Abbeydale
Building Environment Consultants

RIGS REPORT

Knowles Quarry

Barnsley Road, Cudworth

Report: 151094RIGS

Date: March 2020

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RIGS REPORT
Knowles Quarry, Cudworth

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RIGS REPORT
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1. INTRODUCTION

On the instruction of Mr D & Mrs LJ Hewitt-Croft, and guidance of Architect of Peter Dimberline, a RIGS Report was carried out by Abbeydale Building Environment Consultants Ltd (Abbeydale BEC) on Knowles Quarry Ref B173, off Barnsley Road, Cudworth, South Yorkshire.

The site is situated on the South-west side of the village of Cudworth, centred on National Grid Reference 438250E 408695N, with a site area of around 0.2 ha. See Figure 1 below.



FIGURE 1 - LOCATION PLAN

This report was produced for our client, Mr D & Mrs LJ Hewitt-Croft, and their advisors and financiers and should not be relied upon or transferred to any other parties without the express written authorisation of Abbeydale BEC and our client. If any other unauthorised third party comes into possession of this report they rely on it at their own risk and the authors owe them no duty of care or skill.

The comments and recommendations present in this report are based on the findings of a review of available information; ground conditions encountered during walkover. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have therefore not been taken in to account by this report. Responsibility cannot be accepted for conditions not revealed by this investigation.

When writing this report the proposed development was for six semi detached houses at, or close to, existing highway levels. If there are changes to these proposals then some modification to the comments and recommendations given may be required. It is understood that the proposed dwellings will have designated private garden areas, as well as parking areas along the rear northern site boundary. The proposed site layout is shown on the site plan in Appendix A.

2. OBJECTIVES

This report has been undertaken to evaluate potential influences the proposed development will have on the a Regionally Important Geological Site (RIGS) located within the development area.

As part of this evaluation the potential impact upon the identified RIGS has been made, thus determining if there are any potential significant loss of function as a site of scientific interest. The report gives recommendations and options to mitigate any potential risks to the RIGS for future scientific work.

The report has not been used to evaluate the current site proposals (where known) with regard to geotechnical and engineering considerations to determine what impact the anticipated ground conditions will have on the integrity of any structures and associated construction or protection proposed as part of the development proposals.

3. THE SITE

As part of the RIGS planning assessment, a site walkover was undertaken on 11 March 2020, to determine the presence of any visually identifiable features that may pose a potential risk to the RIGS in future.

The site is a disused quarry of about 0.2ha on the north side of Barnsley Road at the south-western end of Cudworth. The current site layout is shown on Figure 2.

The earliest OS maps of 1854 show the quarry which by 1906 had been enlarged to its current form. The following OS map of 1931 records the quarry as disused and shows the terrace of houses within the eastern half of the quarry.

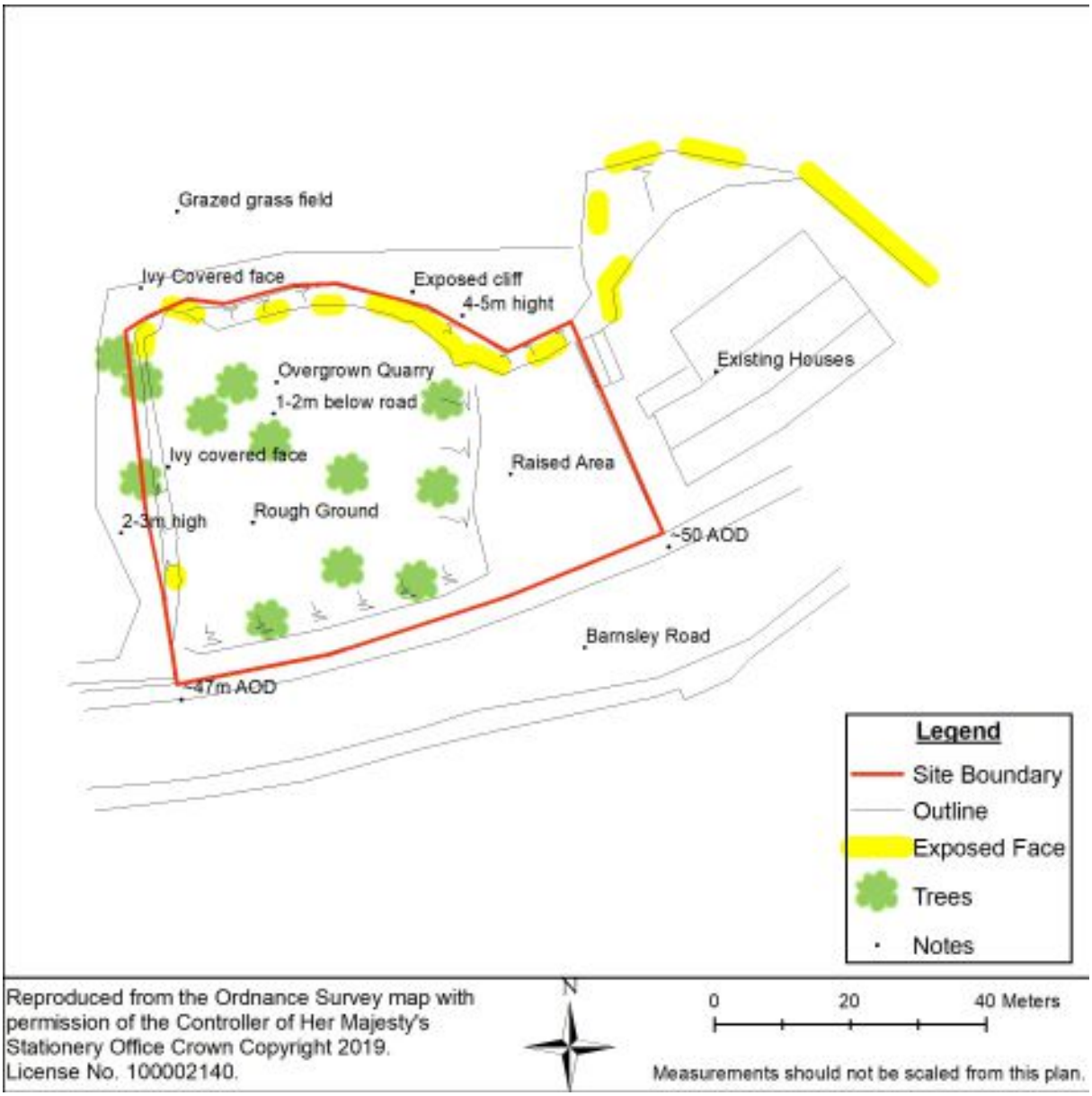


FIGURE 2 - SITE PLAN

Currently the surface of the quarry floor on which development is proposed is covered with rubble and the remains of past buildings poking through vegetation that cloaks the site. A temporary steel container was located on the eastern side of the site, next to the houses, on raised ground which was at or just above the level of Barnsley Road. The remaining area of proposed development is currently estimated to be 1-2m below the level of the highway, which reduces in level from about 50m AOD at the south-east corner to around 47m AOD at the south-west corner, along the southern site boundary.

Near vertical quarry faces form the northern and western boundaries of the proposed development. They range from 5m to 7m high along the northern face, reducing to road level along the western side. Whilst good exposures of the rock face are available across the eastern half of the north face, the remaining faces are heavily covered by ivy which was well established and seen growing from both the quarry floor and overhanging from the ground above. Semi mature trees were also seen on the quarry floor and on the ground above.

Whilst the region had experienced periods of prolonged heavy rain prior to our visit, no evidence of ponding or running water was seen in the floor or faces of the quarry.

4. GEOLOGY

The geological survey maps of the area, Sheet SE30NE and Yorkshire County Series Sheet 275NW have been examined along with the memoir of the area. The site is shown to be underlain by sandstone between the Sharlston Top Coal and Sharlston Low Coal dipping gently to the east. The exposed quarry sandstone is named in the Sheffield Area Geology Trust (SAGT) report as the Glasshoughton Rock (Bolsovian Westphalian C). The quarry exposure has particular scientific interest having sections in two directions through a cross bedded distributary channel unit.

A geological fault is conjectured approximately 50m to the south of the site, trending east - west and downthrowing strata 20m to the north. The fault is also recorded under the site in workings at depth.

No drift deposits are present over solid geology, with only residual soil overlying the bedrock sequence.

5. GEOCONSERVATION SIGNIFICANCE

This site is an important and well used Westphalian sand-body site, which is why it was originally selected as a RIGS. The RIGS site boundary of Knowles Quarry runs around the perimeter, covered by the site application, and also extends north-east to include the alley way next to the adjacent terraced houses. It is this north-east end which is currently most visited, as it is easily accessible and permission to visit is feely given by the householders in the terraced housing. See blue boundary line in SAGT 2019 report map, reproduced below as Figure 3.

The site contains a rare and scientifically important example of a sand unit deposited within the Carboniferous Pennine Coal Basin. The features can be viewed in two perpendicular directions which enables 3D reconstruction of its morphology and the measurement of paleo-current directions, thus enhancing the scientific and educational value of the site.

The site has been used by Leng et. al (1999); Hallsworth & Chisholm, (2000), in published work on the origin of Pennine sand bodies. In order to illustrate sand body

architecture in Southern North Sea reservoir rocks (Guion & Davies-Vollum 2013). It also features in the Yorkshire Geological Society's Field Guide Volume 4. (Jones &

Guion 2002). In addition, there is a scientific paper by Ian Chisholm on the geochemistry of zircon fragments in the sandstone from this specific site.

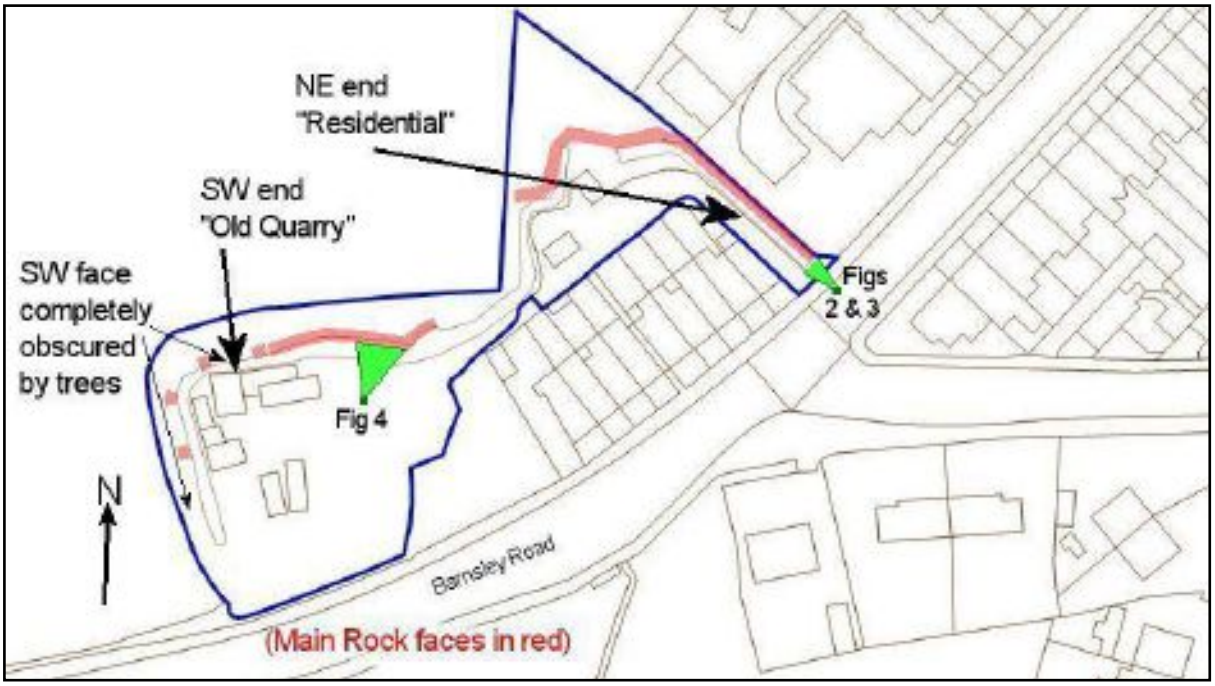


FIGURE 3 - SAGT FEBRUARY 2019 CONSULTATION SITE PLAN.

6. DEVELOPMENT PROPOSALS

6.1. General

Prior to the development proposals being submitted, consultation with interested parties was undertaken. To mitigate concerns raised by SAGT amendments were made to the original proposals as discussed below, with the final outline plan presented in Appendix A

6.2. Property Locations

To meet both planners and SAGT access requirements the properties have been aligned along Barnsley Road as are the existing terrace of houses to the east of the site. The properties ground floor levels are to be set at or slightly above existing road levels. When preparing this report 3 pairs of semi-detached houses, (Plots 1 & 2) to the west of the access and 4 semi-detached houses (Plots 3 & 4 and Plots 5 & 6) were being proposed.

The access road provide between Plots 2 & 3 gives access to communal parking to the rear, together with a back passage behind Plots 5 & 6. The proposal is to raise the parking area levels up to 1m above Barnsley Road at the point of access.

6.3. Rockface Access

The development as proposed provides general access to the rear of the proposed properties in a similar manner to that offered to the remainder of the exposure behind the terraced housing to the east. A concern made by SAGT was how to protect the car park area from falling stone without obscuring the exposure for future research. Whilst it was accepted that large parts of the face had been obscured by ivy growth, SAGT see this as an opportunity to have this western section better exposed by removing vegetation back to an earlier state.

They also expressed concern that by raising ground levels within the quarried area, exposure at the base of the quarry could be permanently lost. The developer has also to be mindful of the Health & Safety issues that will arise by providing increased access at the base of an exposed rock face that could potentially fail or spall stone.

We understand that SAGT would consider the use of protective netting used on many developments as a total loss of exposure and would require such areas cleared, logged and photographed by a SAGT nominated geologist before this was undertaken. If however the ivy vegetation was to remain and SAGT nominated access accepted, the use of the ivy as a more natural protection could be considered.

Following discussions we propose that the ivy over the rock face is trimmed back to remove the various layers of historic growth and dead wood. However, sufficient ivy is left to grow where directly secured to the rock, particularly where the rock is heavily fractured. In that way the face is protected from spoiling, avoiding the need for artificial netting protection.

To avoid covering the lower rock face and provide a rock trap we propose a gabion wall or equivalent, is constructed at least 1m back from the rock face and used to support the raised development earthworks. The ground directly next to the rock face would therefore remain at its existing levels.

6.4. Private Garden Area (Plot 1).

The front western section of quarry face is to be located within Plot 1. Following our discussions with both the developer it has been agreed that the gabion wall 1m back from the face arrangement proposed for the car park area is to be continued down the side of the garden. Arrangements with the property's deeds will be required to allow SAGT nominated access to this area, with a gate at the carpark boundary.

Whilst issues related to Health & Safety are not part of this reports brief, SAGT would accept the use of the ivy providing natural protection in treating the face in the same manner as the car park areas.

7. REGULATORY APPROVAL

The conclusions and recommendations in this report are based on a review of available information and observations made during the site walkover survey undertaken. The conclusions cannot be guaranteed to gain regulatory approval if this report is required as part of a planning application. If it is required as such it should be passed to the relevant regulatory bodies for their comment and approval.

8. CONCLUSIONS

Having made a number of modifications to allow SAGT better access to the face, the developer presents this RIGS report for planning approval. By placing the housing to the front of the site and providing the car parking requirements to the rear, general access has been made to the rock face at the rear for the lifetime of the properties being proposed. To avoid obscuring the bottom of the face a retaining structure is proposed 1m back from the face to allow the development areas to be raised to a level at or just above the level of Barnsley Road which reduces from ~50m to 47m AOD along the site's frontage. A low level fence will need to be placed on this wall to meet Health & Safety requirements. The wall will also be extended down the western side of the site to the front of Plot 1.

When developing the site the tree and ivy vegetation on the rock face will be cut back, but with sufficient ivy left where directly secured to the rock, particularly where the rock is heavily fractured. In that way the face is protected from spoiling, avoiding the need of artificial netting protection.

Legal arrangement will need to be made with SAGT to determine the level of access permitted.

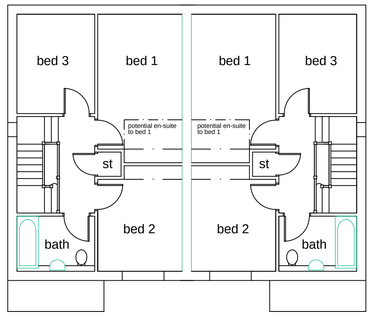
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APPENDIX A - PROPOSED LAYOUT

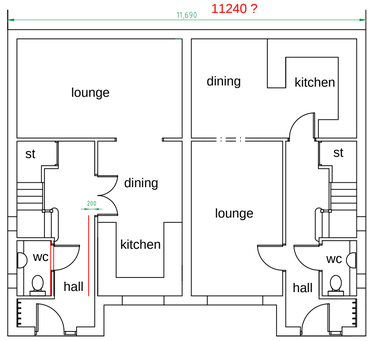
1) This drawing and the design and details depicted thereon are the copyright of Peter Dimberline Chartered Architect.
2) All dimensions on this drawing are to be checked by the Contractor and any discrepancies are to be reported to the Architect.
3) Do not scale critical dimensions off this drawing.
4) Contractor to ensure that all Health & Safety requirements (CDM Regulations) in relation to this project will be complied with.



proposed site layout 1:200



first floor



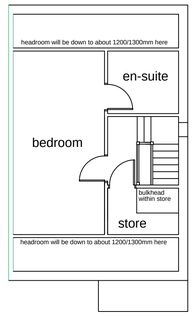
ground floor

first floor

ground floor

alternative 1 alternative 2

suggested dwelling layouts



potential roof void plan
suggestion only

REVISIONS

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PROJECT
Proposed residential development

LOCATION
Knowles Quarry, Barnsley Road, Cudworth, Barnsley

DRAWING
Proposed site plan

SCALES 1:200 and 1:100 DATE Mar' 20

DRWG No. 2018/15/01 DRAWN BY PD

REV.