Environmental
Geotechnical
Specialists

REPORT

job number J3501/16/EDS	site address 18 Stringer House Lane, Emley, Huddersfield, HD8 9SU
date 19.05.16	
written by R.A. Palmer	
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Constructionline
QMS ISO 9001 REGISTERED
QMS ISO 14001 REGISTERED
QMS OHSAS 18001 REGISTERED

GEOTECHNICAL
ENVIRONMENTAL

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A REPORT ON A COAL MINING RISK ASSESSMENT

at

18 STRINGER HOUSE LANE, EMLEY, HUDDERSFIELD HD8 9SU

for

ALLYSON MAKIN

Report No J3501/16/EDS **May 2016**

1. INTRODUCTION

It is understood that the site is to be developed by the renovation and extension of an existing barn; the general arrangement of which is shown on the attached plan in Appendix 1. As part of the planning application for development at the site, a Coal Mining Risk Assessment has been requested by the planning authority. Consequently, a desktop study was commissioned in order to assess the risk to the development from coal mining. This report presents the findings of the study.

2. GEOLOGICAL DESK STUDY

The geological desk study has been undertaken using the following sources of information.

- British Geological Survey map sheet[1].
- British Geological Survey *Geology of Britain Viewer*[2].
- Coal Authority Report[3].
- British Geological Survey *Borehole Records*[4].

2.1 British Geological Survey Maps and Viewer

The appropriate map sheet for the site and the geology viewer has been examined and the following table presents the indicated geology:

[1] Sources: British Geological Survey (NERC) Map Sheet 77; Huddersfield; Solid and Drift Edition
[2] Sources: British Geological Survey (NERC) Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]
[3] Coal Authority Reference: 51001163628001 Dated 16th May 2016
[4] Sources: British Geological Survey (NERC) Borehole Records [*online resource from* http://www.bgs.ac.uk//]

Table 1: ***Geological Data for the Site***

Strata Type	Strata Name	Previous Name[5]	Description[5]
Superficial Geology	None Present		
Solid Geology	Emley Rock	n/a	Fine-grained flaggy sandstone with mudstone partings.

Topographically, the site is situated on a slope dipping gently to the east.

Geologically, the site is located on the Emley Rock, a named sandstone member of the Pennine Lower Coal Measures Formation. Furthermore, the Flockton Thick Coal seam is known to outcrop approximately 150m to the west of the site. Dip indicators on the geological map suggest that the solid geology underlying the local area dips approximately 3° degrees to the north-east, thus it is anticipated that the Flockton Thick Coal seam may be observed below the site surface.

The Flockton Thick Coal seam then outcrops again approximately 620m to the east of the site. This seam runs parallel with the boundary of a deposit of infilled ground, which is assumed to be associated with historic opencast coal workings. In view of this, it can be considered that this seam has a thickness which could make the extraction of this seam economically viable. Therefore, the seam may have also been worked at depth.

It may be further appreciated that the north-west trending Lepton fault of unknown displacement is recorded as being present 550m to the west of the site.

There is one notable coal seam within the vicinity of the site as summarised below:

Table 2: ***Summary of coal seams within the vicinity of the site.***

Seam Name	Seam thickness[5]*	Outcrop distance from site*[5]
Flockton Thick Coal (FK)	0.3m to 1.5m	150m W
Seams outcropping beyond 1km from the site and to the west of the Lepton Fault		
Third Brown Metal (3BM)	0.0m to 0.8m	1450m W
Middleton Little (ML) or Green Lane	0.2m to 0.9m	1650m W
Middleton Main (MM) or New Hards	0.2m to 1.8m	1850m W
Wheatley Lime (WL)	0.4m to 1.2m	1970m W
Middleton Eleven Yards (MY)	0.0m to 1.1m	2080m W
Blocking Coal (BK)	0.2m to 1.7m	2310m W

[5] Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]

Linfit Lousy Coal (LFT)	0.0m to 1.3m	2680m W	
Shertcliffe Coal (SH)	0.0m to 0.8m	2730m W	215m
Whinmoor Coal	0.0m to 0.9m	2870m W	225m

*All distances are given as approximations only. It should be noted that coal seam thicknesses vary over relatively short distances

The geological data suggests that the Flockton Thick Coal seam will be observed at shallow depths within the top 10m of the site surface. This coal seam is continuous in nature and has an estimated maximum thickness of 1.5m.

It should be appreciated that a number of coal seams outcrop to the west of the site. However, these seams outcrop on the opposite (western) side of the Lepton Fault and within another faulted block, therefore, it is difficult to gauge at what depths these seams will be present.

Due to the generalised dip of the local strata, and taking into account the topography of the area, it is anticipated that the Flockton Thick Coal seam will underlie the site at approximately 8m depth below ground level.

The generalised vertical section (GVS) suggests that the Flockton Thick Coal seam is underlain by the Flockton Thin Coal seam, however, this coal seam does not outcrop to the west of the site, possibly due to displacement caused by the Lepton Fault. Nevertheless, if this coal seam is present beneath the site, the GVS suggests that this coal seam could be present approximately 10m below the Flockton Thick Coal seam, therefore, it is considered that this seam could be observed at depths of around 20m. The published data states that this coal seam can have a thickness of up to 1.4m.

Furthermore, the GVS indicates that the seams that outcrop to the west of the Lepton Fault may be present at depths between 60m and 225m beneath the site.

2.2 Coal Authority Mines Report

As part of this study a Non-residential Coal Authority Mining Report has been obtained. The report is presented as Appendix 2 and for the purposes of discussion has been summarised below:

2.2.1 Underground Coal Mining

Past

The property is in a surface area that could be affected by underground mining in 5 seams of coal at 100m to 210m depth, and last worked in 1985. Any movement in the ground due to coal mining activity should have stopped.
In addition the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered prior to any site works or future development activity

Present
The property is not within a surface area that could be affected by present underground mining.

Future
The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods. The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods. The property is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future.
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

2.2.2 Mine Entries
There are no known coal mine entries within, or within 20 metres of, the boundary of the property. Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

2.2.3 Coal Mining Geology
The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

2.2.4 Opencast Coal Mining

Past
The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present
The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

Future
There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary. The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

2.2.5 Coal Mining Subsidence
The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31st October 1994. There is no current Stop Notice delaying the start of remedial works or repairs to the property. The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

2.2.6 Mine Gas
The Coal Authority has no record of a mine gas emission requiring action.

2.2.7 Hazards Related to Coal Mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

2.2.8 Withdrawal of Support

The property is not in an area where a notice to withdraw support has been given. The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

2.3 Geological Survey Borehole Records

The British Geological Survey (NERC) keeps borehole records from across Britain which are available for public viewing through their website[6]. As part of this study, the records in the area around the site have been reviewed in order to assist in establishing the geological conditions.

Based upon records provided by the British Geological Survey (NERC) the following table has been produced as a summary for the most applicable features of note in relation to this study. The logs of the boreholes are presented as Appendix 3:

Table 3: *Notable Geological Features*

Borehole	Approx. Distance from Site	Coal Seam		
		Name	Thickness	Depth
SE32SW19	360m NE	Middleton Little Wheatley Lime	0.9m n/a	37m 76m
SE21SW11	510m S	Wheatley Lime	0.82m	30.0m*
SE21SW41	530m NW	-	1.07m	200m

*It is not clear at what depth this borehole was started.

It should be appreciated that there was no borehole data available within 250m of the site boundary. Furthermore, there were other boreholes at a greater distance from the site; however, these were felt to be of a lesser value to this study as these boreholes were undertaken in mine shafts and it is not clear at what depths these boreholes were started.

Overall, the BGS borehole records suggest that the generalised profile for the local strata comprises the Pennine Lower Coal Measures; interbedded mudstones, siltstones, sandstones and coal seams were present in the above boreholes.

3. RISK ASSESSMENT

The risk to the stability of the proposed residential development has been evaluated from the data obtained and with reference to the following ratings and definitions:

[6] http://www.bgs.ac.uk/data/boreholescans/

Low - The possibility of instability is unlikely therefore no further action is necessary.

Moderate - The possibility of instability is likely and further investigation or remedial action may be required.

High - The possibility of instability is highly likely and further investigation or remedial action will be necessary.

Table 4: *Development specific risk assessment*

Item	Risk of Instability	Coal Seam(s) Considered	Risk Rating
1	Shallow coal workings	Flockton Thick Coal (FK)	Moderate
2		Flockton Thin Coal (FN)	Moderate
3	Coal workings at depth	Third Brown Metal (3BM) to Whinmoor Coal (W)	Low

On the basis of all of the information provided above it is concluded that there are shallow coal seams in the vicinity of the site. Whilst these seams may be of limited thicknesses, the possibility of these seams being worked below the site cannot be ruled out. Historic coal mining activity is evident in the nearby area, and therefore it is considered that if coal was known to be close to ground level it could have been removed illicitly via shallow mining methods with relative ease.

It may be noted that guidance available from both the NHBC and the CIRIA publication, SP32 - *construction over abandoned mine workings,* suggests that competent overburden thickness above a coal seam should be greater than 10 times the thickness of a seam plus seam thickness in order that the collapse of workings would pose a low risk to surface structures.

On this basis, assuming a maximum thickness of the Flockton Thick Coal seam to be 1.5m, 16.5m of competent overburden is required to prevent instability to future surface structures. As this seam is anticipated to be found within 10m of the site surface, it is considered that there will not be a sufficient thickness of competent overburden above this seam in order to prevent instability caused by the presence of any illicit voids.

In addition, it is anticipated that the Flockton Thin Coal seam could also be present beneath the site. It is suggested that this seam has a maximum thickness of 1.4m, therefore, 15.4m of competent overburden is required to prevent instability to future surface structures. If this seam has been worked a sufficient thickness of competent overburden may still overlie this coal seam if the seam is found to be present at depths beyond 15.4m and has a maximum thickness of 1.4m. However, it should be appreciated that this seam may be found at a shallower or deeper depth than estimated and may have a variable thickness.

In light of the above, a moderate risk rating has been assigned to these two seams, and further investigation is recommended to prove/disprove the presence of illicit mining activity.

In regard to deeper mining which could affect the site, the Coal Authority data suggests that the property is in an area that could be affected by underground mining in 5 seams of coal at 100m to 210m depth, and last worked in 1985. It is considered that any movement in the ground due to coal mining activity should have stopped. Furthermore, it is considered that there will be a sufficient thickness of competent overburden above these seams to prevent instability caused by the presence of any illicit voids.

In addition, the published geological data would suggest that there are other coal seams present beneath the site which are not known to have been worked. However, these seams may have been illicitly worked. Despite this, these seams are anticipated to be at depths beyond 30m so it is considered that there would be a sufficient thickness of competent overburden above these seams. Therefore, there is considered to be a low risk of instability at the site due to workings at depth.

4. CONCLUSIONS

In light of the potential risks of instability below the site from the working of shallow coal, it cannot be recommended that development takes place without further investigation to conclusively determine the presence of such workings. This work should include physical drilling methods to explore the ground conditions.

General practice is to undertake rotary openhole boreholes at three locations across the site to mitigate against the potential for drilling through pillars associated with pillar and stall workings. Furthermore, it is normal to investigate the ground to 30m below ground level; any workings below this depth are unlikely to result in significant instability. It may, therefore, be possible to undertake one borehole to 30m in the first instance with the remaining boreholes proving the depth and continuity of the coal seam. In any event, it is considered that approval should be sought with the Local Authority as to the efficacy of this approach.

It is of note that Rogers Geotechnical Services would be happy to assist in any further intrusive investigation that may be required.

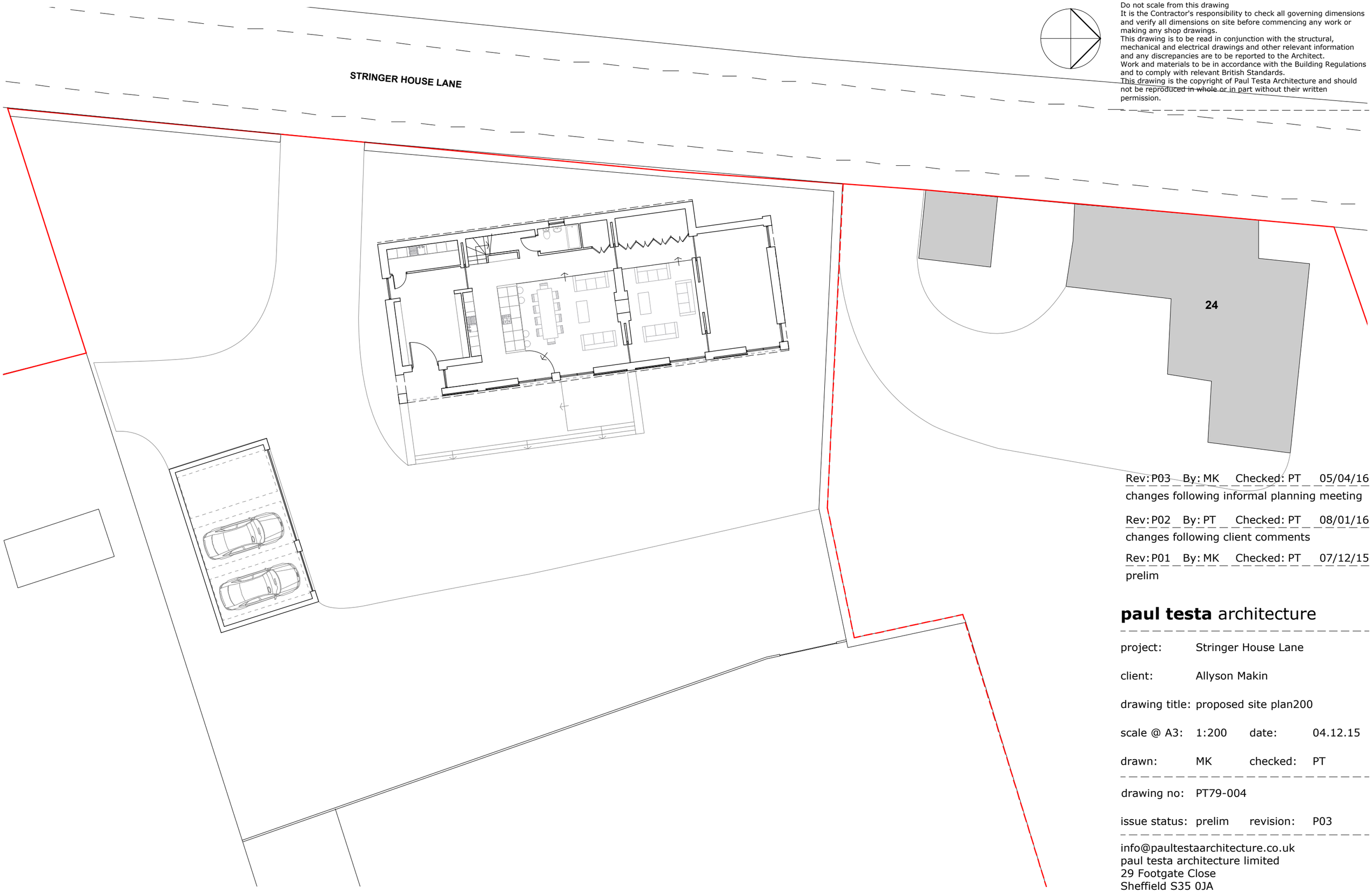
For and on behalf of
Rogers Geotechnical Services Ltd,

Robert Palmer, MSc, FGS.
Graduate Geotechnical Engineer

Steve Rogers, CGeol, MICE, MCIHT, FGS.
Technical Director

APPENDIX 1

SITE PLAN



1:200 site plan

Notes:
Do not scale from this drawing
It is the Contractor's responsibility to check all governing dimensions and verify all dimensions on site before commencing any work or making any shop drawings.
This drawing is to be read in conjunction with the structural, mechanical and electrical drawings and other relevant information and any discrepancies are to be reported to the Architect.
Work and materials to be in accordance with the Building Regulations and to comply with relevant British Standards.
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Rev: P03 By: MK Checked: PT 05/04/16
changes following informal planning meeting

Rev: P02 By: PT Checked: PT 08/01/16
changes following client comments

Rev: P01 By: MK Checked: PT 07/12/15
prelim

paul testa architecture

project: Stringer House Lane

client: Allyson Makin

drawing title: proposed site plan200

scale @ A3: 1:200 date: 04.12.15

drawn: MK checked: PT

drawing no: PT79-004

issue status: prelim revision: P03

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Stringer House Lane
Emley,
Huddersfield,
HD8 9SU
Google earth
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100 m

APPENDIX 2

COAL AUTHORITY MINING REPORT

The Coal Authority

Resolving the impacts of mining

CON29M Non-Residential Mining Report

18 STRINGER HOUSE LANE
EMLEY
HUDDERSFIELD
HD8 9SU

Date of enquiry:	16 May 2016
Date enquiry received:	16 May 2016
Issue date:	16 May 2016
Our reference:	51001163628001
Your reference:	J3501/16/EDS

CON29M Non-Residential Mining Report

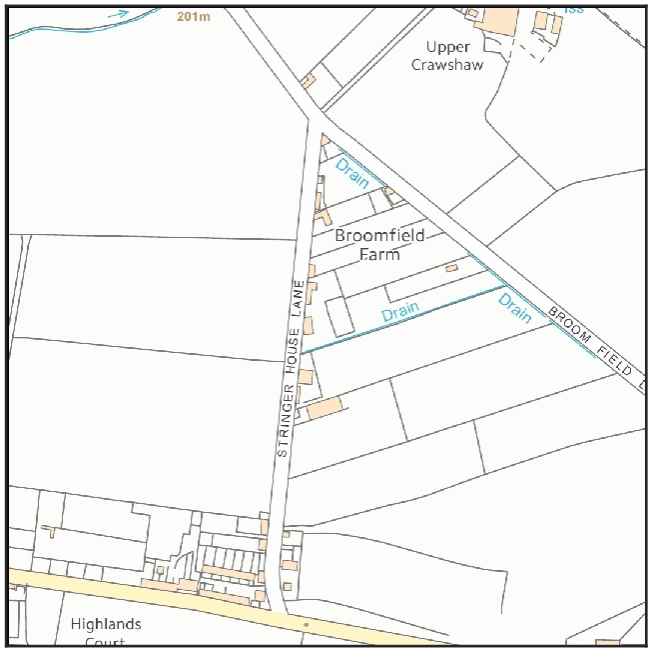
This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Client name

Rogers Geotechnical Services Ltd

Enquiry address

18 STRINGER HOUSE LANE, EMLEY,
HUDDERSFIELD, HD8 9SU



Approximate position of property

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.gov.uk/coalauthority

/company/the-coal-authority
/thecoalauthority
/coalauthority

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Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	Yes
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	Yes
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is in a surface area that could be affected by underground mining in 5 seams of coal at 100m to 210m depth, and last worked in 1985.

Any movement in the ground due to coal mining activity should have stopped.

In addition the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered prior to any site works or future development activity. Your attention is drawn to the Comments on the Coal Authority information section of the report.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10. Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

12. Withdrawal of support

The property is in an area where a notice to withdraw support was given in 1976.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13. Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

15. Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Comments on the Coal Authority information

The Coal Authority own the copyright in this report and the information used is protected by our database right.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

Disclaimer

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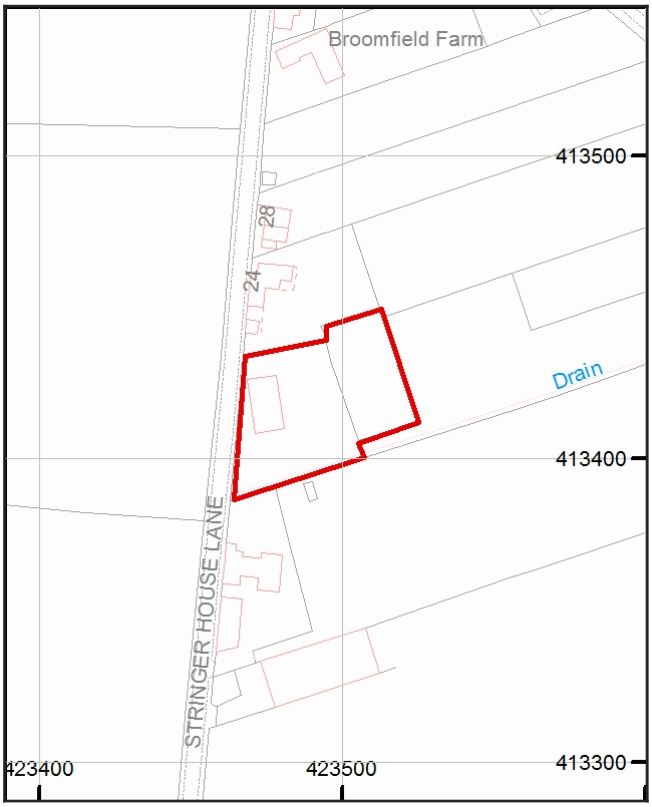
Alternative formats

If you would like this report in an alternative format, please contact our communications team.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



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NG18 4RG

www.gov.uk/coalauthority

/company/the-coal-authority
/thecoalauthority
/coalauthority

VAT receipt	
Issued by:	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date:	16 May 2016
Issued to:	ROGERS GEOTECHNICAL SERVICES LTD BARNCLIFFE MILLS NEAR BANK HUDDERSFIELD HD8 8LU
Property search for:	18 STRINGER HOUSE LANE EMLEY HUDDERSFIELD HD8 9SU
Reference number:	51001163628001
Date of issue:	16 May 2016
Cost:	£77.00
VAT @ 20%:	£15.40
Total received:	£92.40
VAT registration:	598 5850 68

APPENDIX 3

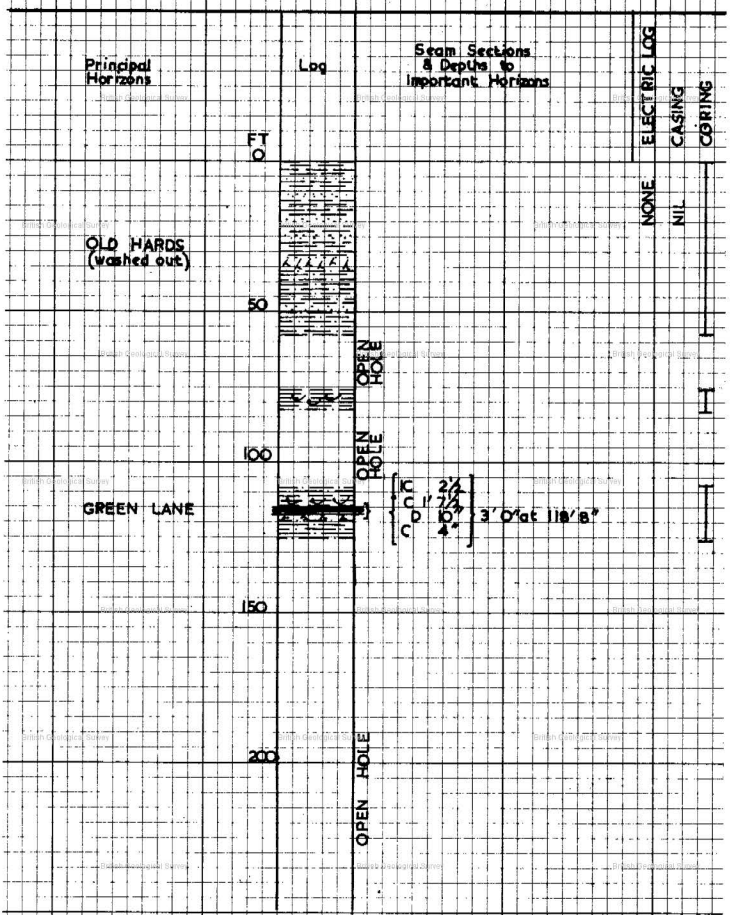
BGS BOREHOLE RECORDS

COMMERCIAL IN CONFIDENCE

31 MAY 1974

YORKSHIRE 261 NE
EMLEY MOOR COLLIERY
No 14 U.G.B.H.

SE 21 SW /19
Sept. Oct 1972
255' A.O.D.



Floor of WHEATLEY LIME SEAM 249' 6"

YORKSHIRE WATER AUTHORITY – Survey of Existing Boreholes

I.G.S. Ref. No SE..21.24/11. N.G.R. SE...2360..1295.....

Licence No.

OWNERS NAME .....

ADDRESS ..Fanny Main., Emley Moor. (and Stringers Shaft)
.....Emley.....

App No

Authorised Abstractio

g.p.h.
g.p.d.
m.g.a.

Depth	Thickns	STRATA DETAILS
19'4"	6'	Loose Ground
20'6"	2"	Bind
36'6"	10"	Rock
37'4"		Bind
91'		Rock
91'4"	4"	Bind + rock
92'9"	1'5"	COAL
95'4"	2'7"	Aord
		Wheatley Lime

Dia. .....

Depth ..95'4".....

Lining .....

Well sinker .....

Date .1893.....

R.W.L. .....

P.W.L. .....

British Geological Survey

Form P70

COMMERCIAL : IN CONFIDENCE

Section of Crawshaw Lane Borehole

Purpose - To prove the Whinmoor Seam

Exact Site - SE/23262/13922

Level at which bore commenced relative to O.D. 202.36m A.O.D

Date of sinking or boring - March, 1983

Sinker or borer - N.C.B. Barnsley Area

Cores other than coal examined by W. J. Smith

6 inch Map	
(County Sheet and Quarter)	261 NE
(Nat. Grid Sheet and Quarter)	SE21SW

Attach tracing from a map or sketch map if possible

SE 21 SW / 41

2326 1392.

Geological Classification	Nature of Strata	Thickness m	Thickness cm	Depth m	Depth cm
	Open hole - no cores	191	87	191	87
	Silty mudstone with plant straps and Ironstone bands	1	07	192	94
	Mudstone with Ironstone bands		45	193	39
	Banded sandstone and siltstone	1	22	194	61
	Siltstone massive		61	195	22
	Sandstone well cemented (cank)		66	195	88
	Banded sandstone and siltstone	1	75	197	63
	Siltstone with sandy streaks and ferruginous patches		79	198	42
	Silty mudstone with sandy streaks		81	199	23
	Mudstone, dark at base, Ironstone nodules		26	199	49
(	COAL 16)				
(	Mudstone listricated 2)				
(	COAL Inferior 7)	1	07	200	56
(	Mudstone with coal streaks 30)				
(	COAL 46)				
(	COAL canneloid inferior 6)				
	Mudstone canneloid		2	200	58
	Mudstone compact with roots		43	201	01
	Silty mudstone with occasional roots		31	201	32
	Siltstone		46	201	78
	Bottom of Borehole				

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