                |  |                                        | 5.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.00-5.10                                                                                                                                                                                                                                                       | 6                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.10-5.20                                                                                                                                                                                                                                                       | 5                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.20-5.30                                                                                                                                                                                                                                                       | 6                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.30-5.40                                                                                                                                                                                                                                                       | 6                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.40-5.50                                                                                                                                                                                                                                                       | 7                                    |                                                                |  |                                        | 5.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.50-5.60                                                                                                                                                                                                                                                       | 7                                    |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.60-5.70                                                                                                                                                                                                                                                       | 10                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.70-5.80                                                                                                                                                                                                                                                       | 11                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.80-5.90                                                                                                                                                                                                                                                       | 12                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 5.90-6.00                                                                                                                                                                                                                                                       | 17                                   |                                                                |  |                                        | 6.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.00-6.10                                                                                                                                                                                                                                                       | 17                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.10-6.20                                                                                                                                                                                                                                                       | 15                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.20-6.30                                                                                                                                                                                                                                                       | 12                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.30-6.40                                                                                                                                                                                                                                                       | 10                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.40-6.50                                                                                                                                                                                                                                                       | 10                                   |                                                                |  |                                        | 6.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.50-6.60                                                                                                                                                                                                                                                       | 10                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.60-6.70                                                                                                                                                                                                                                                       | 12                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.70-6.80                                                                                                                                                                                                                                                       | 12                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.80-6.90                                                                                                                                                                                                                                                       | 13                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 6.90-7.00                                                                                                                                                                                                                                                       | 13                                   |                                                                |  |                                        | 7.00                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 7.00-7.10                                                                                                                                                                                                                                                       | 13                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 7.10-7.20                                                                                                                                                                                                                                                       | 13                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 7.20-7.30                                                                                                                                                                                                                                                       | 14                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 7.30-7.40                                                                                                                                                                                                                                                       | 14                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 7.40-7.50                                                                                                                                                                                                                                                       | 14                                   |                                                                |  |                                        | 7.50                                                                                             |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| 7.50-7.60                                                                                                                                                                                                                                                       | 50                                   |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  |                                              |                                    |  |  |  |  |
| <div>Remarks</div> <div>63.5kg weight, fall of 750mm.</div>                                                                                                                                                                                                     |                                      |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  | <div>Scale (approx)</div> <div>1:40</div>    | <div>Logged By</div> <div>HB</div> |  |  |  |  |
|                                                                                                                                                                                                                                                                 |                                      |                                                                |  |                                        |                                                                                                  |                                                                      |  |  |  | <div>Figure No.</div> <div>NE4303A.DP5</div> |                                    |  |  |  |  |

|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------|--|--|--|----------------------------------------------|------------------------------------------|------------------------------------|--|--|--|--|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS</div><div>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                                      |                                                                |                        |                                        | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div> |                                                   |  |  |  | <div>Probe Number</div> <div>DP7</div>       |                                          |                                    |  |  |  |  |
| <div>Method</div> <div>Dynamic Probing</div>                                                                                                                                                                                                                          |                                      | <div>Cone Dimensions</div> <div>Diameter 50mm, Angle 90°</div> |                        | <div>Ground Level (mOD)</div>          |                                                                                                  | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div> |  |  |  |                                              | <div>Job Number</div> <div>NE4303A</div> |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      | <div>Location</div> <div>AS PLAN</div>                         |                        | <div>Dates</div> <div>09/10/2023</div> |                                                                                                  | <div>Engineer</div>                               |  |  |  |                                              | <div>Sheet</div> <div>1/1</div>          |                                    |  |  |  |  |
| <div>Depth (m)</div>                                                                                                                                                                                                                                                  | <div>Blows for Depth Increment</div> | <div>Field Records</div>                                       | <div>Level (mOD)</div> | <div>Depth (m)</div>                   | <div>Blows for Depth Increment</div> <div>05101520253035404550</div>                             |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>0.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>0.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>1.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>1.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>2.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>2.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>3.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>3.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>4.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>4.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>5.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>5.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        | <div>6.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.20-6.30                                                                                                                                                                                                                                                             | 4                                    |                                                                |                        | <div>6.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.30-6.40                                                                                                                                                                                                                                                             | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.40-6.50                                                                                                                                                                                                                                                             | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.50-6.60                                                                                                                                                                                                                                                             | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.60-6.70                                                                                                                                                                                                                                                             | 4                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.70-6.80                                                                                                                                                                                                                                                             | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.80-6.90                                                                                                                                                                                                                                                             | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 6.90-7.00                                                                                                                                                                                                                                                             | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.00-7.10                                                                                                                                                                                                                                                             | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.10-7.20                                                                                                                                                                                                                                                             | 5                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.20-7.30                                                                                                                                                                                                                                                             | 8                                    |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.30-7.40                                                                                                                                                                                                                                                             | 10                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.40-7.50                                                                                                                                                                                                                                                             | 10                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.50-7.60                                                                                                                                                                                                                                                             | 7                                    |                                                                |                        | <div>7.50</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.60-7.70                                                                                                                                                                                                                                                             | 11                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.70-7.80                                                                                                                                                                                                                                                             | 12                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.80-7.90                                                                                                                                                                                                                                                             | 14                                   |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| 7.90-8.00                                                                                                                                                                                                                                                             | 50                                   |                                                                |                        | <div>8.00</div>                        |                                                                                                  |                                                   |  |  |  |                                              |                                          |                                    |  |  |  |  |
| <div>Remarks</div> <div>63.5kg weight, fall of 750mm.</div>                                                                                                                                                                                                           |                                      |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  | <div>Scale (approx)</div> <div>1:40</div>    |                                          | <div>Logged By</div> <div>HB</div> |  |  |  |  |
|                                                                                                                                                                                                                                                                       |                                      |                                                                |                        |                                        |                                                                                                  |                                                   |  |  |  | <div>Figure No.</div> <div>NE4303A.DP7</div> |                                          |                                    |  |  |  |  |

|                                                                                                                                                                                                                                                                 |                                      |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--|--|--|----------------------------------------------|------------------------------------------|--|--|--|--|--|
| <div><div><div>S</div><div>S</div></div><div><div>SUB SURFACE</div><div>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL &amp; ENVIRONMENTAL CONSULTANTS<br/>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907</div></div></div> |                                      |                                                                |                        |                                        | <div>Site</div> <div>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</div>                                                                                              |                                                   |  |  |  | <div>Probe Number</div> <div>DP8</div>       |                                          |  |  |  |  |  |
| <div>Method</div> <div>Dynamic Probing</div>                                                                                                                                                                                                                    |                                      | <div>Cone Dimensions</div> <div>Diameter 50mm, Angle 90°</div> |                        | <div>Ground Level (mOD)</div>          |                                                                                                                                                                                               | <div>Client</div> <div>GROUNDWORK YORKSHIRE</div> |  |  |  |                                              | <div>Job Number</div> <div>NE4303A</div> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                 |                                      | <div>Location</div> <div>AS PLAN</div>                         |                        | <div>Dates</div> <div>09/10/2023</div> |                                                                                                                                                                                               | <div>Engineer</div>                               |  |  |  |                                              | <div>Sheet</div> <div>1/1</div>          |  |  |  |  |  |
| <div>Depth (m)</div>                                                                                                                                                                                                                                            | <div>Blows for Depth Increment</div> | <div>Field Records</div>                                       | <div>Level (mOD)</div> | <div>Depth (m)</div>                   | <div>Blows for Depth Increment</div> <div><div>0</div><div>5</div><div>10</div><div>15</div><div>20</div><div>25</div><div>30</div><div>35</div><div>40</div><div>45</div><div>50</div></div> |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.00-0.10                                                                                                                                                                                                                                                       | 2                                    |                                                                |                        | 0.00                                   |                                                                                                            |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.10-0.20                                                                                                                                                                                                                                                       | 2                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.20-0.30                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.30-0.40                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.40-0.50                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.50-0.60                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        | 0.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.60-0.70                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.70-0.80                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.80-0.90                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 0.90-1.00                                                                                                                                                                                                                                                       | 1                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.00-1.10                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        | 1.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.10-1.20                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.20-1.30                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.30-1.40                                                                                                                                                                                                                                                       | 6                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.40-1.50                                                                                                                                                                                                                                                       | 6                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.50-1.60                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        | 1.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.60-1.70                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.70-1.80                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.80-1.90                                                                                                                                                                                                                                                       | 2                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 1.90-2.00                                                                                                                                                                                                                                                       | 2                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.00-2.10                                                                                                                                                                                                                                                       | 4                                    |                                                                |                        | 2.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.10-2.20                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.20-2.30                                                                                                                                                                                                                                                       | 2                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.30-2.40                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.40-2.50                                                                                                                                                                                                                                                       | 4                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.50-2.60                                                                                                                                                                                                                                                       | 4                                    |                                                                |                        | 2.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.60-2.70                                                                                                                                                                                                                                                       | 12                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.70-2.80                                                                                                                                                                                                                                                       | 14                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.80-2.90                                                                                                                                                                                                                                                       | 30                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 2.90-3.00                                                                                                                                                                                                                                                       | 32                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.00-3.10                                                                                                                                                                                                                                                       | 25                                   |                                                                |                        | 3.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.10-3.20                                                                                                                                                                                                                                                       | 16                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.20-3.30                                                                                                                                                                                                                                                       | 16                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.30-3.40                                                                                                                                                                                                                                                       | 25                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.40-3.50                                                                                                                                                                                                                                                       | 18                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.50-3.60                                                                                                                                                                                                                                                       | 10                                   |                                                                |                        | 3.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.60-3.70                                                                                                                                                                                                                                                       | 10                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.70-3.80                                                                                                                                                                                                                                                       | 10                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.80-3.90                                                                                                                                                                                                                                                       | 10                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 3.90-4.00                                                                                                                                                                                                                                                       | 9                                    |                                                                |                        | 4.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.00-4.10                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.10-4.20                                                                                                                                                                                                                                                       | 8                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.20-4.30                                                                                                                                                                                                                                                       | 11                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.30-4.40                                                                                                                                                                                                                                                       | 9                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.40-4.50                                                                                                                                                                                                                                                       | 4                                    |                                                                |                        | 4.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.50-4.60                                                                                                                                                                                                                                                       | 4                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.60-4.70                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.70-4.80                                                                                                                                                                                                                                                       | 4                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.80-4.90                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 4.90-5.00                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        | 5.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.00-5.10                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.10-5.20                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.20-5.30                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.30-5.40                                                                                                                                                                                                                                                       | 3                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.40-5.50                                                                                                                                                                                                                                                       | 4                                    |                                                                |                        | 5.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.50-5.60                                                                                                                                                                                                                                                       | 5                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.60-5.70                                                                                                                                                                                                                                                       | 6                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.70-5.80                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.80-5.90                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 5.90-6.00                                                                                                                                                                                                                                                       | 10                                   |                                                                |                        | 6.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.00-6.10                                                                                                                                                                                                                                                       | 9                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.10-6.20                                                                                                                                                                                                                                                       | 8                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.20-6.30                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.30-6.40                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.40-6.50                                                                                                                                                                                                                                                       | 6                                    |                                                                |                        | 6.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.50-6.60                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.60-6.70                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.70-6.80                                                                                                                                                                                                                                                       | 6                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.80-6.90                                                                                                                                                                                                                                                       | 6                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 6.90-7.00                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        | 7.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.00-7.10                                                                                                                                                                                                                                                       | 7                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.10-7.20                                                                                                                                                                                                                                                       | 9                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.20-7.30                                                                                                                                                                                                                                                       | 9                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.30-7.40                                                                                                                                                                                                                                                       | 9                                    |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.40-7.50                                                                                                                                                                                                                                                       | 11                                   |                                                                |                        | 7.50                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.50-7.60                                                                                                                                                                                                                                                       | 14                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.60-7.70                                                                                                                                                                                                                                                       | 16                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.70-7.80                                                                                                                                                                                                                                                       | 20                                   |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| 7.80-7.90                                                                                                                                                                                                                                                       | 50                                   |                                                                |                        | 8.00                                   |                                                                                                                                                                                               |                                                   |  |  |  |                                              |                                          |  |  |  |  |  |
| <div>Remarks</div> <div>63.5kg weight, fall of 750mm.</div>                                                                                                                                                                                                     |                                      |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  | <div>Scale (approx)</div> <div>1:40</div>    | <div>Logged By</div> <div>HB</div>       |  |  |  |  |  |
|                                                                                                                                                                                                                                                                 |                                      |                                                                |                        |                                        |                                                                                                                                                                                               |                                                   |  |  |  | <div>Figure No.</div> <div>NE4303A.DP8</div> |                                          |  |  |  |  |  |

## FIGURES



|                                                                                                                                                                                                                                                 |                                |              |                                                                                                      |                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------|------------------------------------------------------------------------------------------------------|---------------------------|
|  <b>SUB SURFACE</b><br>SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS<br>3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907 | <b>General Site Location</b>   |              |                                                                                                      |                           |
| Site<br><b>PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE</b>                                                                                                                                                            | Date Drawn<br><b>17-Nov-23</b> | Date Checked | Orientation<br> | Job No.<br><b>NE4303A</b> |
| Client<br><b>GROUNDWORK YORKSHIRE</b>                                                                                                                                                                                                           | Drawn By<br><b>TP</b>          | Checked By   | Scale<br>-                                                                                           | Figure No.<br><b>1</b>    |



# Phoenix Park, Barnsley Red Line Boundary Plan



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Ordnance Survey

## Notes:

- 1) Figured dimensions to be taken. Do not scale dimensions. Contractors must verify all dimensions on site before preparing shop drawings or commencing any work.
- 2) Copyright ©. This drawing must not be reproduced without the permission of Groundwork Yorkshire.

**ADDRESS:**  
Phoenix Park  
Barrowfield  
Rd, Thurnscoe,  
Rotherham,  
S63 0BD

**GRID REF:**  
SE 46130 05288



| Rev | Revision Notes | Drawn | Check | Date |
|-----|----------------|-------|-------|------|
| 1   |                |       |       |      |
| 2   |                |       |       |      |
| 3   |                |       |       |      |
| 4   |                |       |       |      |
| 5   |                |       |       |      |

**GROUNDWORK YORKSHIRE**  
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|          |                        |     |                        |
|----------|------------------------|-----|------------------------|
| Rev      | Phoenix Park, Barnsley | Rev | Red Line Boundary Plan |
| 23.08.22 |                        |     |                        |
| 001      |                        | TM  | MK                     |
|          |                        |     | MS                     |



## SUB SURFACE

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

## Site Location

PHOENIX PARK, BARROWFIELD ROAD, THURNSCOE,  
ROTHERHAM, SOUTH YORKSHIRE

Client  
GROUNDWORK YORKSHIRE

Date Drawn  
17-Nov-23

Date Checked

Orientation

Job No.

NE4303A

Drawn By  
TP

Checked By

Scale

Figure No.

2





