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Basement Impact Assessment
Audit

For

London Borough of Camden

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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 Network Building (95-100 Tottenham Court Road & 76-80 Whitfield Street) and 88 Whitfield Street, London, W1T 4TP (planning reference 2020/5624/P, 2020/5631/P, 2020/5638/P). The basement is considered to fall within Category B 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. For Reserved Matters Application 1 (RM01 office scheme), the Basement Impact Assessment (BIA) has been prepared and reviewed by individuals with suitable qualifications in accordance with CPG Basements. For Reserved Matters Application 2 (RM02 lab scheme), the qualifications of the individuals involved in the Basement Structures and Construction Report needs to be confirmed.

1.5. The site is roughly rectangular in plan and is currently occupied by a six-storey building. There is an existing single-storey basement occupying the majority of the building footprint.

1.6. The proposed development will involve the demolition of the existing building and construction of a new nine (RM01) or eight (RM02) storey building with a lowered single basement level across the entire footprint of the site. The new basement excavation will be, on average, up to c.6.30m deep (RM01) or c.7.50m deep (RM02).

1.7. A new secant pile wall is proposed to be cast around the perimeter of the proposed basement.

1.8. An outline construction sequence for the proposed basement, including the temporary works, is presented.

1.9. The site appears to fall within the LUL influence zone and the Crossrail 2 safeguarding zone while a number of sewer and water mains are present in proximity. An impact assessment on these assets will be required as a separate process in accordance with their owners' policies.

1.10. Screening & scoping sections are presented supported by desk study information and a site walkover, as required by CPG Basements.

1.11. A preliminary site-specific ground investigation was undertaken. Additional ground investigation is proposed by the BIA to further inform the design stages and confirm the BIA assumptions.

1.12. A groundwater flow assessment is presented. It is accepted that the proposed development is not anticipated to significantly impact the hydrogeology of the local area.

1.13. A ground movement assessment (GMA) and a monitoring strategy during construction have been presented for scheme RM01. A number of queries have been raised in this audit and need to be addressed by the applicant.

1.14. A GMA, a damage assessment, an outline monitoring strategy, outline structural calculations and a non-technical summary have not been provided and are requested for scheme RM02.

1.15. It is accepted that there will be no impact to the surface water from the proposed development.

1.16. It cannot be confirmed that the BIA complies with the requirements of CPG Basements until the queries raised in Section 4 and Appendix 2 are addressed.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 22/12/2020 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Network Building (95-100 Tottenham Court Road & 76-80 Whitfield Street) and 88 Whitfield Street, London, W1T 4TP (planning reference 2020/5624/P, 2020/5631/P, 2020/5638/P).

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

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance: Basements. March 2018.
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

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. The planning reference 2020/5624/P corresponds to an outline application described on LBC's website as "*Outline application for demolition of office building (95-100 TCR & 76-80 Whitfield St) and 7 flats (88 Whitfield Street) and construction of a new building to provide for a maximum of 17275 sqm (GIA) of 'commercial business and service' floorspace (use Class E) along with details of access, scale and landscaping and other works incidental to the application. Details of layout and appearance are reserved. CONSULTATION NOTE: Application is linked to redevelopment of 14-19 Tottenham Mews (ref 2020/5633/P) and Reserved Matters details for*

office building (ref 2020/5631/P) and Reserved Matters details for lab-enabled building (ref 2020/5638/P)".

The Reserved Matters Application 1 (RM01) with reference no 2020/5631/P is for an office scheme and is described on LBC's website as "*Reserved Matters details of layout and appearance for an office building comprising one basement level, ground floor and eight upper floors and associated cycle parking, servicing and all necessary enabling works, associated with planning application reference 2020/5624/P [for the demolition of office building (95-100 TCR & 76-80 Whitfield St) and 7 flats (88 Whitfield Street) and construction of a new building to provide for a maximum of 17275 sqm (GIA) of 'commercial business and service' floorspace (use Class E) along with details of access, scale and landscaping and other works incidental to the application']. CONSULTATION NOTE : Application is linked to an application for outline planning permission (ref 2020/5624/P) which is currently under assessment*".

The Reserved Matters Application 2 (RM02) with reference no 2020/5638/P is for a lab-enabled scheme. The LBC's Audit Instruction described the planning proposal as "*Reserved Matters details of layout and appearance for a building with lab-enabled use comprising one basement level, ground floor and seven upper floors, associated with planning application reference 2020/5624/P [for the demolition of office building (95-100 TCR & 76-80 Whitfield St) and 7 flats (88 Whitfield Street) and construction of a new building to provide for a maximum of 17275 sqm (GIA) of 'commercial business and service' floorspace (use Class E) along with details of access, scale and landscaping and other works incidental to the application']. CONSULTATION NOTE: Application is linked to an application for outline planning permission (ref 2020/5624/P) which is currently under assessment*".

The Audit Instruction did not clarify whether the subject site involved, or was a neighbour to, any listed buildings.

2.6. This audit considers the basement developments proposed under both the RM01 (office scheme) and RM02 (lab scheme) applications, as they appear to be of similar extent.

2.7. CampbellReith accessed LBC's Planning Portal on 4/1/2021 and gained access to the following relevant documents for audit purposes for the outline application:

- "Structural Engineering Report", Outline Application, 11/11/2020, Rev.P1, Elliott Wood Partnership Ltd;
- "Surface Water Drainage Statement", Outline Application, 19/11/2020, Rev.P1, Elliott Wood Partnership Ltd. It is included as Appendix B in the above Outline SER report;
- "Geotechnical and Geoenvironmental Interpretative Report" (GIR), October 2020, Rev.0, Card Geotechnics Ltd. It is included as Appendix C in the above Outline SER.

2.8. CampbellReith accessed LBC's Planning Portal on 4/1/2021 and gained access to the following relevant documents for audit purposes, for the RM01 application (office scheme):

- "Structural Engineering Report & Basement Impact Assessment" (SER), Reserved Matters Application 01, 11/11/2020, Rev.P1, Elliott Wood Partnership Ltd;
- "Preliminary Basement Impact Assessment" (Geotechnical BIA), November 2020, Rev.1, Card Geotechnics Ltd. It is included as Appendix C in the above SER report;
- Design & Access Statement, 25/11/2020, Reserved Matters 01 Office Scheme, by Piercy & Company;
- Planning Application Drawings consisting of:
    - Existing Plans, dated 25/11/2020, by Piercy & Company;
    - Demolition Plans, dated 25/11/2020, by Piercy & Company;
    - Proposed Plans, dated 25/11/2020, by Piercy & Company.

2.9. CampbellReith accessed LBC's Planning Portal on 18/1/2021 and gained access to the following relevant documents for audit purposes, for the RM02 application (lab scheme):

- "Basement Structures and Construction Report" (BSCR report), 20/11/2020, Rev.P02, AKT II Ltd;
- Design & Access Statement, Reserved Matters 02, Life Science Scheme, 25/11/2020, by Piercy & Company;
- Planning Application Drawings consisting of:
    - Proposed Plans, dated 27 & 28/10/2020, by HOK International Ltd.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	As noted	Yes for scheme RM01 (office scheme). Authors' credentials for RM02 (lab scheme) are missing and are requested.
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plan/maps included?	Yes	
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	Refer to Section 3.3 of the Geotechnical BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to Section 3.2 of the Geotechnical BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to Section 3.4 of the Geotechnical BIA.
Is a conceptual model presented?	Yes	Refer to Section 7 of the GIR.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	Refer to Section 7 of the GIR.
Is monitoring data presented?	Yes	Refer to Section 7.7.1 of the GIR.
Is the ground investigation informed by a desk study?	Yes	Refer to the GIR.
Has a site walkover been undertaken?	Yes	Refer to the GIR, Section 2.2.1.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Refer to Section 2.4 of the Geotechnical BIA.
Is a geotechnical interpretation presented?	Yes	Refer to Section 9 of the GIR.
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	As noted	A ground movement assessment is presented in the Geotechnical BIA report for RM01 (office scheme). A ground movement assessment has not been submitted for RM02 (lab scheme) and is requested.
Are the baseline conditions described, based on the GSD?	Yes	

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	As noted	Yes for scheme RM01. A GMA is missing for scheme RM02 and is requested.
Are estimates of ground movement and structural impact presented?	As noted	Refer to Sections 8 & 9 of the Geotechnical BIA for scheme RM01. A GMA and damage assessment is requested for scheme RM02.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	As noted	An impact assessment has been provided and is appropriate for scheme RM01 – with the note that queries have been raised as discussed in detail in Section 4 of this audit. An impact assessment on stability and surrounding buildings is requested for scheme RM02.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	As noted	Yes for scheme RM01. No for scheme RM02 and is requested.
Has the need for monitoring during construction been considered?	As noted	Yes for scheme RM01. However, queries have been raised in Section 4 of this audit. No for scheme RM02 and is requested.
Have the residual (after mitigation) impacts been clearly identified?	As noted	Yes for scheme RM01. No for scheme RM02 and is requested.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	For scheme RM01, queries have been raised about the ground movement and damage assessment in Section 4 of this audit. A ground movement and damage assessment is missing and is requested for scheme RM02.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	However, queries have been raised about the ground movement assessment in Section 4 of this audit.
Are non-technical summaries provided?	As noted	Yes for scheme RM01 - refer to Section 1 of the SER Report and Section 11 of the Geotechnical BIA. No for scheme RM02. It is requested.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) for scheme RM01 (office scheme) consists of a Structural Engineering Report (SER) prepared by Elliott Wood Partnership Ltd and a Preliminary Basement Impact Assessment (Geotechnical BIA) issued by Card Geotechnics Ltd. The reports for scheme RM01 have been prepared and reviewed by individuals with suitable qualifications in accordance with CPG Basements.

4.2. For RM02 (lab scheme), the Basement Structures and Construction Report (BSCR) issued by AKT II Ltd, does not present the qualifications of the individuals involved in its production. The qualifications of the authors and reviewers of that report is requested.

4.3. The site is located at 95-100 Tottenham Court Road and 76-80 Whitfield Street, termed “The Network Building”, and 88 Whitfield Street. The site is roughly rectangular in plan and is currently occupied by a six-storey office and retail building. There is an existing single-storey basement occupying the majority of the building footprint with a finished floor level (FFL) at 25.01mOD. The site is generally flat with a gentle downward slope from northwest to southeast from c.28.00mOD to 27.80mOD respectively.

4.4. The proposed development will involve the demolition of the existing building and construction of a new nine (RM01 office scheme) or eight-storey (RM02 lab scheme) building with a lowered single basement level across the entire footprint of the site.

4.5. According to available data, the plan area of the proposed basement proposed will be approximately the same for the two schemes. The main difference is that the superstructure is proposed to comprise a lightweight CLT and steel frame for the office scheme (RM01) and a concrete flat slab laboratory (RM02); therefore, the proposed building loads are anticipated to be different for the two schemes. Another difference between the two schemes, is the thickness of the raft foundation proposed and the required basement excavation to accommodate it as discussed in detail below.

4.6. The building for schemes RM01 and RM02, is proposed to be supported by a raft foundation 750mm and 1500mm thick, respectively. The increased thickness of the raft in RM02 scheme is related to the increased building weight. For scheme RM01, the proposed basement slab level will be at 22.56mOD and only locally deeper, at 20.76mOD to accommodate the proposed lift pits. The basement excavation formation level for RM01 is proposed to be at 21.61mOD. Therefore, for RM01, the new basement excavation will be about 3.30m deep in areas where the existing basement is present, and up to 6.30m deep elsewhere, and only locally up to c.8m, where the lift pits are proposed. For RM02, the proposed basement slab level will also be at 22.56mOD but due to the thicker raft proposed, the new basement excavation will be about

4.10m deep in areas where the existing basement is present, and up to 7.50m deep elsewhere. The proposed formation level for RM02 will be at 20.50mOD.

4.7. A hard/firm cut-off secant pile wall consisting of 600mm diameter piles with a male to male spacing of 750mm c/c for RM01 (800mm c/c for RM02) is proposed to be cast around the perimeter of the proposed basement and inside the perimeter of the existing basement wall, where the latter is present. The proposed secant pile wall will be designed to resist lateral loads only and is proposed to be propped in the temporary case for both schemes. It is proposed to be installed from a piling platform level at 27.00mOD which is anticipated to be formed by backfilling the existing basement footprint after the demolition works are completed. The secant piled wall will be supported by the foundation raft and the ground floor slab in the long term.

4.8. For scheme RM01, an outline construction sequence for the proposed basement, including the temporary works required, is discussed in Section 5.1 and further presented in drawings in Appendix B of the SER. Similarly, for scheme RM02, an outline construction sequence is presented in Section 5 and drawings are attached in Appendix 1 of the BSCR report.

4.9. According to the Geotechnical BIA report (RM01), the site appears to fall within the LUL influence zone and the Crossrail 2 safeguarding zone while a number of sewer and water mains are present in proximity. These site constraints are also discussed in Section 2.3 of the BSCR, for RM02. An impact assessment on these assets will be required in accordance with the respective asset owner's policies and shall form separate submissions for whichever scheme is progressed to the next stage. Such an impact assessment check is outside the remit of this audit report.

4.10. Screening charts for the hydrogeology, land stability and hydrology of the site are included in Sections 3.2 to 3.4 of the Geotechnical BIA report. Scoping sections are included in Section 4 and are supported by desk study information and a site walkover, as required by CPG Basements. This information is considered relevant for both schemes.

4.11. A preliminary site-specific ground investigation (GI) was undertaken, as part of a phased site investigation approach, and a Geotechnical and Geoenvironmental Interpretative Report has been provided, relevant to both schemes considered. The site specific GI comprised two boreholes to 10m and 30m depth and three hand-dug foundation inspection pits within the existing basement. The GI recorded on average Made Ground to 2.50m depth over Lynch Hill Gravel Member to 4.50m depth over London Clay to 23m depth over Lambeth Group. For RM02, the ground model assumed in Appendix 3 – "Geotechnical Design Note" appears inconsistent (table vs cross section) with regard to the top of the River Terrace Gravels and London Clay strata, and this shall be amended.

4.12. Additional ground investigation is proposed by the Geotechnical BIA for scheme RM01, in the form of four foundation inspection pits and one additional 30m borehole in the eastern part of the site along with three wall and slab non-destructive scans, in order to determine the party wall foundation relationship with the Qube building to the north, validate the ground model and further de-risk the site. According to the Geotechnical BIA, the additional investigation will inform the final design and a final Basement Impact Assessment for scheme RM01. The same comments and proposal of the Geotechnical BIA for scheme RM01, for additional investigation, are applicable to scheme RM02.

4.13. Groundwater strikes encountered during the investigation works and subsequent monitoring readings indicate that groundwater rests at or below 23.62mOD and this elevation has been taken as the design water level for RM01. For RM02, a deeper groundwater level was assumed (22mOD) and this is requested to be clarified as it is not a moderately conservative assumption.

4.14. A groundwater flow assessment is presented in Section 7 of the Geotechnical BIA for scheme RM01, which is also considered applicable to scheme RM02. It is anticipated that the groundwater will flow around the proposed basement due to the relatively high lateral permeability of the Lynch Hill Gravel Member. However, it is recommended that this preliminary conclusion is confirmed in the light of the monitoring data obtained from the proposed additional ground investigation and monitoring. For the purposes of this BIA audit and based on the data currently available, it is accepted that the proposed development is not anticipated to significantly impact the hydrogeology of the local area.

4.15. A ground movement assessment (GMA) has been presented in the Geotechnical BIA report for scheme RM01. The ground movements due to demolition works, installation of the proposed secant piled wall, excavation of the basement, application of the proposed structural loads, short and long term conditions have been considered in the GMA. Proprietary software (Pdisp, Wallap) was used together with a modified CIRIA C760 methodology for the assessment of ground movements due to wall installation. Relevant ground movement contour plans and graphs have been produced and are attached in the Geotechnical BIA report.

4.16. Neither a GMA nor a damage assessment have been submitted for scheme RM02 and are requested. Due to the deeper excavation proposed (in order to accommodate the thicker raft foundation), the different anticipated building loads and the different number of temporary prop levels (1 no prop row in RM01 vs 2 no prop rows in RM02), the GMA and damage assessment provided for RM01 is not appropriate for RM02.

4.17. The comments made in the following paragraphs refer to the GMA for scheme RM01.

4.18. In the GMA, horizontal and vertical ground movements due to the installation of the proposed secant piled wall have been assumed to be equal to 0.02% of wall length, based on a case

study paper by Ball et al. (2014), which are significantly lower than those suggested by CIRIA C760 (0.08% and 0.05% for horizontal and vertical movements, respectively). The case study by Ball et al., refers to a contiguous piled wall consisting of 300mm diameter piles as opposed to a secant piled wall proposed for this site (i.e. tighter pile layout is proposed for this site) consisting of 600mm diameter piles (i.e. double size piles are proposed at this site). It is requested that additional relevant case studies and information are provided to support the anticipated ground movements or a sensitivity analysis be undertaken with regard to the anticipated ground movements due to wall installation by adopting the moderately conservative approach suggested by CIRIA C760.

4.19. Further, the GMA shall be reviewed in accordance with the following comments:

A construction sequence commencing at a level of 27mOD is proposed (level of proposed piling platform), however, in some locations the basement excavation will start at c.28mOD given the level of surrounding areas (footpaths and highways). Clarification is requested as to the impact of any enabling works required to achieve the piling platform level and confirmation that the current GMA is valid for the deeper excavation. The enabling works shall be included in the construction sequence.

The basement layout considered in Figure 2 of the GMA is of a smaller extent towards the northern-central area of the site when compared to the latest architectural drawings dated 25/11/2020. However, the basement excavation considered in Figure 6 of the GMA seems to match that proposed by the Architect and the structural proposal. Confirmation is required that the correct extent of the basement excavation has been considered in the GMA and in accordance with the latest proposal.

The Wallap analysis assumes a secant piled wall installed at 27mOD with a temporary propping frame installed at a higher elevation (27.5mOD). A clarification is required whether it is intended to install a temporary support at a higher level.

Convergence errors are noted in the output of Wallap analysis for critical section 3 and these should be reviewed and corrected as required.

Figure 19 of the GMA indicates L/H=2.08 while the main text states L/H=1.78 for the Qube building. A clarification/amendment is required.

4.20. The GMA confirms that the anticipated structural damage to the Qube building to the north of the site will be within Category 1 of Burland Scale. Maximum vertical and horizontal ground movements of 11mm and 4mm are suggested by the GMA for the surrounding highways namely Tottenham Court Road, Howland Street, Whitfield Street, stating also that these values are not expected to significantly affect the roadways considered. The damage assessment

presented in the GMA shall be revised, as necessary, in accordance with the comments discussed in the previous paragraphs.

4.21. Section 10 of the GMA proposes a monitoring strategy to be applied during construction with predefined ground movement trigger levels in accordance with the Observational Method of CIRIA Report 185. However, CIRIA's Observational Method is relevant mainly to the design method, not the monitoring strategy. It is understood that the design at the site will be undertaken by use of calculation, not by use of the Observational Method. Also, the trigger levels adopted during construction shall be informed by the ground movements predicted in the GMA. Clarifications and amendments are requested.

4.22. Monitoring of all structures and infrastructure is also recommended by the SER (scheme RM01) during excavation and construction. It is requested that monitoring is also undertaken during the demolition and enabling works stages to confirm the conclusions of the GMA.

4.23. The proposed basement plan and wall sections attached to the Geotechnical BIA (scheme RM01) indicate 450mm diameter piles at 600mm c/c which contradicts the structural proposal and the main text of the Geotechnical BIA report for 600mm diameter piles at 750mm c/c for the male piles. An amendment is required.

4.24. An outline monitoring strategy and outline structural calculations shall be provided for scheme RM02.

4.25. The site is located within Flood Zone 1 and is not located in an area identified by the London Borough of Camden as a Local Flood Risk Zone. A Surface Water Drainage Statement has been provided which includes a SuDS strategy. The latter allows for blue and green roof systems along with drainage into the existing sewer, which is anticipated to provide an improvement of the run-off compared to the existing situation. It is accepted that there will be no impact to the surface water from the proposed development. Drainage into the existing sewer will require permission from Thames Water.

4.26. A non-technical summary has not been submitted and is requested for scheme RM02, in accordance with LBC guidance.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) for scheme RM01, has been prepared and reviewed by individuals with suitable qualifications in accordance with CPG Basements.

5.2. The qualifications of the individuals involved in the production of the BSCR for RM02 (lab scheme) shall be presented.

5.3. The site is roughly rectangular in plan and is currently occupied by a six-storey building. There is an existing single-storey basement occupying the majority of the building footprint.

5.4. The proposed development will involve the demolition of the existing building and construction of a new nine (scheme RM01) or eight (scheme RM02) storey building with a lowered single basement level across the entire footprint of the site. On average, the new basement excavation will be up to c.6.30m deep (RM01) or c.7.50m deep (RM02).

5.5. Different building loads, thickness of raft foundation, basement excavation depth and levels of temporary propping are proposed for the two schemes.

5.6. A new secant pile wall is proposed to be cast around the perimeter of the proposed basement.

5.7. An outline construction sequence for the proposed basement, including the temporary works, is presented for both schemes.

5.8. The site appears to fall within the LUL influence zone and the Crossrail 2 safeguarding zone while a number of sewer and water mains are present in proximity. An impact assessment on these assets will be required as a separate process in accordance with their owners' policies.

5.9. Screening & scoping sections are presented, supported by desk study information and a site walkover, as required by CPG Basements.

5.10. A preliminary site-specific ground investigation (GI) was undertaken. Additional ground investigation is proposed by the Geotechnical BIA to further inform the next stage of the design and confirm the assumptions of the BIA.

5.11. The ground model assumed in the BSCR report (scheme RM02) needs to be clarified.

5.12. It is accepted that the proposed development is not anticipated to significantly impact the hydrogeology of the local area.

5.13. For RM02, a deeper design groundwater level was assumed compared to what the monitoring data suggest and this shall be reviewed.

5.14. A ground movement assessment and a monitoring strategy during construction have been presented for scheme RM01. Queries have been raised in this audit which need to be addressed by the applicant.

5.15. A ground movement and damage assessment has not been submitted and is requested for scheme RM02.

5.16. An outline monitoring strategy and outline structural calculations shall be provided for scheme RM02.

5.17. It is accepted that there will be no impact to the surface water from the proposed development.

5.18. A non-technical summary has not been submitted and is requested for scheme RM02.

5.19. It cannot be confirmed that the BIA complies with the requirements of CPG Basements until the queries raised in Section 4 and Appendix 2 are addressed.

Appendix 1: Residents' Consultation Comments

None pertinent to the BIA

Appendix 2: Audit Query Tracker

Audit Query Tracker – Scheme RM01 (Office Scheme)

Query No	Subject	Query	Status	Date closed out
1	Stability	Additional information shall be provided to support the suggested by the GMA reduction of the anticipated ground movements due to wall installation or a sensitivity analysis be undertaken using CIRIA C760 curves – Audit Section 4.18.	Open	
2	Stability	Construction sequence to include enabling works and temporary works required to achieve pile platform level and support external ground levels – Audit Section 4.19.		
3	Stability	A clarification is required regarding the validity of the GMA given the construction sequence starts at 27mOD while some surrounding areas are at c.28mOD – Audit Section 4.19.	Open	
4	Stability	The basement layout considered in Figure 2 of the GMA is of a smaller extent to the current proposal. A clarification is required - Audit Section 4.19.	Open	
5	Stability	Convergence error messages in Wallap analysis shall be clarified/amended - Audit Section 4.19.	Open	
6	Stability	Contradictory information about the ratio L/H considered for Qube building in the GMA shall be clarified - Audit Section 4.19.	Open	
7	Stability	The proposed Observation Method shall be clarified. The ground movement trigger values shall be informed by the GMA - Audit Section 4.21.		
8	Stability	Monitoring during the demolition and enabling works stages is requested to be added in the monitoring strategy – Audit Section 4.22.	Open	
9	Stability	Inconsistencies encountered in the proposed basement plan and wall sections attached to the Geotechnical BIA shall be amended – Audit Section 4.23.	Open	
10	Stability	An impact assessment on third parties assets (LUL, Thames Water etc.) will be required in accordance with the respective asset owner's policies – Audit Section 4.9.	Note	N/A

Audit Query Tracker – Scheme RM02 (Lab Scheme)

Query No	Subject	Query	Status	Date closed out
1	BIA	The qualifications of the individuals involved in the preparation of the BSCR are requested – Audit Section 4.2.	Open	
2	BIA	The ground model assumed in the BSCR report (scheme RM02) needs to be clarified – Audit Section 4.11.	Open	
3	Hydrogeology	The deeper design groundwater level assumed in the BSCR compared to what the monitoring data suggest shall be clarified – Audit Section 4.13.	Open	
4	Stability	A ground movement and damage assessment has not been submitted and is requested – Audit Section 4.16.	Open	
5	Stability	An outline monitoring strategy and outline structural calculations shall be provided – Audit Section 4.24.	Open	
6	BIA	A non-technical summary is requested – Audit Section 4.26.	Open	
7	Stability	An impact assessment on third parties assets (LUL, Thames Water etc.) will be required in accordance with the respective asset owner's policies – Audit Section 4.9.	Note	N/A

Appendix 3: Supplementary Supporting Documents

None

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