

## Chelmer Consultancy Services

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# Review of Revised BIA and CMS (Planning Application 2013/6162/P)

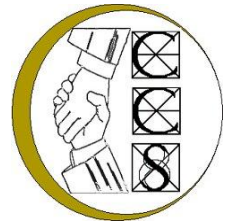
<b>Client:</b>	London Borough of Camden
<b>Site:</b>	2 Oakhill Avenue London NW3 7RE
<b>CCS Ref:</b>	RRBC/4415
<b>Dated:</b>	August 2014

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London Borough of Camden  
PO Box 306  
Sheffield  
S95 1AQ

6<sup>th</sup> August 2014

CCS Ref: RRBC/4415

Dear Sirs,

**2 Oakhill Avenue, London NW3 7RE –  
Planning Application 2013/6162/P  
Review of Revised BIA and CMS**

Thank you for forwarding the revised Basement Impact Assessment (BIA, Issue No.4, 8<sup>th</sup> July 2014) and Construction Method Statement (CMS, Rev. A, June 2014) in relation to the above planning application, together with the covering letters from GEA Associates and Price & Myers respectively.

This letter report should be read in conjunction with the revised documents and our original Independent Assessment report dated 24<sup>th</sup> April 2014. Only the revised aspects of the BIA and CMS have been considered.

1. Each of the items of concern about the original BIA, as set out in paragraph 3.2.2 of our original Independent Assessment report (with more detailed explanations in Section 2.3), are reviewed below:

a. **The surface water and flooding aspects of the screening (Stage 1) and scoping (Stage 2) should be reviewed and amended as necessary by an appropriately qualified and experienced Chartered Engineer/Hydrologist (2.3.3); the missing impact assessment for surface water and flooding (Stage 4) should be added (2.3.12), including an assessment of the changes to paved surfaces and confirmation (or otherwise) that the existing discharge volumes of the surface water run-off will not be altered:**

As indicated by GEA's covering letter (dated 8<sup>th</sup> July 2014) the CMS now includes (in Sections 3.4 and 4.1) much more information regarding surface water and flooding, and this has been reflected in the screening, scoping and impact assessment tables within the BIA.

It has now been shown that the landscaping proposals will increase the drained area which discharges to the mains system from 123m<sup>2</sup> to 267m<sup>2</sup>. Attenuation storage measures are proposed, with the volume of attenuation, peak flow rates and discharge rates to sewers all to be agreed with Thames Water.

Status: We recommend that a requirement to submit design drawings for the attenuation storage and full hydraulic design calculations to prove that there will be no increase in the flow rates discharged to the mains drainage system should be placed as a condition on any planning consent which may be granted.

b. **The four screening questions which were incorrectly answered 'No' (2.3.4) should be revised, those items should be added to the scoping (2.3.6), and the resultant additional actions should be added to Stage 4 as appropriate:**

These screening questions are now answered appropriately except for Stability Screening Q14 which refers only to London Underground (LUL) tunnels as shown on Arup's Figure 18 (and "online", though no details are given) and Thames Water's tunnels. LUL have tunnels which are not shown on any of the public maps, some of which are operational (one of which was drilled into by a piling rig a few months ago), and there are several cable tunnels below London for both power and communications.

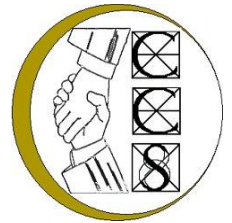
Status: No further action required, except as recommended for item 'j' below.

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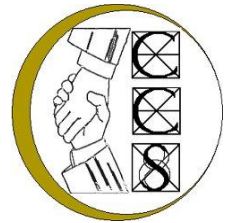
- c. **Justifications should be added for all “No” responses (2.3.5):**  
This has been done.  
Status: No further action required.
- d. **The scoping should be expanded to include matters relevant to design and construction of the basement, not just the ground investigation (2.3.7):**  
The change in hard surfaces and the potential consequences have been added.  
Status: No further action required, except as noted for item ‘j’ below.
- e. **The ground model should include (or refer to) preliminary design groundwater levels (2.3.9):**  
This has been done.  
Status: No further action required.
- f. **Calculations of predicted ground movements alongside the basement should be provided for both the underpins and the bored pile walls, together with preliminary estimates of heave beneath the basement (2.3.10(1 & 2)): and**
- g. **Damage category assessments should be undertaken, once the predictions of ground movement are available (2.3.10(1)):**  
No ground movement analysis has been included, as noted in GEA’s covering letter (because it was not included in the instructions from their client). The BIA therefore remains non-compliant with the requirements of paragraph 2.30 of CPG4.  
Status: A further revision or addendum to the BIA is required to include “calculations of predicted ground movements and structural impact” on the neighbouring properties including classification of the predicted damage using Burland categories as presented in CPG4, CIRIA Report C580 and elsewhere.  
(However, it should be noted that, contrary to the statement in CPG4, the calculations given in Appendix D of the Camden Geological, Hydrogeological and Hydrological Study are NOT examples of appropriate ground movement calculations).
- h. **Requirements should be added for removal of local softened areas of the formation and replacement with concrete, and protection of the formation from water by blinding with concrete immediately after excavation and inspection (2.3.10(4)):**  
Both these requirements have been met.  
Status: No further action required.
- i. **The reason(s) why the recorded groundwater levels above Ordnance Datum indicate a southeasterly hydraulic gradient (and potential flow direction) within the site, against the fall of the land (ie: uphill, from BH1 to BH4) must be considered/explained. The predicted/design groundwater levels should then be re-assessed (2.3.11):**  
The groundwater flow direction has been re-assessed as “toward the west or southwest”, which is more plausible. The (provisional?) design water level of 7.20m above TBM is not unreasonable based on the monitoring results presented.  
Status: No further action required.

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- j. **Only railway tunnels appear to have been considered; a services search is required to check for other deep infrastructure (2.3.4). While that could be undertaken post-planning, at least a CON29DW search should be undertaken pre-planning in order to identify the location of the sewer mentioned by one of the objectors (2.4.2):**

GEA's covering letter states that a full services search has been undertaken and is appended to their report, excluding Thames Water's plans (which are now presented in Appendix C to the CMS), but no such appendix is present. No adopted mains sewer is shown on Thames Water's plans "only centimetres from the digging" as claimed by one of the objectors.

Status: We recommend that a condition should be placed on any planning consent which may be granted, requiring the applicant to submit the findings of a full services search before any construction works start on site. See discussion under item 'b' above for explanation of why this is required.

2. Each of the items of concern about the original CMS, as set out in paragraph 3.2.1 of our original Independent Assessment report (with more detailed explanations in Section 2.2), are reviewed below:

- i. **The underpins have specifically been designed "to avoid temporary propping during bulk excavation" (2.2.3). This would appear to apply to both the excavations and the completed underpins. If so implemented, the lack of temporary propping would almost certainly lead to unacceptably large ground movements and associated structural damage to the adjoining and adjacent properties (Nos 2C and 4 Oakhill Avenue), so a revised scheme with detailed recommendations for temporary support to both the excavations and the completed underpins should be submitted pre-planning (i.e. : before any planning consent is granted for this scheme):**

Temporary propping has now been indicated as a requirement within the CMS report and on the drawings (see CMS, Section 3.3, Section 5.1 and Appendix F). The construction sequence in Appendix F shows that the piles will be used for lateral support in the temporary situation (which did not apply previously) and Section 3.3 of the CMS states that the "permanent structure will be designed for both the temporary case, and the permanent case" which is taken to override the statement in Price & Myers' (P&M's) covering letter that the underpin loads will only be transferred into the piles in the permanent case.

Status: No further action required by P&M. Full compliance with all aspects of the CMS could be included as a condition on any planning consent which may be granted.

- ii. **The CMS includes a partially complete screening section (inappropriately titled 'Scoping of Issues') with some incorrect responses which contradict the screening in the BIA (2.2.2). This should either be deleted or corrected and completed:**

This section has been deleted from the CMS.

Status: No further action required.

- iii. **The drawings appear to indicate that the scheme involves a combination of a piled basement slab together with a strip footing beneath the steel columns supporting the flank wall (alongside the garden maisonette's living room fireplace), as well as underpinning (2.2.5b). The use of different founding systems should be minimised as much as possible in order to reduce the potential for differential settlements. If separate strip footing was intended beneath the flank wall and garden maisonette's living room then the interaction should be more clearly detailed:**

The strip footing has been replaced by RC groundbeams spanning between the piles, and the label "strip footing" has been removed.

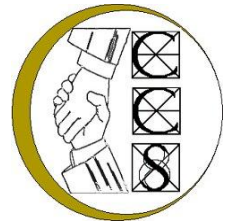
Status: No further action required.

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- iv. **The revised foundation scheme should include assessment of ground movements, both vertical and horizontal, around the basement (in either the CMS or the BIA; see 2.2.4 above and also 3.2.2f), the likely depth and magnitude of heave below the basement (2.2.5c), and settlement of the piles (2.2.5g):**

P&M state that the ground movement calculations would be completed at a later design stage and as part of the Party Wall Agreement process, and they predict that the damage would be expected to fall within Burland Category 2 or below. This approach does not comply with the requirements of either CPG4 or the general policy set out in DP27. The settlement of the piles is stated as being specified "to allow only minimal settlement (10mm)"; as the piles will support the underpins such movement is likely to lead to at least Category 2 damage in the adjoining house.

Status: The original recommendation, as given above, remains valid. See also paragraph 1.g above.

- v. **Construction of a retaining wall within the RPA of the 10m high Mimosa tree (T4) in 2C's garden (2.2.5d) conflicts with the arboricultural report, so will not be acceptable as currently proposed:**

P&M's covering letter states that they understand that tree T4 fell down in storms earlier this year (and that T2 and T5 were damaged and felled).

Status: This issue appears not to exist any longer.

- vi. **Details should be provided of the special measures proposed by P&M for "quiet" breaking out of concrete floor slabs and footings (2.2.5f):**

This statement has been removed from the CMS.

Status: No further action required.

- vii. **The CMS (or BIA) should substantiate the claimed no (net) change in hard surfacing area (2.2.6 and 2.3.4):**

The change in hard surfacing has been calculated and appropriate recommendations have been made.

Status: No further action required.

3. The matters which could sensibly be made the subject of planning conditions, as set out in paragraph 3.3.2 of our original Independent Assessment report, remain valid. In addition, other planning conditions are proposed in paragraphs 1.a, 1.j and 2.i above.

4. For compliance with CPG4, a further revision of, or addendum to, the BIA is required with ground movement analyses as set out in paragraphs 1.g and 2.iv above.

We trust this review meets your requirements and draw your attention to the limitations on interpretation below. Please do not hesitate to contact us if you require clarification of any of the above matters.

Yours faithfully

A handwritten signature in black ink, appearing to read 'K.R. Gabriel', followed by a long horizontal line extending to the right.

Keith Gabriel  
MSc DIC CGeol FGS  
UK Registered Ground Engineering Adviser