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Geotechnical Engineering | Geoenvironmental Consultants

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# PRELIMINARY GEOENVIRONMENTAL APPRAISAL

## of land at

## EATON HOUSE, LEEK

**Prepared on behalf of LNT Construction Limited**

**Report 6080/1**

**October 2018**

**FOREWORD (Preliminary Geoenvironmental Investigation Report)**

This report has been prepared for the sole use and reliance of LNT Construction Limited and cannot be relied upon by any other parties without the express written authorisation of Calabrian Limited (Calabrian). Any unauthorised third party relies on this report at their own risk and the authors owe them no duty of care.

The report presents observations and factual data obtained during our site investigation and provides an assessment of geoenvironmental issues with respect to information provided by the Client regarding the proposed development. Further advice should be sought from Calabrian prior to significant revision of the development proposals.

The report should be read in its entirety, including all associated drawings and appendices. Calabrian cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context

The findings and opinions conveyed in any Desk Study section of the report (including review of any third-party reports) are based on information obtained from the sources listed, which Calabrian understands are reliable. All reasonable skill, care and diligence has been applied in examining the information obtained. However, Calabrian accept no responsibility for inaccuracies in the data supplied or for opinions based on any such inaccurate data.

Where the report refers to the potential presence of invasive weeds such as Japanese Knotweed, or the presence of asbestos containing materials, it should be noted that the observations are for information only and should be verified by a suitably qualified expert.

Calabrian reserve the right to amend their conclusions and recommendations in the light of further information that may become available.

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# 1 INTRODUCTION

## 1.1 THE COMMISSION AND SCOPE

Calabrian Limited (Calabrian), were commissioned by LNT Construction Limited (LNT) to carry out a preliminary geoenvironmental appraisal of land at Eaton House, Leek.

The agreed scope for this report is summarised below with full details of Calabrian's appointment included in Appendix A:

- A site walkover and inspection;
- an assessment of the land use history;
- determination of the site's environmental setting;
- assessment of anticipated ground conditions, including potential contaminants;
- assessment of anticipated foundation and engineering issues associated with redevelopment for a residential care home end-use; and,
- provision of recommendations for an appropriate ground investigation.

This preliminary appraisal comprised inspection of historical and geological maps and data provided by the British Geological Survey and Landmark. In addition, a site walkover survey has been carried out by Calabrian.

## 1.2 OBJECTIVES

To identify salient geoenvironmental issues affecting the site to enable LNT to obtain budget costs for the necessary site preparatory and remediation works, and to support the initial submission of a planning application to the local authority.

## 1.3 DEVELOPMENT PROPOSALS

We understand that consideration is being given to redevelopment of the site with a two-storey, H-shaped residential care home with associated gardens/landscaping, car park and access road. A proposed site layout has been provided by LNT as drawing referenced ST136EQ-F-01, dated 12/06/2018; this is reproduced as Drawing 6080/2.

## 1.4 LIMITATIONS

General notes and limitations relevant to all Calabrian preliminary investigations are described in the Foreword and should be read in conjunction with this report. The text of the report draws specific attention to any modification to these procedures and to any other special techniques employed.

# 2 SITE DESCRIPTION

## 2.1 GENERAL

Details of the site are given below:

- Location: 500m east of Leek town centre
- National Grid Reference: SJ 990 567
- Nearest Postcode: ST13 6EQ
- Area: 0.46 hectares

Known Services:

- Underground gas, electric, telecom and sewer; and,
- overhead telecom.

## 2.2 SITE FEATURES

Calabrian completed a walkover survey of the site on 11th October 2018.

The site is generally level and accessed directly from Buxton Road in the south. Eaton House occupies the southern half of the site and comprises a single flat roofed, brick and render constructed, two-storey office building. A small area of maintained landscaping forms the frontage with Buxton Road. Vehicle access to the north is gained along the western boundary with a pedestrian access along the eastern boundary.

Eaton House is current used for offices, training and administration mainly by various NHS services.

The northern half of the site is entirely occupied by a tarmac surfaced car park. This appears to be level with land to the west; however, to the north at around the same level of the car park extends the flat roof of the adjacent works building. It is assumed that the works building retains the northern boundary of the site; this appears to be around 6m in height.

To the east of the car park offset brick retaining walls form a ramp that leads south then north gaining the lower level of the works to the north. There are several mature trees along this eastern boundary.

The retaining walls in the east appeared to be in good condition and did not show any obvious structural defects. The retaining wall within the works to the north could not be seen from within the site.

A steel palisade fence forms the northern boundary with a concrete fence to the west. Low iron railings form the eastern and southern boundaries.

Existing salient features, at the time of the walkover are presented on Drawing No. 6080/3. A selection of site photographs are included on Drawing 6080/4.

# 3 SITE HISTORY

The table below provides a summary of the sites development history and previous land uses along with relevant information from the immediate surrounding area. A selection of Ordnance Survey (OS) maps are reproduced in Appendix B.

| OS Map Date | On Site | Near-by |
|---|---|---|
| 1879 | Three small buildings (likely residential) with enclosure shown in the south-western corner of the site. | Timber yard to the west, Buxton Road with residential properties beyond to the south and open fields to the north and east. |
| 1937 | 'Silk Mill' building shown occupying the southern 70% of the site. | Birch Gardens now shown the east. |
| 1964 | Now noted simply as 'Mill' the original building has been extended north across the entire site area and around 100m further north. | Some earthworks are noted to the north of the mill; these are presumed to be associated with ground level changes to provide a service yard to the mill. |
| 1978 | Building on site now noted as 'Warehouse' | Part of the northern section of the mill appears to have been removed. |
| 1990 | Building on site appears to have reduced in size back to its 1937 footprint. | |
| 2018 | The current OS maps still show the building occupying around 70% of the site area. Drawing 6080/3 details the footprint of this building. | |

*It is not the intention of this report to describe in detail all the changes that have occurred on or adjacent to the site. Significant former uses/operations are highlighted in bold text for ease of reference.*

# 4 ENVIRONMENTAL SETTING

## 4.1 GENERAL

Information supplied by the BGS and Landmark is summarised in the table below and presented in Appendix C.

| Issue<br>Data Reviewed | Remark |
|---|---|
| **Geology**<br>1:50,000 BGS map (Sheet 111, Buxton)<br>Borehole Data | Superficial – None.<br>Solid - Morridge Formation - mudstone, siltstone and sandstone.<br>Shallowest coal seam - None.<br>Strata Dip - 16° to 22° to south.<br>Faults – Possible along western boundary.<br>A deep borehole close to the sites eastern boundary identified clay to around 5m with mudstone beneath. Borehole south of Buxton Road found clay to around 3.5m with mudstone beneath. |
| **Mining**<br>Coal Authority<br>BGS maps | The site is located beyond the CA's defined coalfields. |
| **Quarrying**<br>Landmark Report<br>Historical OS Plans | None within 250m. |
| **Radon**<br>BRE Report BR211<br>Landmark Report | No measures required.<br>The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). |
| **Hydrogeology**<br>Landmark Report<br>Groundwater Vulnerability map (Sheet 17) | Source Protection Zone? None beneath site.<br>Aquifers: None (Drift); Secondary (Solid).<br>Groundwater abstractions? Closest 200m north-west for industrial process.<br>Pollution incidents? None relating to the site. |
| **Hydrology**<br>Landmark Report | Nearest watercourse(s) – 93m north-west (un-named running in open channel between culverts).<br>Water quality – River Churnet (1km north-west) A.<br>Pollution incidents? None relating to the site.<br>Abstractions? None within 1km.<br>Discharge consents? None relating to the site. |
| **Flood Risk**<br>Landmark Report | The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low. |

## 4.2 LANDFILLS

Known or suspected areas of landfill in the vicinity of the proposed development site are summarised below:

| Name (Data Source) | Location | Description |
|---|---|---|
| British Trimmings, Ball Haye Road<br>EAHLD28810<br>1/E/77/0009 (B 3) | NGR: 398858, 356862<br>(125m north-west) | First Input Date: 31st December 1977<br>Last Input Date: 31st December 1992<br>Specified Waste Type: Deposited Waste included Inert, Industrial and Commercial Waste.<br>Ash, flue sweepings (ex. works), hardcore and rubble |
| Land Between Weston Street and Prince Street<br>EAHLD28854 | NGR: 399178, 356837<br>(166m north-east)<br>*BGS note this site as being 60m north-east* | First Input Date: Not Supplied<br>Last Input Date: Not Supplied<br>Specified Waste Not Supplied |

## 4.3 LAND CONTAMINATION - PART IIA & PLANNING

Local Authorities have responsibilities with respect to land contamination in the context both of Part IIA of the Environmental Protection Act 1990, and Planning.

The contaminated land regime in Part IIA was introduced specifically to address the historical legacy of land contamination. It applies where there is unacceptable risk, assessed on the basis of the current use and the relevant circumstances of the land. It is not directed to assessing risks in relation to a future use of the land that would require a specific grant of planning permission. This is primarily a task for the planning system, which aims to control development and land use in the future.

Planning

As of 27th March 2012, Planning Policy Statement (PPS23) was replaced by the National Planning Policy Framework (NPPF). With respect to contamination and site investigation the NPPF sates that:

- 'Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

*Planning policies and decisions should ensure that:*

- the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses, and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;
- after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and
- adequate site investigation information, prepared by a competent person, is presented'.

Annex 2 of the NPPF states that 'all investigations of land potentially affected by contamination should be carried out in accordance with established procedures (such as BS10175 - 2011, Code of Practice for the Investigation of Potentially Contaminated Sites)'.

This Site

Given the presence of a secondary aquifer below the site and no nearby watercourse, the environmental setting of the site is considered to be of moderate sensitivity.

Whilst current use of the site is considered unlikely to have given rise to any significant ground and groundwater contamination its former use as a mill may have caused some minor contamination of the ground.

### 4.4 Preliminary Conceptual Site Model

The historical plans show that the site has been occupied by a mill this has the potential to have caused some, likely only minor, ground contamination.

A preliminary conceptual site model is presented as Drawing No 6080/5. Clearly, the conceptual model will be subject to modification in light of data arising from any future intrusive ground investigation.

## 5 CONCLUSIONS & RECOMMENDATIONS

### 5.1 General

It is understood that LNT are considering acquisition of the site with a view to redevelopment with a two-storey residential car home.

The main issues considered in this report, and in particular in Sections 3 and 4 are based on a review of historical data and available information. This report provides an assessment of geoenvironmental issues and implications associated with residential redevelopment of the site.

### 5.2 Mining and Quarrying

This site is located beyond the CA's defined coalfields.

There are no quarries noted within 250m of the site.

### 5.3 Hazardous Gas

There are two former landfill sites within 250m of the site; although these do not appear to have accepted waste capable of generating significant quantities of hazardous gas this cannot be fully quantified at this stage and further assessment will be required during any future intrusive site investigation.

The site is neither underlain by shallow mineworkings nor located in an area considered susceptible to mines gas emissions.

BRE Report BR211 (2015 Edition) indicates that radon protection measures are not required for new dwellings at the site. Information from Landmark confirms that the site is in an area where less than 1% of homes are estimated to be above the action level, and that radon protection measures are therefore not required.

As such, special precautions against hazardous gas may be required on this site.

## 5.4 Foundations

At present, no geotechnical ground investigation data is available and consequently it is only possible to estimate the ground conditions. Before firm foundation recommendations can be given, it will be necessary to undertake an appropriate ground investigation. However, tentative recommendations are provided below.

The published geological data suggests that clay and mudstone underlie the site although there is the potential for deeper made ground behind the retaining walls to the north and east.

Firm and stiff clay should provide sufficient bearing capacity to enable the adoption of strip footings for the two-storey care home. Reinforcement, as a precaution against differential settlement, is recommended only where foundation excavations encounter significant lateral and vertical variations in strata.

Made ground is not generally considered a suitable founding material and foundations should be taken through it, into underlying natural in-situ strata of adequate bearing capacity. Consequently, alternative foundation solutions will be required in any areas of deep made ground (greater than about 1.5m).

All concrete slabs and service ducts will require breaking out during the demolition of existing buildings. Foundations of plots that conflict with relict foundations should be taken to greater depth than the relict foundations and into natural ground of adequate bearing capacity.

## 5.5 Flooding

The EA indicate that the site is not located within an indicative floodplain.

## 5.6 Drainage and External Works Issues

Given anticipated ground conditions, soakaways will not provide a viable solution for the disposal of surface water. It is recommended that the developer contact the local water services with respect to capacity in existing foul and surface water sewers in the vicinity of the development area.

There are retaining walls to the north and east of the site and these should be inspected by a qualified structural engineer. Any potential party wall issues should also be investigated.

## 5.7 Contamination & Remediation

The site is likely to be underlain by some made ground associated with previous development of the site. The previous use as a mill is unlikely to have caused significant contamination but some minor contamination may be expected.

## 5.8 Potential Development Constraints

Development close to the existing retaining walls would require further consideration.

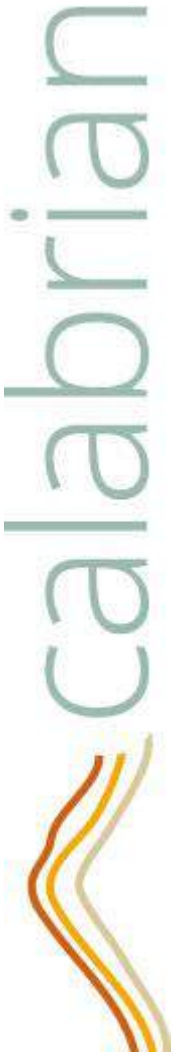
## 5.9 Further Investigation

Whilst the site is considered suitable for its current and proposed use, the proposed change in use will require intrusive investigation.

This would include:

- Machine-excavated trial pits and boreholes to determine near surface ground conditions including depth to natural ground, the presence of obstructions, groundwater and stability;
- geotechnical soils analysis to enable foundation recommendations;
- chemical testing on soil and if necessary groundwater, samples to assess the significance of contamination, if any, as a result of former industrial land use.
- gas monitoring and risk assessment; and,
- asbestos survey.

| DRAWINGS | |
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client

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