
MINING INVESTIGATION
FOR PROPOSED DRIVE-THRU UNIT
AT CYFARTHFA RETAIL PARK
MERTHYR TYDFIL
SOUTH WALES

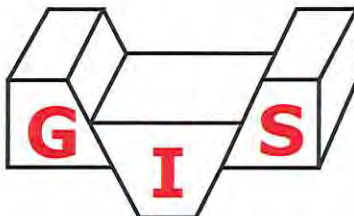
CARRIED OUT FOR:

CLIENT: CORONA VULCAN MERTHYR LIMITED
ENGINEER: WATERMAN STRUCTURES LIMITED

DATE: FEBRUARY 2023 **REPORT NO:** 2371 A

**GROUND INVESTIGATION
SPECIALISTS LIMITED**

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WV5 9EZ



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REPORT NO: 2371 A

MINING INVESTIGATION
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REPORT NO: 2371A

MINING INVESTIGATION
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SOUTH WALES

1.0 INTRODUCTION

In May 2022 Ground Investigation Specialists Limited (GIS) produced a ground investigation report (ref no: 2371) for Savills (acting on behalf of Corona Vulcan Merthyr Limited) for the construction of a new drive-thru unit at Cyfarthfa Retail Park in Merthyr Tydfil, South Wales. The Engineer retained for the project was Waterman Structures Limited of Birmingham.

As part of the investigation, local borehole records were assessed which indicated the presence of suspected mine workings or a mine entry (adit) c.8m from the site boundary. The borehole, drilled as part of works for the construction of the adjacent A 470 Taff Vale Trunk Road, encountered a 4.5m thick cavity at a depth 20.0m.

The aim of this investigation was to ascertain whether the proposed building area was underlain by mine workings/ possible mine entry. Fieldworks were carried out between 16th and 19th January 2023 and consisted of sinking seven probe boreholes by means of rotary open hole drilling.

This report presents a factual account of the work undertaken and comments on the findings of the investigations, giving recommendations for foundation design with regard to the long term mining stability of the site. It should be read in conjunction with GIS Ground Investigation report no. 2371.

This report has been produced for the sole use of Corona Vulcan Merthyr Limited and their advisors in support of the new retail development. No liability can be accepted for its use by other parties or for other development proposals.

2.0 SITE INVESTIGATION

Between 16th and 19th January 2023 a Klemm 802 rotary drilling rig was mobilised to sink seven boreholes (R1 – R7), all to a depth of 35m.

The approximate location of the rotary boreholes were decided by the Engineer, as shown on the site plan included in section 7.0. Boreholes R1 and R7 at the eastern end of the site were drilled where a new retaining structure is to be constructed, while the remaining five boreholes were drilled in the area of the proposed building.

The reduced levels provided on the exploratory logs are approximate as they have been extrapolated from topographical data included on Powell Dobson Architects drawing no. 18126 (05) 002.

The method of drilling employed a drill bit which was rotated and advanced into the ground, using compressed air-mist as the flushing method. The chippings of soil and rock-strata returned to the surface through the annulus between the drill rods and the borehole. The samples were logged at the surface continuously by the drilling foreman.

Although this method of drilling is less accurate as a means of identifying the rock penetrated or precise depths of the strata encountered, it is particularly sensitive to the presence of mine workings as cavities or shattered strata are immediately apparent from changes in the rate of penetration and a loss or reduction in the volume of drilling flush returns.

The fair drawn logs of the exploratory boreholes are included in section 5.0, as based on the foreman driller's description of the flush returns.

On completion of drilling, the boreholes were backfilled with a combination of arisings, and cement.

3.0 GROUND CONDITIONS

3.1 Anticipated Geology

Reference to report 2371 would show that the initial ground investigation had proved the site was underlain by a significant thickness of colliery and foundry-type waste **made ground**, extending to a depth of 6.0m (*approximate level of 200.1mAOD*) in BH1 in the eastern part of the site and 10.0m (*c.197mAOD*) in borehole BH2 in the western part. It comprised for the most part of medium dense dark grey fine to coarse angular gravel sized fragments of shaley mudstone. Underlying the made ground, **glacial drift** was encountered to the base of both cable percussive boreholes, comprising medium dense brown very clayey gravelly sand or sandy gravel.

The full thickness of the glacial drift deposits was not proved. From the available BGS records the underlying solid geology was expected to comprise Carboniferous era strata of the **South Wales Lower Coal Measures Formation**, comprising a sequence of interbedded mudstones, siltstones and sandstones with coal seams and ironstone beds of former economic importance. Of note was the presence of coal seams in three mine probe boreholes drilled close to the western site boundary. The seams ranged in thickness from 0.25 to 1.25m thick. Of particular note was a c.4.5m thick cavity which was proved below a depth of 20.0m in borehole SO00NW487 (situated c.8m from the western site

boundary). As detailed in report 2371, the Coal Authority believed the cavity was associated with ironstone workings in the Rosser Ironstone Beds.

3.2 Strata Encountered

Full details of the strata encountered are presented on the fair drawn logs included in section 5.0. However, as a brief guide, the main engineering geology horizons encountered in the rotary boreholes are summarised below:

Made ground (colliery waste) was encountered to depths (*levels*) ranging between 5.5m (*c.201.7mAOD*) in R4 and 7.0m (*c.199.3mAOD*) in R3.

Glacial drift (sandy gravel) was encountered to depths (*levels*) of between 10.6m (*c.194.3mAOD*) in R7 and 16.5m (*c.189.8 and 190.7mAOD*) in both R3 and R4 respectively.

Below the drift, **South Wales Lower Coal Measures Formation** strata were encountered, initially comprising interbedded grey sandstones and grey mudstones. Thin coal seams (0.3m thick) were recorded at 11.7 – 12.0m (*c.193.2 – 192.9mAOD*), and 13.7 – 14.0m (*c.191.2 – 190.9mAOD*) in borehole R6, and 15.8 – 16.1m (*c.189.1 – 188.8mAOD*) in R7.

Of particular note however was the presence of “**backfilled workings**” at a depth (*level*) of 19.7 – 20.9m (*c.185.2 – 184.0mAOD*) in R6, marked by a significant change in the rate of penetration of the drill rods between those depths, and a total loss of flush returns below 19.7m.

4.0 ENGINEERING COMMENTS

4.1 Introduction

Reference to Powell Dobson Architects drawing no. 18126 (05) 003 Rev B (included in section 7.0) would show that it is proposed to construct a new 1800 sq ft drive-thru retail unit in the western part of the site. The remainder of the site will be developed for car parking. Due to a raising of site levels, a retaining structure will be constructed around the southern end of the car park.

4.2 Foundations

Rotary borehole R6 has confirmed the building area to be underlain by shallow mine workings at a depth of 19.7 to 20.9m, below only 8.4m of bedrock (and which could be less than this in other areas where rockhead is deeper). The collapse of shallow workings around borehole R6 (and possibly beneath other parts of the building area) has the potential for migrating voids to break out at rockhead, causing the overlying drift deposits and made ground to collapse into them and be transmitted to the surface in the form of excessive settlement, resulting in structural damage to the new retail unit.

To alleviate this risk it will be necessary to stabilise the mine workings by undertaking a grid drilling and pressure grout operation before the new building is constructed. Consideration should also be given to carrying out stabilisation works (drilling and grouting) beneath the proposed retaining structure. Treatment should extend to a depth of about 23m in both areas.

Drilling will start on the lowest dip side. Casing will be installed to rockhead and once drilled to depth, a mix of typically 10:1 Pulverised Fuel Ash (PFA) and Ordinary Portland Cement (OPC) grout will be injected into the base of the borehole via a flexible tremie. Sand or gravel may be added to thicken the mix depending on the grout-take, while the borehole grid may be tightened depending on grout-take and other factors. The works require specialist equipment and knowledge. Two such companies (Apex Drilling Services Limited of Bridgend, Wales; and M & J Drilling Services Limited of Tipton, West Midlands) have been approached for quotations and their correspondence relating to the retail unit only is included in section 6.0.

Taken at face value the two quotes are similar (in the order of [REDACTED] excluding VAT). However it is worth noting that Apex have allowed for injecting two-thirds more grout than M & J. Adjusting the Apex quote to allow for 66 tonnes of grout in-line with M & J provides a more like-for-like quote in the order of [REDACTED]. There would also be potential significant savings (in the order of [REDACTED]) if the drilling companies were not required to provide their own security and welfare facilities.

It is also worth noting that having carried out the rotary investigation, Apex already have a good knowledge of the site and its geology and are local to the area.

To carry out ground treatment for the retaining wall which is believed to be about 65m long, it is estimated for budget purposes that the drilling and grouting costs for both companies would be about [REDACTED] based on drilling a line of 12no boreholes (6.0m apart) and injecting approximately 50 tonnes of 10:1 pfa : cement grout.

The drilling and grouting works should not be carried out without first the written approval and permission of the Coal Authority.

Following completion of the drilling and grouting works, the shallow foundation solutions described in detail in section 5.3 of report 2371 remain applicable for the proposed retail unit, namely either:

- i) a reinforced semi-rigid raft foundation with perimeter downstand beams,
- or,
- ii) a more heavily reinforced ground beam solution (reinforcing bars top to bottom) with an independent floating floor slab. Mesh reinforcement should be placed in both the top and bottom of the slab.

The alternative of employing a pile and beam solution is not considered a suitable or economical solution given that the piles would need to be taken into solid bedrock below the depth of the treated mine workings.

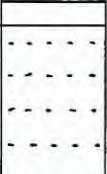
T.J. McLaren, BSc., FGS.
Senior Ground Engineer

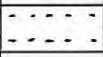
H.S. Lister, BSc., C Sci., C. Geol., FGS.
Director

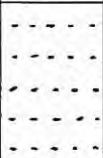
Ground Investigation Specialists Limited

5.0

ROTARY BOREHOLE LOGS

GROUND INVESTIGATION SPECIALISTS LIMITED									
CONTRACT: Cyfarthfa Retail Park, Merthyr Tydfil						BOREHOLE No. R1			
CLIENT: Savills						SHEET 1 OF 1			
ENGINEER: Waterman Structures Limited						JOB No. 2371 A			
DATES DRILLED: 19.01.23			RIG TYPE: Klemm 802			DRILLER: BJ			
GROUND LEVEL: c. 205.9 m AOD			DRILLING METHOD: Rotary Open Hole (Air Mist)			ANGLE: Vertical			
Drilling & Casing Progress	Core Recovery %			DRILLERS STRATA DESCRIPTION	Legend	Depth (m) GL	Reduced Level (m)		
	T	S	R						
Cased to 15.00m				Made ground (colliery waste)		6.60	199.30		
				Brown sandy GRAVEL. (GLACIAL DRIFT)		13.90	192.00		
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		15.00	190.90		
				Grey MUDSTONE with sandstone bands. (SOUTH WALES LOWER COAL MEASURES FORMATION)		29.20	176.70		
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		35.00	170.90		
				Borehole Complete.					
				Backfilled with arisings and cement mix.					
REMARKS:					T = total core recovery S = solid core recovery R = rock quality designation		FIG NO.		

GROUND INVESTIGATION SPECIALISTS LIMITED							
CONTRACT: Cyfarthfa Retail Park, Merthyr Tydfil					BOREHOLE No. R2		
CLIENT: Savills					SHEET 1 OF 1		
ENGINEER: Waterman Structures Limited					JOB No. 2371 A		
DATES DRILLED: 17.01.23			RIG TYPE: Klemm 802		DRILLER: BJ		
GROUND LEVEL: c. 206.2 m AOD			DRILLING METHOD: Rotary Open Hole (Air Mist)		ANGLE: Vertical		
Drilling & Casing Progress	Core Recovery %			DRILLERS STRATA DESCRIPTION	Legend	Depth (m)	Reduced Level (m)
	T	S	R				
Cased to 15.00m.				Made ground (colliery waste)		6.90	199.30
				Brown sandy GRAVEL. (GLACIAL DRIFT)		14.70	191.50
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		16.00	190.20
				Grey MUDSTONE with sandstone bands. (SOUTH WALES LOWER COAL MEASURES FORMATION)		28.00	178.20
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		35.00	171.20
				Borehole Complete. Backfilled with arisings and cement mix.			
REMARKS:					T = total core recovery S = solid core recovery R = rock quality designation		FIG NO.

GROUND INVESTIGATION SPECIALISTS LIMITED									
CONTRACT: Cyfarthfa Retail Park, Merthyr Tydfil						BOREHOLE No. R3			
CLIENT: Savills						SHEET 1 OF 1			
ENGINEER: Waterman Structures Limited						JOB No. 2371 A			
DATES DRILLED: 17.01.23			RIG TYPE: Klemm 802			DRILLER: BJ			
GROUND LEVEL: c. 206.3 m AOD			DRILLING METHOD: Rotary Open Hole (Air Mist)			ANGLE: Vertical			
Drilling & Casing Progress	Core Recovery %			DRILLERS STRATA DESCRIPTION		Legend	Depth (m) GL	Reduced Level (m)	
	T	S	R						
Cased to 18.00m				Made ground (colliery waste).			7.00	199.30	
				Brown sandy GRAVEL. (GLACIAL DRIFT)			16.50	189.90	
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)			17.60	188.80	
				Grey MUDSTONE with sandstone bands. (SOUTH WALES LOWER COAL MEASURES FORMATION)			28.70	177.60	
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)			35.00	171.30	
				Borehole Complete. Backfilled with arisings and cement mix.					
REMARKS:						T = total core recovery S = solid core recovery R = rock quality designation		FIG NO.	

GROUND INVESTIGATION SPECIALISTS LIMITED									
CONTRACT: Cyfarthfa Retail Park, Merthyr Tydfil						BOREHOLE No. R4			
CLIENT: Savills						SHEET 1 OF 1			
ENGINEER: Waterman Structures Limited						JOB No. 2371 A			
DATES DRILLED: 16.01.23			RIG TYPE: Klemm 802			DRILLER: BJ			
GROUND LEVEL: c. 207.2 m AOD			DRILLING METHOD: Rotary Open Hole (Air Mist)			ANGLE: Vertical			
Drilling & Casing Progress	Core Recovery %			DRILLERS STRATA DESCRIPTION	Legend	Depth (m) GL	Reduced Level (m)		
	T	S	R						
Cased to 18.00m				Made ground (colliery waste).		5.50	201.70		
				Brown sandy GRAVEL. (GLACIAL DRIFT)		16.50	190.70		
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		17.50	189.70		
				Grey MUDSTONE with sandstone bands. (SOUTH WALES LOWER COAL MEASURES FORMATION)		30.00	177.20		
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		35.00	172.20		
				Borehole Complete. Backfilled with arisings and cement mix.					

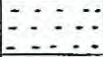
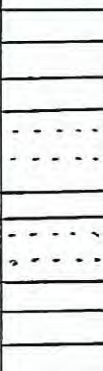
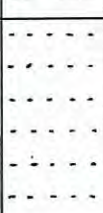
REMARKS:

T = total core recovery

S = solid core recovery

R = rock quality designation

FIG NO.

GROUND INVESTIGATION SPECIALISTS LIMITED							
CONTRACT: Cyfarthfa Retail Park, Merthyr Tydfil					BOREHOLE No. R5		
CLIENT: Savills					SHEET 1 OF 1		
ENGINEER: Waterman Structures Limited					JOB No. 2371 A		
DATES DRILLED: 17.01.23			RIG TYPE: Klemm 802		DRILLER: BJ		
GROUND LEVEL: c. 206.4 m AOD			DRILLING METHOD: Rotary Open Hole (Air Mist)		ANGLE: Vertical		
Drilling & Casing Progress	Core Recovery %			DRILLERS STRATA DESCRIPTION	Legend	Depth (m) GL	Reduced Level (m)
	T	S	R				
Cased to 13.50m				Made ground (colliery waste).		5.80	200.60
				Brown sandy GRAVEL. (GLACIAL DRIFT)		12.40	194.00
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		14.00	192.40
				Grey MUDSTONE with sandstone bands. (SOUTH WALES LOWER COAL MEASURES FORMATION)		27.90	178.50
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		35.00	171.40
				Borehole Complete. Backfilled with arisings and cement mix.			
REMARKS:					T = total core recovery S = solid core recovery R = rock quality designation		
					FIG NO.		

GROUND INVESTIGATION SPECIALISTS LIMITED							
CONTRACT: Cyfarthfa Retail Park, Merthyr Tydfil				BOREHOLE No. R6			
CLIENT: Savills				SHEET 1 OF 1			
ENGINEER: Waterman Structures Limited				JOB No. 2371 A			
DATES DRILLED: 18.01.23		RIG TYPE: Klemm 802		DRILLER: BJ			
GROUND LEVEL: c. 204.9 m AOD		DRILLING METHOD: Rotary Open Hole (Air Mist)		ANGLE: Vertical			
Drilling & Casing Progress	Core Recovery %			DRILLERS STRATA DESCRIPTION	Legend	Depth (m) GL	Reduced Level (m) 204.9
	T	S	R				
Cased to 11.50m				Made ground (colliery waste).		7.10	197.80
				Brown sandy GRAVEL. (GLACIAL DRIFT)		11.30	193.60
				GREY SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		11.70	193.20
				COAL. (SOUTH WALES LOWER COAL MEASURES FORMATION)		12.00	192.90
				GREY MUDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		13.70	191.20
				COAL. (SOUTH WALES LOWER COAL MEASURES FORMATION)		14.00	190.90
				Grey MUDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION)		19.70	185.20
				Backfilled WORKINGS – no flush or returns.		20.90	184.00
				Normal drilling – no flush or returns.		28.60	176.30
				Hard drilling – no flush or returns.		35.00	169.90
			Borehole Complete. Backfilled with arisings and cement mix.				

REMARKS: Borehole monitored for methane, carbon dioxide and carbon monoxide where coal and workings encountered – no detectable levels encountered.	T = total core recovery S = solid core recovery R = rock quality designation	FIG NO.
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GROUND INVESTIGATION SPECIALISTS LIMITED									
CONTRACT: Cyfarthfa Retail Park, Merthyr Tydfil							BOREHOLE No. R7		
CLIENT: Savills							SHEET 1 OF 1		
ENGINEER: Waterman Structures Limited							JOB No. 2371 A		
DATES DRILLED: 18.01.23				RIG TYPE: Klemm 802			DRILLER: BJ		
GROUND LEVEL: c. 204.9 m AOD				DRILLING METHOD: Rotary Open Hole (Air Mist)			ANGLE: Vertical		
Drilling & Casing Progress	Core Recovery %			DRILLERS STRATA DESCRIPTION	Legend	Depth (m) GL	Reduced Level (m) 204.90		
	T	S	R						
Cased to 12.00m				Made ground (colliery waste)		5.70	199.20		
				Brown sandy GRAVEL. (GLACIAL DRIFT)		10.60	194.30		
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION).		12.00	192.90		
				Grey MUDSTONE with sandstone bands. (SOUTH WALES LOWER COAL MEASURES FORMATION).		15.80	189.10		
				COAL. (SOUTH WALES LOWER COAL MEASURES FORMATION).		16.10	188.80		
				Grey MUDSTONE with sandstone bands. (SOUTH WALES LOWER COAL MEASURES FORMATION).		31.70	173.20		
				Grey SANDSTONE. (SOUTH WALES LOWER COAL MEASURES FORMATION).		35.00	169.90		
				Borehole Complete.					
				Backfilled with arisings and cement mix.					

REMARKS:	T = total core recovery	FIG NO.
	S = solid core recovery	
	R = rock quality designation	

6.0

DRILLING AND GROUTING QUOTATIONS

GIS Ltd

From: [REDACTED]
Sent: 31 January 2023 12:30
To: GIS Ltd
Cc: [REDACTED]
Subject: FW: Merthyr Tydfil
Attachments: Budget Quotation - Cythara Road.pdf

Good afternoon, Howard

Further to the previous SI we attach a schedule of rates to the cover the quantities detailed in your email.

In addition, I list the following concerns/qualifications as follows:

1. All licences, setting out of corner pegs, services provided to Apex F.O.C.
2. Apex will require an adequate water supply onsite, established prior to mobilising.
3. The site has a significant drift thickness of up to 18.5mts, which will to be Cased off both initially in steel and then plastic duct.
4. All drilling to be completed using air mist as the flushing medium.
5. The site is subject to vandalism therefore a security charge is included within rates.
6. No allowance made for the removal of surplus material upon completion together with fencing of the site and any wheel wash/road sweeping required.

Finally, all certification design of foundation to be carried by others.

We trust you find our quotation of interest and await your further instruction.

Best regards

Matthew Prior



Sturmi Way, Village Farm Industrial Estate, Pyle, Bridgend – CF33 6BZ

[REDACTED]
www.apexdrilling.co.uk

07000 300 454
[REDACTED]

From: [REDACTED]
Sent: 30 January 2023 10:06
To: [REDACTED]
Subject: FW: Merthyr Tydfil

Hi Thomas,

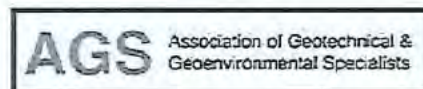
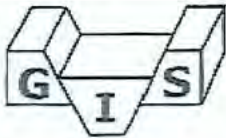
Sorry about this, is there any chance we could have a quote today as we're being chased for it by the Client?

Kind regards,

Tom McLaren
Senior Ground Engineer

Ground Investigation Specialists Ltd

First Floor
Lowcroft House
Church Road
Wombourne
WV5 9EZ



From: GIS Ltd
Sent: 26 January 2023 12:53
To: T [REDACTED] >
Subject: RE: Merthyr Tydfil

Hi Tom,

Further to our discussion and the drilling works you did for us at Cyfarthfa Retail Park in Merthyr Tydfil, please could you provide a budget cost for drilling and grouting 16 no. boreholes to a depth of c.23m. The void we found was 1.2m thick from 19.7 to 20.9m, and was found in one of the 5 boreholes. So allowing 20% we anticipate a grout take in the order of c.60m³.

If you require any further information please let us know.

Kind regards,

Tom McLaren
Senior Ground Engineer

Ground Investigation Specialists Ltd

First Floor
Lowcroft House
Church Road
Wombourne
WV5 9EZ





Budget Quotation

Client: G.I.S Ltd
Site: Cyfartha Retail Park
Deployment: Klemm 802 c/w Compressor and 2 Man Crew
Description: Drilling and Grouting
Duration Estimated 2.5/3 Weeks

Mobilise rig

Set up

Steel Case Superficials

Install Temp Plastic Casing

Openhole below Casing (Air mist)

Mobilise Grout Plant

Supply OPC

Supply PFA

Supply Chippings

Supply 360 c/w Operator

Mix & Inject @ 10:1

Adequate Water supply/Reinstatement

Security(Duration)

GIS Ltd

From:
Sent:
To:
Cc:
Subject:



Hello Tom,

Apologies, barely been at my desk since we spoke the other day.

I've had a look at this for you and based upon the 16 holes to ca. 23m depth and allowing perhaps 66t of 10:1 PFA/OPC grout would suggest a budget allowance of [REDACTED]

We envisage perhaps 1 week work, but the amount of equipment that needs to be mobilised on and off to handle grouting of around 60m3, together with drilling rig becomes a significant part of the cost.

I have a scribbled page of rates here that I have worked up to get to this figure.

We've assumed that you would be obtaining the CA permit and that a Main Contractor would have fenced off the site working area.

I have included for welfare and security which accounts for some [REDACTED] of the cost which could be saved if already in place by others.

Hope this assists.

Kind regards

Stephen Rule
Managing Director

M & J Drilling Services Ltd
Unit 44
Coneygree Industrial Estate
Tipton
West Midlands
DY4 8XP



Whilst M & J Drilling Services Ltd has taken reasonable steps to try to identify any software viruses contained in this email, it could potentially contain viruses which our antivirus software has failed to identify. In order to be completely satisfied that this email and any attachments are virus free you should carry out your own antivirus checks before opening any attachment. M & J Drilling Services Ltd will not accept any liability for damage caused by computer viruses emanating from this email.

From: GIS Ltd <mail@gisltd.uk>

Sent: 26 January 2023 13:07

To: [REDACTED]

Subject: FW: Merthyr Tydfil

Hi Steve,

Further to our discussion, the site address is Cyfarthfa Retail Park in Merthyr Tydfil
(<https://goo.gl/maps/G4QgXK1Ur6Gu62ed6>).

Please could you provide a budget cost for drilling and grouting 16 no. boreholes to a depth of c.23m. The void we found was 1.2m thick from 19.7 to 20.9m, and was found in one of the 5 boreholes. So allowing 20% we anticipate a grout take in the order of c.60m³.

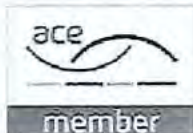
If you require any further information please let us know.

Kind regards,

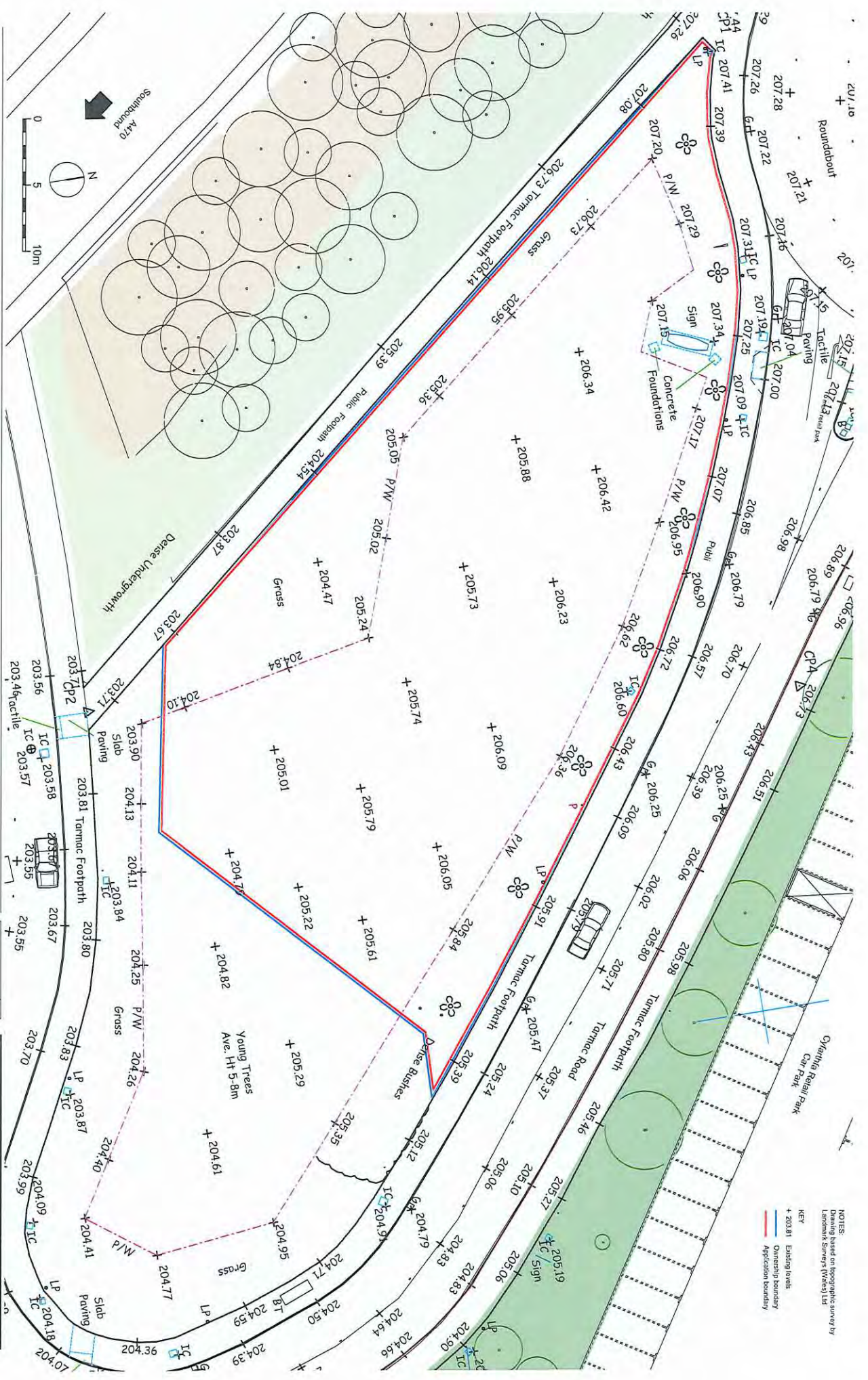
Tom McLaren
Senior Ground Engineer

Ground Investigation Specialists Ltd

First Floor
Lowcroft House
Church Road
Wombourne
WV5 9EZ



7.0 SITE PLANS



NOTES:
Drawing based on topographic survey by
Landmark Surveys (Wales) Ltd

KEY
+ 203.81 Existing levels
--- Ownership boundary
--- Application boundary

Figured dimensions and levels to be used.
Any necessary must be referred to the
Design drawings and large scale drawings
take precedence over smaller drawings.

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PRELIMINARY	DESIGN	TENDER	CONSTRUCTION
✓			

powelldobson
ARCHITECTS

Contract: Drive-thru Unit
Cynethia Retail Park, Merthyr Tydfil
Title: Existing Site Plan

Drawing No.: 19128 (05) 192
Rev.: -

Scale: 1:250 @ A3
Date: 04.10.18
Drawn: JH
Checked: CB