INVESTIGATE

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SUB SURFACE
Site Investigation Specialists,
Geotechnical & Environmental Consultants

GROUND INVESTIGATION REPORT

FOR
LAND AT 23 BAR LANE,
STAINCROSS,
BARNSLEY,
SOUTH YORKSHIRE,
S75 6GE

PREPARED FOR
MR CARL MASTERS

REPORT NO. NE4296
DECEMBER 2023

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GROUND INVESTIGATION FOR LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

CLIENT: MR CARL MASTERS

ARCHITECT: ALAN ROBINSON

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1. INTRODUCTION

This report has been prepared in accordance with an email, dated 23rd August 2023, from the Architect on behalf of the Client.

The brief was set out in our estimate, ref. E8067 and dated 2nd August 2023, with amendments as the investigation proceeded and includes:

- 6 No. rotary boreholes
- 9 No. trial pits
- In-situ testing
- Geotechnical laboratory testing
- Installation of standpipes followed by groundwater and ground gas monitoring
- Provision of an interpretative report on the above.

1.1 Site Location and Description

The site is located at 23 Bar Lane, Staincross, Barnsley, South Yorkshire, S75 6GE, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is 433725, 409793.

As shown on Figures 1 and 2, the about 0.3 hectare roughly rectangular shaped site is bounded to the east by No. 21 Bar Lane and No.'s 100 to 110 Eastfield Crescent, to the north by an undeveloped and partially wooded area, to the west by No. 25 Bar Lane and an area of undeveloped grass surfaced land, and to the south by Bar Lane (B6131). The site is currently occupied by a two storey detached house of brick construction and some outbuildings/ animal barns. There is evidence of past animal storage such as horses on site and fruit trees in the north west.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand that it is proposed to demolish the existing buildings on site and construct housing, and a temporary layout plan is given as Figure 2. We understand, however that the specific site plan may change and therefore any recommendations given are in general terms only.

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.

It was required to determine the presence of any shallow coal seams, and associated mineworkings, in order to assess the risk to near surface ground stability. In addition it was required to check the position of a conjectured fault on site.

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

2. INVESTIGATION

2.1 Investigation Details

Six rotary boreholes were put down to depths of between 25.00 and 30.00 metres using a T. Cop Rotary drill rig at the positions determined and set out by Sub Surface North East Limited, as shown on Figure 3. Boreholes were advanced by rotary open hole drilling techniques, with water flushing medium. The foreman driller logged chippings flushed to the surface during drilling and the resulting Rotary Borehole Records are appended. On completion the rotary boreholes were backfilled with Bentonite grout.

Nine trial pits were taken out by a mechanical excavator at the positions determined and set out by Sub Surface North East Limited, as shown on Figure 3. The trial pits were excavated to depths of between 1.10 and 4.25 metres, representative samples were taken and the materials were logged in accordance with BS.5930:2015+A1:2020. The resulting Trial Pit Records are appended. On completion the trial pits were backfilled with arisings and partially compacted by the excavator, but it is likely that loose or soft pockets will still remain.

2.2 Sub Surface Detail

Details of the strata encountered in the ground investigation are given on the appended Rotary Borehole Records and Trial Pit Records. The exploratory holes found Made Ground or topsoil to depths of between 0.20 and 0.80 metres, overlying generally soft low strength becoming firm medium strength clays below around 1.60 metres with bands of fine to coarse sand. Bedrock was encountered at depths between 1.60 and 3.60 metres excepting in trial pits TP3 to TP8 where bedrock wasn't encountered. The depths of strata found were as follows:

TABLE 1 STRATA

Expl. Hole No.	Depth of Made Ground (m)	Depth of Topsoil (m)	Depth of Cohesive Deposits (m)	Depth of Granular Deposits (m)	Depth to Bedrock (m)	Depth of Hole (m)
R1	0.30	-	1.70 2.00	1.80 2.50	2.50	25.00
R2	0.50	-	1.20	2.20	2.20	25.00
R3	0.40	-	0.80	2.10	2.10	25.00
R4	-	0.70	1.60	2.80	2.80	25.00
R5	-	0.50	2.50	-	2.50	30.00
R6	-	0.40	1.50	3.60	3.60	25.00

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TABLE 1 STRATA (Cont'd)

Expl. Hole No.	Depth of Made Ground (m)	Depth of Topsoil (m)	Depth of Cohesive Deposits (m)	Depth of Granular Deposits (m)	Depth to Bedrock (m)	Depth of Hole (m)
TP1	0.30	-	-	1.60	1.60	4.10
TP2	0.40	-	2.80	-	2.80	3.00
TP3	0.30	-	0.80 2.10	1.80 >3.35	-	3.35
TP4	0.80	-	>1.10	-	-	1.10
TP4A	0.45	-	>2.60	-	-	2.60
TP5	0.20	-	>1.85	-	-	1.85
TP6	0.40	-	>3.70	-	-	3.70
TP7	0.40	-	>4.25	-	-	4.25
TP8	0.60	-	>3.90	-	-	3.90

R = Rotary Borehole, TP = Trial Pit.

A general summary of the strata found is as follows:

2.2.1 Made Ground and Topsoil

Made Ground was encountered to depths of between 0.20 and 0.80 metres. In R1, TP1, TP2, TP3, TP4, TP4A, TP5, TP6, TP7 and TP8 to depths of between 0.05 and 0.60 metres Made Ground comprised friable dark brown sandy clayey silt with occasional rootlets.

Clay pipes were found in TP1, TP2 and TP3 at depths of between 0.10 and 0.20 metres. These are likely to be old drainage pipes.

Underlying the initial layer of Made Ground in TP4 at a depth of 0.45 metres, Made Ground comprised brown and grey gravel and cobble sized fragments of brick and concrete to a depth of 0.80 metres. TP4 appeared to encompass an old soakaway pit.

Underlying the initial layer of Made Ground in TP5 in the west of the site at a depth of 0.05 metres, Made Ground comprised an old concrete slab to a depth of 0.10 metres, overlying partially cemented, partially loose brick, roof tiles rubble and occasional suspect cement bound asbestos fragments.

In R2 and R3 in the west of the site Made Ground comprised concrete to a depth of 0.20 metres, overlying hardcore to a depth of between 0.40 and 0.50 metres.

Brown sandy topsoil was observed in R4, R5, and R6 in the north and east of the site to depths of between 0.40 and 0.70 metres.

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2.2.2 Drift Deposits

Cohesive deposits were observed underlying the Made Ground to depths of between >1.10 metres and >4.25 metres in TP2, TP4 to TP7, and R5 and generally comprised light brown, brown and occasional grey mottled slightly gravelly clay with occasional cobbles and boulders of sandstone and local thin bands and lenses of silt and sand. The clay ranges in strength. In TP4 the clay was measured to be very soft, very low strength and this is likely due to water softening from the old soakaway pit. In TP6 the clay was very soft very low strength becoming firm medium strength below 0.95 metres. In TP2, TP4A, and TP7 the clay was initially soft low strength becoming firm medium strength below 0.60, 2.10, and 1.60 metres depth respectively and stiff high strength in TP2 below 1.40 metres depth. In R5 and TP5 the clay was firm medium strength.

In R2, R3, R4 and R6 superficial deposits comprised brown and orangish grey sandy clay to depths of 1.20, 0.80, 1.60 and 1.50 metres respectively, overlying brown clayey sand to depths of 2.20, 2.10, 2.80 and 3.60 metres respectively.

In R1 cohesive deposits were observed underlying the Made Ground to a depth of 1.70 metres and comprised generally soft to very soft orangish brown slightly gravelly sandy clay, overlying granular deposits comprised of reddish brown silty fine to medium sand to a depth of 1.80 metres, overlying stiff brown slightly gravelly slightly sandy silty clay to a depth of 2.00 metres, overlying brown silty slightly clayey fine to coarse sand with occasional pockets of sandy clay to a depth of 2.50 metres.

In TP1 superficial deposits underlying the Made Ground at a depth of 0.30 metres comprised gravelly medium sand to a depth of 1.00 metres, overlying gravelly coarse sand at one end of the trial pit adjacent to the fault line.

In TP3 and TP8 roughly south of the identified fault line superficial deposits generally comprised soft low strength to very soft very low strength slightly gravelly slightly sandy silty clay to depths of 0.80 and 1.10 metres respectively. Underlying this in TP3 granular deposits comprised slightly gravelly medium sand to a depth of 1.80 metres while in TP8 cohesive deposits comprised soft low strength becoming firm medium strength below 1.50 metres slightly gravelly clay to a depth of 1.65 metres. Both these strata contain occasional cobbles and boulders of sandstone which could be considered to be likely derived from the fault zone. Underlying this in TP3 firm medium strength dark brown gravelly clay were observed to 2.10 metres, overlying brown slightly gravelly medium to coarse sand to the depth of the exploratory hole. Underlying this in TP8 firm medium strength brown, dark brown and occasional grey mottled slightly gravelly clay to the depth of the exploratory hole.

2.2.3 Bedrock

Bedrock was encountered at depths of between 1.60 and 3.60 metres in R1 to R6 and TP1 and TP2.

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The conjectured fault was encountered in trial pit TP1 and a diagram is given on the appended Trial Pit logs. To the east of the fault the Wooley Edge sandstone is observed at a depth of 1.00 metres to the base of the pit while to the west of the fault the sequence of bedrock begins at 1.60 metres with very weak very thinly bedded dark brown highly weathered mudstone to 2.10 metres, overlying coal to 2.50 metres, overlying very weak very thinly bedded grey highly weathered mudstone to the base of the pit. The orientation of the fault could not be determined due to the fault plane being highly weathered however it appears to trend approximately south west to north east.

In TP2 bedrock encountered at a depth of 2.80 metres comprised weak thinly bedded brown moderately weathered coarse grained sandstone to the base of the pit. Based on the stratigraphy of TP1, either TP2 is situated to the east of the fault or was terminated on a large sandstone boulder.

Bedrock was encountered in R1, R2, R3, R4, R5, ad R6 at depths of 2.50, 2.20, 2.10, 2.80, 2.50, and 3.60 metres respectively. The bedrock strata revealed in the rotary boreholes across the site follows the following stratigraphic sequence:

- Weak brown sandstone to depths of between 3.10 and 9.50 metres (becoming strong below 4.50 and 4.00 metres depth in R2 and R3 respectively).
- Weak to medium strong brown mudstone to depths of between 5.30 and 10.60 metres (0.20 metre thick coal seam encountered in R3 at 7.50 metres depth, 0.40 metre thick coal seam encountered in R4 at 8.60 metres depth).
- Medium strong grey to dark grey mudstone to depths of between 10.20 and 14.70 metres (becoming strong in R5 below 0.30 metre thick coal seam encountered at 10.50 metres depth).
- Medium strong to strong grey and light grey siltstone to depths of between 12.90 and 18.20 metres.
- Medium strong to strong grey, light grey and dark grey mudstone to depths of between 17.50 and 22.00 metres.
- Medium strong to strong grey and light grey siltstone to depths of between 19.80 and >25.00 metres (reaching the end of the borehole in R6).
- Medium strong to strong grey and light grey mudstone to the depths of the boreholes R1 to R5.

2.2.4 Groundwater

A groundwater seepage was encountered in TP1 at 0.40 metres depth. Moderate groundwater inflow was encountered in TP4 at 0.06 metres depth. 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 R2, R3, R5, and R6 to a depth of 4.00 metres, found groundwater to be at 0.40 to 0.50 metres, 1.10 to 1.50 metres, 0.05 to 0.10 metres, and 0.50 to 1.00 metres depth respectively.

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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.

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

Twenty-six hand shear vane tests were undertaken in the trial pits and the results are given on the appended Trial Pit Records.

3.3 Installations and Monitoring

On completion of the rotary boreholes R2, R3, R5 and R6, hdpe standpipes were installed to a depth of 4.00 metres. The standpipes are slotted from 1.00 metres 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 Rotary Borehole Records.

Monitoring of the standpipes for ground gas and groundwater has been undertaken on 2 of 6 scheduled occasions to date using portable equipment. A Gas Data GFM 435 was used for monitoring methane, carbon dioxide, oxygen, gas flows and atmospheric pressure. The results of the monitoring is given on the appended Ground Gas and Groundwater Monitoring Results sheet.

3.4 Laboratory Testing

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

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

One sample of suspected cement bound asbestos was subjected to an asbestos screen. Where asbestos was detected by the screen, asbestos type was determined.

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.

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The internet based British Geological Survey (BGS) Viewer indicates that the site is underlain by Carboniferous Pennine Middle Coal Measures formation comprising the Woolley Edge Rock composed of sandstone interbedded with mudstone, siltstone and other subordinate sandstone units with occasional seams of coal. A thin layer of superficial deposits in the form of weathered rockhead are likely to be present. Given the above there is an indication that the geological formation will be similar beneath the site and the immediate surrounding area and hence some continuity might be assumed, but not guaranteed.

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 Rotary Borehole Records and Trial Pit Records and a summary of the ground conditions is given in Section 2.2.

4.2 Geology and Mining

4.2.1 Geological Appraisal

We are not aware that any geological appraisal has previously been undertaken for this site. However, the British Geological Survey Onshore GeoIndex accessed on 14th December 2023 indicated that the site would be underlain by the Carboniferous Pennine Middle Coal Measures formation comprising the Woolley Edge Rock composed of sandstone interbedded with mudstone, siltstone and other subordinate sandstone units with occasional seams of coal. No superficial deposits are indicated to be present however around 40 metres east of the site Mid-Pleistocene Till composed of Diamicton (poorly sorted gravelly sandy silty clays) is recorded to an unknown depth and this may also underly the site. In addition a layer of weathered rockhead is likely to be present.

We recommend that a Geological and Mining Risk Assessment is undertaken to determine the likely sequence of strata and depths to named coal seams beneath the site on both sides of the fault.

4.2.2 Mining Appraisal

We are not aware that any mining appraisal has previously been undertaken for this site. The Principal Mining Engineer for Barnsley Metropolitan Borough Council has advised the Architect of conjectured coal seams. A copy of this plan is appended as Figure 4 and this information has been extrapolated to be shown on Figure 3. We would recommend that a Consultants Coal Authority Mining Report is obtained.

4.2.3 Findings of the Ground Investigation

The conjectured fault was observed in TP1 in the north of the site. As all the exploratory holes which encountered bedrock follow a similar stratigraphic sequence of sandstone (likely the Wooley Edge sandstone) overlying interbedded medium strong to strong mudstones and siltstones with a thin seam of coal encountered in some of the boreholes, we consider it likely that the majority of the site lies to the east of the fault with only the north western corner of the site likely to lie to the west of the fault.

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Coal seams were not encountered in all of the exploratory holes. Where they were encountered they have been tabulated below:

TABLE 2 INTACT COAL SEAMS

Exploratory Hole No.	Depth below rockhead (m)	Seam Thickness (m)
TP1	0.50	0.30
R3	5.40	0.20
R4	5.80	0.40
R5	8.00	0.30

It is possible that these were not observed in the remaining rotary boreholes due to the seams being partially mined and settlement causing the voids to seal or they are relatively thin seams that have either thinned out or not picked up during drilling due to their small size. We would recommend that a Consultants Coal Authority Mining Report is obtained and a Geological and Mining Risk Assessment undertaken to determine the likely depths of named coal seams beneath site to better assess the potential hazard.

4.2.4 Conclusions and Recommendations

Faults in the UK are generally stable and not subject to geological movement. However, they do provide a zone of weakness making it easier for any subsidence caused by coal mining to be transmitted along them to the surface.

Surface instability arises when the collapse of mineworkings migrates upwards through the roof strata and back to the surface or near surface level. There is considered to be a potential for this if there is less than ten times the unworked thickness of the coal seam in intact rock strata above the mined coal seam and potentially greater in a fault zone.

In addition residual settlement of incompletely collapsed and consolidated mineworkings can take place over a long period after mining has taken place. It should be noted that although the risk of residual settlement may be increased by the stresses imposed by a surface load, settlement can and does occur irrespective of ground surface loads.

Given the above we recommend that, subject to a Geological and Mining Risk Assessment, the proposed buildings are constructed on reinforced concrete semi-raft foundations, which is able to span 3.0 metres and cantilever 1.5 metres due to a loss of support, with downstand beams. It should be noted that a semi raft foundation should have an integral suspended floor slab.

Although we have traced no record of mine entries, observations should be kept throughout all site operations for signs attributable to an unrecorded mineshaft or adit. If a mineshaft or adit is suspected, appropriate action would need to be taken in the light of the established condition and location as determined by inspection and investigation.

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4.3 Foundations

We understand that it is proposed to demolish the existing buildings on site and construct housing. However, at the time of writing this report no specific details regarding the building layout, proposed foundations and design loadings were available and consequently the recommendations given are in general terms only.

The ground investigation found Made Ground or topsoil to depths of between 0.20 and 0.80 metres, overlying generally soft low strength becoming firm medium strength clays below around 1.60 metres with bands of fine to coarse sand. Bedrock was encountered at depths between 1.60 and 3.60 metres excepting in trial pits TP3 to TP8 where bedrock wasn't encountered.

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.

Providing there is sufficient load bearing capability and subject to the findings of a Coal Mining Risk Assessment including a Coal Authority Consultants Mining Report we recommend that the proposed buildings are constructed on a reinforced concrete semi-raft foundation which is able to span 3.0 metres and cantilever 1.5 metres due to a loss of support founded in the natural firm medium strength cohesive strata.

Atterberg limit tests on the cohesive strata indicate clays of low to intermediate plasticity which are considered to have a low susceptibility to shrinkage and swelling with varying moisture content. Given the above foundations should be taken down to a minimum 0.75 metres below finished ground level to avoid the zone which is subject to seasonal moisture content variation and frost action. If buildings are to be constructed adjacent to existing trees, trees are to be removed and/or trees are to be planted then the guidelines given in the National House Building Council (NHBC) Standards Chapter 4.2, 'Building Near Trees', should be followed for clays of low shrinkage and swelling potential.

Further precautions might need to be taken to protect walls and floor slabs from the effects of swelling following the removal of the trees or the cutting of the roots. Damage is likely to be caused when desiccated cohesive soils expand on taking up moisture previously taken by the roots; if for example, walls are constructed such as to constrain such soils to a limited volume.

It should be noted that in parts of the site the natural strata is at a depth of in excess of 0.75 metres and in these areas foundations should be taken down to a minimum 0.10 metres below the base of the Made Ground unless the NHBC guidelines indicate a greater depth.

In view of the depth of foundations required it is anticipated that trench fill will be used to bring levels back up to the surface. Largely dependent upon the cost of disposal of arisings, we anticipate that trench fill would normally be economically viable providing foundation depths do not exceed about 2.50 to 3.00 metres.

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

TABLE 3 SAFE BEARING CAPACITY

Expl Hole No.	Depth (m)	Shear Strength (kN/m^2)	Safe Bearing Pressure for Raft Foundation (kN/m^2)	Recommended Minimum Foundation Depth (m)
TP2	0.90	52	95	0.75
	1.60	76	140	
TP3	0.50	38	70	1.80
	0.70	46	85*	
	1.90	44	80	
TP4A	0.70	24	45	1.00
	1.00	42	80*	
	1.60	36	65	
TP5	1.10	52	95	0.75
TP6	0.60	15	25	0.95
	0.90	25	45	
	1.00	46	85	
	1.50	52	95	
	2.10	76	140*	
	3.30	58	110	
TP7	0.90	20	35	1.60
	1.10	32	60	
	1.60	42	80	
	2.70	49	90	
	3.60	75	140	
TP8	0.85	18	30	1.50
	1.20	38	70	
	1.50	44	80	
	1.90	48	90	
	2.80	56	105	

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

Shear strengths determined by hand shear vane test.

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Appreciable variations in safe bearing capacity are indicated in Table 3 and as a consequence of this, and the need to utilise a generally applicable safe bearing pressure to enable designs to be reasonably formulated, we recommend that values of 80 kN/m^2 should not be exceeded for the recommended minimum foundation depth given.

All formation levels should be carefully inspected by an experienced and qualified engineer to confirm the appropriateness of the design figures used with any soft, loose, or rubbly zones removed and replaced with lean mix concrete. The formation should then be blinded with lean mix concrete as soon as possible after exposure, if there is to be a delay before construction, to prevent water softening or disturbance.

It should be noted that the safe bearing pressures given for the cohesive strata do not take into consideration settlement. Settlement is dependent upon loading intensity, the width of the foundation and the coefficient of volume compressibility (Mv) of the compressible strata. When details of the foundations are formulated we recommend that total and differential settlements are assessed to ensure that they are within acceptable limits.

Should granular strata be present at the proposed formation level we recommend that foundation excavations should be locally deepened in order that the formation is entirely within similar strata. If this is not possible we recommend that reinforcement in foundations is provided to give adequate strength to bridge or cantilever over areas of significantly differing rates of settlement and to induce an increase in the settlement where relatively low settlements are expected.

Where trial pits have been taken out during the ground investigation, it is likely that there will be localised ground softening in these areas. This should be considered during development.

4.4 Floor Slab Construction

With regard to the design and construction of the floor slab this should contain appropriate top and bottom reinforcement and be integral with the reinforced concrete semi-raft foundation. In addition we would recommend the removal of any topsoil and other deleterious material and Made Ground to a depth of say 0.60 metres and the level brought up with a graded granular hardcore compacted in layers not exceeding 150mm.

4.5 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.

The trial pit sides were found to have variable stability during the relatively short period that they were left open and unsupported with instability found in TP3 and TP4.

It is recommended that all excavations to greater than 1.20 metres 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.

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A groundwater seepage was encountered in TP1 at 0.40 metres depth. Moderate groundwater inflow was encountered in TP4 at 0.06 metres depth. 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 R2, R3, R5, and R6 to a depth of 4.00 metres, found groundwater to be at 0.40 to 0.50 metres, 1.10 to 1.50 metres, 0.05 to 0.10 metres, and 0.50 to 1.00 metres depth respectively.

Should groundwater seepages occur and water accumulate in the excavation it should be able to be removed by pumping from a filtered sump. Care will need to be taken when reducing groundwater levels to ensure that adjoining/ nearby buildings, structures and services are not affected.

4.6 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 5.0 (acidic) to 10.9.

Soluble sulphate concentrations were also determined for the soil samples and the results ranged from 0.02 to 0.12 g/l.

The results indicate that the Design Sulphate Class for the site should be DS-1.

Our knowledge of the site and ground conditions indicates that the site is “brownfield” and acidic with potentially mobile groundwater. Consequently, in accordance with the Design Sulphate Class for the site together with the site and groundwater conditions an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-3z should be used as detailed on the appended extract.

4.7 Contamination Considerations

An assessment of contamination on site has not been carried out and we would recommend that this is completed and a remediation scheme devised prior to commencing groundworks.

During excavations of trial pit TP5 in the west of the site rubble was discovered underlying an old concrete slab which contained suspected cement bound asbestos (CBA) fragments. In line with the duty of care a sample of this was tested and the results are appended.

Chrysotile (white) asbestos was detected in the cement sample analysed.

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4.8 Ground Gas Considerations

Ground gas monitoring has been undertaken on 2 of 6 scheduled occasions to date 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 4 GROUND GAS CONCENTRATIONS AND FLOW RATE

Methane (% vol. In air)	Carbon Dioxide (% vol. in air)	Oxygen (% vol. in air)	Gas Flow Rate (litres/ hour)
0.0	0.4 to 2.3	15.2 to 20.2	<0.1

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

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

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

The characteristic hazardous gas flow rate (Q_{hg}) is calculated by dividing the maximum gas (methane or carbon dioxide) concentration by 100 and multiplying by the maximum flow rate in litres per hour (minimum 0.1 l/hr for Sub Surface monitoring equipment). For this site Q_{hg} = [2.3/ 100] x 0.1 = 0.0023 l/hr

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

BS.8485:2015+A1:2019, Table 4, indicates that for a CS1 and the type of development proposed a score of zero gives no protection and remedial measures required.

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

Any manholes, inspection chambers or other void spaces formed beneath the sites ground surface are potential ground gas traps. Precautions, as per the excavations above, should be taken.

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

Sub Surface North East Limited
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Tel: 01924 278181 Fax: 01924 283455 Email: dsimpson@subsurface.co.uk

4.9 General

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

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

In the preparation of this report no consideration has been given to:

- the historical, geological, mining and/ or environmental setting of the site
- the possible presence of contamination
- the long term stability of the existing slopes and/or retaining structures and the short and long term stability of any proposed slopes and/or retaining structures required for the proposed development
- flora and fauna

as this was outside our brief. The above should be addressed prior to development.

We recommend that a Geological and Mining Risk Assessment is undertaken for this site.

It should be noted that we have made recommendations for further investigation in Section 4.7 to address asbestos contamination in the west if the site. We would recommend contamination analysis is undertaken for this site.

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

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.

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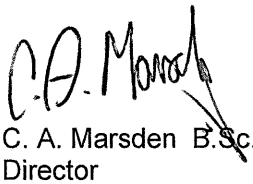
We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr David Simpson at our Ossett office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. NE4296
DECEMBER 2023

L. A. W. McCall - Bhakta B.Sc.(Hons.)
Geotechnical Engineer
For and on behalf of
Sub Surface Consultants Limited



C. A. Marsden B.Sc.(Hons.), C.Eng., M.I.C.E.
Director
For and on behalf of
Sub Surface Consultants Limited.

Sub Surface North East Limited
RCM Business Centre, Dewsbury Road, Ossett, West Yorkshire, WF5 9ND
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INSITU TEST RESULTS

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

Insitu Test Results

Site: LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE

Client: MR CARL MASTERS

Architect: ALAN ROBINSON

Job Number: NE4296

Sheet: 1 / 1

Ground Gas and Groundwater Monitoring Results Sheet

Date	Hole No.	Methane (% Volume)	Carbon Dioxide (% Volume)	Oxygen (% Volume)	Gas Flow Rate (l/hr)	Atmospheric Pressure (m bars)	Depth to Groundwater (m)
01/12/2023	R2	0.0	***1.5***	19.0	<0.1	998	0.40
	R3	0.0	***1.9***	***17.9***	<0.1	998	1.50
	R5	*	*	*	*	*	0.10
	R6	0.0	0.4	20.2	<0.1	998	1.00
12/12/2023	R2	0.0	***2.3***	***15.7***	<0.1	989	0.50
	R3	0.0	***2.1***	***15.2***	<0.1	989	1.10
	R5	*	*	*	*	*	0.05
	R6	0.0	0.6	20.2	<0.1	989	0.50

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

* = Water close to ground level

LABORATORY TEST RESULTS

SUB SURFACE
SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Laboratory Test Results

Site : LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

Client : MR CARL MASTERS

Architect : ALAN ROBINSON

Job Number NE4296

Sheet 1 / 1

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

Borehole/ Trial Pit	Depth (m)	Sample	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Group Symbol	Laboratory Description
				Percentage %	Moisture Content %						
TP2	0.75	D	18	96	19	35	18	17	0.05	CL/CI	Firm brown and grey CLAY
TP2	1.50	D	17	89	19	34	18	16	0.07	CL	Stiff slightly gravelly CLAY. Gravel is subangular fine sandstone and siltstone
TP2	2.30	D	16	94	17	32	18	14	-0.07	CL	Stiff slightly gravelly CLAY. Gravel is subangular fine sandstone and siltstone
TP4A	0.80	D	26	98	27	33	20	13	0.50	CL	Soft locally firm light brown and brown slightly gravelly CLAY with localised silt bands
TP4A	2.20	D	16	96	17	28	17	11	-0.03	CL	Firm brown gravelly silty CLAY. Gravel is fine sandstone and siltstone
TP5	1.00	D	21	99	21	33	20	13	0.09	CL	Firm light brown and brown slightly gravelly CLAY with occasional sandstone cobbles and boulders
TP5	1.70	D	16	94	17	29	17	12	0.00	CL	Firm light brown and brown slightly gravelly CLAY with occasional sandstone cobbles and boulders
TP6	0.90	D	20	99	20	31	19	12	0.10	CL	Very soft to soft brown silty CLAY with occasional thin sand lenses
TP6	2.00	D	19	99	19	34	18	16	0.08	CL	Firm locally stiff brown slightly gravelly silty CLAY
TP6	2.90	D	23	94	24	25	18	7	0.93	CL	Firm locally stiff brown slightly gravelly silty CLAY
TP7	1.10	D	21	97	22	35	17	18	0.26	CL/CI	Soft brown and grey gravelly CLAY. Gravel is subangular to rounded fine to medium sandstone and siltstone
TP7	3.00	D	15	95	16	28	14	14	0.13	CL	Firm brown and grey gravelly CLAY. Gravel is subangular to rounded fine to medium sandstone and siltstone

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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Laboratory Test Results

Site : LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

Client : MR CARL MASTERS

Architect : ALAN ROBINSON

Job Number NE4296

Sheet 1 / 1

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

Borehole/ Trial Pit	Depth (m)	Sample	Concentration of Sulphate			Total Sulphur %	Magnesium mg/l	Ammonium NH4 mg/l	Water Soluble Chloride mg/l	Water Soluble Nitrate mg/l	pH	Design Class	Laboratory Description
			Soil										
			Total S03 %	S04 in 2:1 water:soil g /l	Ground Water g /l								
TP2	0.75	D		0.12							6.4	DS-1	Firm brown and grey CLAY
TP3	1.00	D		0.02							7.1	DS-1	Possible MADE GROUND: brown and grey slightly gravelly medium SAND with occasional cobbles and boulders of sandstone
TP5	0.10	B		0.07							10.9	DS-1	MADE GROUND: Partially cemented partially loose brick, roof tiles, rubble and occasional suspect CBA fragments
TP6	0.90	D		0.03							5.0	DS-1	Very soft to soft brown silty CLAY with occasional thin sand lenses
TP6	2.90	D		0.03							6.1	DS-1	Firm locally stiff brown slightly gravelly silty CLAY
TP7	2.40	D		0.02							6.6	DS-1	Firm brown and grey gravelly CLAY. Gravel is subangular to rounded fine to medium sandstone and siltstone

Method of Preparation : BS 1377:PART 1:1990:7.5 Preparation of soil for chemical tests BS 1377:PART 3:1990:5.2, 5.3, 5.4 & 9.4

Method of Test : Lab in-house methods based on BS1377: Part 3 for contents of water sol sulphate, pH, chloride and magnesium. Lab in-house method based on MEWAM (EA, 2006) for total sulphur

Remarks : Classification relates to Design Sulphate Class of BRE Special Digest 1 (2005)

AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION.

Table C1 Aggressive Chemical Environment for Concrete (ACEC) classification for natural ground locations [a]

Sulfate				Groundwater		
Design Sulfate Class for location	2:1 water/soil extract [b]	Groundwater	Total potential sulfate [c]	Static water	Mobile water	ACEC Class for location
1	2 (SO_4 mg/l)	3 (SO_4 mg/l)	4 (SO_4 %)	5 (pH)	6 (pH)	7
DS-1	< 500	< 400	< 0.24	≥ 2.5		AC-1s
					> 5.5 [d]	AC-1 [d]
					2.5–5.5	AC-2z
DS-2	500–1500	400–1400	0.24–0.6	> 3.5		AC-1s
					> 5.5	AC-2
				2.5–3.5		AC-2s
					2.5–5.5	AC-3z
DS-3	1600–3000	1500–3000	0.7–1.2	> 3.5		AC-2s
					> 5.5	AC-3
				2.5–3.5		AC-3s
					2.5–5.5	AC-4
DS-4	3100–6000	3100–6000	1.3–2.4	> 3.5		AC-3s
					> 5.5	AC-4
				2.5–3.5		AC-4s
					2.5–5.5	AC-5
DS-5	> 6000	> 6000	> 2.4	> 3.5		AC-4s
				2.5–3.5	≥ 2.5	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_4) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).
d For flowing water that is potentially aggressive to concrete owing to high purity or an aggressive carbon dioxide level greater than 15 mg/l (Section C2.2.3), increase the ACEC Class to AC-2z.

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

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

Sulfate and magnesium						Groundwater		ACEC
Design Sulfate Class for location	2:1 water/soil extract [b]		Groundwater		Total potential sulfate [c]	Static water	Mobile water	Class for location
1	2 (SO_4 mg/l)	3 (Mg mg/l)	4 (SO_4 mg/l)	5 (Mg mg/l)	6 (SO_4 %)	7 (pH) [d]	8 (pH) [d]	9
DS-1	< 500		< 400		< 0.24	≥ 2.5		AC-1s
							> 6.5 [d]	AC-1
							5.5–6.5	AC-2z
							4.5–5.5	AC-3z
							2.5–4.5	AC-4z
DS-2	500–1500		400–1400		0.24–0.6	> 5.5		AC-1s
							> 6.5	AC-2
						2.5–5.5		AC-2s
							5.5–6.5	AC-3z
							4.5–5.5	AC-4z
							2.5-4.5	AC-5z
DS-3	1600–3000		1500–3000		0.7–1.2	> 5.5		AC-2s
							> 6.5	AC-3
						2.5–5.5		AC-3s
							5.5–6.5	AC-4
							2.5–5.5	AC-5
DS-4	3100–6000	≤ 1200	3100–6000	≤ 1000	1.3–2.4	> 5.5		AC-3s
							> 6.5	AC-4
						2.5–5.5		AC-4s
							2.5–6.5	AC-5
DS-4m	3100–6000	> 1200 [e]	3100–6000	> 1000 [e]	1.3–2.4	> 5.5		AC-3s
							> 6.5	AC-4m
						2.5–5.5		AC-4ms
							2.5–6.5	AC-5m
DS-5	> 6000	≤ 1200	> 6000	≤ 1000	> 2.4	> 5.5		AC-4s
						2.5–5.5	≥ 2.5	AC-5
DS-5m	> 6000	> 1200 [e]	> 6000	> 1000 [e]	> 2.4	> 5.5		AC-4ms
						2.5–5.5	≥ 2.5	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_4), 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	23-27361	*Issued:*	24-Nov-23

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

Our Reference	23-27361
Client Reference	NE4296
Order No	(not supplied)
Contract Title	BAR LANE (BARNSLEY)
Description	6 Soil samples, 1 Misc sample.
Date Received	21-Nov-23
Date Started	21-Nov-23
Date Completed	24-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil/Misc Samples

Our Ref 23-27361
Client Ref NE4296
Contract Title BAR LANE (BARNSLEY)

			Lab No	2265159	2265160	2265161	2265163	2265164	2265165
			.Sample ID	TP2	TP3	TP5	TP6	TP6	TP7
			Depth	0.75	1.00	0.10-0.20	0.90	2.90	2.40
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	10/11/2023	10/11/2023	10/11/2023	10/11/2023	10/11/2023	10/11/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Inorganics									
pH	DETSC 2008#		pH	6.4	7.1	10.9	5.0	6.1	6.6
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	120	19	71	31	29	21

Summary of Asbestos Analysis
Bulk Samples

Our Ref 23-27361
Client Ref NE4296
Contract Title BAR LANE (BARNSLEY)

Lab No	Sample ID	Sample Location	Material Type*	Result	Comment*	Analyst
2265162	TP5 0.10-0.20		Cement	Chrysotile	none	Lee Kerridge

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 23-27361
Client Ref NE4296
Contract BAR LANE (BARNSLEY)

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2265159	TP2 0.75 SOIL	10/11/23	PT 500ml	pH + Conductivity (7 days)	
2265160	TP3 1.00 SOIL	10/11/23	PT 500ml	pH + Conductivity (7 days)	
2265161	TP5 0.10-0.20 SOIL	10/11/23	PT 1L	pH + Conductivity (7 days)	
2265162	TP5 0.10-0.20 MISC	10/11/23	PT 500ml		
2265163	TP6 0.90 SOIL	10/11/23	PT 500ml	pH + Conductivity (7 days)	
2265164	TP6 2.90 SOIL	10/11/23	PT 500ml	pH + Conductivity (7 days)	
2265165	TP7 2.40 SOIL	10/11/23	PT 500ml	pH + Conductivity (7 days)	

Key: P-Plastic 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.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

ROTARY BOREHOLE RECORD SHEETS

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T.COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
Location	**Dates**		**Architect**	**Sheet**
AS PLAN	28/11/2023		ALAN ROBINSON	1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00					C		(0.30) 0.30	MADE GROUND : friable dark brown slightly sandy silty clay with occasional rootlets.		
							(1.00)	Soft brown, orangish brown and dark brown mottled slightly gravelly slightly sandy silty CLAY with occasional rootlets and roots and occasional pockets of sandy clay. Gravel is subangular fine to medium sandstone.		
1.00-2.00					C		1.30 (0.40) 1.70	Very soft light yellowish brown and occasional orangish brown mottled slightly gravelly sandy silty CLAY with occasional pockets of sand. Gravel is subangular fine to medium sandstone.		
							1.80 (0.20) 2.00	Reddish brown silty fine to medium SAND.		
2.00-3.00					C		(0.50) 2.50	Stiff brown and occasionally grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to medium sandstone and coal.		
								Brown and orangish brown silty slightly clayey fine to coarse SAND with occasional pockets of sandy clay.		
							(3.60)	Weak brown SANDSTONE		
							6.10 (1.40)	Weak brown MUDSTONE.		
							7.50 (1.10)	Medium strong brown MUDSTONE.		
							8.60 (1.40)	Medium strong grey MUDSTONE.		

Remarks
Strata descriptions below rockhead based upon foreman drillers inspection of chippings flushed to the surface.
Foreman driller recorded no voids, broken ground or loss of flush.
On completion backfilled with gravel and sealed with bentonite.

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R1

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T.COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
	Location	**Dates**	**Architect**	**Sheet**
	AS PLAN	28/11/2023	ALAN ROBINSON	2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							10.00	Medium strong grey MUDSTONE		
							(3.50)			
							13.50	Strong grey SILTSTONE.		
							(1.30)			
							14.80	Medium strong grey MUDSTONE.		
							(3.70)			
							18.50	Strong grey SILTSTONE		
							(1.50)			

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R1

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T.COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
	Location	**Dates**	**Architect**	**Sheet**
	AS PLAN	28/11/2023	ALAN ROBINSON	3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							20.00	Strong grey SILTSTONE.		
							(1.30)			
							21.30	Medium strong grey MUDSTONE.		
							(3.70)			
					28/11/2023:		25.00	Complete at 25.00m		

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R1

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
Location	**Dates**		**Architect**	**Sheet**
AS PLAN	27/11/2023		ALAN ROBINSON	1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.20) 0.20	MADE GROUND : Concrete.			
							(0.30) 0.50	MADE GROUND : Hardcore.			
							(0.70) 1.20	Brown sandy CLAY.			
							(1.00) 2.20	Brown clayey SAND.			
							(2.30) 4.50	Weak brown SANDSTONE.			
							(2.70) 7.20	Strong brown SANDSTONE.			
							(2.30) 9.50	Medium strong light brown MUDSTONE.			
							(0.50)	Medium strong grey MUDSTONE.			

Remarks
Strata descriptions based upon foreman drillers inspection of chippings flushed to the surface.
Foreman driller recorded no voids, broken ground or loss of flush.
On completion installed a 50mm diameter HDPE gas and groundwater monitoring standpipe with 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 to GL.

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R2

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
Location	**Dates**		**Architect**	**Sheet**
AS PLAN	27/11/2023		ALAN ROBINSON	2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							10.00				
							(2.20)	Medium strong grey MUDSTONE			
							12.20	Strong grey SILTSTONE.			
							(1.80)				
							14.00	Medium strong grey MUDSTONE.			
							(3.50)				
							17.50	Strong grey SILTSTONE.			
							(2.30)				
							19.80	Medium strong grey MUDSTONE.			

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R2

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
Location	**Dates**		**Architect**	**Sheet**
AS PLAN	27/11/2023		ALAN ROBINSON	3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.20) 20.00	Medium strong grey MUDSTONE.			
							(5.00)				
					27/11/2023:		25.00	Complete at 25.00m			

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R2

SUB SURFACE

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

Site
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

Borehole Number
R3

Boring Method
T. COP Rotary Drill
Water Flush

Casing Diameter
150mm cased to 2.50m

Ground Level (mOD)

Client
MR CARL MASTERS

Job Number
NE4296

Location
AS PLAN

Dates
27/11/2023

Architect
ALAN ROBINSON

Sheet
1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.20) 0.20	MADE GROUND : Concrete.			
							(0.20) 0.40	MADE GROUND : Hardcore.			
							(0.40) 0.80	Brown sandy CLAY.			
							(1.30) 2.10	Brown clayey SAND.			
							(1.90) 4.00	Weak brown SANDSTONE.			
							(2.00) 6.00	Strong brown SANDSTONE.			
							(1.50) 7.50	Medium strong brown MUDSTONE.			
							(0.20) 7.70	COAL.			
							(0.60) 8.30	Medium strong brown MUDSTONE.			
							(1.70)	Medium strong grey MUDSTONE.			

Remarks
Strata descriptions based upon foreman drillers inspection of chippings flushed to the surface.
Foreman driller recorded no voids, broken ground or loss of flush.
On completion installed a 50mm diameter HDPE gas and groundwater monitoring standpipe with 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 to GL.

Scale (approx)
1:50

Logged By
DS

Figure No.
NE4296.R3

SUB SURFACE

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

Site
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

Borehole Number
R3

Boring Method
T. COP Rotary Drill
Water Flush

Casing Diameter
150mm cased to 2.50m

Ground Level (mOD)

Client
MR CARL MASTERS

Job Number
NE4296

Location
AS PLAN

Dates
27/11/2023

Architect
ALAN ROBINSON

Sheet
2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							10.00				
							(1.50)	Medium strong grey MUDSTONE.			
							11.50				
							(1.90)	Medium strong grey SILTSTONE.			
							13.40				
							(4.60)	Medium strong light grey MUDSTONE.			
							18.00				
							(2.00)	Medium strong light grey SILTSTONE.			

Remarks

Scale (approx)
1:50

Logged By
DS

Figure No.
NE4296.R3

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 2.50m		MR CARL MASTERS	NE4296
Location	**Dates**		**Architect**	**Sheet**
AS PLAN	27/11/2023		ALAN ROBINSON	3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							20.00	Medium strong light grey SILSTONE.			
							(1.50)				
							21.50	Medium strong light grey MUDSTONE.			
							(3.50)				
					27/11/2023:		25.00	Complete at 25.00m			

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R3

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R4

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
	Location	**Dates**	**Architect**	**Sheet**
	AS PLAN	24/11/2023	ALAN ROBINSON	1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.70)	Brown sandy TOPSOIL.		
							0.70	Orangish grey sandy CLAY.		
							(0.90)			
							1.60	Brown clayey SAND.		
							(1.20)			
							2.80	Weak brown SANDSTONE.		
							(4.70)			
							7.50	Weak light brown MUDSTONE.		
							(1.10)			
							8.60	COAL		
							(0.40)			
							9.00	Medium strong dark grey MUDSTONE.		
							(1.20)			

Remarks
Strata descriptions based upon foreman drillers inspection of chippings flushed to the surface.
Foreman driller recorded no voids, broken ground or loss of flush.
On completion backfilled with gravel and sealed with bentonite.

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R4

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R4

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
	Location	**Dates**	**Architect**	**Sheet**
	AS PLAN	24/11/2023	ALAN ROBINSON	2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							10.20	Strong grey SILTSTONE.		
							(2.70)			
							12.90	Medium strong grey MUDSTONE.		
							(4.40)			
							17.30	Medium strong dark grey MUDSTONE		
							(2.70)			

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R4

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R4

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
	Location	**Dates**	**Architect**	**Sheet**
	AS PLAN	24/11/2023	ALAN ROBINSON	3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							20.00			
							(1.00)	Medium strong dark grey MUDSTONE.		
							21.00			
							(2.10)	Strong grey SILTSTONE.		
							23.10			
							(1.90)	Strong grey MUDSTONE.		
					24/11/2023:		25.00	Complete at 25.00m		

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R4

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

Borehole Number
R5

Boring Method
T. COP Rotary Drill
Water Flush

Casing Diameter
150mm cased to 3.00m

Ground Level (mOD)

Client
MR CARL MASTERS

Job Number
NE4296

Location
AS PLAN

Dates
23/11/2023

Architect
ALAN ROBINSON

Sheet
1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.50) 0.50	Brown sandy TOPSOIL.			
							(2.00) 2.50	Firm orangish grey silty CLAY.			
							(0.60) 3.10	Weak brown SANDSTONE.			
							(2.20) 5.30	Weak brown MUDSTONE.			
							(2.60) 7.90	Medium strong grey MUDSTONE.			
							(2.60)	Medium strong dark grey MUDSTONE.			

Remarks
Strata descriptions based upon foreman drillers inspection of chippings flushed to the surface.
Foreman driller recorded no voids, broken ground or loss of flush.
On completion installed a 50mm diameter HDPE gas and groundwater monitoring standpipe with 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 to GL.

Scale (approx)
1:50

Logged By
DS

Figure No.
NE4296.R5

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

Borehole Number
R5

Boring Method
T. COP Rotary Drill
Water Flush

Casing Diameter
150mm cased to 3.00m

Ground Level (mOD)

Client
MR CARL MASTERS

Job Number
NE4296

Location
AS PLAN

Dates
23/11/2023

Architect
ALAN ROBINSON

Sheet
2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							10.50 (0.30) 10.80	COAL. Strong dark grey MUDSTONE.			
							(3.70)				
							14.50	Strong light grey SILTSTONE.			
							(1.70)				
							16.20	Strong light grey MUDSTONE.			
							(2.80)				
							19.00	Strong light grey SILTSTONE			
							(1.00)				

Remarks

Scale (approx)
1:50

Logged By
DS

Figure No.
NE4296.R5

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R5

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.00m		MR CARL MASTERS	NE4296
	Location	**Dates**	**Architect**	**Sheet**
	AS PLAN	23/11/2023	ALAN ROBINSON	3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							20.00	Strong light grey SILTSTONE.			
							(2.20)				
							22.20	Strong light grey MUDSTONE.			
							(7.80)				
					23/11/2023:		30.00				

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R5

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R6

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.50m		MR CARL MASTERS	NE4296
	Location	**Dates** 24/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.40)	Brown sandy TOPSOIL.			
							0.40	Orangish grey sandy silty CLAY.			
							(1.10)				
							1.50	Brown clayey SAND.			
							(2.10)				
							3.60	Weak brown SANDSTONE.			
							(5.90)				
							9.50	Weak brown MUDSTONE.			

Remarks
Strata descriptions based upon foreman drillers inspection of chippings flushed to the surface.
Foreman driller recorded no voids, broken ground or loss of flush.
On completion installed a 50mm diameter HDPE gas and groundwater monitoring standpipe with 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 to GL.

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R6

SUB SURFACE

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

Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R6

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.50m		MR CARL MASTERS	NE4296
	Location	**Dates** 24/11/2023	**Architect** ALAN ROBINSON	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(1.10)				
							10.60	Medium strong grey MUDSTONE.			
							(4.10)				
							14.70	Strong grey SILTSTONE.			
							(3.50)				
							18.20	Medium strong grey MUDSTONE.			
							(1.30)				
							19.50	Medium strong dark grey MUDSTONE.			
							(0.50)				

Remarks

Scale (approx)	Logged By
1:50	DS

Figure No. NE4296.R6

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site	Borehole Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	R6

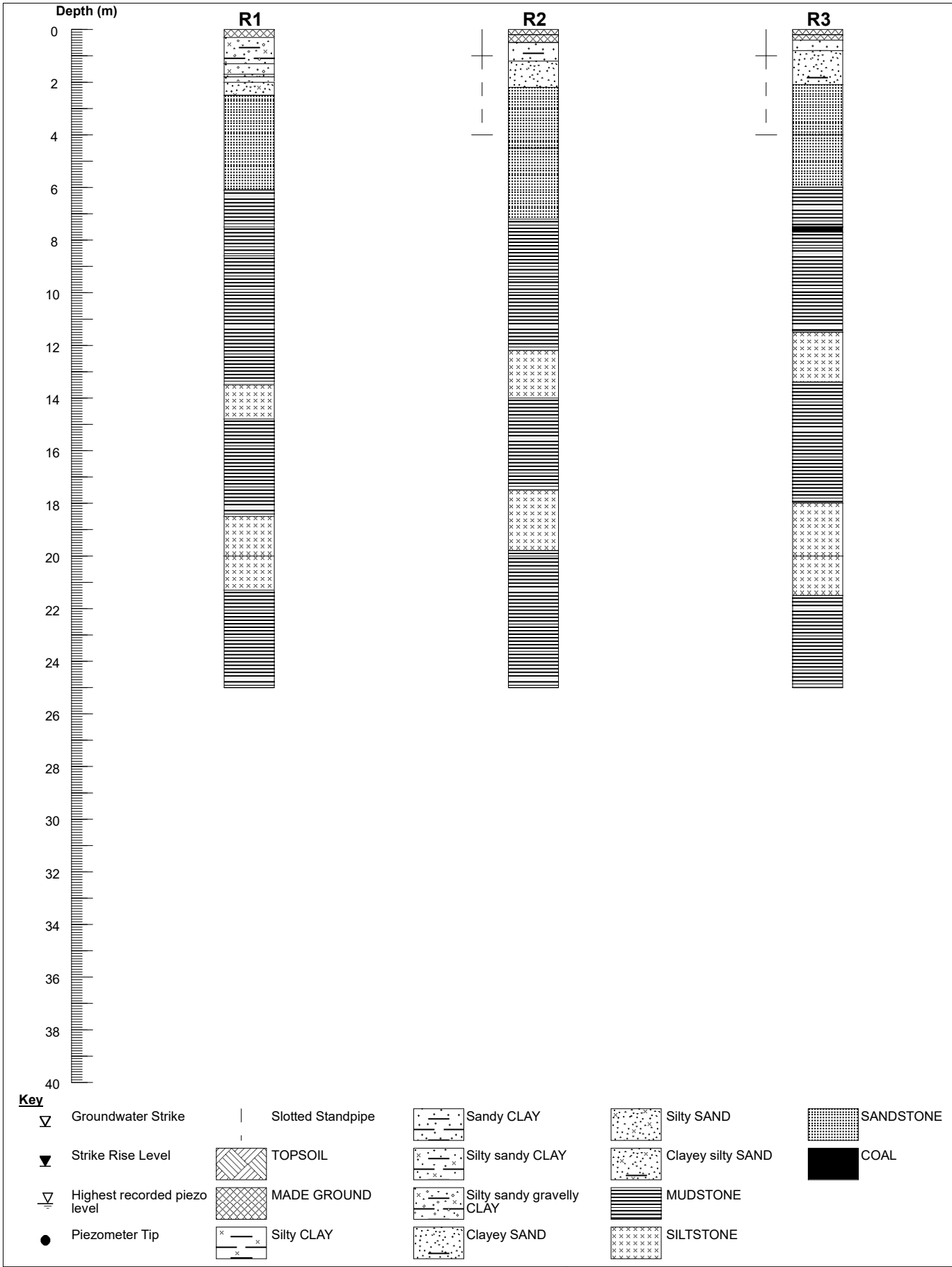
Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
T. COP Rotary Drill Water Flush	150mm cased to 3.50m		MR CARL MASTERS	NE4296
	Location	**Dates** 24/11/2023	**Architect** ALAN ROBINSON	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							20.00	Medium strong dark grey MUDSTONE.			
							(2.00)				
							22.00	Strong grey SILTSTONE.			
							(3.00)				
					24/11/2023:		25.00	Complete at 25.00m			

Remarks

Scale (approx)	Logged By
1:50	DS

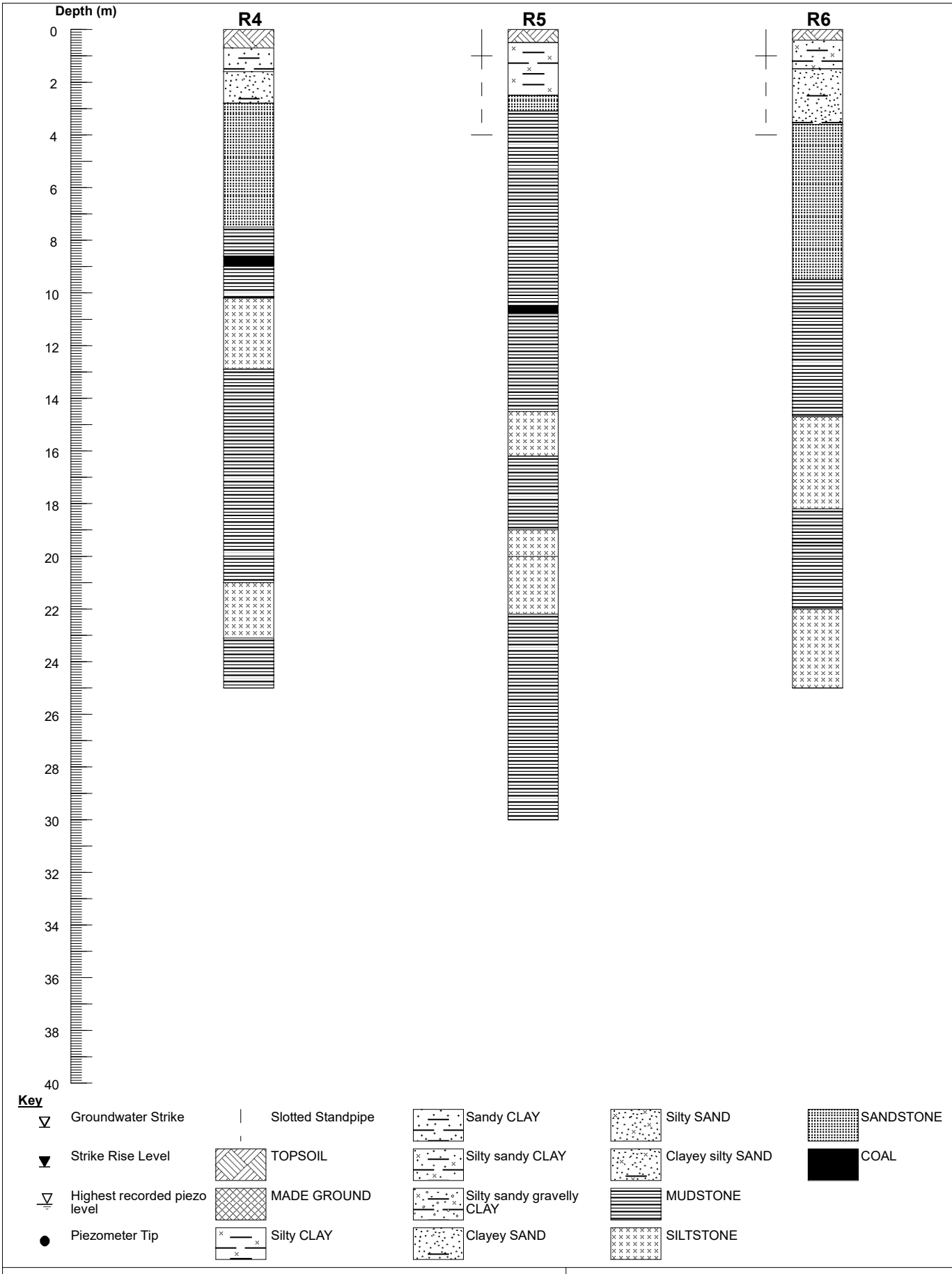
Figure No. NE4296.R6



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

Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	18/01/2024		1/2	NE4296
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
MR CARL MASTERS			1:200[V]	NE4296.1



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

Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	18/01/2024		2/2	NE4296
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
MR CARL MASTERS			1:200[V]	NE4296.1

TRIAL PIT RECORD SHEETS

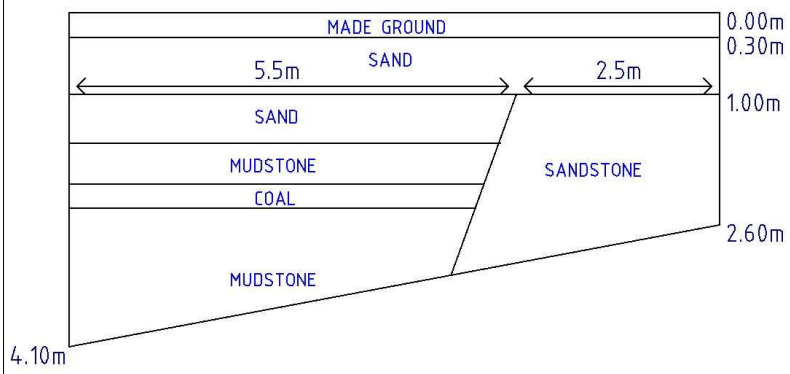
SUB SURFACE

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

Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 8.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15	B		Water seepage(1) at 0.40m.		(0.30)	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets. …at 0.20m : clay pipe		
0.50	B				0.30 (0.70)	Light brown and light grey gravelly medium SAND with bands of slightly gravelly sand. Gravel sized fragments are fine to medium sandstone lithorelicts (completely weathered bedrock).		▽1
0.90	D				1.00 (0.60)	Brown very gravelly coarse SAND. Gravel sized fragments are fine to coarse sandstone lithorelicts (completely weathered bedrock). Fractured sandstone beyond suspected fault.		
1.50	D				1.60 (0.50)	Very weak very thinly bedded dark brown highly weathered MUDSTONE.		
1.80	D				2.10 (0.30)	Very weak very thinly bedded dark grey highly weathered COAL.		
2.20	D				2.40	Very weak very thinly bedded grey highly weathered MUDSTONE in places completely weathered to a clay.		
3.20	D				(1.70)			



Remarks

Ground water seepage at 0.40 metres. Slight to moderate centralised water entry at approximate position of fault zone.
Pit sides remained vertical and stable.
On completion backfilled with arisings
Fault zone fractured with water inflow approximately 17.5m from the site boundary

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP1

SUB SURFACE

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

Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 8.00		MR CARL MASTERS	NE4296
	Location	**Dates**	**Architect**	**Sheet**
	AS PLAN	10/11/2023	ALAN ROBINSON	2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			10/11/2023:		4.10	Complete at 4.10m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP1

SUB SURFACE

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

Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP2

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				(0.40) 0.40	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets. …at 0.10m : clay pipe		
0.50	D				(0.20) 0.60	Soft light brown silty CLAY with some bands of clayey silt.		
0.75	D		HV at 0.90m c=52kPa		(0.80) 1.40	Firm medium strength brown and grey CLAY.		
1.50	D		HV at 1.60m c=76kPa		(1.40) 2.80	Stiff high strength slightly gravelly CLAY. Gravel is subangular fine sandstone and siltstone.		
2.30	D							
2.85	D		10/11/2023:DRY		(0.20) 3.00	Weak thinly bedded brown moderately weathered coarse grained SANDSTONE.		
						Complete at 3.00m		

Plan

Remarks

No groundwater inflow.
HV = Hand Shear Vane test
Pit sides remained vertical and stable.
On completion backfilled with arisings

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP2

SUB SURFACE

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Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP3

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND : friable dark brown sandy clayey silty with occasional rootlets. …at 0.10m : clay pipe		
0.20	B				0.30			
0.40	B					Possible Made Ground : Soft low strength becoming firm medium strength yellowish brown sandy CLAY.		
			HV at 0.50m c=38kPa		(0.50)	…below 0.60m : firm medium strength		
			HV at 0.70m c=46kPa		0.80			
						Possible Made Ground : Brown and grey slightly gravelly medium SAND with occasional cobbles and boulders of sandstone.		
1.00	D				(1.00)			
1.60	D							
1.80	D				1.80			
			HV at 1.90m c=44kPa		(0.30)	Firm medium strength dark brown gravelly CLAY. …at 1.80m : old root traces		
2.00	B				2.10			
						Brown slightly gravelly medium to coarse SAND. Gravel is subangular fine to medium sandstone.		
2.50	D				(1.25)			
3.30	D		10/11/2023:DRY		3.35	Complete at 3.35m		

Plan

Remarks

Pit sides partially collapsing.
HV = Hand Shear Vane test
No groundwater inflow.
On completion backfilled with arisings

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP3

SUB SURFACE

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

Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			Moderate water inflow(1) at 0.06m.		(0.45)	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets.		▽1
0.30	B				0.45			
					(0.35)	MADE GROUND : brown and grey gravel and cobble sized fragments of brick and concrete.		
0.70	B				0.80			
			HV at 0.95m c=15kPa		(0.30)	Very soft very low strength brown silty CLAY.		
1.00	B				1.10			
			10/11/2023:			Complete at 1.10m		

Plan

Remarks

Pits sides collapsing
HV = Hand Shear Vane test
Moderate groundwater inflow at 0.06m.
Presumed old soakaway pit
On completion backfilled with arisings.

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP4

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP4A

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.45)	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets.		
					0.45	Soft low strength locally firm medium strength light brown and brown slightly gravelly CLAY with localised silt bands.		
			HV at 0.70m c=24kPa					
0.80	D							
			HV at 1.00m c=42kPa			…at 1.00m : with occasional sandstone boulders.		
					(1.65)			
1.40	D							
			HV at 1.60m c=36kPa					
					2.10	Firm brown gravelly silty CLAY. Gravel is fine sandstone and siltstone.		
2.20	D				(0.50)	…at 2.40m : sandstone boulder.		
					2.60	Complete at 2.60m		
			10/11/2023:DRY					

Plan

Remarks

Pit sides remained vertical and stable.
HV = Hand Shear Vane test
No groundwater inflow.
On completion backfilled with arisings.

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP4A

SUB SURFACE

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

Site
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE

Trial Pit Number
TP5

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.20	B				0.05	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets.		
0.10-0.20	D				0.10 (0.10)			
					0.20	MADE GROUND : old concrete slab.		
						MADE GROUND : partially cemented, partially loose brick, roof tiles rubble and occasional suspect cement bound asbestos fragments.		
0.50	D					Firm medium strength light brown and brown slightly gravelly CLAY with occasional sandstone cobbles and boulders.		
1.00	D		HV at 1.10m c=52kPa		(1.65)			
1.70	D				1.85	…at 1.85m : boulders of sandstone.		
			10/11/2023:DRY			Complete at 1.85m		

Plan

Remarks

Pit sides remained vertical and stable.
HV = Hand Shear Vane test
No groundwater inflow.
On completion backfilled with arisings.

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP5

SUB SURFACE

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

Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP6

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED			MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				(0.40)	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets.		
0.50	D				0.40	Very soft very low strength to soft low strength brown silty CLAY with occasional thin sand lenses.		
			HV at 0.60m c=15kPa		(0.55)			
0.90	D		HV at 0.90m c=25kPa HV at 1.00m c=46kPa		0.95	Firm medium strength brown slightly gravelly CLAY. Gravel is fine brown sandstone.		
1.20	D				(0.35)			
					1.30	Firm medium strength locally stiff high strength brown slightly gravelly CLAY.		
			HV at 1.50m c=52kPa					
2.00	D					...at 2.10m: stiff high strength		
			HV at 2.10m c=76kPa		(2.40)			
2.90	D					...2.80m to 3.00m : occasional dark brown and brown gravelly sand bands.		
			HV at 3.30m c=58kPa					
3.50	D							
			10/11/2023:DRY		3.70	Complete at 3.70m		

Plan

Remarks

Pit sides remained vertical and stable.
HV = Hand Shear Vane test
No groundwater inflow.
On completion backfilled with arisings.

Scale (approx)	Logged By	Figure No.
1:25	HB	NE4296.TP6

SUB SURFACE

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

Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP7

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				(0.40)	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets.		
					0.40			
0.60	D				(0.55)	Soft low strength light brown and brown silty CLAY.		
			HV at 0.90m c=20kPa		0.95			
1.10	D		HV at 1.10m c=32kPa			Soft low strength becoming firm medium strength brown and grey gravelly CLAY. Gravel is subangular to rounded fine to medium sandstone and siltstone.		
1.70	D		HV at 1.60m c=42kPa			…below 1.60m : firm medium strength.		
2.40	D				(3.30)			
			HV at 2.70m c=49kPa					
3.00	D							
3.60	D		HV at 3.60m c=75kPa					

Plan

Remarks

Pit sides remained vertical and stable.
HV = Hand Shear Vane test
No groundwater inflow.
On completion backfilled with arisings.

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP7

SUB SURFACE

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Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP7

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			10/11/2023:DRY		4.25	Complete at 4.25m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP7

SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site	Trial Pit Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	TP8

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
MACHINE EXCAVATED	0.60 x 3.00		MR CARL MASTERS	NE4296
	Location AS PLAN	**Dates** 10/11/2023	**Architect** ALAN ROBINSON	**Sheet** 1/1

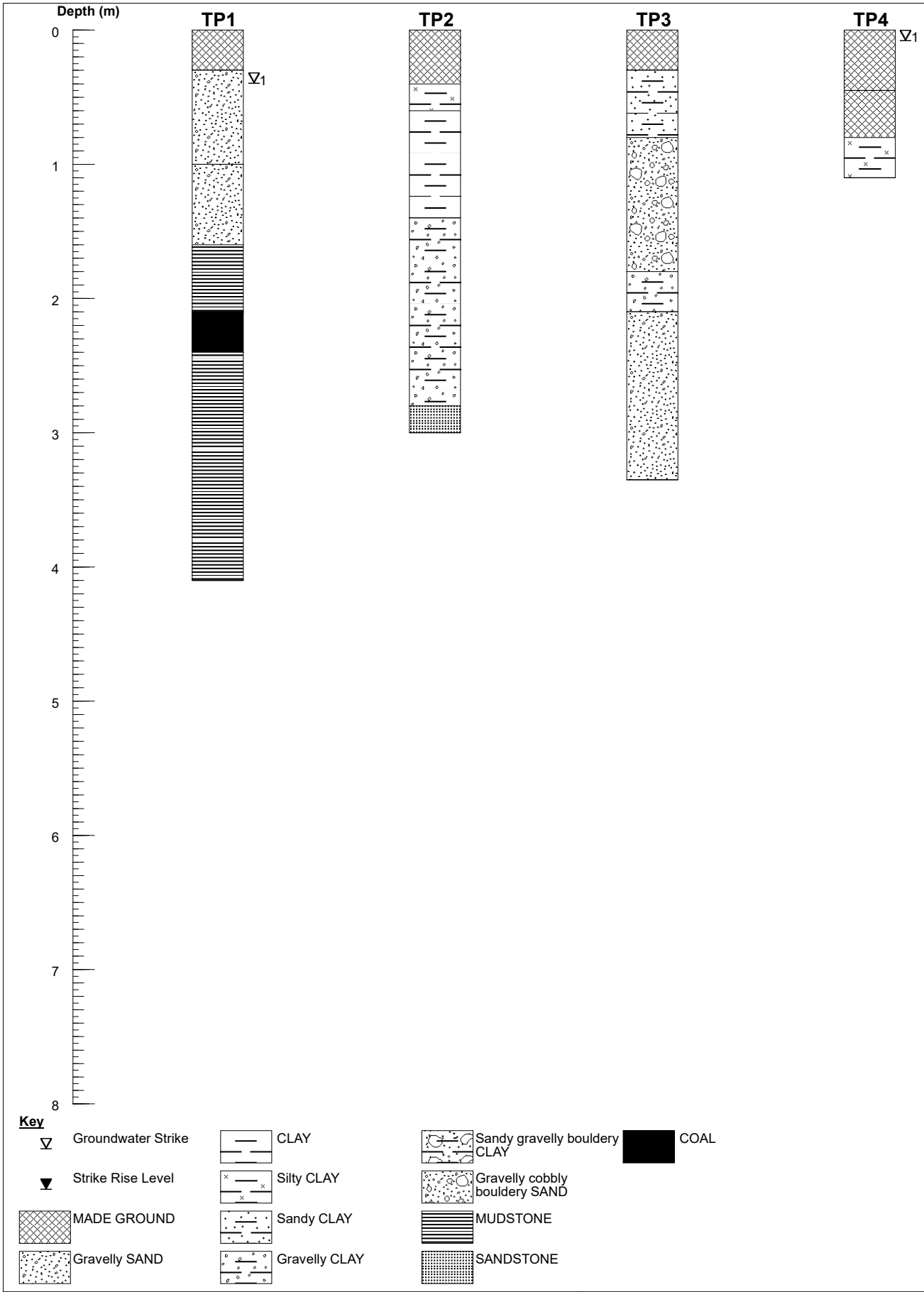
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.05	B				0.05	MADE GROUND : friable dark brown ashy sandy clayey silt with occasional rootlets.		
					(0.55)	MADE GROUND : friable dark brown sandy clayey silt with occasional rootlets.		
0.70	D				0.60	Very soft very low strength slightly gravelly light brown silty CLAY with occasional sandstone cobbles. Gravel is subangular fine to coarse sandstone.		
			HV at 0.85m c=18kPa		(0.50)			
1.20	D		HV at 1.20m c=38kPa		1.10	Soft low strength becoming firm medium strength brown slightly gravelly CLAY with occasional sandstone boulders. Gravel is subangular fine sandstone and siltstone.		
			HV at 1.50m c=44Kpa		(0.55)	…below 1.50m : firm medium strength.		
1.70	D		HV at 1.90m c=48kPa		1.65	Firm medium strength brown, dark brown and occasional grey mottled slightly gravelly CLAY. Gravel is subangular fine to medium sandstone and siltstone.		
2.60	D		HV at 2.80m c=56kPa		(2.25)			
3.20	D							
3.80	D		10/11/2023:DRY		3.90	Complete at 3.90m		

Plan

Remarks

Area of old bonfire.
Pit sides remained vertical and stable.
HV = Hand Shear Vane test
No groundwater inflow.
On completion backfilled with arisings.

Scale (approx)	Logged By	Figure No.
1:25	DS/HB	NE4296.TP8



SUB SURFACE
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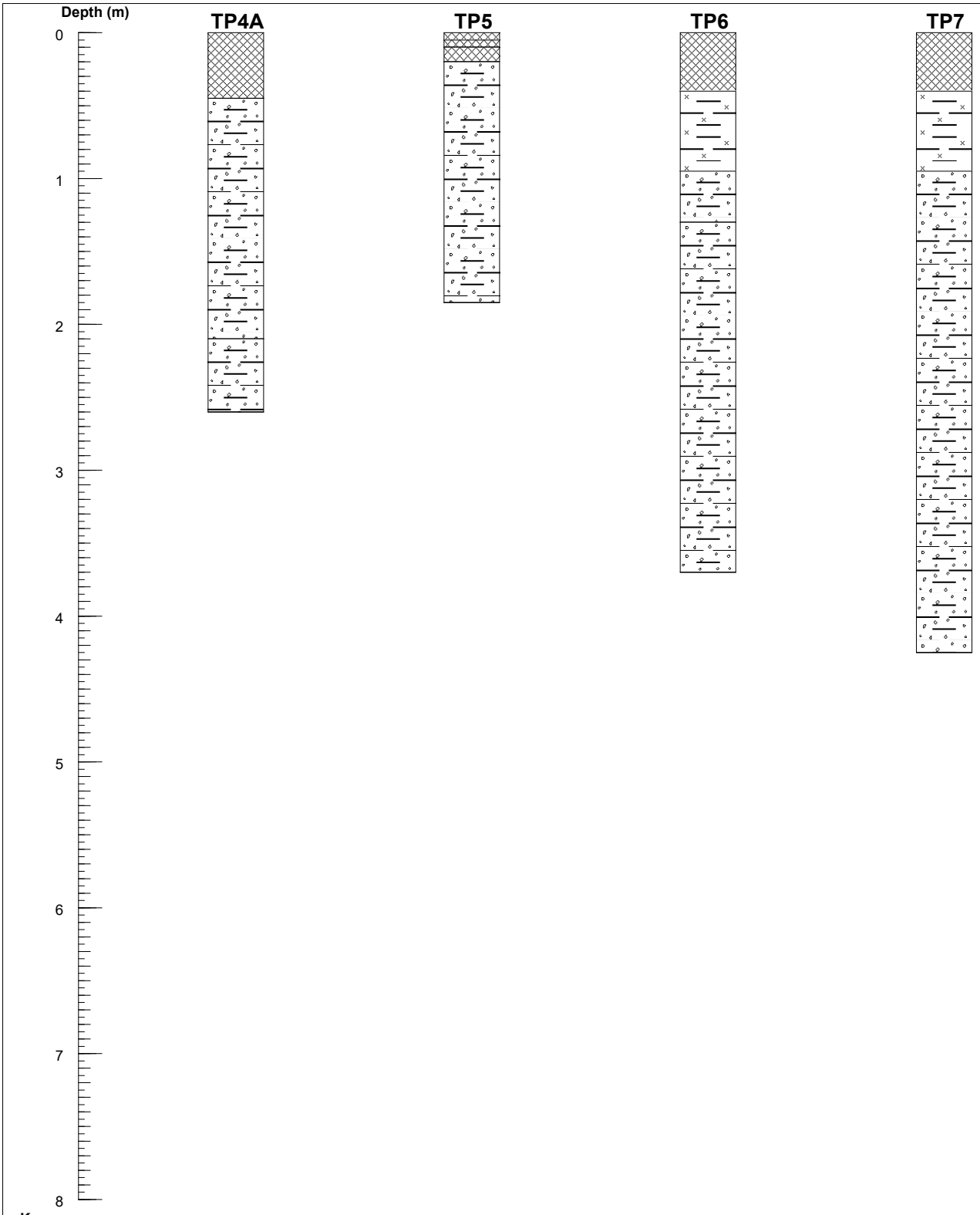
Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	18/01/2024		1/3	NE4296
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
MR CARL MASTERS			1:40[V]	NE4296.1



Key

- Groundwater Strike
- Strike Rise Level
- MADE GROUND
- Gravelly SAND
- CLAY
- Silty CLAY
- Sandy CLAY
- Gravelly CLAY
- Sandy gravelly bouldery CLAY
- Gravelly cobbly bouldery SAND
- MUDSTONE
- SANDSTONE
- COAL

SUB SURFACE
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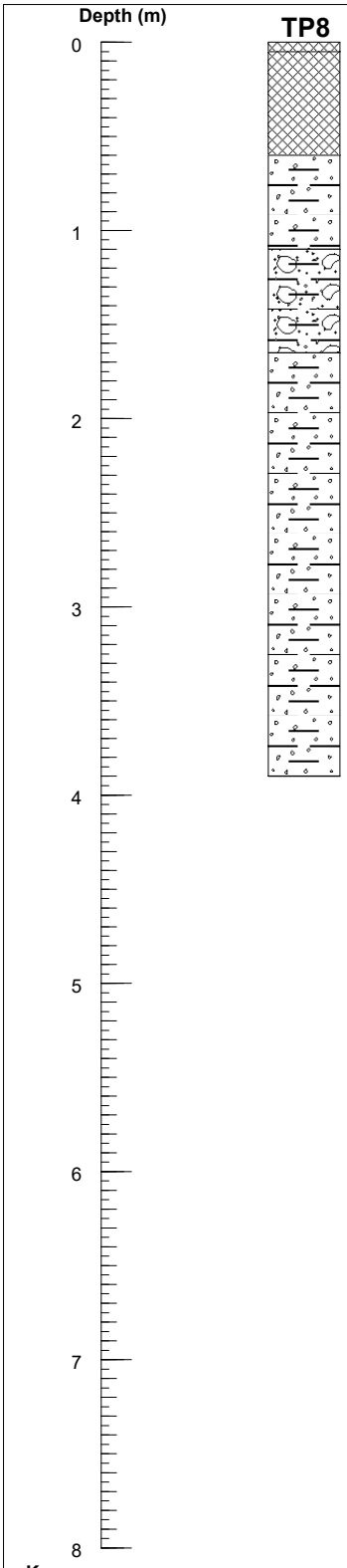
Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	18/01/2024		2/3	NE4296
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
MR CARL MASTERS			1:40[V]	NE4296.1



Key

- Groundwater Strike
- Strike Rise Level
- MADE GROUND
- Gravelly SAND
- CLAY
- Silty CLAY
- Sandy CLAY
- Gravelly CLAY
- Sandy gravelly bouldery CLAY
- Gravelly cobbly bouldery SAND
- MUDSTONE
- SANDSTONE
- COAL

SUB SURFACE
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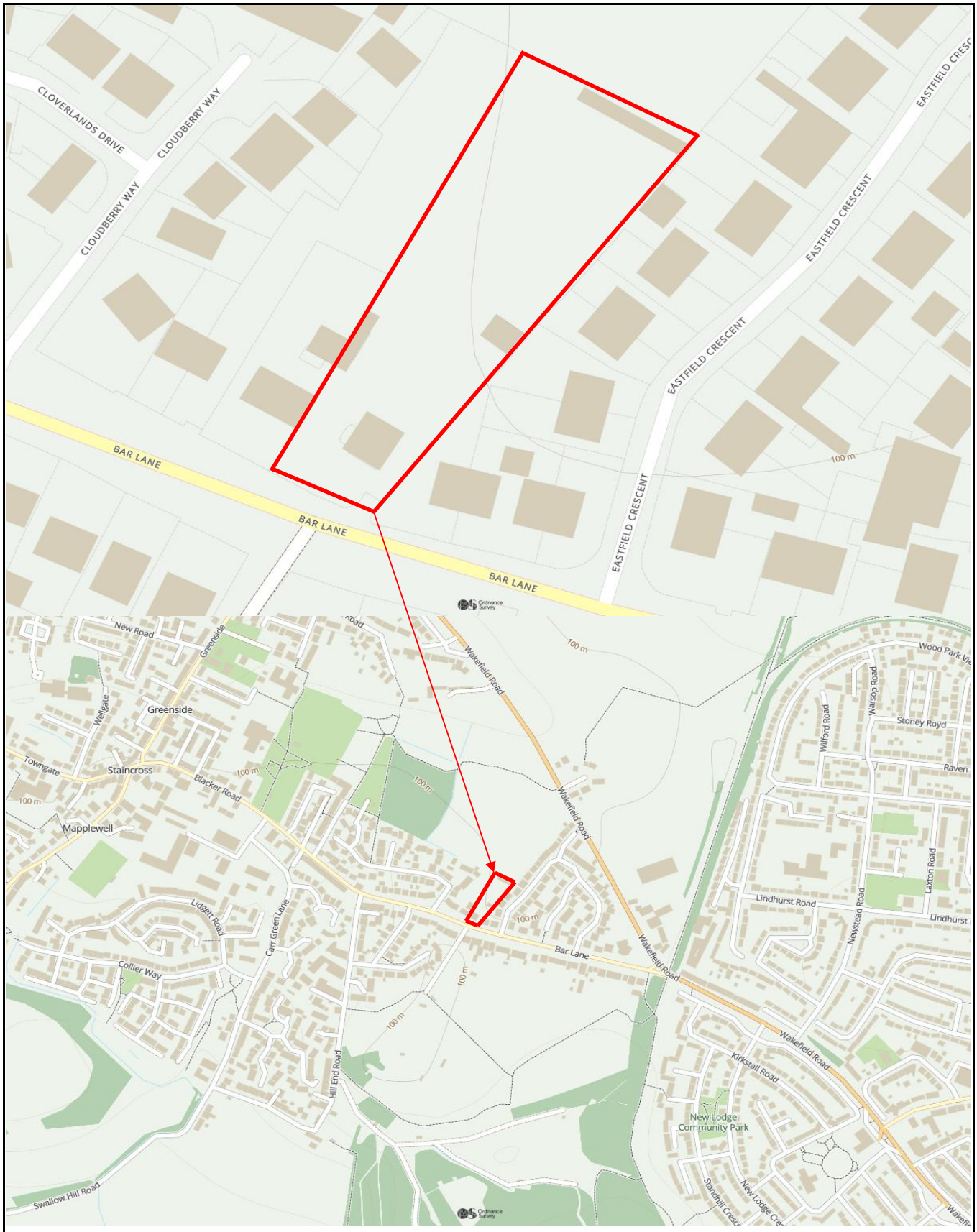
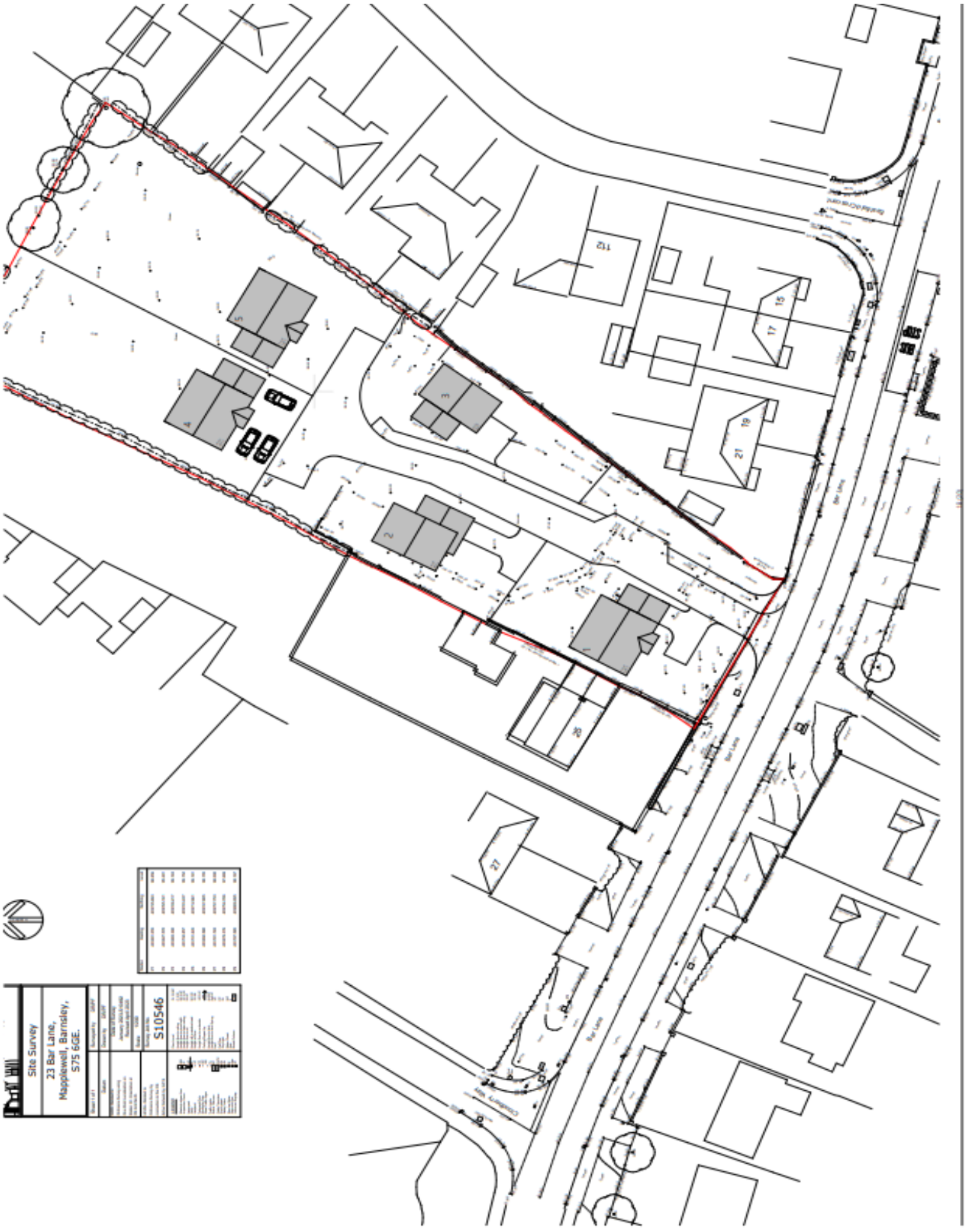
Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S75 6GE	18/01/2024		3/3	NE4296
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
MR CARL MASTERS			1:40[V]	NE4296.1

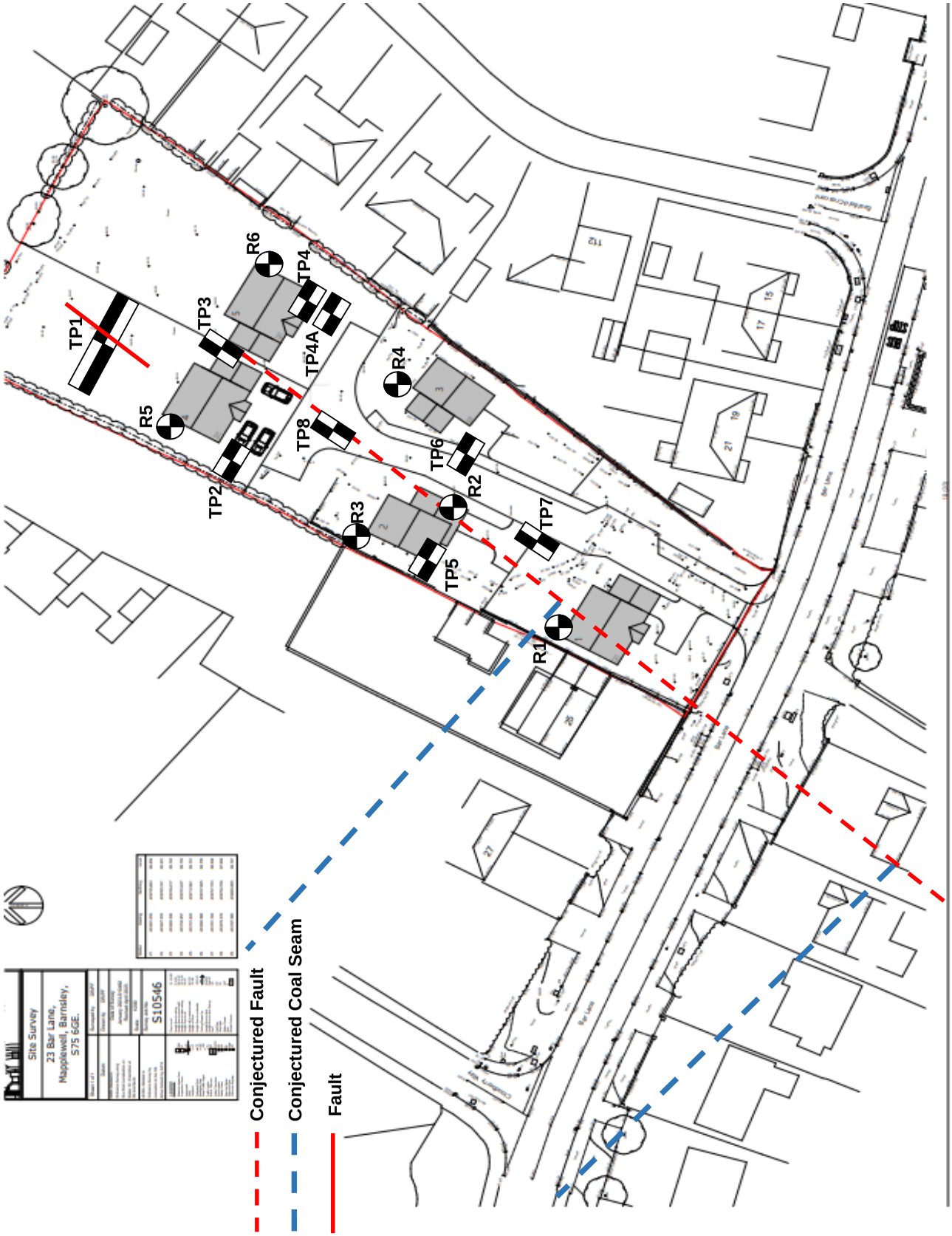
FIGURES



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	General Site Location			
Site LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S74 8HJ	Date Drawn 06-Dec-23	Date Checked	Orientation N	Job No. NE4296
Client MR CARL MASTERS	Drawn By LMB	Checked By	Scale _	Figure No. 1



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Development Plan			
Site LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S74 8HJ	Date Drawn 06-Dec-23	Date Checked	Orientation	Job No. NE4296
Client MR CARL MASTERS	Drawn By LMB	Checked By	Scale _	Figure No. 2



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Exploratory Hole Location Plan			
Site LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S74 8HJ	Date Drawn 06-Dec-23	Date Checked	Orientation	Job No. NE4296
Client MR CARL MASTERS	Drawn By LMB	Checked By	Scale _	Figure No. 3

SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Conjectured Position of Fault and Coal Seams			
Site LAND AT 23 BAR LANE, STAINCROSS, BARNSLEY, SOUTH YORKSHIRE, S74 8HJ	Date Drawn 06-Dec-23	Date Checked	Orientation	Job No. NE4296
Client MR CARL MASTERS	Drawn By LMB	Checked By	Scale –	Figure No. 4