

# UCL, New Student Centre

## Supervisor Report

Curtins' Ref: 060487

Revision: 1

Issue Date: 24 June 2016

Client Name: University College London

Client Address:

Site Address:

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Site visit date	-
Attended by	-
Author	Neill Duke

## 1. INTRODUCTION

- 1.1 Curtins have been engaged as UCL's Supervisor for the construction of the New Student Centre building, comprising a double storey basement and five upper storeys. The named Certifying Engineer, Neill Duke, has not been involved in the design development of the project.
- 1.2 Within this report, we provide comment upon the Basement Construction Plan (BCP) as prepared by the contractor, Mace Ltd, for the new building. That report has been based upon the Basement Impact Assessment (BIA), Stage 4 report prepared by Curtins in August 2015, Mace's own construction expertise and their appointed temporary works consulting engineer, Bridges Pound. The BCP is specifically intended to contain:
- method statement detailing proposals for ensuring the safety and stability of neighbouring properties;
  - method statement including temporary works proposals;
  - monitoring – settlement, heave and inclinometers; and
  - local and other factors affecting construction.
- 1.3 The original submission of the BCP was the first issue dated 02.02.16 as received from Sam Wood, Senior Project Manager at Arcadis, the Client's appointed project manager. Most recently, revision 9 of the BCP dated 20.06.16 has been received from Mace. The amendments made to the report have been listed in a table of revisions following Mace's incorporation of various comments received from various parties. This report is based upon the most recent revision.
- 1.4 The BCP is also intended to address the matters recommended by Campbell Reith Consulting Engineers, engaged by London Borough of Camden, in their report titled "Land between 26 Gordon Street and 15 Gordon Street, London NW1H", dated August 2015, namely:
- detailed construction method statement;
  - groundwater monitoring and confirmation of impact on groundwater flow;
  - ground movement monitoring and building damage assessment; and
  - confirmation of impact on surrounding buried services.

## 2. OBSERVATIONS AND DISCUSSION

2.1 We find the content of section 2, Existing Conditions, to be satisfactory and to concur with our records.

### 2.2 Section 3 – Condition Surveys

Eleven condition surveys for internal and external areas and buildings are noted to be on file for record purposes.

### 2.3 Section 4 – UXO Mitigation

It is noted that BACTEC have been engaged by Mace. In our opinion BACTEC have a recognised expertise in this discipline and therefore we would be guided by them. It appears that an appropriate level of surveying has been agreed so BACTEC's methodology and recommendations should be appropriate and applied.

### 2.4 Section 5 – Movement Monitoring Proposal

It is evident that the need for movement monitoring is clear to Mace with the site being between three existing buildings. A regime of movement monitoring during the construction works was set out in Curtins' BIA report. Those proposals were brought forward into the first issue of the BCP, but have since been revised following discussion between the novated engineer and the certifying engineer. Whilst the amended proposals have reduced the number of monitoring locations, in our opinion, the amendment is an improvement upon the original proposals. The amendments to the proposals are shown in the table on page 6.

It is noted that Mace have proposed some additional monitoring, which is considered appropriate, that being monitoring prior to the commencement of the construction works (section 5.2). This is intended to capture the movement of the buildings due to other factors, e.g. thermal movements. In our opinion this is worthwhile and would agree that this will form a "baseline" for appraisal of monitoring of movements measured whilst the various construction works are in progress on site.

The proposed frequencies of monitoring for the pre-start and each of the four stages of the works (piling, capping beam, excavation and basement construction) are set out in table on page 10 and are considered appropriate.

Mace have proposed an acceptable process for review of the monitoring in progress. Further, in the event of actual monitoring revealing movement in excess of predictions, a suitable course of action has been proposed.

### 2.5 Section 6 - Utilities.

Mace have commenced service diversion works for the HV cables, gas and water mains that

## 2. OBSERVATIONS AND DISCUSSION

are in proximity to the works and might have been adversely affected. Those works are part of an early enabling package, in consultation with the statutory authorities.

An LV cable is being retained but considered to be sufficiently far away not to be at significant risk.

### 2.6 Section 7 – Piling.

We have made a brief review of Keltbrays' proposals. A secant piled wall is required for this project and to be installed by a rotary bored technique. That kind of pile minimises adverse effects upon adjoining buildings. The proposed type of pile is consistent with expectations for this development. Whilst Keltbray's report is fairly standard, we note it has been tailored to be project specific and that the piles are noted as having been designed in accordance with Curtins' BIA for ground movement.

We have not undertaken a detailed check of the pile designs, nor would we expect to, the majority of the design output is computer generated from project specific input data.

The risk control measures have been applied to the piling and consequently reduced the residual risks to the lowest levels possible.

### 2.7 Section 8 – Programme – no comments.

### 2.8 Section 9 – Methodology and Sequencing

A detailed method statement has been prepared in the BCP including for establishment, the piling mat, installation of piles and excavation works.

One aspect that needs to be included having been requested by Campbell Reith is the monitoring of ground water levels. Curtins' novated team have also informed Mace of this need.

### 2.9 Section 10 - Temporary Works Design

A deviation from Curtins' BIA report is the number of levels of temporary propping. Mace have engaged Bridges Pound Consulting Engineers as their temporary works engineers and they have based their temporary works around using only one level of hydraulic bracing struts positioned at capping beam level. Those struts are proposed to be installed diagonally across the corners of the basement. The diagonal struts bear against reinforced concrete corbels. Design of those corbels is yet to be developed by Bridges Pound, but Mace know it is outstanding and that aspect of the design will be progressed in due course.

We are satisfied that the consulting engineer has understood the requirements of the temporary works and produced appropriate designs.

In the permanent works, the design of the secant piled wall is a propped cantilever, which is unchanged.

## 2. OBSERVATIONS AND DISCUSSION

### 2.10 Section 11 – Ground Movement Assessment

Mace confirm that Bridges Pound temporary works analysis has been based upon Curtins' BIA and that the designs are within the specified allowable deflection tolerances.

The construction of a secant piled wall basement within such an urban environment is not an unusual situation. Consequently, the methods of works being employed are not uncommon. Mace have possession of the condition surveys for the neighbouring buildings and recognise that the damage category assessment should not exceed Category 2, "slight", which is basically easily filled cracks with redecoration being required and possibly some works to ensure weather tightness is maintained.

### 2.11 Section 12 – Appendices

We have now received all the information identified in the various appendices.

### 2.12 Campbell Reith report, section 3 - BIA audit check list

This reveals there to be four items against which "No" has been entered. The items are not numbered as such, but the first and third items have been addressed by the latest issue of the BIA being signed off by a geotechnical engineer, Charlie Renold, with qualifications as noted below.

## Basement Impact Assessment Stage 4



Rev	Description	Issued by	Checked	Date
01	First Issue	SE	SS	15/07/2015
02	Updated to include geotechnical review, non-technical summaries and construction sequence	SE	SS-CR	04/08/2015
03	Proposed basement level updated	JJ	SS	21/08/2015

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Author	Date
<b>Guleyman Ekingen</b> BSc, MSc, CEng, MStructE Project Engineer	15/07/2015
Reviewed - Structural	Date
<b>Stefano Strazzullo</b> BEng(Hons) Associate	15/07/2015
Reviewed – Subterranean (Groundwater) Flow	Date
<b>Charlie Renold</b> BSc(Hons) MSc CGeol EurGeol Associate	28/07/2015

## 2. OBSERVATIONS AND DISCUSSION

The next item concerns the groundwater monitoring, which has been described above.

### 2.13 Campbell Reith report, section 4 – Discussion

4.1 to 4.15 inclusive - these are mostly statements not requiring comment, as except as below.

4.3 – the construction method statement has been developed.

4.6 – groundwater monitoring – as noted elsewhere in this report.

4.7 – scheme specific ground movement and building damage assessment has been provided.

4.14 – within the BCP it states, “(11.3) as a mitigation process movement monitoring will be heavily scrutinised during construction” and “ (5.4) If the predictions show that movement in excess of the agreed limits is likely to be induced then remedial action will be taken”, Mace do not specify trigger levels as such.

4.15 – it was suggested that confirmation be provided that the scheme addresses any constraints that Crossrail may impose, but the reality is that the piles in closest proximity were installed previously by others some time ago and is therefore not considered an issue.

### 2.14 Campbell Reith report, section 5 – Conclusions

5.1 to 5.10 inclusive - these are mostly statements not requiring comment, as except as below.

5.7 – ground water monitoring – outstanding at present

5.10 – Ground water monitoring and confirmation of impact on ground water flow – outstanding at present

### 3. SUMMARY

- 3.1 We are satisfied that the Basement Construction Plan has been developed significantly since it was originally issued.
- 3.2 We are of the opinion that the BCP addresses satisfactorily Campbell Reith's requirement for:
- Detailed Construction Method Statement
  - Updated Ground Movement and Building Damage Assessment for final scheme
  - Confirmation of impacts on surrounding buried services
- 3.3 There is one aspect that has not been covered to date, that being the Groundwater monitoring and confirmation of impact on groundwater flow. This is not considered to be a "show stopper". It is something that can be instigated and progressed concurrently with the early stages of works. We do not consider this a reason to delay submission of the BCP and now that the basic principles of the BCP have been agreed.
- 3.4 The most significant change to Curtins' Basement Impact Assessment report is the reduction in the amount of temporary propping. However, we are satisfied that Bridges Pound, the consulting engineer engaged by Mace, have prepared and designed a suitable system.
- 3.5 The design of the corbels, where the diagonal propping connects to the permanent works of the capping beam, is outstanding at present. However, that can be developed by Mace's temporary works engineer in due course, following our appraisal of their BCP. We do not consider this a reason to delay submission of Mace's BCP.
- 3.6 The movement monitoring has been reassessed. Although there are less monitoring points in the latest proposals, the locations have been re-positioned slightly and are thought to be an improvement upon the original proposals.
- 3.7 As noted before, this form of construction is deployed often for such construction projects with success.
- 3.8 We consider this Basement Construction Plan satisfactory subject to the proposals for the ground water monitoring being formalised and the movement trigger levels being identified.
- 3.9 In conclusion, we are satisfied that the Basement Construction Plan, revision 9, as prepared by Mace, can be submitted to the London Borough of Camden.



#### SIGNATORY

This report has been prepared on the basis of visual observations and without the benefit of any site investigations or monitoring, nor any tests on services. Our report is provided for the sole use of the named client and is confidential to the client and his professional advisors. All parts of the property that were covered, unexposed or inaccessible were not inspected and therefore we are unable to report that such parts are free from defects.

Name

Neill C Duke  
BSc(Hons) CEng MICE

Signature



Date

24 June 2016



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