CampbellReith
consulting engineers

The Hall School

23 Crossfield Street, London NW3

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-38

Revision: F2

November 2017

Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ

T:+44 (0)20 7340 1700
F:+44 (0)20 7340 1777
E:london@campbellreith.com
W:www.campbellreith.com

Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	January 2017	Comment	MLml-12466-38-250117-The Hall School-D1.doc	ML	GK	GK
F1	April 2017	Planning	MLml-12466-38-130417-The Hall School-F1.doc	ML	ADM	ADM
F2	Nov 2017	Planning – updated to consider revised BIA and objectors comments	MLemb12466-38-221117-The Hall School. F2	ML	EMB	EMB

Document Details

Last saved	23/11/2017 10:17
Path	MLemb12466-38-221117-The Hall School-F2.doc
Author	Maddalena Losito BEng MSC CEng MICE
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12466-38
Project Name	The Hall School, 23 Crossfield Street London
Planning Reference	2016/6319/P

Contents

Appendix

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for The Hall School, 23 Crossfield Street NW3 4NT (planning reference 2016/6319/P). The basement is considered to fall within Category C as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.

1.4. The BIA has been prepared by Geotechnical and Environmental Associates (GEA), with supporting documents by Elliott Wood Partnership, using individuals who possess suitable qualifications. Some discrepancies exist between the documents which should be resolved.

1.5. The site is currently occupied by The Hall School, a partly four storey and partly three storey building, including a lower ground level, with a single storey section extending across the south eastern corner of the site. It is proposed that part of the school will be demolished and a two storey basement will be constructed within the footprint of the existing buildings, utilising contiguous bored pile walls and localised underpinning.

1.6. The BIA identified the site is underlain by Made Ground over London Clay. The site specific ground investigation proved that Made Ground extends to depths between 1.00m and 3.80m below ground level. The ground water table was encountered during the site investigation in the Made Ground.

1.7. Clarifications have been received about the preliminary construction sequence, including sketches to identify methodologies to be utilised and indicative temporary works required to stabilise the excavation during the basement works.

1.8. A Ground Movement Analysis has been undertaken and damage up to Burland category 2 is predicted for one of the neighbouring structures which contravenes the Local Plan. Other structures are predicted to experience Category 0 or 1 damage, however, this cannot be confirmed as numerous questions are raised on the version presented in the October 2017 BIA.

1.9. An outline monitoring strategy has been proposed for all the structures within the development's zone of influence and includes appropriate trigger values and contingency action plans.

1.10. It is accepted that the development site will not impact upon slope stability.

1.11. It is accepted that the development will not impact on the wider hydrogeology or hydrology of the area and is at low risk of flooding. It is noted that a Drainage and SUDS Assessment has been completed that concluded SUDS strategies are not practicable to install due to site constraints. It is proposed to maintain existing rates of surface water discharge.

1.12. Numerous technical objections have been raised which have been reviewed by CampbellReith. In summary, it is not considered that the objections provide new evidence that the basement proposals will cause unacceptable damage to the structural stability of surrounding buildings or to the water environment, although the queries raised in Section 4 (and summarised in Appendix 2) require to be addressed. Additionally the construction of the working platform for the piling rig should be covered in the CMP.

1.13. Until the outstanding queries are addressed, it cannot be confirmed that the BIA meets the criteria of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 15 December 2016 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for The Hall School, 23 Crossfield Street, NW3 4NT Camden Reference 2016/6319/P. CampbellReith was instructed to undertake a further audit in November 2017 to consider an updated BIA addressing a minor revision to the scheme, and technical reports submitted on behalf of objectors to the basement proposals.

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- Local Plan adopted June 2017 (new since F1 audit issued).

2.4. The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment;

c) avoid cumulative impacts upon structural stability or the water environment in the local area, and;

evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5. LBC's Audit Instruction described the planning proposal as *"Demolition of the 'Centenary' and 'Wathan Hall' buildings and erection of new four storey building with glazed link to original school building, two storey rear extension with external terrace and enlarged basement, replacing the existing Wathan Hall, and enlargement of rear roof storey and insertion of three*

dormer windows to old school building, all in association with providing additional accommodation for the existing school use (Class D1)."

2.6. The Audit instruction also confirmed that 23 Crossfield Street is not listed, not is it a neighbour to a listed building.

2.7. Following the issue of CampbellReith's initial audit, CampbellReith accessed LBC's Planning Portal on 10 April 2017 and gained access to the following additional documents for audit purposes:

- Desk Study and Basement Impact Assessment (ref J15302, issue 2, Final revised) dated 2 March 2017 by Geotechnical and Environmental Associates (GEA).
- Planning Application Drawings consisting of Proposed Basement Propping sequence, drawing no. S-3000-P1, S-3010-P1. S-3020-P1.
- Structural and Civil Engineering Report and Basement Impact Assessment (ref 2150206, rev P5) dated March 2017 by Elliott Wood Partnership.
- Structural Calculations Basement - Preliminary (ref 2150206, rev P1) dated March 2017 by Elliott Wood Partnership.
- Movement Monitoring Report (ref 2150206, rev P1) dated March 2017 by Elliott Wood Partnership.
- Anticipated Construction Programme dated March 2017
- Letter of Response to BIA Audit dated 2 March 2017 by Geotechnical and Environmental Associates (GEA).

2.8. In November 2017 CampbellReith was instructed to review further documents and update the audit report. It should be noted that other reports both by the applicant's teams and on behalf of the objectors have been submitted to Camden, however, it is only the most recent that have been audited as they largely supersede earlier documents. The documents considered in this revised audit are listed below:

- Structural and Civil Engineering Report and Basement Impact Assessment (ref 2150206, rev P7), dated October 2017 by Elliott Wood Partnership (which includes site investigation report and Ground Movement Assessment prepared by GEA, dated October 2017.
- Residual differences of technical opinion on the BIA for Hall School, First Steps Ltd, dated 1 November 2017.
- Letter reports, Eldred Geotechnics Ltd, Ref Planning Application 2016/1639/P – 23 Crossfield Road NW3 4NU, dated 2 and 9 November 2017.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See BIA Section 9.3.
Is data required by Cl.233 of the GSD presented?	Yes	However, works programme to be provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	See Audit Paragraph 4.3.
Are suitable plan/maps included?	Yes	See GEA report Section 2.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See GEA report Section 3.1.2.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See GEA report Section 3.1.1 and 3.1.3.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See GEA report Section 3.1.1 and 3.1.3.
Is a conceptual model presented?	Yes	See GEA report Section 5 and 7.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See GEA report Section 4.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See GEA report Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See GEA report Section 4.
Is factual ground investigation data provided?	Yes	See GEA report appendix.
Is monitoring data presented?	Yes	See GEA report Section 5.3.
Is the ground investigation informed by a desk study?	Yes	Contained in GEA report.
Has a site walkover been undertaken?	Yes	See GEA report Section 1.3.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	
Is a geotechnical interpretation presented?	Yes	See GEA report Section 5, 7 & 8.
Does the geotechnical interpretation include information on retaining wall design?	Yes	See Audit Paragraph 4.5.
Are reports on other investigations required by screening and scoping presented?	Yes	FRA / Drainage Assessment.
Are the baseline conditions described, based on the GSD?	Yes	Included within BIA.
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented	Yes	See GEA report Part 3 – however significant queries are raised in Section 4 of this audit report.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Ground monitoring and temporary propping are proposed.
Has the need for monitoring during construction been considered?	Yes	See BIA Section 12.4. and Appendix 7
Have the residual (after mitigation) impacts been clearly identified?	No	There are significant queries on the GMA (see Section 4 of this audit report).
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	However significant queries are raised in Section 4 of this audit report with respect to predicted damage.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	FRA / Drainage Assessment.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	However significant queries are raised in Section 4 of this audit report with respect to predicted damage.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	Additionally, significant queries are raised in Section 4 of this audit report with respect to predicted damage.
Are non-technical summaries provided?	No	However a conclusion is provided, see GEA report Section 13.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been produced by structural engineering consultants, Elliott Wood Partnership, with support from Geotechnical and Environmental Associates (GEA). The authors possess relevant qualifications.

4.2. The proposal includes the demolition of part of the existing school building and the increase in area and depth of the single storey basement to provide a two storey basement, approximately 8 metres deep, within the proposed building footprint. The BIA states that the basement retaining wall will be formed through a combination of underpinning of the existing basement wall and a bored pile wall below the remaining footprint of the new section of the building that does not currently include a basement. The new scheme has a slightly smaller footprint than the original and proposes a combination of secant and contiguous piled wall sections.

4.3. The BIA provides outline design information of the retaining wall (i.e. pile length, diameter and spacing) and describes a typical bottom up methodology for the construction. Moreover, the proposal identifies the need for a temporary propping system and outline information is provided. It should be noted however that the form of the basement and the sequence of construction described by Elliott Wood have not been carried forward to the Ground Movement and Building Damage Assessment (Appendix 3 of the BIA). For example, there are the following discrepancies:

- The GMA refers only to a contiguous piled wall and notes that 'top down construction' is preferred.
- The mid-level (B1) slab is noted to be at 2.29m below ground level which does not agree with the BIA.

4.4. The relevant maps extracts from the Arup GSD, Camden SFRA and Environment Agency (EA) referenced in the screening process are included and it is accepted that the outcomes of the screening process have been correctly identified.

4.5. A ground investigation has been carried out by GEA through the installation of 4 no. boreholes and the investigation of surrounding party wall foundations by 5 no. trial pits. These have revealed the site stratigraphy to consist of 1.0m to 3.8m of Made Ground underlain by London Clay to depths exceeding 15m. The ground model including the strength profile is considered reasonable based on the ground investigation data. Although groundwater was monitored at shallow depth, the water encountered is considered to be perched water within the more permeable sections of the Made Ground.

4.6. Although Section 8.1 of the BIA anticipates that the impacts of groundwater will be extremely low to negligible, an allowance for dewatering will be made for perched water in the excavation

and construction of the basement through the use of strategically placed sumps with intermittent pumping. It is stated that the basement has been designed to resist buoyancy and heave. GEA recommend that groundwater monitoring is continued.

4.7. A Ground Movement Assessment has been carried out by GEA to determine the effect of the piling, underpinning and excavation on the adjoining/adjacent properties. It was accepted in the original BIA that the assumptions and the output of the assessment were in agreement with industry practice, however, a number of queries are raised with respect to the new GMA/damage assessment.

4.8. The BIA notes that the proposed basement walls will be constructed by a combination of traditional underpinning and bored piles. It is noted that the effect of the underpinning has been considered referencing CIRIA 580. Although this methodology is designed for embedded retaining walls, it is frequently used as a preliminary assessment for underpinned construction. Predicted movements for the underpinned walls have been reduced in the new GMA when compared to the original; no explanation is given to justify this alteration and, in our experience, the predicted movements are below those which would typically be associated with two stage underpinning. Justification is required.

4.9. The predicted movements due to the piled section of the basement excavation have been evaluated using Wallap and X-Disp adopting the ground movement curves for 'excavations in front of a stiff wall in stiff clay'. An adequate propping system has been proposed to confirm the assumptions made in the GMA, and the X-Disp inputs have been provided. However, in addition to the points raised in para 4.3, there are a number of further queries as follows:

- Clarification is required as to the meaning of the second para of Section 11.1.2 and also what is meant by 'control of propping' in the fourth para. Again it is noted that movements have reduced significantly from the initial assessment; they are lower than would be suggested by reference to CIRIA C760 and justification is not provided by the supporting text and assessments.

- It is noted that damage corresponding to Burland Category 2 is predicted for the garage to No 24 Crossfield Road (paras 12.1 and 12.3). This contravenes the Local Plan which states that damage is to be limited to Category 1.

- Para 12.3 also states that predicted movements can be reduced by the use of propping. However, the predictions of ground movement using both Wallap and X-Disp assume propping is in place.

- Para 13.1 indicates that the impact of a 250mm liner wall has been considered in the GMA. Clarification should be provided as to how and where this is demonstrated.

- The Wallap analysis contains numerous errors such as prop spacing (1m is appropriate only for floor slabs), the wall adhesion coefficient and the geometry of the garage

surcharge. The value of k_o adopted for the London Clay is low and could underestimate ground movements and it is not clear if the topmost temporary prop and slab will clash.

4.10. Preliminary damage assessments would suggest that whilst the retained school building and the garage to No 24 Crossfield Road could fall into the Category 2, with damage to all other structures will be restricted to Categories 0 and 1. However, this is not demonstrated by the GMA submitted.

4.11. It is noted that a robust propping system is proposed as a mitigation measure. Moreover, an observational approach with regards to monitoring is proposed together with a traffic lights system of trigger levels and contingency measures to be implemented if movements exceed the predictions, in accordance with best industry practice. Final details should be agreed once the final construction sequence is known.

4.12. The BIA had identified the potential for heave of the underlying clay soils to occur and suitable mitigation is proposed. P-Disp inputs have been provided. Heave is discussed in more detail below.

4.13. The anticipated construction programme has been submitted.

4.14. A Movement Monitoring Report has been presented, where details of the monitoring strategy and trigger levels are proposed, in agreement with industry practice. Moreover, a pre and post condition survey of the existing structures affected by the proposed basement construction has been suggested in the BIA.

4.15. It is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding.

4.16. It is noted that a Drainage and SUDS Assessment has been completed that concluded SUDS strategies are not practicable to install due to site constraints. It is proposed to maintain existing rates of surface water discharge.

4.17. As noted above, technical reports have been submitted on behalf of objectors to the scheme. Dr de Freitas of First Steps Ltd has four main objections which are that (i) the BIA does not consider the geology beneath the neighbouring structures, (ii) the flow of groundwater has been misunderstood, (iii) the soil properties ascribed are not justified and (iv), there is an unacceptable caveat to GEA's report.

4.18. With respect to the geology, reference is made by First Steps to a borehole available on the BGS website some 300m to the southwest of the site (it should be noted that neighbouring buildings are defined in Camden's Terms of Reference as those within a distance of 4 x the basement depth, i.e. c32m in this instance). It is stated that this borehole is evidence of 'hill

wash' deposits being present beneath neighbouring structures. Reference to the borehole shows that the stratum in question extends to a depth of 0.60m and is described as Topsoil. GEA have sunk four exploratory holes on site (i.e. within 32m of the neighbouring structures) and whilst there is reference to occasional sandy lenses, the logs do not appear to show significant thicknesses of significantly weaker 'hill wash' deposits. It is therefore not considered that significant new evidence has been presented.

4.19. It is stated that the flow of water has not been understood in the BIA. Reference to the Environment Agency web site shows that the site is underlain by a 'non-productive' stratum. This is defined as a deposit with "negligible significance for water supply or base flow" reflecting the low permeability of the stratum and the absence of significant volumes of water. The guidance notes provided by Arup to accompany the BIA screening process advise that whether the basement extends below the water table or not is only relevant where the site is underlain by an aquifer. On the basis of these two facts, combined with the relatively limited increase in basement width normal to postulated groundwater flow and the distance to other significant basements, it is accepted that the impact to subterranean flows has been correctly assessed in the BIA as being low.

4.20. With respect to the caveat referred to in para 12.1 of First Steps' report, this is a standard wording. CampbellReith is satisfied that GEA have adopted standard techniques of site investigation and geotechnical evaluation and it is considered that their ground model and the suggested soil parameters should give a reasonable indication of the soil's behaviour

4.21. In his letter of 2 November 2017, Mr Eldred also raises three main concerns; (i) the prediction of ground movements uses an inappropriate model, (ii) the construction of the existing basement will already have induced movements and strains and (ii) the prediction of damage is not appropriate to the construction of the neighbouring properties.

4.22. With respect to the first item, Mr Eldred appears the say that a retaining wall system can only be considered to be stiff with a top down sequence. Reference to CIRIA C760 shows that the term can be applied to walls with high level permanent and temporary props as is the case here.

4.23. It is also stated that the current basement is supported by a cantilever wall. This is not the case; the wall is propped at the top. It is accepted that the construction of the existing basement will have caused ground movement, however, notwithstanding the queries raised by this audit, it is considered that a ground movement prediction based on the full final depth of the basement should capture historic and predicted future movements.

4.24. It is accepted that the cross walls to the properties adjacent to the school building are not equivalent to deep beams, however, it is considered likely that these houses will have spine walls and that the movement and damage assessments are appropriate to those.

4.25. Further concerns are raised by Mr Eldred in his letter of 9 November. These comprise the impact of heave, the assumptions made in the GMA, practicalities of constructing a working platform for a piling rig, and the effects of concrete shrinkage.

4.26. With respect to the first and second points, it is noted that the retaining wall identified as being at risk of tilting due to heave is propped top and bottom and tied into the piled basement slab. The query on the GMA is amongst those raised in preceding sections of the audit report. Regarding concrete shrinkage, whilst we would question that the effects could result in a significant increase in movement of the basement walls, we would request that this is addressed by the applicant's structural engineer.

4.27. The question with respect to the working platform is also valid and should be addressed in the Construction Management Plan.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by a well-known firm of consultants who possess relevant qualifications and experience.

5.2. The proposed two storey basement utilises a mixture of contiguous bored piled retaining walls installed from existing ground level and underpinning of the existing single storey basement wall. Some discrepancies in the description of the substructure exist between the reports prepared by EWP and GEA.

5.3. The BIA has confirmed that the proposed basement will be founded within London Clay.

5.4. The relevant maps extracted from the Arup GSD, Camden SFRA and Environment Agency (EA) identifying the site location have been included, to support statements made in the BIA screening process.

5.5. Outline retaining wall design and a preliminary temporary works scheme including sequencing and propping sketches have been provided, in accordance with CPG4.

5.6. Damage assessments of The Hall School building and of 24 Crossfield Street would suggest that the retained school building and one of the walls of 24 Crossfield Street could fall inside the Category 2 damage category. However, significant queries are raised with respect to the modelling of ground movements.

5.7. It is noted that a robust propping system is proposed as a mitigation measure in conjunction with an observational approach with regards to monitoring and a traffic lights system of trigger levels; in accordance with best industry practice.

5.8. It is accepted that there are no slope stability concerns with respect to the development proposals.

5.9. It is accepted that the development will not impact on the wider hydrogeology or hydrology of the area and is at low risk of flooding.

5.10. It is noted that a Drainage and SUDS Assessment has been completed that concluded SUDS strategies are not practicable to install due to site constraints. It is proposed to maintain existing rates of surface water discharge.

5.11. Numerous technical objections have been raised which have been reviewed by CampbellReith. In summary, it is not considered that the objections provide new evidence that the basement proposals will cause unacceptable damage to the structural stability of surrounding buildings or to the water environment, although the queries raised in the preceding paragraphs (and

summarised in Appendix 2) require to be addressed. Additionally the construction of the working platform for the piling rig should be covered in the CMP.

5.12. Until the outstanding queries are addressed, it cannot be confirmed that the BIA meets the criteria of CPG4.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Wade	12 Crossfield Road	05/01/17	Basement excavation and effect on existing foundations of nearby buildings.	See audit paragraphs 1.8, 1.9, 4.7 and 5.6
Balint-Kurti	40 Eton Court, Eton Avenue	04/01/17	Risk of structural damage to existing garages	See audit paragraphs 1.8, 1.9, 4.7 and 5.6
Mayne	12 Crossfield Road	11/01/17	Basement excavation and effect on existing foundations of nearby buildings	See audit paragraphs 1.8, 1.9, 4.7 and 5.6
The and Loh	Flat 1, 26 Adamson Road	11/01/17	Construction of the basement excavation and effect on existing foundations of nearby buildings	See audit paragraphs 1.8, 1.9, 4.7 and 5.6
Hall School Opposition Group	Not given	Not given	Basement Construction Implications	See audit paragraphs 1.8, 1.9, 4.7 and 5.6
First Steps Ltd	Unit 17, Hurlingham Studios, Ranelagh Gardens, SW6 3PA	01/11/17	Various queries on ground and groundwater model.	See audit paragraphs 4.17 – 4.20
Eldred Geotechnics Ltd	11A Woodside, Chelsfield, Orpington, BR6 6JR	02 and 09/11/17	Various queries on ground movement assessment and structural assessment.	See audit paragraphs 4.21 – 4.28

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Proposed construction methodology and sequence not sufficiently detailed. Structural Engineer to provide indicative temporary works scheme.	Closed – Construction sequence and indicative propping scheme (as 4.3 and 4.7).	13/04/17
2	Stability	Retaining wall	Closed - Outline retaining wall design required (as 4.2 and 4.3).	13/04/17
3	Stability	Damage assessment	Closed – Damage Assessment of The Hall School building to be provided (as 4.11)	13/04/17
4	Stability	Damage assessment	Closed – X-Disp and P-Disp input to be provided (as 4.10 and 4.12).	13/04/17
5	Stability	Monitoring	Closed – Proposals for monitoring. Further detail on trigger levels and pre-condition surveys of affected assets required prior to commencement of the construction works (as 4.14).	13/04/17
6	BIA	Works Programme	Closed – an outline works programme should be provided (as 4.13).	13/04/17
7	BIA	Discrepancies in the description of the scheme and methodology exist between the EWP and GEA documents		
8	Stability	Numerous queries raised on GMA/building damage assessment contained within October 2017 BIA		
9	Stability	Consideration of concrete shrinkage required		

Appendix 3: Supplementary Supporting Documents

None

London

Friars Bridge Court
41- 45 Blackfriars Road
London, SE1 8NZ

T: +44 (0)20 7340 1700
E: london@campbellreith.com

Birmingham

Chantry House
High Street, Coleshill
Birmingham B46 3BP

T: +44 (0)1675 467 484
E: birmingham@campbellreith.com

Surrey

Raven House
29 Linkfield Lane, Redhill
Surrey RH1 1SS

T: +44 (0)1737 784 500
E: surrey@campbellreith.com

Manchester

No. 1 Marsden Street
Manchester
M2 1HW

T: +44 (0)161 819 3060
E: manchester@campbellreith.com

Bristol

Wessex House
Pixash Lane, Keynsham
Bristol BS31 1TP

T: +44 (0)117 916 1066
E: bristol@campbellreith.com

UAE

Office 705, Warsan Building
Hessa Street (East)
PO Box 28064, Dubai, UAE

T: +971 4 453 4735
E: uae@campbellreith.com