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ARUP

13 Fitzroy Street
London
W1T 4BQ
United Kingdom

t +44 20 7636 1531
d +44 20 7755 4029

stuart.pennington@arup.com
www.arup.com

For the attention of London Borough of Camden

5 Pancras Square
London N1C 4AG

21 February 2019

Dear Sir/Madam

140-146 Camden Street
London NW1 9PF

Section 106 Agreement
Review by Certifying Engineer

Introduction

The Section 106 Agreement for this property, dated 11 May 2014, requires that the owner (Elebro Ltd.) present a Detailed Basement Construction Plan (DBCP) and the objectives of this plan are, to minimise the impact of the development on neighbouring properties and the water environment, and to maintain the structural stability of the property and neighbouring properties through a programme of mitigation measures.

Apart from nearby buildings, neighbouring properties include the Regent's Canal, its towpath, and other nearby relevant infrastructure such as, the Camden Road bridge and the Fleet Sewer.

At a basic level the Agreement describes the DBCP as 'a plan setting out detailed information including reports, drawings and calculations setting out the design and construction of the basement forming part of the development'. However, it is also sets out that it should include a programme of mitigation measures, and detailed measures described in Clause 2.2.2(2)(c)(i) to (vii).

It is a requirement of the Agreement that the impact of the development on the structural integrity of neighbouring properties is no worse than 'slight' on the Burland Category of Damage scale.

The Price & Myers Basement Impact Assessment and the independent review by Chelmer, both dated July 2015, discuss mitigation measures proposed at that time and form an initial point of reference for the DBCP.

Certifying Engineer

The Agreement requires that the owner appoint an independent suitably certified and qualified engineer (the Certifying Engineer), to review the DBCP and present a two page report to the Council. It is my understanding that Council have approved me for this role.

I am a civil engineer specialising in the field of geotechnics and I am a chartered member of the Institution of Civil Engineers.

I understand that the role of the Certifying Engineer is to confirm that the DBCP has been formulated in accordance with the terms of the Agreement described in Clause 2.2.2.

Outline of review

I have read the DBCP, dated 21 Feb 2019, which includes relevant design and construction documentation, such as:

- a review of the existing structure;
- a response to the 2015 basement impact assessment;
- a description of the proposed foundations and retaining walls;
- a review of the ground and groundwater conditions;
- a description of the proposed construction methodology;
- an account of the basement design;
- an assessment of the basement impact;
- proposals for monitoring, and
- various design drawings, calculations and method statements.

I have also looked at the Construction Management Plan (CMP), dated 15 Feb 2018, which addresses construction traffic and community liaison.

It was observed during the review that there was contractor documentation (method statements) which was preliminary in nature. Nevertheless, these documents did include sufficient detail to convey the intended methodology, which can be developed further and coordinated as 'for construction' documentation with the Basement Design Engineer (BDE).

During the review process I raised several questions and comments with the design team. These comments have been addressed.

Proposed basement development

The proposed basement can be broadly divided into two, based on the extent of excavation. Currently, the southern half of the property contains a basement which is roughly level with the Regent's Canal; the northern half has no basement. There is a dividing retaining wall which supports the ground to the north and the difference in level is about 3.3m.

The intention is for a common level basement across the site which is slightly lower than currently present in the existing basement. It is proposed that the reduction in level will be achieved through a combination of secant and sheet piling, propped to control movements.

Groundwater control is to be achieved through the use of secant piles, sheet piles with clutches, and localised sumps and pumps.

There are existing piles under the southern half of the property; however, it is not proposed that these be reused. New piles are proposed across the property to support the new building of up to eight storeys.

The details of the basement and the sequence of construction are described through a series annotated plan and cross-section drawings.

Significant change since 2015 Basement Impact Assessment (BIA)

A significant change to the method proposed by Price & Myers in 2015 is the removal of underpinning which was proposed along the eastern boundary beneath the Morgan House footings and along the southern part of the western boundary beneath the existing basement wall.

The support to Morgan House is now proposed to be propped secant piling. Given the position of the Morgan House footings and the presence of groundwater this is considered to be a prudent choice.

For the retaining wall along Camden Street it is proposed to leave the existing wall in place and line it with a new wall. This is also considered to be a prudent choice.

Extent of investigation and designers response to data

Several stages of ground investigation have been undertaken, including one since the BIA. The most recent investigation undertaken by Arup and Concept (2016) sought to better understand ground parameters, groundwater conditions, contamination and the characteristics of existing structures.

In response, the designers have adopted appropriately conservative parameters and methods of modelling. There is recognition of the need to control groundwater and ground movements. Provision is made during construction for further confirmation of existing structures.

Response to Chelmer's assessment of the BIA

Chelmer's report raises several comments and issues to be considered and developed further to mitigate the impact of the basement on neighbouring properties. The designers have taken these on board and developed appropriate responses.

Impact of basement on surface water and groundwater

Surface water flooding is identified as a potential hazard along Bonny Street and the Regent's Canal. On Bonny Street provision is made to divert surface water in the drainage strategy whilst along the canal provision is made for minimum cill levels and flood proof openings.

The construction of the basement will effectively cut the flow of groundwater across the site in the strata above the London Clay. The flow is dominated by apparent leakage from

the Regent's Canal which pushes north against the regional flow, and dissipates to the east and west. A hydrogeological study which addresses BIA concerns and examines the site in light of the more recent groundwater data concludes that changes in groundwater level around the site will be insignificant for neighbouring properties. The study also recommends appropriately conservative groundwater levels for design of the basement.

Ground movement and impact

The assessment of short and long term ground movement due to the construction of the basement has been undertaken using a combination of industry recognised methods and is considered to be an appropriately conservative approach.

The most significant impact is stated to occur at Morgan House where a 'slight' Burland Category of Damage is predicted. This is within the permitted level of impact.

It is noted that the Burland approach was developed for masonry structures. As Morgan House is understood to be a combination of masonry and steel frame, it is anticipated to be more tolerant of movement.

The impact on other neighbouring properties and infrastructure has been assessed to be minimal. The development has separate approval from Thames Water for building over the Fleet Sewer.

Monitoring

Reasonable endeavours have been made to record the existing condition of neighbouring structures and appropriate proposals for movement monitoring have been presented to control the basement works and facilitate the future assessment of impact.

Provision is made during construction for groundwater monitoring.

Provision is made for the BDE to be retained through construction to review the works.

Construction Management Plan (CMP)

A separate CMP has been formulated using Council's CMP pro forma which addresses the impact of construction traffic on local residents and businesses, and outlines the process for liaison with these stakeholders.

Maintenance of the basement

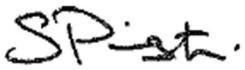
It is stated that no special measures are required for ongoing maintenance of the basement.

Conclusion

I have reviewed the DBCP (which incorporates the design plans) for this property and it is my view that it has been formulated in accordance with the requirements of the Agreement described under Clause 2.2.2.

I have arrived at this conclusion by undertaking a high-level review of the DBCP. I have not undertaken detailed checking of calculations presented in the plan.

Yours faithfully



Stuart Pennington
Senior Engineer

Enc Table 1 – Compliance with Agreement
Table 2 – Recognition of issues raised in Chelmer report

Table 1 – Compliance with Agreement

Agreement Clause	Reference	Comment
2.2.2(2)(a)	DBCP: Executive Summary	Accepted
2.2.2(2)(b)	DBCP: Section 10	Accepted
2.2.2(2)(c)	Letter by BDE	Accepted
2.2.2(2)(c)(i)	DBCP: Appendix H	Accepted
2.2.2(2)(c)(ii)	DBCP: Section 11, Appendices B, G	Accepted
2.2.2(2)(c)(iii)	DBCP: Appendices A, B, E, F	Accepted
2.2.2(2)(c)(iv)	DBCP: Section 11	Accepted
2.2.2(2)(c)(v)	No special measures	Accepted
2.2.2(2)(c)(vi)	DBCP: Section 11, Appendix G	Accepted
2.2.2(2)(c)(vii)	CMP	Accepted

Table 2 - Recognition of issues raised in Chelmer report

Chelmer Section	Reference	Comment
2.1.1	DBCP: Sections 6.1.1 to 6.1.5	Accepted
2.1.2	DBCP: Section 8	Accepted
2.2.2-2	DBCP: Section 6.1.3	Accepted
2.2.2-3	DBCP: Section 6.2, Appendix B	Accepted
2.2.3	DBCP: Section 6.1.6	Accepted
2.3.6	DBCP: Executive Summary	Accepted
2.3.8	DBCP: Appendix B	Accepted
2.3.13	DBCP: Section 4	Accepted
2.3.14 and 3.3.1-i	DBCP: Section 4	Accepted
2.3.17	DBCP: Section 3	Accepted
2.3.19 and 2.3.20	DBCP: Section 6.1.3	Accepted
2.3.19-3 and 3.2.3	DBCP: Section 10.3, Appendix J	Accepted
2.3.19-4	DBCP: Section 10.3, Appendix J	Accepted
2.3.21, 2.3.30 and 2.3.31	DBCP: Section 10.4	Accepted
2.3.23	DBCP: Sections 6, 7	Accepted
2.3.25	DBCP: Section 10	Accepted
2.3.26	DBCP: Section 10.1	Accepted
2.3.28	DBCP: Section 11, Appendix G	Accepted
2.3.29	DBCP: Section 10.5	Accepted
3.3.1-ii	DBCP: Sections 7, 10.3	Accepted
3.3.1-iii	DBCP: Appendix B	Accepted
3.3.1-iv	DBCP: Executive Summary	Accepted