Abbeydale
Building Environment Consultants

FLOOD RISK ASSESMENT REPORT

CROWTREE FARM
OAKAMOOR

Report 418040FREa June 2014

Client:
Laver Leisure
36 Bridge Business Centre
Beresford Way
Chesterfield
S41 9FG

Planning Consultant:
HOW Planning LLP
40 Peter Street
Manchester
M2 5GP

Abbeydale Building Environment Consultants, 4 Neville Street, Wakefield, WF1 5EF
Tel: 01924 376622 Fax: 01924 376661 VAT: 600 2099 91
Email: info@abbeydalebec.com Website: www.abbeydalebec.com

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1. INTRODUCTION

On behalf of Laver Leisure a flood risk assessment was carried out by Abbeydale Building Environment Consultants (ABEC) on a site off Eaves Lane, Oakamoor.

The site, Crow Tree Farm, is located between Moneystone Quarry to the west and Oakamoor Village on the lower south side of Eaves Lane and is centred within National Grid Reference square SK 049 459, at approximately 150m to 210m AOD. See Fig 1. The site covers an area of approximately 24 hectares.

Due to the size of the site and in accordance with the requirements of the National Planning Policy Framework (NPPF), a flood risk assessment has been prepared.

This report was produced on behalf of our client, Laver Leisure 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 Ltd and our client. If any 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.

2. THE SITE

The proposed development is to demolish the existing barn building at Crow Tree Farm and erect two new stable buildings on a similar footprint. There are proposals to change the use of the existing buildings into a reception, offices and a tack room and to create a formalised car parking and manoeuvring area. See Fig 2. The farm buildings are located at the north western corner of fields associated with the farm which slope down gently to the southwest. A further field to north east of the junction with Eaves Lane and Blakeley Lane is also included within the site boundary.

As shown on the 1:5,000 OS map, Fig 3, the site and surrounding ground gently falls to the southwest with no significant streams crossing the site. Drainage will be mainly through the permeable subsurface strata, flowing to a small stream located in an incised valley forming the lower southern boundary. The stream then flows through woodland entering the River Churnet about 400m southwest of the site boundary at about 105m AOD.

3. HISTORY

Examination of the historic Ordnance Survey maps of the area shows the farm buildings to gradually increased in size and number over the past 100 years, but the associated fields and woodlands have remained relatively unchanged. Similarly the land to the north and east of the farm has remained unchanged, however to the west, the land has been transformed over the past 50 years with the recently closed Moneystone Quarry.

4. GEOLOGY

The Geological Survey maps of the area, BGS Sheet 124 and SK04 NE and SK04NW along with memoir of the area have been examined. The farm and field areas are shown to be underlain by the Rough Rock Sandstone of the uppermost unit of the Upper Carboniferous Millstone Grit (Namurian) Series, which is overlain by Upper Carboniferous Coal Measures mudstones and siltstones. See Fig. 3.

The Rough Rock Sandstone is fine to medium grained and is composed largely of quartz grains. The sandstone is normally hard and well cemented. However, it does contain beds and lenses of uncemented and poorly cemented weak sandstone. Also present are thin beds or lenses of shale, along with beds of very hard white siliceous sandstone. The sandstone has an on site maximum thickness of 35m, with an average dip of 5 to 7 degrees and up to 12 degrees south - southwest.

The overlying Coal Measures, consisting mainly of mudstone, outcrop in the central western fields and therefore cap the sandstone, as the strata dips to the southwest.

No drift deposits are record, with residual soil estimated to be about 0.5m thick.

The Crowtrees Fault lies near to the eastern boundary of the site. The fault is trending north - south and has downthrown strata approximately 20m to the west, resulting in the sandstone being uneconomic in this area.

5. HYDROGEOLOGY

The Environment Agency (EA) website indicates the site to be located on a Secondary A aquifer (formerly minor aquifer). The aquifer material is largely impermeable, however, fractures, joints and bedding planes will allow the movement of groundwater. Although Secondary A aquifers do not produce large quantities of water, they are important for local supplies and in supplying base flows to rivers. See Appendix A.

To the south of the site and the River Churnet, approximately 600m from the southern boundary is a Principal aquifer (formerly major aquifer). Within the aquifer is a source protection zone borehole. However, its protection zones I, II and III are all to the south of the borehole and thus to the south of the site. Relevant EA maps are appended.

Surface Features

The soils on site can be divided into two soil types, generally to the north of Eaves Lane soils have a high leaching (H3) potential due to their coarse texture, whereas on the south side of Eaves Lane soils have a low leaching potential.

The nearest named surface water feature is approximately 400m to the south of the site called The River Churnet. In the area of the site, the River Churnet flows towards the east in a meandering channel, with a total catchment area of approximately 233km^2.

The stream that flows in the incised valley adjacent to the western boundary drains an area of about 0.3km^2, so only forming a very small part of the Churnet's catchment.

6. FLOOD RISK & HISTORIC FLOODING

The flood risk along the Churnet Valley is categorised as low due to its rural nature, with some high risk areas within the main towns, the nearest one being Leek (upstream of the site). The area is susceptible to high levels of surface runoff, due to its elevation and steep sided valleys creating 'flashy' conditions. This can result in the fast onset of flooding and deep fast flowing water in urban areas, particularly where bridges and development constrict the channel.

There have been two recorded flood events along the River Churnet, namely November 1959 and December 1964. The 1959 event did not extend as far downstream as the site, but covered an area between the sewage works up stream of Leekbrook to Consall Wood, which is about 6 km upstream of the site. The 1964 event covered a 22 km stretch of the river from a similar point as in 1959, extending to the village of Alton. In the locality of the site the flood waters reached no further than the pumping station, located on the northern bank of the river at about 109m AOD. See attached extract of Tile E3 from Staffordshire Moorlands District Council, Strategic Flood Risk Assessment for Local Development Framework Level 1 Volume 1 - FINAL January 2008 (Staffordshire Moorlands SFRA). Appendix B. In both cases very few properties were affected along the length of the river.

The site is up slope and outside the flood plain, within Zone 1. See extract from Tile B6 from Staffordshire Moorlands SFRA in Appendix B.

The risk of flooding from land above (to the north) of the site is minimal as the land remains in agriculture and is within 500m of the watershed.

There is no documented evidence of farm, fields or stream flooding.

7. FLOOD RISK VULNERABILITY

The current proposed buildings range from less vulnerable, such as barns and stables, to more vulnerable such as holiday-lets and farm house. As limited changes to the external areas are being proposed the level of risk will remain unchanged.

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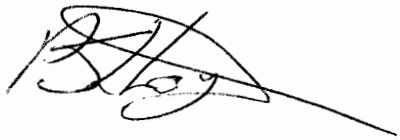
The site is located in flood Zone 1 (low probability) and therefore all land uses are appropriate. Therefore an exception test is not required.

The change of use application proposes a change to the existing built development, and the creation of new development. The site outline will remain as existing therefore there will be no residual flood related risk associated with the change of use.

8. CONCLUSIONS

The site is located outside the flood plain (Zone 1) with only the land in the Churnet valley, beyond the south boundary of the site, within Zones 2 and 3a. Consequently the type of development proposed is appropriate to the risk and no further assessment is required. The existing surface water drainage regime will be retained.

For and on behalf of Abbeydale BEC Ltd.



Peter J Lloyd BSc. MSc. C.Geol FGS.
Senior Geologist
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FIGURES