Site Investigations
Geologists
Environmental &
Geotechnical

Engineers



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FAO Mr Dickon Howell 23 Hauxley Links Low Hauxley Northumberland NE65 0JW

13th September 2023

COAL MINING INVESTIGATION

CARR STONE VILLA, LOW HAUXLEY S230715

Dear Mr Howell

INTRODUCTION

Solmek Ltd. were instructed by Green Roof Structures on behalf of Mr Howell to undertake a Coal Mining Investigation on an area of land within Carr Stone Villa, Low Hauxley, Northumberland. It is understood that the proposals are to redevelop the property. A site location map (Figure 1) is included within Appendix A.

A previous desk-based mining risk assessment was carried out by Intersoil Limited as referenced below:

Intersoil Limited Coal Mining Risk Assessment Report (Ref 23025Carr, 6th March 2023).

Details of the geology and mining history are included within this report.

In summary, the report determined that the site was underlain by a shallow coal mining risk and therefore, it recommended that rotary boreholes were drilled on site to identify the presence or otherwise of shallow workings below the plot to fully determine the risk.

The fieldwork and testing was generally carried out according to:

BS 5930:2015+A1:2020 Code of Practice for Ground Investigations Rock and soil descriptions shall be in accordance with BS EN ISO 14689-1:2003, BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004

CIRIA C758D Abandoned Mine Workings Manual

The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

SITE DESCRIPTION & FIELDWORK

The site lies at approximate NGR 428553, 602838 within the village of Low Hauxley, Northumberland, NE65 0JS. The property is named Carr Stone Villa and lies on the western side of the main road through Low Hauxley.



Page 1 of 3



At the time of the investigation the rear of the property comprised turf and the front areas were paved.

The fieldwork was undertaken on 18th August 2023. The scope of works included:

- 3no. openhole rotary boreholes (BH01 to BH03 inclusive) drilled to a depth of 30.00mbgl.
 - Undertaken to investigate areas of weak/broken rock associated with potential ancient unrecorded coal workings at shallow depth (i.e. <30m depth).

The boreholes were backfilled with bentonite/grout upon completion.

Descriptions of the strata encountered in the boreholes with details of groundwater are presented in Appendix B (enclosed). A plan showing the location of the boreholes is also enclosed (Figure 2, Appendix A).

GROUND CONDITIONS

Made ground ranged in depth from 0.40mbgl in BH03 to 0.50mbgl in BH01 and BH02. Within BH01 topsoil covered the area which was underlain by further made ground to 0.50mbgl. The made ground comprised house bricks within BH02 to 0.50mbgl and the lithology of the made ground in BH03 was not logged by the driller.

The underlying natural deposits comprised slightly clayey to clayey gravelly sand within BH01 and BH03 to depths of 4.50mbgl and 4.70mbgl respectively. The gravel component comprised sandstone. In BH02 a 0.40m thick layer of sandy clay overlay dense sand to 4.50mbgl. Underlying the granular stratum boulder clay was proven to depths of between 6.80mbgl (BH01) and 7.20mbgl (BH03).

The three rotary boreholes proved light grey to dark grey mudstone from depths of between 6.80mbgl in BH01 and 7.20mbgl in BH03 to a depth of 12.00mbgl within all three boreholes. An intact coal seam was encountered at this depth which was present to depths between 13.00 (BH02) and 13.40mbgl (BH01). The coal seam within BH01 was split with a further recording of intact coal between 14.00mbgl and 14.50mbgl. The driller recorded further traces of coal within BH02 at 15.00mbgl and at 14.30mbgl in BH03. Mudstone with sandstone bands was then recorded to the termination depth of the boreholes (30.00mbgl). No voids or loss of flush were recorded.

Groundwater was encountered at depths of between 10.00mbgl (BH02 and BH03) and 10.20mbgl (BH01). It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities. Therefore, water levels significantly higher than those found during this investigation may be encountered.

GEOTECHNICAL TESTING RESULTS

Samples taken from the boreholes underwent a series of geotechnical tests (BS 1377:1990) to aid foundation design and soil description. The geotechnical results are presented in Appendix C.

One sample recovered from BH02 has been subject to a moisture content test at 0.80mbgl. The moisture level was 26%.

Three samples from the boreholes were subject to Particle Size Distribution (PSD) tests in accordance with BS1377 Part 2 to aid soil descriptions. The results have been used to prepare precise soil descriptions in accordance with BS5930:2015 Section 6.

Three samples from the boreholes were tested for acidity and soluble sulphate content to assess whether the natural material may be potentially aggressive to building fabric. The results of the testing for pH ranged from 7.6 to 9.0 indicating alkaline conditions. Soluble sulphates were recorded at levels ranging from 81mg/l to 750mg/l.

CONCLUSIONS

According to the Coal Mining Risk Assessment Report prepared by Intersoil Limited, the site is within a designated Coal Mining Reporting Area as defined by the Coal Authority; and appears to be within or very close to a Coal Mining "Development High Risk Area".





The general guidance and good practice for assessing if a seam is within influencing distance to the surface is if rock cover (not including made ground and drift) is greater than 10x the worked thickness of the coal seam, then generally no void migration will reach the interface of the rock and drift deposits/made ground and thus no instability via a crown hole tyre collapse will occur.

The Coal Mining Risk Assessment states, the shallowest known worked coal seam is the High Main which outcrops 23m south of the site. Assuming a drift thickness of 8.00m, the seam may be expected 11.00m below ground level. It is described as 'workable'. Intersoil Limited consider there to be a potential for shallow underground workings below the site.

Given this, three open rotary boreholes were drilled to 30.00mbgl as part of this site investigation for the new development.

Subsequently the three rotary boreholes proved mudstone from depths of between 6.80mbgl and 7.20mbgl to a depth of 12.00mbgl. Intact coal was encountered from this depth to 13.00mbgl (BH02), 13.20mbgl (BH03) and 13.40mbgl (BH01). The coal seam within BH01 was split with a further recording of intact coal between 14.00mbgl and 14.50mbgl. The driller recorded further traces of coal within BH02 at 15.00mbgl and at 14.30mbgl in BH03. Mudstone with sandstone bands was then recorded below this to 30.00mbgl. The cross section (Figure 3) in Appendix A shows the solid geology in profile.

No voids or loss of flush were recorded during drilling, suggesting no evidence of workings beneath the site.

Given these findings there is a low risk of mining instability that would affect the proposed development.

As such based on the information within the three boreholes drilled at the site; foundations can safely be placed onto the natural competent strata without further remedial measures.

Yours sincerely.

Deryck Simpson.

On behalf of Solmek Ltd.







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APPENDIX A



🔶 SOLMEK
12-16 Yarm Road, Stockton on Tees, TS18 3NA Tel: 01642 607083 Email: info@solmek.com
Figure Title
Site Location Plan
Project Number
S230715
Project Name
Carr Stone Villa, Low Hauxley
Client
Dickon Howell
Date
September 2023
DRG Number
Figure 1
Scale
1:25000 @ A4 [DO NOT SCALE]
Legend Key Project Bounds - Project Bounds



SOLMEK 12-16 Yarm Road, Stockton on Tees, TS18 3NA Tel: 01642 607083 Email: info@solmek.com Figure Title **BH** Location Plan Project Number S230715 Project Name Carr Stone Villa, Low Hauxley Client Dickon Howell Date September 2023 DRG Number Figure 2 Scale @ A4 [DO NOT SCALE] 1:500 Legend Key Locations By Type - RO Project Bounds - Project Bounds

Figure Title	Cross Section Plan Da		Date	September 2023		
Project Number	S230715		DRG Number	Figure 3		SOLMEK
Project Name	Carr Stone Villa, Low H	Hauxley	Horizontal Scale	1:198		12-16 Yarm Road, Stockton on Tees, TS18 3NA
Client	Dickon Howell		Vertical Scale	1:267		Tel: 01642 607083 Email: info@solmek.com
	1					· · · · · · · · · · · · · · · · · · ·
	-1					
	-5 - · · · · · · · · · · · · · · · · · ·					
Legend Key	-10					
	.14 .15 .16 .17					
	-18		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		18 19 00 20 21
	-22					
-31.00	-26			· · · · · · · · · · · · · · · · · · ·		26 27 28 28 29
Chainage (n	-30	4 00				
Offset (m)		0. 17.0		0.24 17. 19.		388 33
Elevation (m	nAOD)					

APPENDIX B













APPENDIX C

Laboratory Report Fr	G2M Testing (Stockton) 12-16 Yarm Road, Stockton on Tees,		
Site name	TS18 3NA		
Carr Stone Villa, Low Hauxley	S230715	01642 033318 info@g2mtesting.co.uk	10258

Client details:

Reference:	S230715
Name:	Solmek
Address:	12 Yarm Road,
	Stockton-on-tees,
	TS18 3NA
Telephone:	01642 607083
Email	acutts@solmek.com
Lillall.	acatalesennemeen
FAO	Adrain Cutts
1110.	
Samples received:	
Date commenced:	30/08/2023
	_ 0/ 00/ 2020
Date reported:	08/09/2023

Observations and interpretations are outside of the UKAS Accreditiation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:		
		D.Anderson (Managing Director)	
	~	J. Brischuk (Laboratory Manager)	

Summary of Classification Tests								12-16 Yai Stockton	rm Road, on Tees,						
Site name					Jo	Job number						TS18 3NA			
	Carr Stone Vi	lla, Low Haux	ley			S230715					0715 jpfo@a2mtestina.co.uk				
												0	0		
Hole	De Top m	epth Base m	Туре	w %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Prep	paration method
BH02	0.80		В	26	105										
						+									
						-									
	ļ														

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Кеу	Description		Category	BS Test Code
W	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content pas sieve	ssing 425µm		BS 1377:1990 Part 2 Clause 3.2
W	Liquid limit	Single point	-S	BS 1377:1990 Part 2 Clause 4.4
VV L		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wΡ	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Ра	Percentage passing 425um sieve	Э		
Pr	Percentage retained 425um siev	/e		
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
ΙL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"			

Approved by	D Anderson
Approval date	07/09/2023 09:56
Date report generated	
Report Number	

G2M Testing (Stockton)

ch



Siev	ving	Sedimentation				
Particle Size mm	% Passing	Particle Size mm	% Passing			
125	100					
90	100					
75	100					
63	100					
50	100					
37.5	100					
28	100					
20	99					
14	99					
10	99					
6.3	97					
5	96					
3.35	95					
2	93					
1.18	92					
0.6	91					
0.425	90					
0.3	82					
0.212	56]				
0.15	22]				
0.063	9					

980

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	6.7
Sand	84.3
Fines <0.063mm	9.0

Grading Analysis		
D100	mm	
D60	mm	0.224
D30	mm	0.163
D10	mm	0.0674
Uniformity Coefficient		3.3
Curvature Coefficient		1.8

Remarks

Preparation and testing in accordance with test method unless noted below

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	05/09/2023 14:02



Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98		
0.425	97		
0.3	94		
0.212	83		
0.15	68		
0.063	63		

-		~			
Dry	Mass	ot	samp	le,	q

1131

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.9
Sand	36.1
Fines <0.063mm	63.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with test method unless noted below

Accreditation st	tatus
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Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	07/09/2023 10:05



Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	90		
20	89		
14	87		
10	86		
6.3	84		
5	83		
3.35	81		
2	80		
1.18	79		
0.6	76		
0.425	74	1	
0.3	67		
0.212	43		
0.15	14	1	
0.063	4]	

nple Proportions	% d
v coarse	

Dry Mass of sample, g

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	20.2
Sand	75.7
Fines <0.063mm	4.0

2075

Grading Analysis		
D100	mm	
D60	mm	0.272
D30	mm	0.181
D10	mm	0.106
Uniformity Coefficient		2.6
Curvature Coefficient		1.1

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	07/09/2023 10:09



Issued: 06-Sep-23

Certificate Number 23-20726

Client SOLMEK 12 Yarm Road Stockton On Tees Cleveland TS18 3NA

- Our Reference 23-20726
- Client Reference S230715
 - Order No LAB1969
 - Contract Title CAR STONE VILLA
 - Description 3 Soil samples.
 - Date Received 31-Aug-23
 - Date Started 31-Aug-23
- Date Completed 06-Sep-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





Summary of Chemical Analysis Soil Samples

Our Ref 23-20726 Client Ref S230715 Contract Title CAR STONE VILLA

			Lab No	2226252	2226253	2226254
		.S	ample ID	BH01	BH02	BH03
			Depth	0.50	0.80	1.00
			Other ID			
		Sam	ріе Туре	D	D	D
		Samp	ling Date	30/08/2023	<u>30/08/2023</u>	<u>30/08/2023</u>
		Sampl	ling Time	n/s	n/s	n/s
Test	Method	LOD	Units			
Inorganics						
рН	DETSC 2008#		рН	9.0	7.6	7.7
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	81	750	300



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Information in Support of the Analytical Results

Our Ref 23-20726 Client Ref S230715 Contract CAR STONE VILLA

Containers Received & Deviating Samples

				Holding time	inappropriate
		Date		exceeded for	container for
Lab No	Sample ID	Sampled	Containers Received	tests	tests
2226252	BH01 0.50 SOIL	30/08/23	PT 1L		
2226253	BH02 0.80 SOIL	30/08/23	PT 1L		
2226254	BH03 1.00 SOIL	30/08/23	PT 1L		
Kev 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.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377. Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis. The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX D

◆Solmek conditions of offer, notes on limitations & basis for contract (ref: version1/2023)

These conditions accompany our tender and supercede any previous conditions issued. Solmek will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, ground gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Solmek cannot be held liable for any unrecorded or unforeseen obstructions between exploratory boreholes and trial pits. This includes instances where previous structures on the site (buried man made structures) or the presence of boulder clay (cobbles and/or boulder obstructions) have been anticipated. All types of piling operations should make allowance for obstructions within the construction budget to accommodate this. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2011 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. The presence or otherwise of Japanese Knotweed or other invasive plants can be difficult to identify especially during winter months. If Japanese Knotweed or other invasive species are suspect, it should be confirmed by an ecologist. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek you understand and accept that you/your agent have a contractual relationship with Solmek & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Solmek are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete, and Solmek has not allowed for this. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming Solmek agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. Solmek are exempt from the CIS Scheme. Solmek offer to undertake work <u>only</u> in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek's activities or omission of the same are excluded.

