

16 October 2014

Our ref J14280/MC/1

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London Borough of Camden
Town Hall
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Dear Mr Heather

**Re: AUDIT OF BASEMENT IMPACT ASSESSMENT FOR 23 ROCHESTER ROAD,
NW1 9JJ (2014/4559/P)**

Further to your instruction, we have now completed our audit of the Basement Impact Assessment (BIA) relating to the proposed basement construction at the above site and this letter forms our report on the review.

1.0 INTRODUCTION

1.1 Brief

Geotechnical and Environmental Associates Limited (GEA) has been instructed by London Borough of Camden (LBC) to undertake an independent audit of a BIA for the above site and an assessment of the completeness of the submission in satisfying the requirements of Camden Planning Guidance 4.

Specifically LBC has requested that GEA provide an opinion on whether:

1. *The submission contains a Basement Impact Assessment, which has been prepared in accordance with the processes and procedures set out in Camden Planning Guidance 4 2013.*
2. *The methodologies have been appropriate to the scale of the proposals and the nature of the site.*
3. *The conclusions have been arrived at based on all necessary and reasonable evidence and considerations, in a reliable, transparent manner, by suitably qualified professionals, with sufficient attention paid to risk assessment and use of conservative engineering values/estimates.*
4. *The conclusions are sufficiently robust and accurate and are accompanied by sufficiently detailed amelioration/mitigation measures to ensure that the grant of planning permission would accord with DP27, in respect of*
a. maintaining the structural stability of the building and any neighbouring properties

- b. avoiding adversely affecting drainage and run-off or causing other damage to the water environment and*
- c. avoiding cumulative impacts on structural stability or the water environment in the local area.*

In addition, LBC have specified that our review of the submitted BIA should:

- 5. *Raise any reasonable concerns about the technical content or considerations of the submission which should be addressed by the applicant by way of further submission, prior to planning permission being granted. In this case it would need to be apparent that the submission so deficient in some respect that the three conclusions (points 4a-c above) cannot be guaranteed without further information at this stage. Please clearly denote the precise information (if any) that would be required to satisfy 4a-c.*
- 6. *Raise any relevant and reasonable considerations in respect of the structural integrity or condition of the neighbouring properties which may be unknown or unaccounted for by the submission or which would benefit from particular construction measures or methodologies in respect of the development following a grant of permission for the development. Please clearly denote what such conditions should entail.*

1.2 Proposed Development

The site is located on the northern side of Rochester Road, roughly mid-way between its junction with Kentish Town Road and Camden Road. The proposed development comprises the construction of a single storey basement beneath the existing three-storey property. Conventional reinforced concrete underpinning of existing walls is proposed to form the basement. The proposed basement includes the underpinning of the party wall with 24 Rochester Road.

1.3 Documentation

The BIA has been prepared by Card Geotechnics Limited (CGL), referenced 23 Rochester Road Basement Impact Assessment, and dated July 2014. It includes architect's drawings and sections, a proposed method statement for underpin construction and a site investigation by CET Infrastructure Limited referenced F14/146509/GEO dated July 2013. In addition a drainage statement by Chiltern Design, referenced 277 and dated 26 June 2014 has been included within the submission.

2.0 AUDIT OF THE BASEMENT IMPACT ASSESSMENT

2.1 Qualifications and Procedure

This audit has been undertaken by Martin Cooper, a Chartered Civil Engineer (CEng) and Member of the Institution of Civil Engineers (MICE) with over 25 years of experience in the geotechnical industry in conjunction with Steve Branch, a Chartered Geologist (CGeol) with over 28 years of experience of the geotechnical industry and with specific knowledge and experience of the ground and groundwater conditions in the London Borough of Camden.

The review has been carried out by reviewing the BIA in the light of the CPG4 flow chart processes and making additional comment on the sufficiency or inadequacy of information provided where necessary.

2.2 Overview

The BIA is considered to have followed the procedures and protocols of CPG4, there are items that do not appear to fulfil its requirements and there are a number of inadequacies in the information provided. These are discussed in more detail below and referenced by the section number in the BIA.

2.3 Author Qualification

The CGL BIA is written by Adam Cardman, a master's degree qualified senior engineer, checked by Richard Ball, a Chartered Engineer (CEng) and Member of the Institution of Civil Engineers (MICE). The BIA has then been approved for issue by Ian Marychurch, the Managing Director of CGL who is a Chartered Engineer (CEng) and Member of the Institution of Civil Engineers (MICE) as well as being a Chartered Geologist (CGeol).

Section 2.11 of CPG4 requires that the professionals undertaking a BIA have qualifications that are relevant to the matters being considered. In this respect there is evidence of input from a Chartered Civil Engineer specialising in ground engineering such that the land stability assessment requirement is satisfied. CPG4 also requires the input of a "hydrogeologist" who is CGeol and we would assume that Ian Marychurch has sufficient relevant experience to fulfil this role, but perhaps for completeness this could be clarified.

2.4 Setting of the site

The topographical, geological and hydrogeological setting, including bomb damage and flood risk, is discussed in Section Nos 2.1 to 2.7 and it is considered that the site and its context are adequately defined.

2.5 Development Proposals

The development proposal is summarised in Section 2.3 and shown on a series of Clive Sall Architecture drawings.

2.6 Basement Impact Assessment

The BIA is set out such that the four stages are dealt with in a logical sequence. The screening stage flowcharts are included in Section 3 and Section 3.5 summarises the items that require further assessment. Section 4 deals with the scoping and Investigation stages.

The scoping section indicates that a ground investigation is required and sets out minimum requirements of such an investigation. The BIA indicates that the site investigation was undertaken in April and May 2014 by CET Infrastructure, but the Approval Sheet and Foreword of the investigation (Appendix C of the BIA) records the investigation report having been issued in July 2013; we assume that this should read July 2014. LBC Guidance for Subterranean development 2010 authored by Arup provides a framework for the methodology behind assessing the impact of basements within the borough. Section 7.2.2 of the guidance recommends a minimum of three boreholes or trial pits to determine groundwater flow direction. For this site, which is relatively small in size, it is considered unlikely that further boreholes would indicate different information and the investigation is sufficient for its needs.

The ground conditions are discussed in Section 5 of the BIA. This section is considered to represent an adequate interpretation of the findings based on the relatively limited ground investigation undertaken.

Groundwater levels have been monitored on three occasions over a three week period. During the first visit groundwater was measured at 2.49 m. In the second visit groundwater was measured at 2.28 m before the borehole was baled out and allowed to recharge. During the 20 minute observation period following baling the groundwater rose from 5.51 m to 5.47 m and was measured at 4.18 m eight days later. The groundwater regime has not been

fully established and further monitoring would be useful in order to inform the design. However, for construction purposes CGL note in Section Nos 6.3 and 9.1 that groundwater control will be required and that sump pumping should be sufficient to deal with likely inflows; we agree with this conclusion.

There does not appear to have been any investigation to determine the depth and nature of the existing foundations and assumptions have had to be made in this respect. It is considered essential that the existing foundation depth should be determined prior to the commencement of underpinning so that the design of temporary and permanent works can be accurately determined.

2.6.1 Groundwater Flow

Considerations in respect of groundwater flow are set out in Section 6 and the conclusions drawn seem appropriate. However, it would be prudent for additional monitoring to be carried out in the period leading up to construction and particularly during the wetter winter months.

2.6.2 Ground Stability

Land stability is discussed in Section 7 of the BIA and Section 7.1 is considered to sufficiently set out the mechanisms that could cause ground movements at this site. The recommendations in Section 7.2, together with the suggested method statement of basement formation in Appendix D reflect best practice. The provision of temporary propping to the underpins is considered essential in minimising ground movements and therefore the effect on adjacent properties. It is noted however that the 5.1 m high underpins are thought likely to be cast in a single lift. It is thought that casting in two lifts of 2 m to 3 m would be closer to standard practice and the 5.1 m height should only be adopted with justification through examples of precedent. It is anticipated that the detail of the underpinning methodology will be clarified during the detailed design stage as the suggested sequencing appears to be generic rather than site specific advice.

The ground movement analysis is considered appropriate and the derivation of the damage assessment from those movements is predicted as 'Category 1 – very slight'. Damage predictions up to and including 'Category 2 – slight' are acceptable to LBC so the damage levels predicted for the proposed development are not considered likely to be of concern.

The recommendations in respect of monitoring should be adopted and if so should adequately provide against excessive damage being caused to the adjacent properties.

2.6.3 Surface Flow and Flooding

The drainage statement is not referenced in Section 8 of the BIA and as noted previously, the qualifications of the author of that document have not been provided. However, the discussion of surface flow and flooding appear to be generally correct and we are in agreement with the BIA findings in the respect.

3.0 SUMMARY

Our review has found that the Basement Impact Assessment for the proposed development provides a thorough assessment of the impact of its construction and impacts. It has been undertaken in accordance with the requirements of CPG4 and apart from a relatively minor issue is considered as being satisfactory. The information required is summarised below.

- *confirmation that the professional qualifications of the BIA author and consultants meet the requirements of CPG4 in respect of subterranean groundwater flow and surface flow and flooding;*

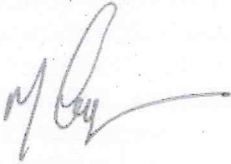
With regard to the items requiring GEA opinion, specifically Item 6 of the brief, it is recommended that a limited number of items are clarified, although the Council may be minded to deal with these by way of planning conditions, namely:.

- *further groundwater monitoring and confirmation that sump pumping will be sufficient to mitigate groundwater ingress;*
- *confirmation of the depth and nature of the existing foundations;*
- *confirmation of the depth of lift to the underpins along with the proposals for temporary propping during construction.*

We trust that the foregoing comments are sufficient for your needs and we would be pleased to discuss the findings in more detail if required and to provide any additional assistance that may be necessary. We will be happy to discuss outstanding matters directly with CGL if that would assist the Council with the process.

Yours sincerely

GEOTECHNICAL & ENVIRONMENTAL ASSOCIATES



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