

Our ref: H19104 PreDem/JR/2020.02.12

Mr D Green
The Gables
Royd Lane
Higham
Barnsley
S75 1PH

12 February 2020

Dear David

**REPLACEMENT DWELLING AT PINE LODGE STAINBOROUGH LANE, HOOD GREEN, BARNSELY S75 3EZ
PRE-DEMOLITION SHALLOW MINING INTRUSIVE INVESTIGATION REPORT**

We are pleased to present our report on the intrusive investigation of potential shallow mine workings, recently undertaken at the above site.

Introduction

Patrick Parsons (PP) have been commissioned by Mr David Green to undertake an intrusive ground investigation to address the potential for historic shallow mining at the site of the existing Pine Lodge dwelling Stainborough Lane, Hood Green, Barnsley, proposed for demolition and replacement with a new dwelling. A drawing by White Agus Partnership showing the existing site and latest preliminary proposed layout is appended to this report.

An earlier Coal Mining Risk Assessment (CMRA) was completed by Design-it Structural Solutions Ltd (Ref. Dit/18/213, dated June 2109), which should be read in conjunction with this report and has informed the requirement for intrusive investigation at the site. In addition, these intrusive works and the recommendations of this report partly form the information required for submission as part of planning application 19/1526 together with Coal Authority (CA) recommendations.

Aim

The aim of the intrusive investigation was to assess whether the site is affected by historic past shallow mining together with determining the location of both recorded and unrecorded mine entries. In addition, monitoring of ground gases has been undertaken. The works involved the installation of shallow gas monitoring wells, the drilling of deeper boreholes to provide information on the presence, depth and nature of any underlying coal seams and associated strata together with the excavation of trial pits and the surface stripping of soils to expose potential mine entries.

This report addresses all coal and non-coal mining related aspects including a review of published geological information and a discussion of the salient points of the previous CMRA, intrusive findings and preliminary recommendations for redevelopment, subject to further intrusive investigation post demolition.

Limitations

This report is based on and limited to an assessment of the information obtained during works undertaken here and has been prepared for the sole use of Mr David Green and his agents only. PPL cannot take responsibility for variations in ground conditions between exploratory holes. This report should not be relied upon by any third party without the written permission of PP.

The presence of the existing dwelling together with the proximity of adjacent mature trees and associated root protection zones present significant constraints to the intrusive investigation at this stage. However, further post demolition intrusive investigation is planned to comprehensively assess the site.

Proposed Development

It is proposed to construct a 1.5 storey dwelling with associated terrace, hardstanding, access road and retain extensive grounds and areas of soft landscaping at the site. The proposed siting of the new replacement dwelling is to be generally at the location of the existing dwelling, within the northeastern area of the overall site. A preliminary proposed layout is appended to this report.

Site Location and Description

The site is located to the north of Stainborough Lane, approximately 600m southeast of the village of Hood Green and 4.5km southwest of Barnsley town centre. The part of the site proposed for redevelopment is at approximate grid reference NGR 413755mE 402755mN.

The northern part of the site (area of proposal) comprises a vacant and derelict single storey dwelling with a garage and swimming pool annex at the northeastern elevation. An area of hardstanding is present immediately north of the property with an access road present to the west and leading to Stainborough Lane to the south. The remainder of the site, essentially the southern extent and a lesser area north of the existing dwelling, comprises extensive areas of soft landscaping with numerous mature trees.

Existing levels at the site fall significantly southwards from approximately 161.0m at the northern boundary to 150.0m AOD at the southern boundary. The existing dwelling lies at approximately 158.0m AOD.

The site is bound to the east by open fields, to the north and west by parkland as part of Wentworth Castle Estate and Stainborough Lane to the south.

Geological and Mining Setting

The earlier CMRA presents those mining legacy risks considered as pertinent to the proposed redevelopment of the site. A further assessment of the site's geological setting and potential risk posed to the site with regards to past shallow mining is summarised below:

- Published British Geological Survey (BGS) mapping shows there are no superficial soils underlying the site
- The site is directly underlain by the undifferentiated strata of the Carboniferous Lower Coal Measures
- There are no faults or abnormal features on or within the vicinity of the site
- The site lies within a coal mining Development High Risk Area (DHRA), as defined by the CA

- Published geological information indicates that there are 2 coal seams potentially present beneath the site at shallow depth. These are the Joan coal and the Flockton Thick coal seams. The Joan coal outcrops within the northern part of the site, beneath the northeastern extent of the existing dwelling, while the Flockton Thick coal outcrops just south of Stainborough Lane to the south of the overall site. Although not indicated on geological mapping, the Tankersley Ironstone seam lies stratigraphically between the Flockton Thick and Joan coal seams and is conjectured as outcropping across the approximate centre of the overall site, itself present at shallow depth beneath the northern area of the site. Local thicknesses for the Joan coal are thin to 0.7m, the Flockton Thick thin to 2.9m and the Tankersley Ironstone seam up to 4.0m, although the economic ironstone is less than 0.3m thick. The Tankersley Ironstone lies some 5m above the Flockton Thick coal seam. Historic BGS mapping indicates former bell pits as present immediately northwest of the site.
- A CA Consultants Coal Mining Report (Ref. 51002154766001, dated July 2019) has been obtained for the site, as appended. The report confirms that the property is in the likely zone of influence from underground mining of coal at shallow depth. This relates to the Flockton Thick coal seam conjectured to be present at approximately 16m depth and extracted at a thickness of 0.84m. A total of 5 no. recorded former mine entries (shafts) are recorded within the vicinity of the existing dwelling or northern part of the site, additional unrecorded mine entries are possible. Historic surface opencast coal mining is recorded immediately east of the overall site and lies within the southeastern part. However, this area is outside of the area proposed for redevelopment. There are no records of any mine gas emissions requiring action within the vicinity of the site.

Rationale for the Intrusive Investigation

The above summary assessment together with the findings and recommendations of the earlier CMRA indicate that there is a high potential for the presence of possible unrecorded shallow coal mine workings associated with the Flockton Thick and Joan coal seams, together with historic exploitation of the Tankersley Ironstone seam, all present beneath the site. In order to fully address this risk, a pre-demolition intrusive investigation comprising rotary open boreholes was proposed to determine the presence, depth, thickness and nature of any coal/ironstone seams beneath the site that would enable an assessment of their potential effect on the site's surface stability. In addition, these intrusive works also comprised the installation of shallow ground gas monitoring wells to establish the presence of any elevated ground gases together with the excavation of trial pits and a surface strip of accessible areas to determine the presence of both recorded and unrecorded mine entries. Part of the overall site to the south of the area of proposed redevelopment is recorded by the CA as having been affected by former surface opencast coal mining, however, as this does not affect the proposal no intrusive investigation of this feature is proposed. All intrusive works were undertaken in accordance with CA guidelines and under a valid licensing permit for such intrusive investigation works.

PP previously corresponded with the CA regarding pre-planning advice on the proposed scope and methodology of intrusive investigations at the site. Although at the time the position of the new dwelling slightly differed from that currently proposed, essentially the methodology remains identical for the revised position of the new dwelling, incorporating both pre and post-demolition phases of intrusive investigation.

Fieldwork

The fieldwork was undertaken in 2 phases, initially on 26th November 2019 and subsequently between 14th and 22nd January 2020. The initial intrusive works comprised the drilling of 5 no. mini percussive

boreholes (WS01 to WS05) to a maximum depth of 5.45m below existing ground level (begl) with 3 no. shallow monitoring wells installed in boreholes WS01, WS03 and WS05. Subsequently, 6 no. rotary percussive open boreholes (R01 to R06) were put down to a maximum depth of 30.0m begl to allow assessment of the soils and solid strata through examination of flush returns and rate of penetration of the drill bit. Observations of groundwater were also made during the advancement of the boreholes. In addition, 2 days of surface stripping to determine the position of recorded and potential unrecorded mine entries together with the excavation of 5 no. trial pits (TP01 to TP05) to a maximum depth of 4.0m begl were undertaken. The borehole locations and the areas of excavation are presented on Dwg. No. H19104-704, appended to this report, together with all exploratory hole records.

Drilling of the rotary mining boreholes was progressed using water flush with the boreholes cased throughout the superficial deposits. In accordance with CA conditions, the borehole head was monitored for gases during its advancement. At this stage, the locations of the exploratory holes and surface stripping was limited to accessible areas, predominantly under soft cover, peripheral to the existing dwelling. The exploratory holes were positioned to avoid known underground services and pre-scanned using a cable avoidance tool (CAT) as a precautionary measure.

With respect to the areas of surface stripping, as presented on Dwg. No. H19104-704, such areas were constrained by root protection areas of existing mature trees and restricted to areas of soft landscaping only. The reasoning behind the selection of these areas considers the recorded positions of the mine entries by the CA, their respective zone of influence (4.0m) assuming an average rockhead depth of 2.0m, their potential departure distances (8.0m) and maximum zone of influence taken from the edge of the departure distance (12.0m) together with the proposed revised position of the new dwelling footprint and its potential to be affected by these mine entries. The area of surface strip at the southeastern corner of the existing dwelling was chosen as an available area of soft landscaping and its proximity to the revised new dwelling footprint. All such completed areas are those considered practical prior to demolition of the existing dwelling with a comprehensive further post-demolition intrusive investigation to be undertaken at a later date.

Ground Conditions

The ground encountered during the intrusive investigations is summarised below:

Hardstanding and Made Ground

At the surface, either coated macadam hardstanding underlain by hardcore, firm and stiff gravelly clay or mudstone gravel (colliery soil) were proved to depths of between 0.25 and 2.2m begl.

Topsoil

Locally, topsoil was present at the surface at between 200 and 300mm thickness.

Natural Residual Cohesive Soils

Beneath the made ground and topsoil, natural residual firm and stiff gravelly clays were proved to depths of between 1.0 and 3.8m begl.

Solid Strata

Solid strata comprising very weak mudstone were present beneath the overlying residual clays and proved to a maximum depth of 30.0m begl. The trial pits all confirmed these strata as competent and unfractured. With depth, these were interbedded with siltstone and sandstone.

Coal Seams (Intact)

A total of 2 no. coal seams were proved beneath the site. A near surface thin coal seam (30 to 100mm thick) was proved in boreholes WS05 and R06 at between 1.6 and 3.85m begl and confined to the northeastern area of the site. A deeper coal seam was identified in the majority of the exploratory boreholes. This coal seam at 1.1m thick was present at depths of between 14.6 and 17.8m begl. In all instances, the deeper coal seam was proved as being intact with no evidence of mine workings. The upper shallow coal seam of limited thickness is at outcrop and is likely to have been significantly removed through erosion and weathering. The upper shallow outcropping coal seam is considered as representing the Joan coal and the deeper seam as being the Flockton Thick coal seam.

Evidence of Past Mine Workings

The mini percussive and rotary boreholes proved evidence suggestive of the past exploitation and disturbance of the strata immediately overlying the deeper or Flockton Thick coal seam. Anomalous strata, presenting as soft and disturbed with partial or total loss of flush returns, was encountered in several boreholes between rockhead and approximately 10 to 12m begl. No evidence of voids was noted. The base of these disturbed strata is approximately 3 to 6m above the underlying Flockton Thick coal, where proved, which is the anticipated level of the Tankersley Ironstone seam. Where partial or total loss of flush was experienced, generally reduced or no drilling returns were noted below these disturbed strata zones and consequently only solid strata was able to be confirmed with no determination of the depth and thickness of the intact deeper Flockton coal seam being possible. However, the presence of only solid strata within the anticipated range of the coal seam, based on evidence from neighbouring boreholes where the coal seam was visually determined within flush returns, indicates no historic exploitation of the underlying Flockton Thick coal seam. Of note, is borehole R01 drilled in close proximity to an unrecorded bell pit. Disturbed mudstone strata is present from rockhead to 12.0m begl in turn underlain by approximately 6.0m of intact mudstone overlying the intact Flockton Thick coal seam, indicative of no continuity between the bell pit mine workings within the Tankersley Ironstone seam and the underlying Flockton Thick coal seam.

Mine Entries

In total, 3 no. mine entries (shafts) were located. Adjacent to the southeastern corner of the existing dwelling, 2 no. unrecorded mine shafts were confirmed. These were 2.0 and 2.5m in diameter, infilled with mudstone gravel. Within the northwestern area of the site (northwest of the existing access road) excavations in the vicinity of the CA recorded mine shaft (CA Ref. 431402-034) located this shaft immediately southeast of its recorded position, at 2.5m diameter. It is considered that all these mine entries are bell pits put down to exploit the underlying Tankersley Ironstone seam. Plans and sections of these shafts are presented on Dwg. Nos. H19104-706A to C, as appended to this report.

Disturbed solid mudstone strata were noted below rockhead during the advancement of borehole WS03 and R01. These are either located in the vicinity of the as proved former mine entries (R01) or adjacent to other CA recorded mine entries (WS03) and considered to be indicative of collapsed or disturbed strata associated with the localised mining from these mine shafts.

Groundwater

No evidence of significant issues of groundwater was noted during the advancement of the exploratory holes, but the use of water flush may have obscured any actual water seepages that may have occurred. Subsequent monitoring of shallow groundwater within wells recorded none with all wells noted as dry.

Gas Monitoring

During the rotary drilling, monitoring of methane, carbon dioxide, carbon monoxide, hydrogen sulphide and oxygen was undertaken at the borehole head. No significantly elevated (or depressed) concentrations were recorded.

To date, the subsequent monitoring of the shallow wells as part of the monitoring programme to assess ground gas risk, recorded no methane, slightly elevated concentrations of carbon dioxide to a maximum of 4.5% v/v, no significantly depressed oxygen levels and no positive gas flow. Carbon monoxide and hydrogen sulphide were not recorded as present. A total of 4 no. visits have been completed out of the proposed 6 no. visits. An addendum ground gas risk assessment is to be prepared under separate cover on completion of the monitoring programme. The preliminary gas monitoring results to date are appended to this report.

Conclusions and Recommendations

Shallow Mine Workings

The findings of the pre-demolition intrusive investigation confirm the presence of historic shallow mining beneath the site. Evidence to date, discounts any shallow mining within the deeper Flockton Thick coal seam with potentially adequate competent rock cover demonstrated above the 1.1m thick coal seam so as not to present a potential risk to surface stability, should past mining of the coal seam have occurred. However, the competency of the overlying strata is compromised through historic exploitation of the Tankersley Ironstone seam beneath the site. Of note, is that no voids were confirmed within the strata associated with the Tankersley Ironstone seam. There is no evidence to suggest that the bell pits were put down to exploit both the Tankersley Ironstone seam and the underlying Flockton Thick coal seam. The Joan coal seam outcropping within the northeastern part of the site is not confirmed as historically exploited. However, this is subject to further confirmatory intrusive investigation across the remaining far northeastern part of the site.

Mine Entries

To date, a total of 3 no. former mine entries (2 no. unrecorded shafts and a recorded shaft) have been confirmed at the site, all considered to represent historic bell pits. One of the unrecorded mine shafts located adjacent to the southeastern corner of the existing dwelling is considered as potentially within influencing distance of the proposed new dwelling footprint, as its footprint plots at present. Given the site's setting within an historically mined area, there is potential for the presence of further unrecorded mine entries on the site, as yet, inaccessible until demolition of the existing dwelling.

Mitigation of Shallow Mining and Mine Entries During Design of Foundations and New Access Road

Until a comprehensive post demolition intrusive investigation has been undertaken, final judgement is reserved with respect to appropriate mitigation during redevelopment.

However, at this stage, preliminary recommendations are that either a raft or piled foundation solution is considered appropriate for the new dwelling. A raft would need to be designed to accommodate and span

any potential formation collapse and subsequent loss of bearing support while a piled solution may be required to be taken to a depth below the deeper Flockton Thick coal seam. Consolidation using grouting is not considered as effective within the strata associated with the exploitation of the Tankersley Ironstone seam, as no voiding was confirmed as present, and should be discounted. The underlying deeper Flockton Thick coal seam is recorded as intact with no treatment of this seam considered necessary. The nature of the shallow Joan coal seam and potential historic workings within the far northeastern corner of the site requires confirmation ahead of finalising any foundation design.

The presence of additional unrecorded mine entries (shafts/bell pits) beneath the footprint of the existing dwelling and its non-investigated curtilage, including the line of the new access road, is considered a significant possibility. Any such mine entries may potentially present a zone of influence of potential surface instability that may potentially affect the footprint of the new replacement dwelling and new access road. Such potential features are to be confirmed by further post demolition intrusive investigation. The siting of the new dwelling and access road should be reserved until such works are completed. Consolidation and capping of such shafts may be necessary where within influencing distance of the new dwelling or new access road. Where such features are confirmed as present beneath areas of proposed peripheral soft landscaping or beneath any proposed new terracing, mitigation using spanning geotextile and geogrids may be appropriate.

As evidence of past shallow mining has only been confirmed as present within, and restricted to, the Tankersley Ironstone seam, and not proved within the underlying Flockton Thick coal seam, any mitigation measures during development to address such features are not within the remit of the Coal Authority. However, the design of any mitigation measures and engineering of foundations would be done in consultation with the build warranty provider.

Ground and Mine Gas and Mitigation During Development

During the advancement of the exploratory rotary boreholes, no significant elevated or depressed gas concentrations were recorded and the presence of historic shallow coal mine workings was not confirmed beneath the site. To date, the gas monitoring programme has not detected any methane, carbon monoxide or significantly elevated concentrations of carbon dioxide, with no positive gas flow. At this stage, in accordance with CIRIA C665, the site would be classified as Characteristic Situation 1 requiring no ground gas protection measures. However, given that the site lies within an historically mined area and until the full gas monitoring programme is complete, judgement is reserved with regards to a final classification of ground gas risk for the site. Any such future gas risk recommendations and appropriate protection measures would be subject to discussions with regulators.

Proposed Further Intrusive investigation

Preliminary areas of proposed post-demolition intrusive investigation are presented on Dwg. No. H19104-705, as appended to this report. Essentially, these areas address those currently beneath the existing dwelling (to include a 4.0m curtilage around the new dwelling footprint), existing and proposed new access road and hardstanding taking into account those areas already investigated pre-demolition and areas that are potentially within the zone of influence of recorded mine shafts (or those zones of influence calculated from the maximum departure distance of each shaft). These works are likely to comprise surface stripping and excavation of trial pits to determine the position of recorded and unrecorded mine entries with respect to the proposed development.

Formal and standalone reports are to be issued for the post-demolition intrusive investigation works together with an addendum ground gas risk assessment upon completion of the monitoring programme.

If you have any queries or require further information, please do not hesitate to contact us.

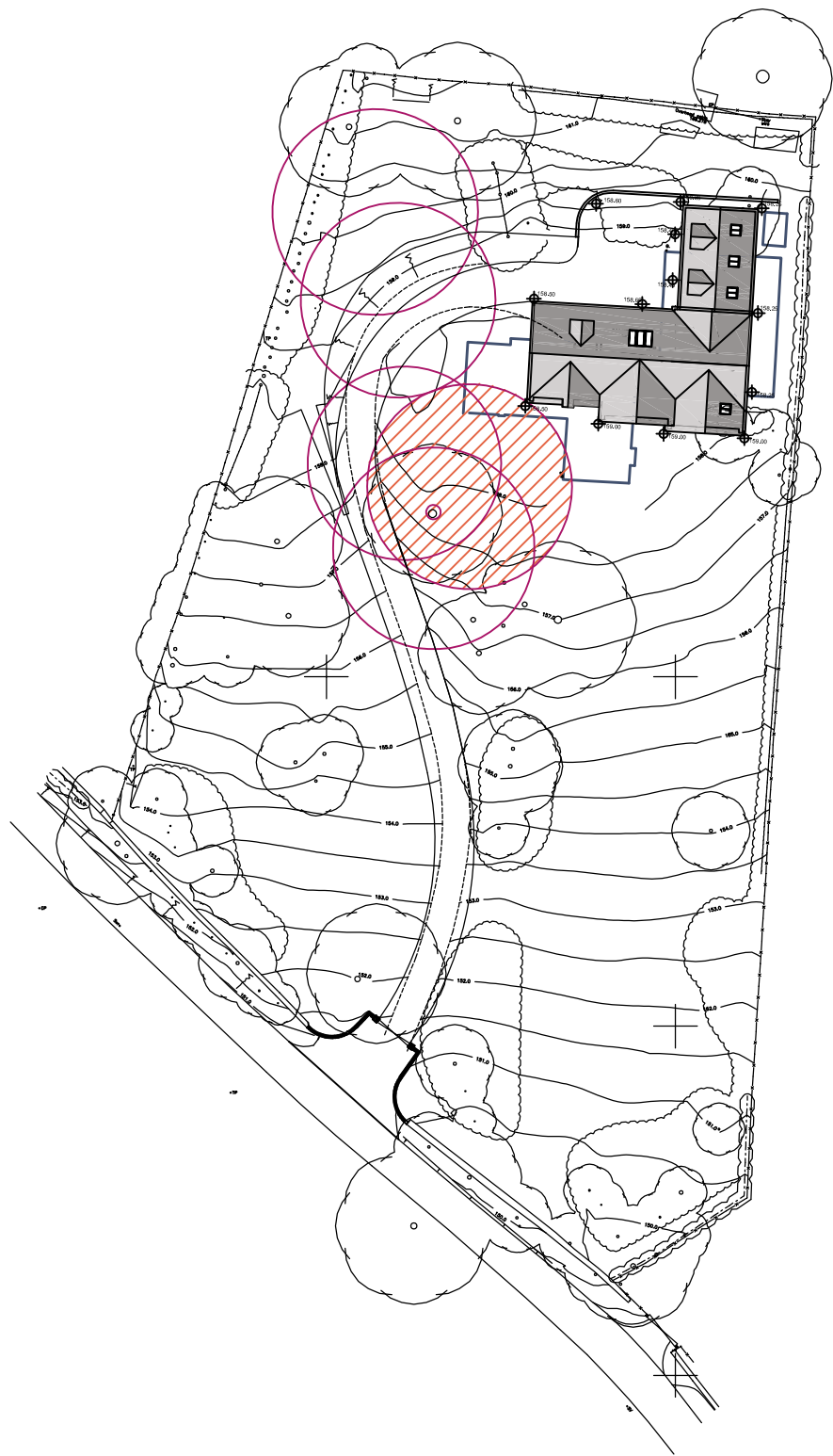
Yours sincerely



Jonny Roberts

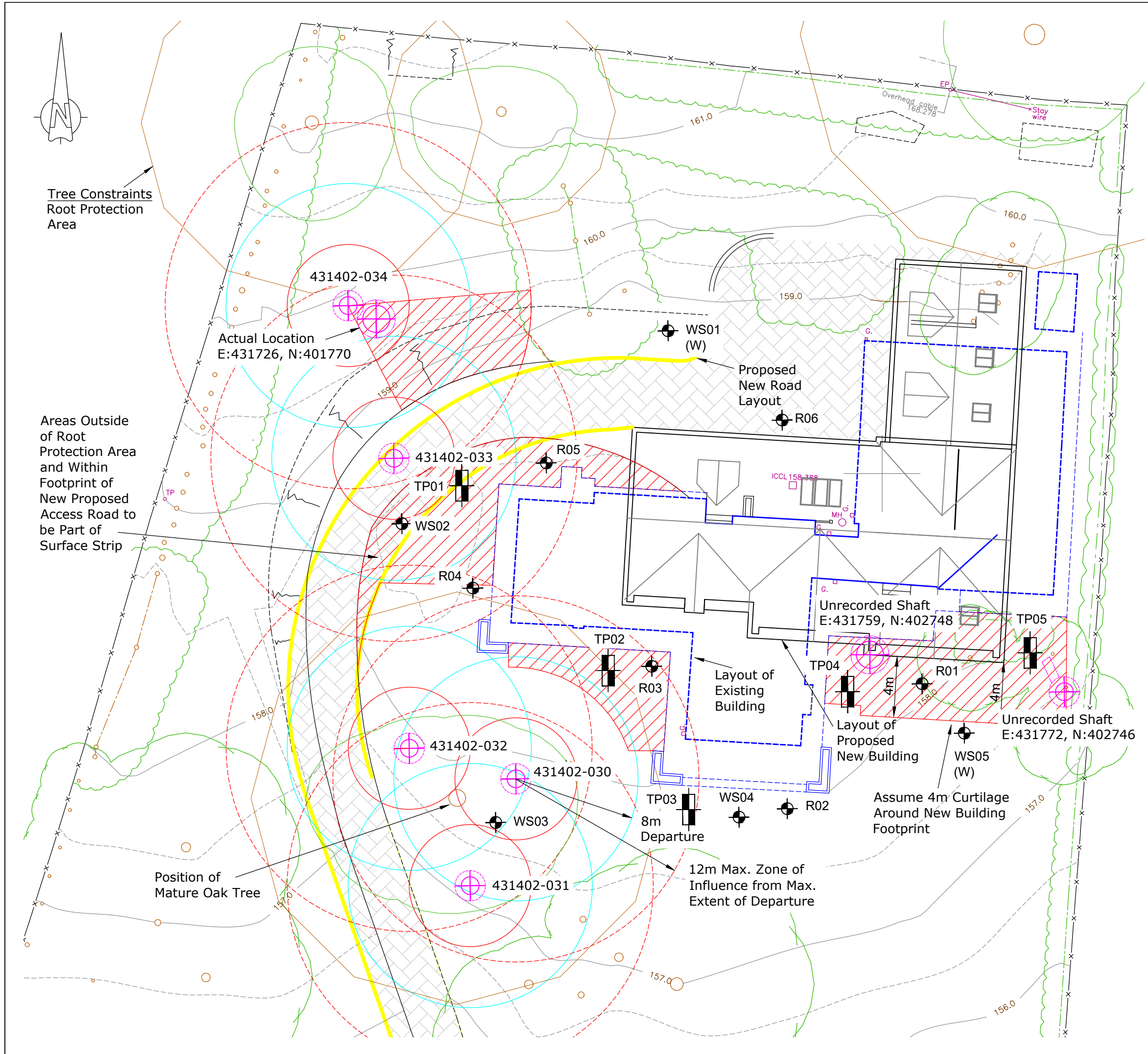
Principal Geoenvironmental Engineer

Enc. Drawings and Sections
Exploratory Hole Records
Preliminary Gas Monitoring Results





 PATRICK PARSONS T. +44 (0)1484 516 977 E. info@patrickparsons.co.uk W. www.patrickparsons.co.uk	Client MR DAVID GREEN	Drawing SITE LOCATION PLAN	Scales NTS	Drawn ACV NOV 2019	Checked JR
	Project REPLACEMENT DWELLING AT PINE LODGE, STAINBOROUGH LANE, HOOD GREEN, BARNSELY		Drawing No. H19104-701	Rev. P1	



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LEGEND

- WS01 (W) MINI PERCUSSIVE BOREHOLE (WITH MONITORING WELL)
- R01 ROTARY OPEN BOREHOLE
- TP01 TRIAL PIT
- 431402-030 APPROXIMATE LOCATION OF HISTORICAL MINE ENTRY (SHAFT) WITH SHAFT REFERENCE FROM COAL AUTHORITY RECORDS (SHAFT ASSUMED 2M IN DIAMETER)
- MINE SHAFT ZONE OF INFLUENCE
- 8M DEPARTURE FROM CENTRE OF MINE SHAFT
- MINE SHAFT ZONE OF INFLUENCE FROM EDGE OF DEPARTURE ZONE
- HATCHED AREAS DENOTE AREAS OF COMPLETED SURFACE STRIP ACCESSIBLE PRIOR TO DEMOLITION

P1	INITIAL ISSUE.	09.01.20 RDV
Rev.	Amendments	Date By
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Project

REPLACEMENT DWELLING AT PINE LODGE, STAINBOROUGH LANE, HOOD GREEN, BARNSELY

Drawing

PRE DEMOLITION - AREAS OF INTRUSIVE INVESTIGATION

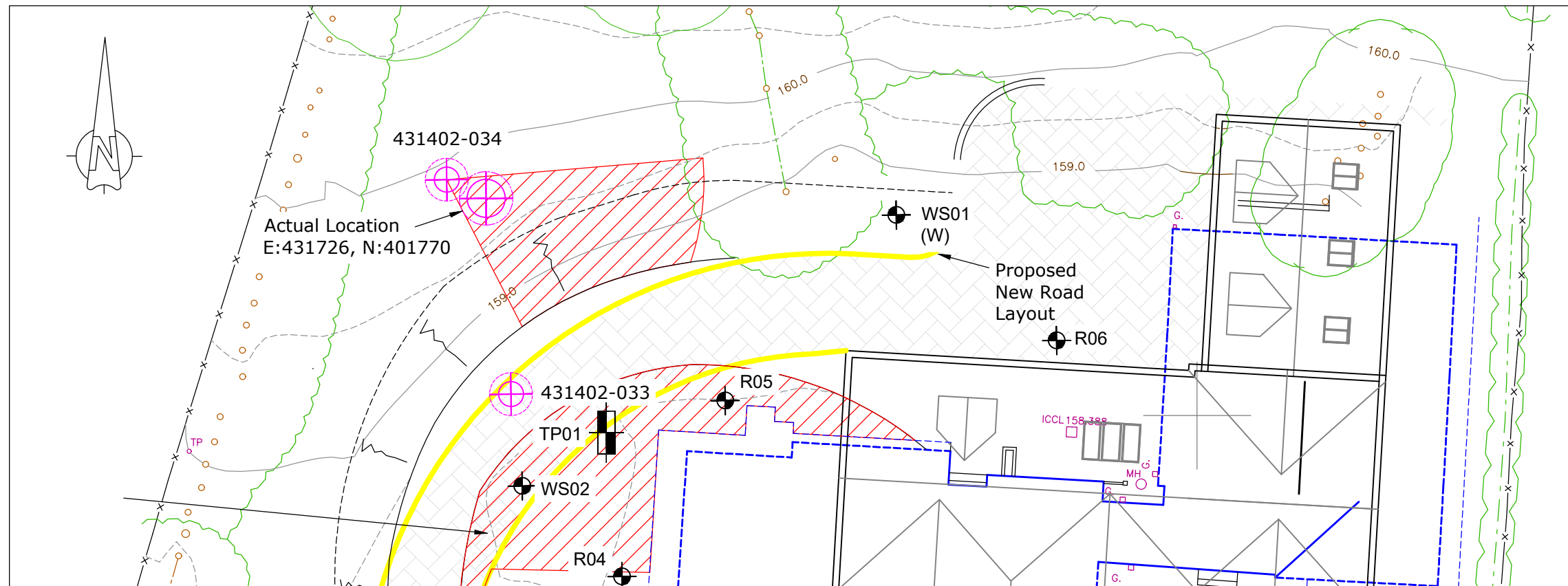
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- LEGEND**
- WS01 MINI PERCUSSIVE BOREHOLE WITH MONITORING WELL
 - R01 ROTARY OPEN BOREHOLE
 - TP01 TRIAL PIT
 - 431402-030 APPROXIMATE LOCATION OF HISTORICAL MINE ENTRY (SHAFT) WITH SHAFT REFERENCE FROM COAL AUTHORITY RECORDS (SHAFT ASSUMED 2M IN DIAMETER)
 - MINE SHAFT ZONE OF INFLUENCE
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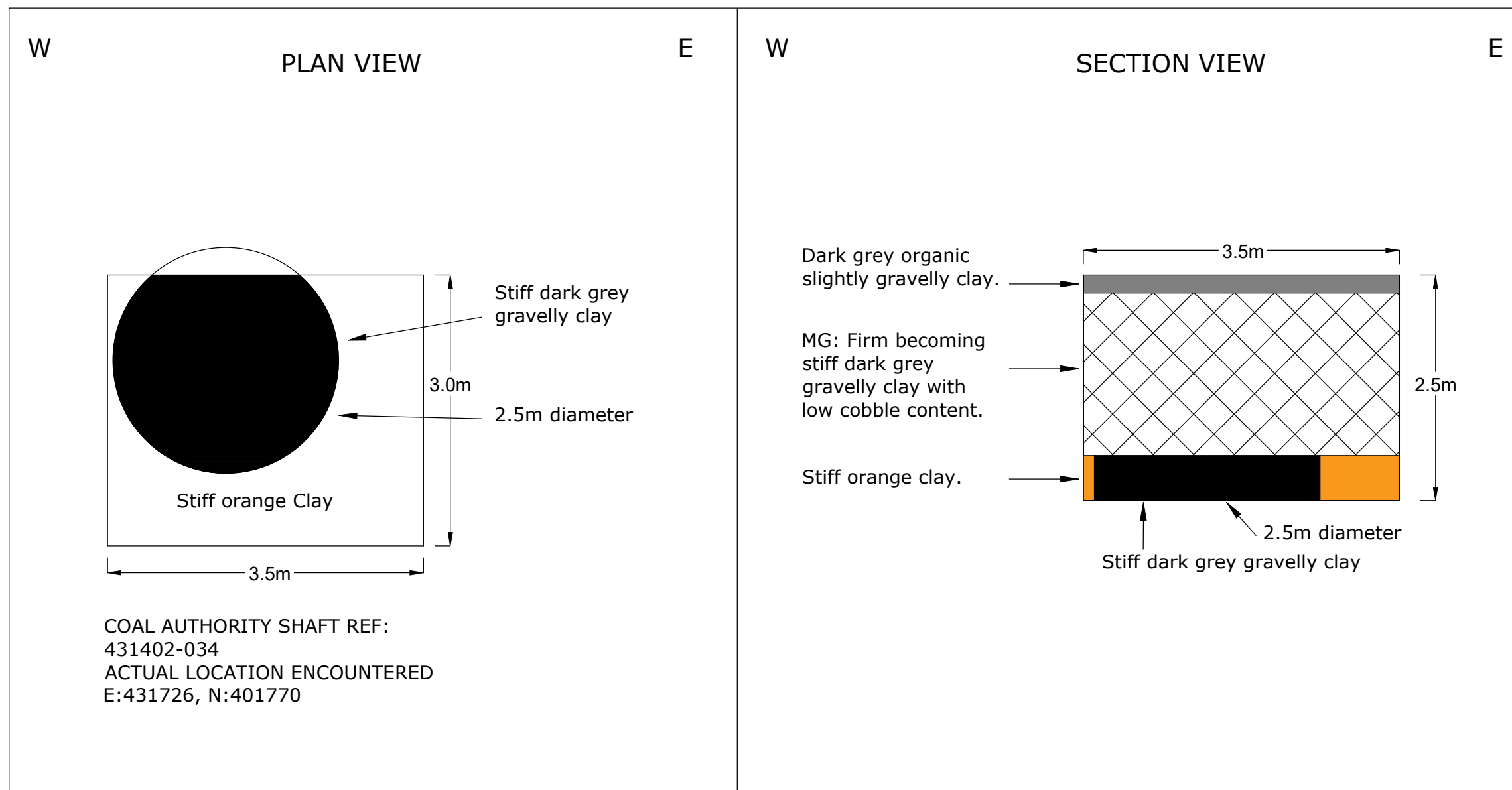
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PRE DEMOLITION - ENCOUNTERED SHAFT PLAN & SECTION

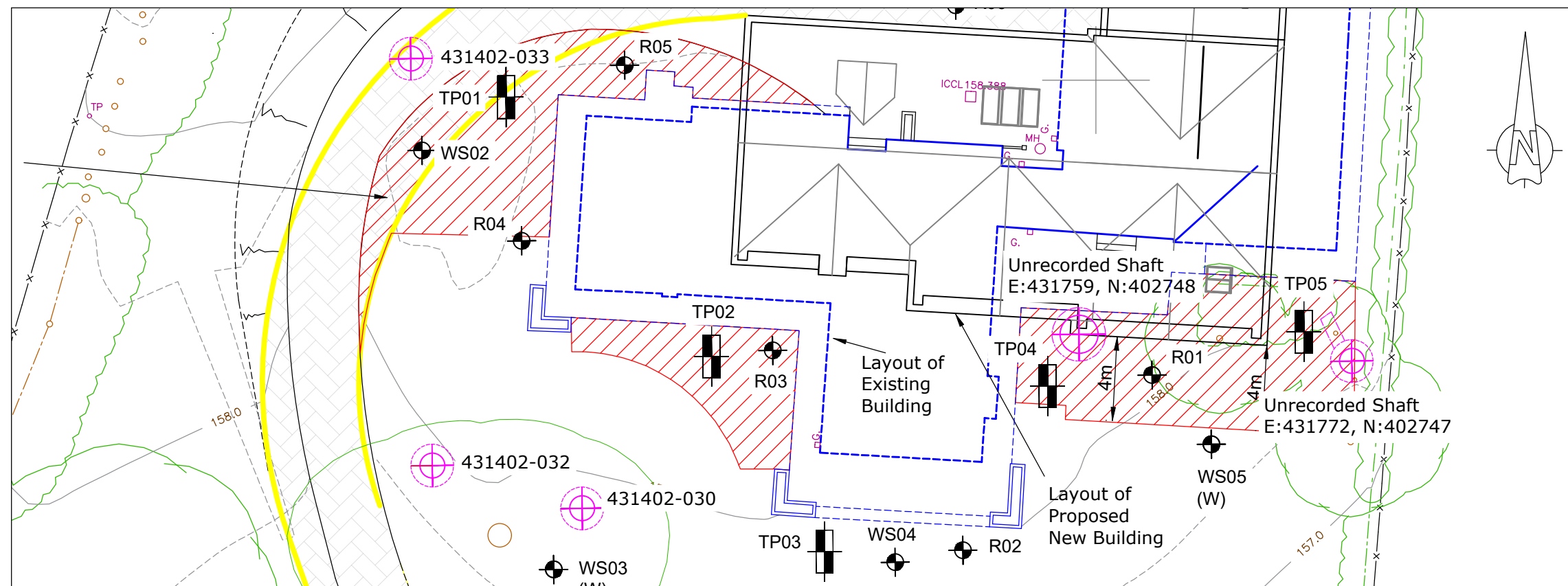
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LEGEND

- WS01 (W) MINI PERCUSSIVE BOREHOLE (WITH MONITORING WELL)
- R01 ROTARY OPEN BOREHOLE
- TP01 TRIAL PIT
- 431402-030 APPROXIMATE LOCATION OF HISTORICAL MINE ENTRY (SHAFT) WITH SHAFT REFERENCE FROM COAL AUTHORITY RECORDS (SHAFT ASSUMED 2M IN DIAMETER)
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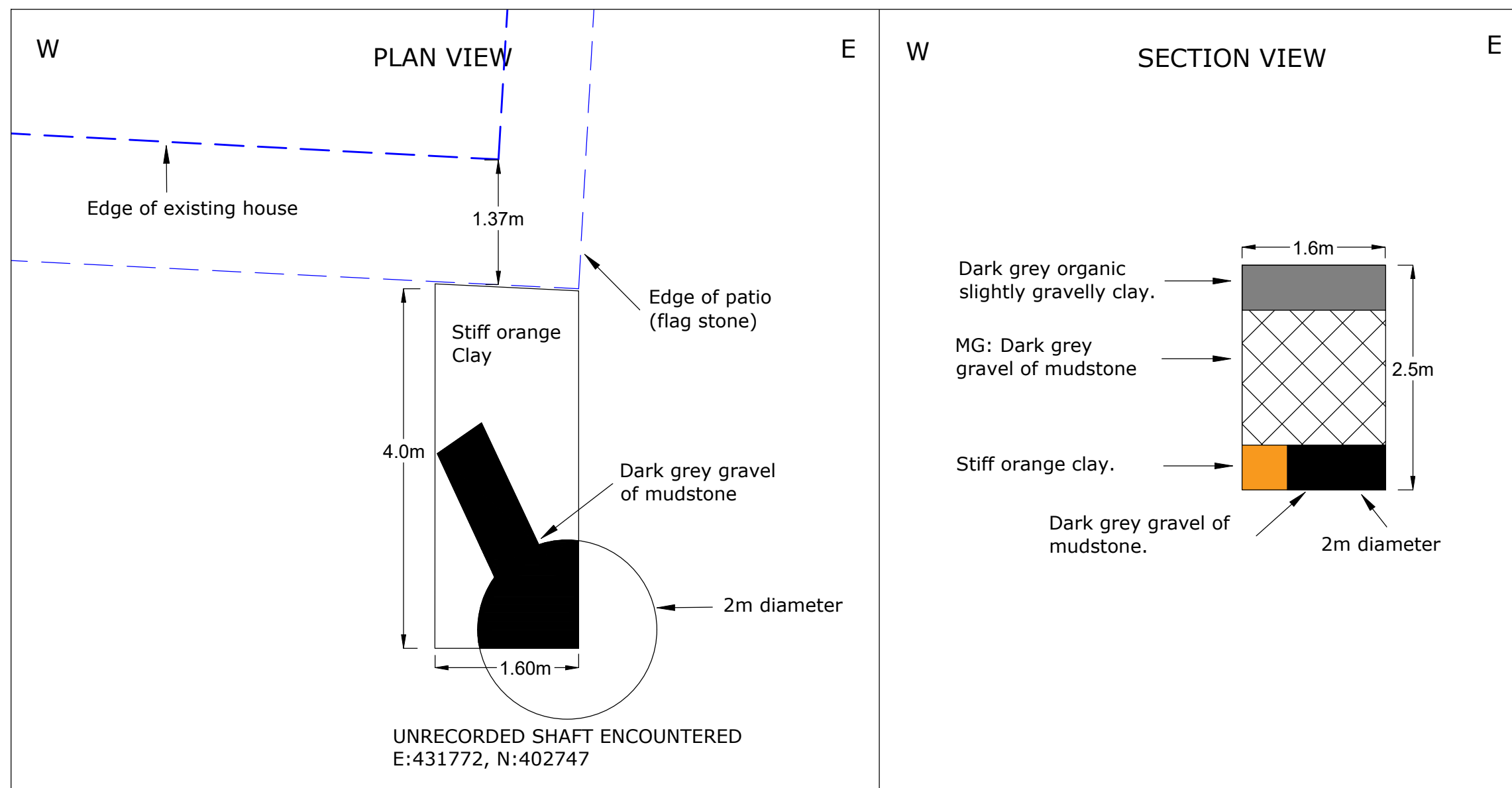
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**PRE DEMOLITION -
ENCOUNTERED SHAFT PLAN &
SECTION**

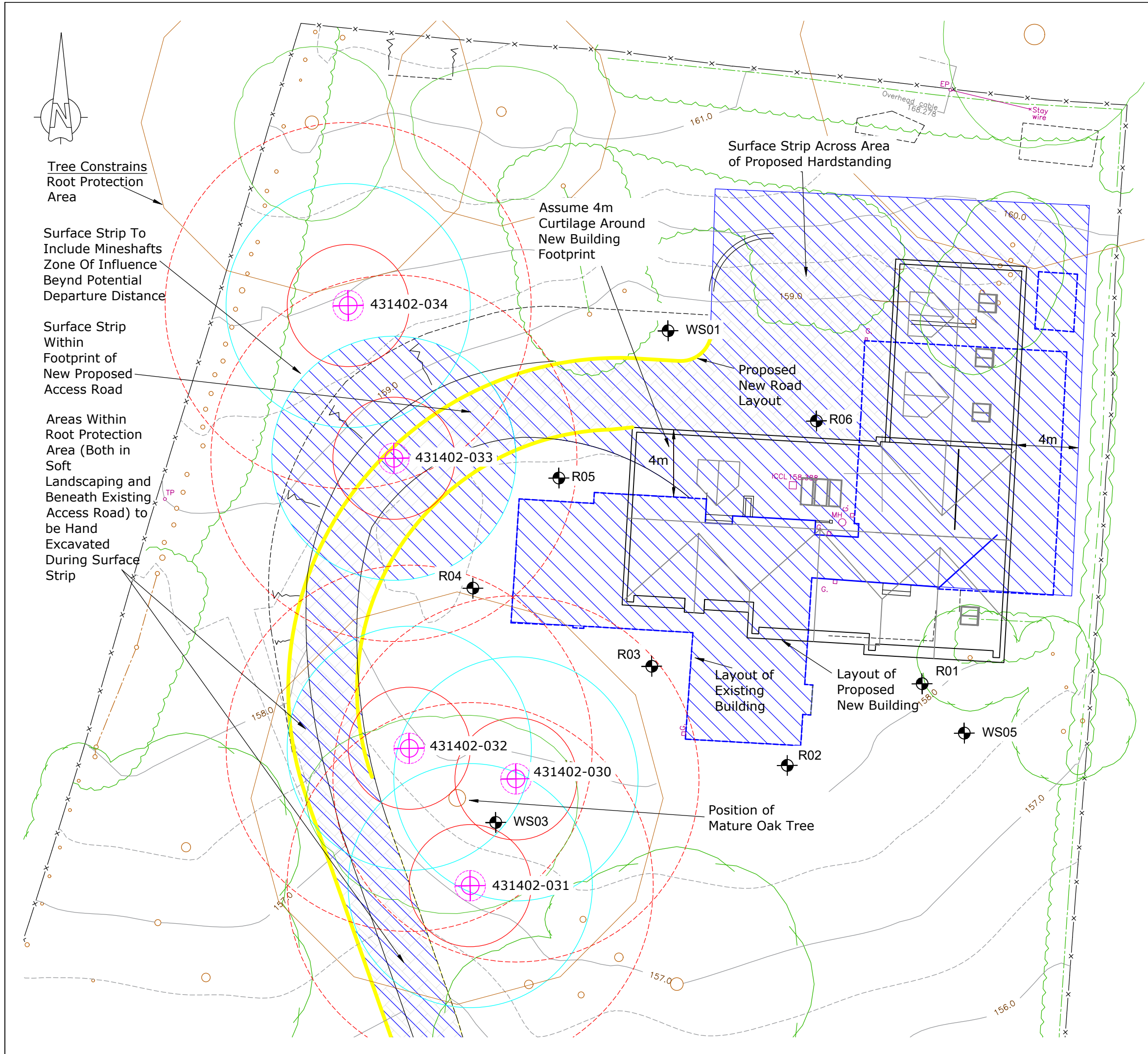
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LEGEND

- WS01 MINI PERCUSSIVE BOREHOLE WITH MONITORING WELL
- R01 ROTARY OPEN BOREHOLE
- 431402-030 APPROXIMATE LOCATION OF HISTORICAL MINE ENTRY (SHAFT) WITH SHAFT REFERENCE FROM COAL AUTHORITY RECORDS (SHAFT ASSUMED 2M IN DIAMETER)
- MINE SHAFT ZONE OF INFLUENCE
- 8M DEPARTURE FROM CENTRE OF MINE SHAFT
- MINE SHAFT ZONE OF INFLUENCE FROM EDGE OF DEPARTURE ZONE
- HATCHED AREAS DENOTE PROPOSED AREAS OF SURFACE STRIP ACCESSIBLE POST DEMOLITION

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Drawing
POST DEMOLITION - PROPOSED AREAS OF INTRUSIVE INVESTIGATION

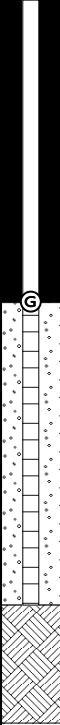
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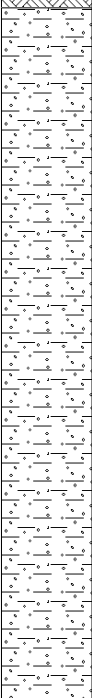
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Drawing No. **H19104-705** Rev. **P1**

				Borehole Log				Borehole No. WS01 Sheet 1 of 1	
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431746E - 402769N	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		158.36	
Client:		Mr David Green				Dates:		26/11/2019	
								Logged By ACV	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10	158.36		Tarmacadam.	
					0.25	158.26		MADE GROUND: Light grey, mottled yellow, clayey gravel. Gravel is angular to coarse limestone.	
								Stiff, light grey and orange mottled, slightly gravelly CLAY. Gravel is angular fine to medium mudstone.	
		1.00	SPT	N=19 (4,5/4,4,4,7)	1.00	158.11		Stiff, brown and dark grey mottled, very gravelly CLAY. Gravel is angular fine to medium of mudstone.	
					1.60	157.36		Very weak, thinly bedded, light brown and grey mottled MUDSTONE. Recovered as gravel.	
		2.00	SPT	N=50 (25 for 125mm/50 for 265mm)	2.39	156.76		End of Borehole at 2.39m	

Remarks 1) No groundwater encountered. 2) Borehole terminated at 2.39m below existing ground level (begl) due to refusal on mudstone. 3) Monitoring well installed to 2m begl.		
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				Borehole Log				Borehole No. WS02 Sheet 1 of 1	
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431732E - 402758N	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		158.63	
Client:		Mr David Green				Dates:		26/11/2019	
								Logged By ACV	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30			0.30	158.63		TOPSOIL: Dark grey, organic, slightly gravelly clay. Gravel is angular fine to coarse mudstone.	1
		0.90 1.00	SPT	HVP=50 N=12 (1,6/4,2,3,3)				Firm becoming stiff, grey, orange and brown mottled, gravelly CLAY. Gravel is angular, fine to coarse mudstone and coal.	
		2.00	SPT	N=23 (5,5/6,5,6,6)				Very weak, thinly bedded, light brown and grey mottled MUDSTONE. Recovered as gravel.	2
		3.00	SPT	50 (9,13/50 for 170mm)				End of Borehole at 3.32m	3
					3.32	156.03			4
									5
Remarks 1) No groundwater encountered. 2) Borehole terminated at 3.32m below existing ground level (begl) due to refusal on mudstone. 3) Borehole backfilled with arisings to existing ground level.									

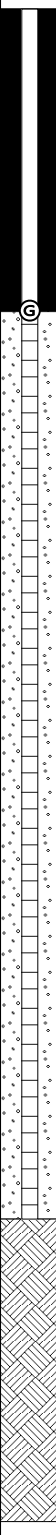
Borehole Log

Borehole No.

WS03

Sheet 1 of 2

Project Name:	Replacement Dwelling at Pine Lodge	Project No.	H19104	Co-ords:	431735E - 402737N	Hole Type	WS
Location:	Stainborough Lane, Hood Green, Barnsley			Level:	157.71	Scale	1:25
Client:	Mr David Green			Dates:	26/11/2019	Logged By	ACV

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		1.00	SPT	N=8 (1,2/2,2,2,2)	1.00	157.21		TOPSOIL: Dark grey, organic, slightly gravelly clay. Gravel is angular, fine to coarse mudstone.	1
								Firm, dark grey and light grey mottled, gravelly CLAY. Gravel is angular, fine to medium mudstone.	
								Firm, dark grey, very gravelly CLAY. Gravel is angular fine to coarse mudstone. Contains roots to 0.7m begl.	
									
				2.00	SPT	N=9 (2,3/3,2,2,2)			
		3.00	SPT	N=5 (2,1/1,1,1,2)					
		4.00	SPT	N=6 (1,2/1,1,2,2)					
		5.00	SPT	N=14 (2,3/3,3,3,5)					5
Continued on Next Sheet									

Remarks

1) No groundwater encountered. 2) Borehole terminated at 5.45m below existing ground level (begl) in mudstone. 3) Monitoring well installed to 4m begl.





Borehole Log

Borehole No.

WS05

Sheet 1 of 2

Project Name: Replacement Dwelling at Pine Lodge

Project No. H19104

Co-ords: 431765E - 402743N

Hole Type WS

Location: Stainborough Lane, Hood Green, Barnsley

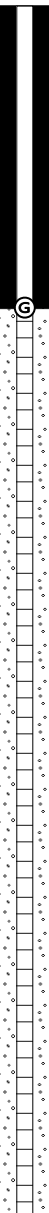
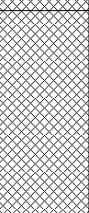
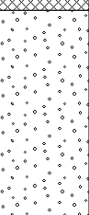
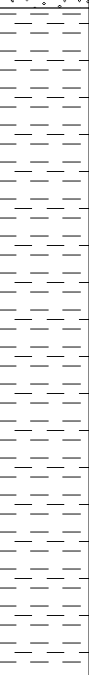
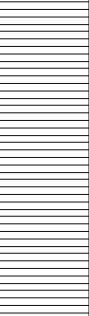
Level: 157.85

Scale 1:25

Client: Mr David Green

Dates: 26/11/2019

Logged By ACV

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	157.85		MADE GROUND: Dark grey, organic, slightly gravelly clay. Gravel is angular, fine to medium mudstone.	
								MADE GROUND: Firm, grey, orange and black mottled, gravelly clay. Gravel is angular, fine to coarse brick, ceramic, sandstone, mudstone and coal.	
		1.00	SPT	N=12 (2,2/3,2,3,4)	0.90	157.65		Medium dense, black becoming light brown GRAVEL. Gravel is angular, fine to coarse mudstone.	1
		2.00	SPT	N=11 (1,1/2,3,3,3)	1.60	156.95		Firm becoming stiff, orange, brown and grey mottled, slightly gravelly CLAY. Gravel is angular, fine to medium mudstone.	2
		2.70		HVP=58					
		3.00	SPT	N=21 (2,3/4,5,6,6)					3
		4.00	SPT	N=16 (6,5/4,4,4,4)	3.85 3.88	156.25 154.00		Very weak, black, lustrous COAL.	4
								Very weak, thinly bedded, light brown and grey mottled MUDSTONE. Recovered as gravel.	
		5.00	SPT	N=7 (1,2/1,2,2,2)				Continued on Next Sheet	5

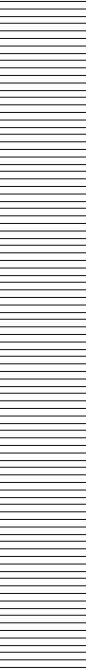
Remarks

1) No groundwater encountered. 2) Borehole terminated at 5.45m below existing ground level (begl) in mudstone. 3) Monitoring well installed to 4m begl.

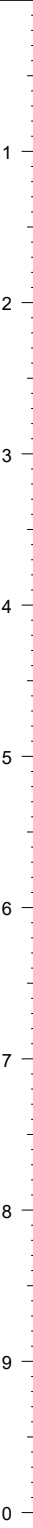
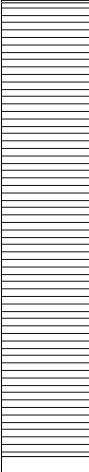


				Borehole Log				Borehole No. R01 Sheet 1 of 3	
Project Name:		Replacement Dwelling at Pine Lodge		Project No. H19104		Co-ords: 431763E - 402746N		Hole Type BH	
Location:		Stainborough Lane, Hood Green, Barnsley				Level: 158.10		Scale 1:50	
Client:		Mr David Green				Dates: 14/01/2020		Logged By JR	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								MADE GROUND: Dark brown, clay and gravel.	1
					1.80	158.10		Light brown CLAY.	2
					3.50	156.30		Dark grey MUDSTONE. (Soft - Possibly Disturbed)	3
								4	
								5	
								6	
								7	
								8	
								9	
								10	
Continued on Next Sheet									
Remarks 1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. Borehole sealed with cement and bentonite at rockhead and the surface on completion.									



				Borehole Log				Borehole No. R01 Sheet 3 of 3			
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431763E - 402746N		Hole Type BH	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		158.10		Scale 1:50	
Client:		Mr David Green				Dates:		14/01/2020		Logged By JR	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					25.00	138.10		Brown SANDSTONE with SILTSTONE bands.	21		
					25.00	138.10		Grey, silty MUDSTONE.	25		
					29.50	133.10		Grey SANDSTONE.	29		
					30.00	128.60		End of Borehole at 30.00m	30		
Remarks 1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. Borehole sealed with cement and bentonite at rockhead and the surface on completion.											

				Borehole Log				Borehole No. R02 Sheet 1 of 2	
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431754E - 402738N	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		157.80	
Client:		Mr David Green				Dates:		14/01/2020	
Logged By		JR							

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.50	157.80		MADE GROUND: Dark brown clay.		
										Light brown CLAY.
					2.80	157.30		Dark grey, silty MUDSTONE.		
					7.00	155.00		Very soft STRATA. (No flush returns)		
					10.00	150.80		Continued on Next Sheet		

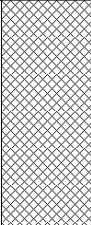
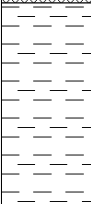
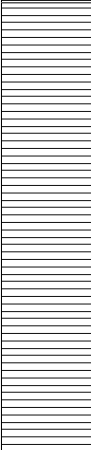
Remarks 1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.		
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				Borehole Log				Borehole No. R02 Sheet 2 of 2	
Project Name:		Replacement Dwelling at Pine Lodge		Project No. H19104		Co-ords: 431754E - 402738N		Hole Type BH	
Location:		Stainborough Lane, Hood Green, Barnsley				Level: 157.80		Scale 1:50	
Client:		Mr David Green				Dates: 14/01/2020		Logged By JR	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					12.80	147.80		Black, silty MUDSTONE. (Partial flush returns)	11
					15.00	145.00		Grey MUDSTONE.	13
					19.00	142.80		Solid STRATA. (No flush returns)	15
								End of Borehole at 19.00m	19
									20

Remarks

1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.


				Borehole Log				Borehole No. R03 Sheet 1 of 2			
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431745E - 402747N		Hole Type BH	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		158.35		Scale 1:50	
Client:		Mr David Green				Dates:		14/01/2020		Logged By JR	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					1.50	158.35		MADE GROUND: Dark brown clay.	1
								Grey brown CLAY.	2
					2.90	156.85		Grey, silty MUDSTONE.	3
					7.00	155.45		Black, silty MUDSTONE.	7
							Continued on Next Sheet		10

Remarks

1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.

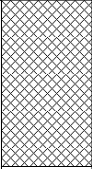
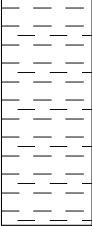


				Borehole Log				Borehole No. R03		
Project Name: Replacement Dwelling at Pine Lodge				Project No. H19104		Co-ords: 431745E - 402747N		Sheet 2 of 2 Hole Type BH		
Location: Stainborough Lane, Hood Green, Barnsley				Level: 158.35		Scale 1:50				
Client: Mr David Green				Dates: 14/01/2020		Logged By JR				
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
									11	
					13.80	151.35		Grey MUDSTONE.	14	
									15	
					16.70	144.55		COAL. (intact)	17	
					17.80	141.65		Grey MUDSTONE.	18	
					19.00	140.55		End of Borehole at 19.00m	19	
									20	

Remarks

1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.



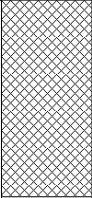
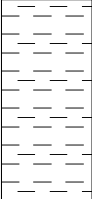
				Borehole Log				Borehole No. R04 Sheet 1 of 2			
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431733E - 402752N		Hole Type BH	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		158.40		Scale 1:50	
Client:		Mr David Green				Dates:		15/01/2020		Logged By JR	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					1.10	158.40		MADE GROUND: Dark brown clay.	1		
								Grey brown CLAY.	2		
					2.60	157.30		Grey MUDSTONE.	3		
									4		
									5		
									6		
									7		
									8		
					8.00	155.80		Dark grey and black, silty MUDSTONE.	9		
									10		
Continued on Next Sheet											
Remarks 1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.											
											

				Borehole Log				Borehole No. R04 Sheet 2 of 2	
Project Name:		Replacement Dwelling at Pine Lodge		Project No. H19104		Co-ords: 431733E - 402752N		Hole Type BH	
Location:		Stainborough Lane, Hood Green, Barnsley				Level: 158.40		Scale 1:50	
Client:		Mr David Green				Dates: 15/01/2020		Logged By JR	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
					15.50	150.40		COAL. (intact)	
					16.60	142.90		Grey, silty MUDSTONE.	
					18.00	141.80		End of Borehole at 18.00m	

Remarks
1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.



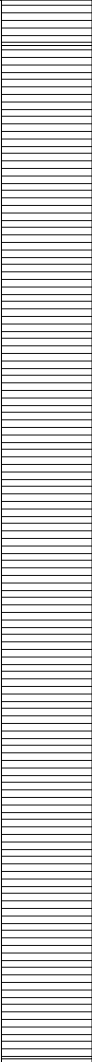
				Borehole Log				Borehole No. R05 Sheet 1 of 2	
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431738E - 402761N	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		158.45	
Client:		Mr David Green				Dates:		15/01/2020	
Logged By		JR							

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					1.30	158.45		MADE GROUND: Dark brown clay.	1
								Brown CLAY.	2
					2.70	157.15		Grey MUDSTONE.	3
					6.00	155.75		Very soft STRATA. (No flush returns)	6
									7
									8
									9
									10

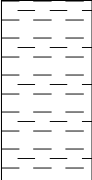
Continued on Next Sheet

Remarks
 1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.



					Borehole Log			Borehole No. R05 Sheet 2 of 2								
Project Name: Replacement Dwelling at Pine Lodge					Project No. H19104		Co-ords: 431738E - 402761N		Hole Type BH							
Location: Stainborough Lane, Hood Green, Barnsley					Level: 158.45		Scale 1:50									
Client: Mr David Green					Dates: 15/01/2020		Logged By JR									
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description								
		Depth (m)	Type	Results												
					10.30	152.45		Solid STRATA. (No flush returns)	11							
					12											
					13											
					14											
					15											
					16											
					17											
					18											
					19											
					20											
												17.00	148.15		End of Borehole at 17.00m	
					Remarks 1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.											

				Borehole Log				Borehole No. R06 Sheet 1 of 2	
Project Name:		Replacement Dwelling at Pine Lodge		Project No.		H19104		Co-ords: 431753E - 402763N	
Location:		Stainborough Lane, Hood Green, Barnsley				Level:		158.40	
Client:		Mr David Green				Dates:		15/01/2020	
								Logged By JR	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30	158.40		MADE GROUND: Tarmacadam and hardcore.	1
								Brown CLAY.	
								COAL smut and CLAY.	
								Grey brown CLAY.	
					1.60	158.10		Grey, silty MUDSTONE.	2
					1.70	156.80			
					2.10	156.70			3
									4
									5
									6
									7
									8
									9
									10
Continued on Next Sheet									

Remarks 1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.		
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Borehole Log

Borehole No.

R06

Sheet 2 of 2

Project Name: Replacement Dwelling at Pine Lodge

Project No.
H19104

Co-ords: 431753E - 402763N

Hole Type
BH

Location: Stainborough Lane, Hood Green, Barnsley

Level: 158.40

Scale
1:50

Client: Mr David Green

Dates: 15/01/2020

Logged By
JR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					10.50	156.30		Very soft STRATA. (No flush returns)	11
					11.60	147.90		Grey MUDSTONE. (Partial flush returns)	12
									13
									14
					14.60	146.80		COAL. (intact)	15
					15.70	143.80		Grey MUDSTONE.	16
					17.00	142.70		End of Borehole at 17.00m	17
									18
									19
									20

Remarks

1) No groundwater encountered. 2) No elevated gas concentrations recorded during advancement of the borehole. 3) Borehole sealed with cement and bentonite at rockhead and the surface on completion.



Trial Pit Log

Trial Pit No
TP01
Sheet 1 of 1

Project Name: Replacement Dwelling at Pine Lodge

Project No.
H19104

Co-ords: 431732.00 - 402759.00
Level: 158.50

Date
22/01/2020

Location: Stainborough Lane, Hood Green, Barnsley

Dimensions (m): 2.20

Scale
1:25

Client: Mr David Green

Depth
3.25

0.85

Logged
ACV

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES					MADE GROUND: Dark grey, organic, slightly gravelly clay. Gravel is angular, fine to medium mudstone.	
				0.30	158.20		MADE GROUND: Firm becoming stiff, grey mottled orange, gravelly clay. Gravel is angular, fine to coarse mudstone, coal, rare brick and limestone.	
	0.60	D						
				1.10	157.40		MADE GROUND: Light yellow gravel. Gravel is angular to subangular, coarse limestone.	1
				1.30	157.20		Stiff, orange mottled brown CLAY.	
								2
				2.60	155.90		Very weak, thinly bedded, light grey mottled brown MUDSTONE. Recovered as gravel.	
								3
				3.25	155.25		End of Pit at 3.25m	
								4
								5

Remarks: 1) No groundwater encountered. 2) Trial pit terminated at 3.25m below existing ground level (begl) within mudstone. 3) Trial pit backfilled with arisings to existing ground level.

Stability: Stable



Trial Pit Log

TrialPit No
TP02
Sheet 1 of 1

Project Name: Replacement Dwelling at Pine Lodge

Project No.
H19104

Co-ords: 431741.00 - 402747.00
Level: 158.20

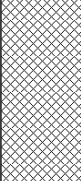
Date
22/01/2020

Location: Stainborough Lane, Hood Green, Barnsley

Dimensions (m): 2.20
Depth 3.60

Scale
1:25
Logged
ACV

Client: Mr David Green

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	ES		0.30	157.90		MADE GROUND: Dark grey, organic, slightly gravelly clay. Gravel is angular, fine to medium mudstone.
				0.70	157.50		MADE GROUND: Firm becoming stiff, grey mottled brown, gravelly clay. Gravel is angular, fine to coarse mudstone. (Reworked natural)
							MADE GROUND: Grey gravel of mudstone. Gravel is angular, fine to coarse mudstone.
	1.60	D		1.50	156.70		Stiff, orange mottled grey CLAY with low cobble and boulder content. Cobbles and boulders are angular to subangular sandstone.
							
							
							
							
							
	3.10	D		3.00	155.20		Very weak, thinly bedded, light grey mottled brown MUDSTONE. Recovered as gravel.
							
				3.60	154.60		End of Pit at 3.60m

Remarks: 1) No groundwater encountered. 2) Trial pit terminated at 3.60m below existing ground level (begl) within mudstone. 3) Trial pit backfilled with arisings to existing ground level.

Stability: Stable



Trial Pit Log

TrialPit No
TP03
Sheet 1 of 1

Project Name: Replacement Dwelling at Pine Lodge

Project No.
H19104

Co-ords: 431747.00 - 402738.00
Level: 157.80

Date
22/01/2020

Location: Stainborough Lane, Hood Green, Barnsley

Dimensions (m): 2.20
0.85
Depth 3.60

Scale
1:25
Logged
ACV

Client: Mr David Green

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30	ES		0.20	157.60		MADE GROUND: Dark grey, organic, slightly gravelly clay. Gravel is angular, fine to medium mudstone and rare brick.
	1.10	D		1.00	156.80		MADE GROUND: Firm becoming stiff, grey mottled brown, gravelly clay with medium cobble content. Gravel is angular, fine to coarse mudstone and brick. Cobble content of brick.
							Stiff, brownish grey and orange mottled, gravelly CLAY. Gravel is angular to round, fine to coarse mudstone and ironstone nodules.
				3.10	154.70		Very weak, thinly bedded, light grey MUDSTONE. Recovered as gravel.
				3.60	154.20		End of Pit at 3.60m

Remarks: 1) No groundwater encountered. 2) Trial pit terminated at 3.60m below existing ground level (begl) within mudstone. 3) Trial pit backfilled with arisings to existing ground level.

Stability: Stable



Trial Pit Log

TrialPit No
TP04
Sheet 1 of 1

Project Name: Replacement Dwelling at Pine Lodge

Project No.
H19104

Co-ords: 431758.00 - 402746.00
Level: 158.30

Date
22/01/2020

Location: Stainborough Lane, Hood Green, Barnsley

Dimensions (m): 2.20

Scale
1:25

Client: Mr David Green

Depth
4.00

0.80

Logged
ACV

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.20	158.10		MADE GROUND: Dark grey, organic, slightly gravelly clay. Gravel is angular, fine to medium mudstone.	
				1.40	156.90		MADE GROUND: Firm, dark grey, gravelly clay with low cobble content. Gravel is angular, fine to coarse limestone, brick, sandstone and mudstone. Cobbles angular of brick.	1
				2.20	156.10		MADE GROUND: Dark grey gravel. Gravel is angular, fine to coarse mudstone.	2
	2.30	D					Stiff, orange mottled brown, slightly sandy CLAY with low cobble content. Sand is fine. Cobbles angular of sandstone.	3
				3.80	154.50		Very weak, thinly bedded, light grey MUDSTONE. Recovered as gravel.	4
				4.00	154.30		End of Pit at 4.00m	5

Remarks: 1) No groundwater encountered. 2) Trial pit terminated at 4.00m below existing ground level (begl) within mudstone. 3) Trial pit backfilled with arisings to existing ground level.

Stability: Stable



Trial Pit Log

TrialPit No

TP05

Sheet 1 of 1

Project Name: Replacement Dwelling at Pine Lodge

Project No.
H19104

Co-ords: 431770.00 - 402748.00
Level: 158.00

Date
22/01/2020

Location: Stainborough Lane, Hood Green, Barnsley

Dimensions (m): 2.20

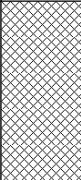
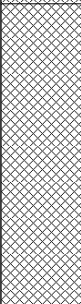
Scale
1:25

Client: Mr David Green

Depth
3.60

0.90

Logged
ACV

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.40	ES		0.60	157.40		MADE GROUND: Dark grey, organic, slightly gravelly clay. Gravel is angular, fine to medium mudstone. Contains plastic fragments.	
				1.60	156.40		MADE GROUND: Dark grey gravel. Gravel is angular, fine to coarse mudstone.	1
	2.00	D					Stiff, orange mottled grey CLAY.	2
				3.10	154.90		Very weak, thinly bedded, light grey MUDSTONE. Recovered as gravel.	3
				3.60	154.40		End of Pit at 3.60m	4
								5

Remarks: 1) No groundwater encountered. 2) Trial pit terminated at 3.60m below existing ground level (begl) within mudstone. 3) Trial pit backfilled with arisings to existing ground level.

Stability: Stable



Ground Gas and Groundwater Monitoring Records



Job No: H19104
Site: Replacement Dwelling Pine Lodge Stainborough Lane, Hood Green, Barnsley
Client: Mr D Green

Visit No: 1 of 4
Date: 13/12/2019
Operator: JR

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		Carbon dioxide (%v/v)		LEL (%)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Diff. borehole Pressure (Pa)	Time for flow to equalise (sec)	Water level (m bgl)	Depth of well (m bgl)	Reduced level (m AOD)	Water level (m AOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady			Peak	Steady								
WS01	0.0	0.0	4.2	4.0	0.0	0.0	0	0	0	0	15.3	15.3			0.0	0.0			DRY	2.00	158.36		1.0 - 2.0	
WS03	0.0	0.0	4.5	4.1	0.0	0.0	0	0	0	0	15.2	15.2			0.0	0.0			DRY	4.00	157.71		1.0 - 3.0	
WS05	0.0	0.0	1.0	1.0	0.0	0.0	0	0	0	0	20.3	20.3			0.0	0.0			DRY	4.00	157.85		1.0 - 3.0	
Max	0.0	0.0	4.5	4.1	0.0	0.0	0	0	0	0	20.3	20.3			<0.1	<0.1			0.00	4.00	158.4		0	
Min	0.0	0.0	1.0	1.0	0.0	0.0	0	0	0	0	15.2	15.2			<0.1	<0.1			0.00	2.00	157.7		0	

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground:

Dry

Calm

None

None

Wind:

X

Light

Slight

Slight

975

Before

Falling

Before

Cloud cover:

Moist

Light

Slight

Slight

Before

Falling

Before

Precipitation:

X

Wet

Moderate

X

Cloudy

X

Moderate

X

Steady

Barometric pressure (mbar)

Snow

Strong

Overcast

975

After

Rising

After

Pressure trend:

Frozen

Air Temperature (Deg. C):

Ground Gas and Groundwater Monitoring Records



Job No: H19104
Site: Replacement Dwelling Pine Lodge Stainborough Lane, Hood Green, Barnsley
Client: Mr D Green

Visit No: 2 of 4
Date: 23/12/2019
Operator: ACV

Monitoring Point	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
	Methane (%v/v)		Carbon dioxide (%v/v)		LEL (%)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Diff. borehole Pressure (Pa)	Time for flow to equalise (sec)	Water level (m bgl)	Depth of well (m bgl)	Reduced level (m AOD)	Water level (m AOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady			Peak	Steady								
WS01	0.0	0.0	2.6	2.6	0.0	0.0	0	0	0	0	20.8	17.1			0.0	0.0			DRY	2.03			1.0 - 2.0	
WS03	0.0	0.0	4.4	4.4	0.0	0.0	0	0	0	0	15.2	15.1			0.0	0.0			DRY	3.97			1.0 - 3.0	
WS05	0.0	0.0	1.3	1.3	0.0	0.0	0	0	0	0	19.6	19.6			0.0	0.0			DRY	4.00			1.0 - 3.0	
Max	0.0	0.0	4.4	4.4	0.0	0.0	0	0	0	0	20.8	19.6			<0.1	<0.1			0.00	4.00				
Min	0.0	0.0	1.3	1.3	0.0	0.0	0	0	0	0	15.2	15.1			<0.1	<0.1			0.00	2.03				

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground:DryMoist

X

WetSnowFrozen

Wind:Calm

X

LightModerateStrong

Cloud cover:NoneSlightCloudy

X

Overcast

Precipitation:NoneSlightModerate

X

Heavy

Barometric pressure (mbar)

1002

BeforeAfter

1002

Pressure trend:FallingSteady

X

Rising

Air Temperature (Deg. C):

6

BeforeAfter

6

Ground Gas and Groundwater Monitoring Records



Job No: H19104
Site: Replacement Dwelling Pine Lodge Stainborough Lane, Hood Green, Barnsley
Client: Mr D Green

Visit No: 3 of 4
Date: 14/01/2020
Operator: JR

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		Carbon dioxide (%v/v)		LEL (%)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Diff. borehole Pressure (Pa)	Time for flow to equalise (sec)	Water level (m bgl)	Depth of well (m bgl)	Reduced level (m AOD)	Water level (m AOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady			Peak	Steady								
WS01	0.0	0.0	1.8	1.8	0.0	0.0	0	0	0	0	18.9	18.9			0.0	0.0			DRY	2.01			1.0 - 2.0	
WS03	0.0	0.0	4.1	4.0	0.0	0.0	0	0	0	0	17.2	17.2			0.0	0.0			DRY	3.97			1.0 - 3.0	
WS05	0.0	0.0	2.1	2.1	0.0	0.0	0	0	0	0	18.3	18.3			0.0	0.0			DRY	4.00			1.0 - 3.0	
Max	0.0	0.0	4.1	4.0	0.0	0.0	0	0	0	0	18.9	18.9			<0.1	<0.1			0.00	4.00				
Min	0.0	0.0	1.8	1.8	0.0	0.0	0	0	0	0	17.2	17.2			<0.1	<0.1			0.00	2.01				

METEOROLOGICAL AND SITE INFORMATION:

State of ground:

Dry

X

Calm

None

None

Wind:

Moist

Light

Slight

X

Slight

990

Before

X

Falling

Before

Cloud cover:

X

Wet

Moderate

x

Cloudy

Moderate

Precipitation:

Steady

Barometric pressure (mbar)

Snow

Strong

Overcast

Heavy

989

After

Rising

After

Pressure trend:

Frozen

Air Temperature (Deg. C):

Ground Gas and Groundwater Monitoring Records



Job No: H19104
 Site: Replacement Dwelling Pine Lodge Stainborough Lane, Hood Green, Barnsley
 Client: Mr D Green

Visit No: 4 of 4
 Date: 29/01/2020
 Operator:

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		Carbon dioxide (%v/v)		LEL (%)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Diff. borehole Pressure (Pa)	Time for flow to equalise (sec)	Water level (m bgl)	Depth of well (m bgl)	Reduced level (m AOD)	Water level (m AOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady			Peak	Steady								
WS01	0.0	0.0	2.7	2.5	0.0	0.0	0	0	0	0	17.8	17.8			0.0	0.0			DRY	2.00			1.0 - 2.0	
WS03	0.0	0.0	4.3	4.0	0.0	0.0	0	0	0	0	17.0	17.0			0.0	0.0			DRY	3.98			1.0 - 3.0	
WS05	0.0	0.0	2.2	2.0	0.0	0.0	0	0	0	0	18.1	18.1			0.0	0.0			DRY	4.00			1.0 - 3.0	
Max	0.0	0.0	4.3	4.0	0.0	0.0	0	0	0	0	18.1	18.1			<0.1	<0.1			0.00	4.00				
Min	0.0	0.0	2.2	2.0	0.0	0.0	0	0	0	0	17.0	17.0			<0.1	<0.1			0.00	2.00				

METEOROLOGICAL AND SITE INFORMATION:

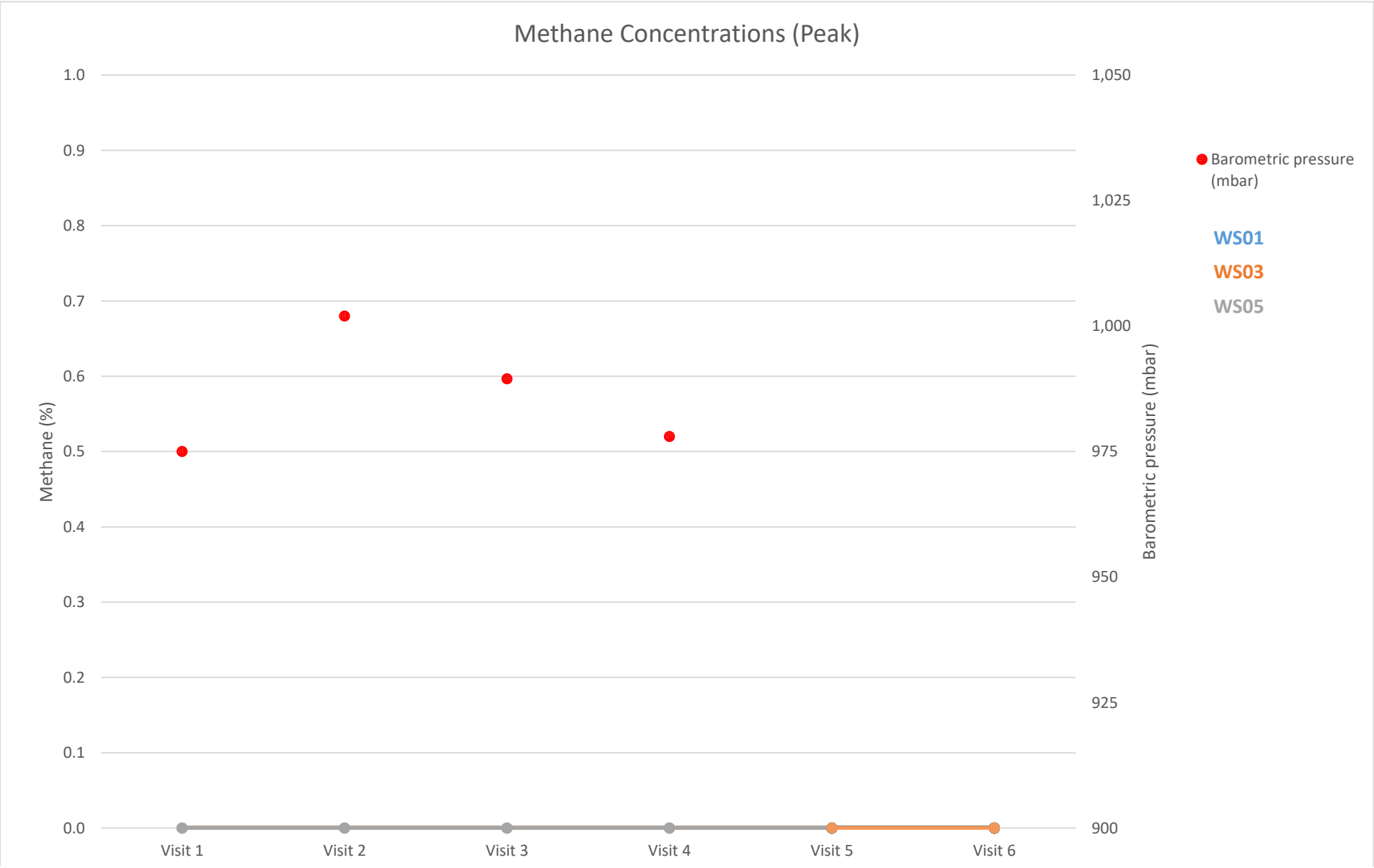
(Select correct box with X or enter data, as applicable)

State of ground:	☐ Dry	☒ Moist	☐ Wet	☐ Snow	☐ Frozen
Wind:	☐ Calm	☒ Light	☐ Moderate	☐ Strong	
Cloud cover:	☐ None	☐ Slight	☒ Cloudy	☐ Overcast	
Precipitation:	☐ None	☒ Slight	☐ Moderate	☐ Heavy	
Barometric pressure (mbar)		978 Before		978 After	
Pressure trend:		☒ Falling	☐ Steady	☐ Rising	
Air Temperature (Deg. C):		Before		After	

Ground Gas and Groundwater Monitoring Records



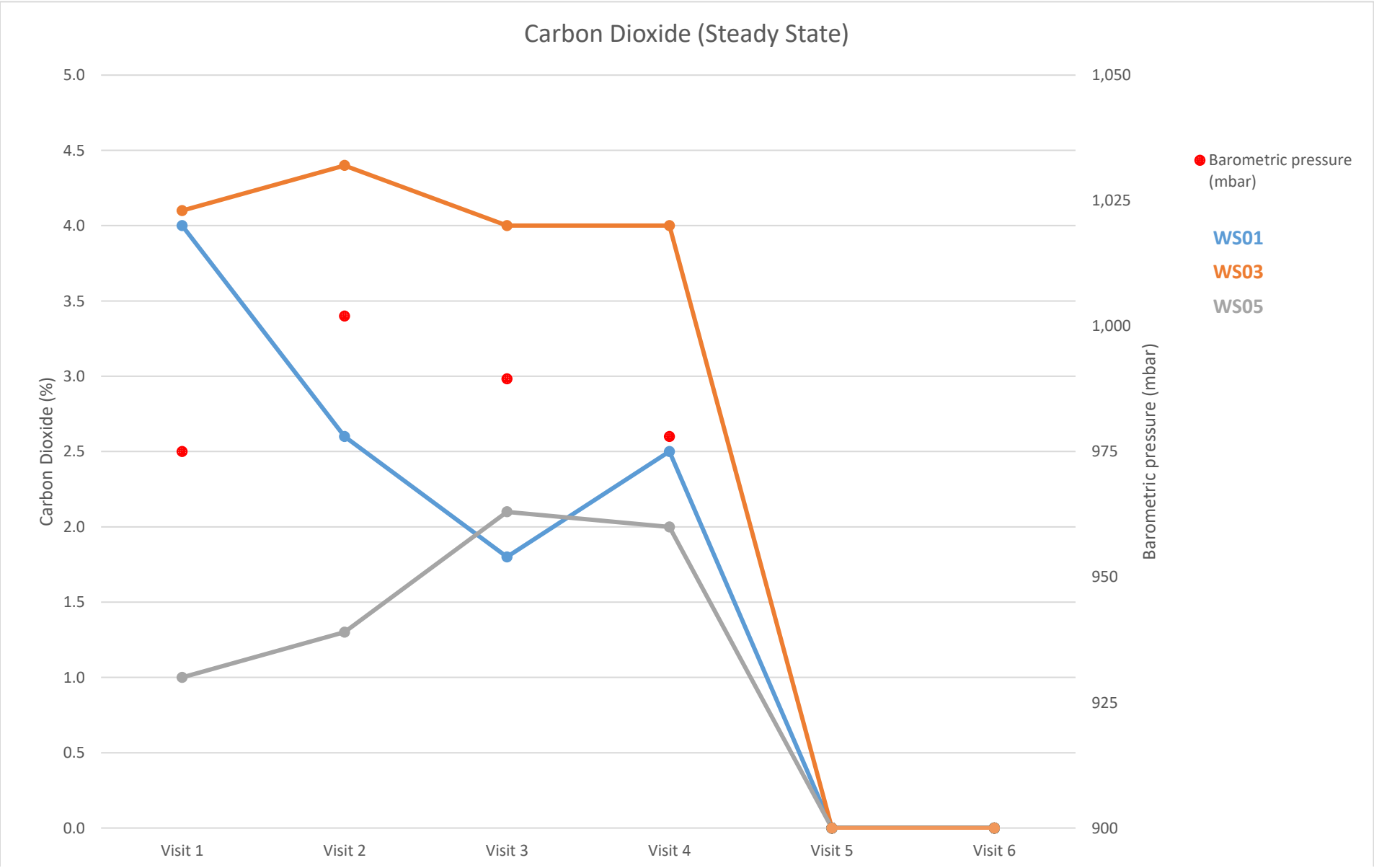
Job No: H19104
Site: Replacement Dwelling Pine Lodge Stainborough Lane, Hood Green, Barnsley
Client: Mr D Green



Ground Gas and Groundwater Monitoring Records



Job No: H19104
Site: Replacement Dwelling Pine Lodge Stainborough Lane, Hood Green, Barnsley
Client: Mr D Green



Ground Gas and Groundwater Monitoring Records



Job No: H19104

Site: Replacement Dwelling Pine Lodge Stainborough Lane, Hood Green, Barnsley

Client: Mr D Green

	MAXIMUM GAS CONCENTRATIONS										MINIMUM		MAX. VOCs		MAX. GAS FLOWS			MAX. WATER LEVELS					Comments	
Monitoring Point	Methane (%v/v)		Carbon dioxide (%v/v)		LEL (%)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Diff. borehole Pressure (Pa)	Time for flow to equalise (sec)	Water level (m bgl)	Depth of well (m bgl)	Reduced level (m AOD)	Water level (m AOD)		Response Zone
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min. Peak	Min. Steady			Peak	Steady								
WS01	0.0	0.0	4.2	4.0	0.0	0.0	0	0	0	0.0	15.3	15.3			<0.1	<0.1		0.00	2.03	158.4		0.00		
WS03	0.0	0.0	4.5	4.4	0.0	0.0	0	0	0	0.0	15.2	15.1			<0.1	<0.1		0.00	4.00	157.7		0.00		
WS05	0.0	0.0	2.2	2.1	0.0	0.0	0	0	0	0.0	18.1	18.1			<0.1	<0.1		0.00	4.00	157.9		0.00		