CampbellReith
consulting engineers

2 - 6 St Pancras Way, London, NW1 0TB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-06

Revision: F1

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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 2-6 St Pancras Way, London, NW1 0TB (planning reference 2021/2671/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. CampbellReith previously audited a basement scheme at the site (audit ref 12727-14, March 2018; planning reference 2017/5497/P). The previous audit recommended that a Basement Construction Plan (BCP) was implemented.

1.4. The proposed redevelopment will involve the demolition of the existing building and erection of 6 new buildings ranging in height from 2 storeys to 12 storeys in height above ground and two basement levels.

1.5. The proposed development scheme is considered to broadly reflect the previously audited scheme. As such, this audit will only address the amendments, which result in an increase in proposed basement depth over part of the site.

1.6. The previous audit noted a recommendation for a BCP to be implemented, due to the scale and complexity of the proposed development, to ensure a robust monitoring methodology was employed to control the works, and to confirm the hydrogeological assessment. The requirement for a BCP is similarly recommended.

1.7. Screening and scoping assessments are presented, and generally accepted.

1.8. Site investigation data and geotechnical interpretation is presented. The site investigation report recommends further groundwater monitoring, which should be presented and assessed within the BCP.

1.9. Outline construction methodology and temporary works information is provided. This should be confirmed within the BCP.

1.10. A Ground Movement Assessment (GMA) has been undertaken. Damage to neighbouring structures is assessed as within Category 1 (Very Slight) in accordance with the Burland Scale.

1.11. The GMA also assesses potential impacts to nearby utility assets, including Thames Water assets. These should be discussed with the relevant authority responsible for each asset and protection criteria agreed.

1.12. An outline structural monitoring proposal is presented. This should be confirmed with the BCP.

1.13. The site is within a Critical Drainage Area (Group 3-003) and on the boundary of Kings Cross Flood Risk Zone. The Flood Risk Assessment confirms the site is predominantly at a low risk of flooding from all sources. Standard flood risk mitigation measures should be implemented within the final design.

1.14. The development will not increase the impermeable area across the site. A SUDS assessment is presented. Off-site drainage flows will be attenuated in accordance with LBC guidance, which will provide a benefit to the wider hydrological environment. Final drainage design should be agreed with Thames Water, LBC and the Canal & River Trust.

1.15. The BIA is considered to meet the criteria of CPG Basements, subject to the implementation of the recommended BCP.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 28 June 2021 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 2-6 St Pancras Way, London, NW1 0TB, Camden Reference 2021/2671/P. CampbellReith previously audited a basement scheme at the site (ref 12727-14, March 2018) in relation to planning application reference 2017/5497/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:

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG): Basements. January 2021
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- The Local Plan (2017): Policy A5 (Basements).

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; and,

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 existing building, and redevelopment to provide a nine-storey building with two basement levels for flexible Class E and Sui Generis Use, a two-storey Pavilion for flexible Class E and Sui Generis Use, along with associated cycle parking, servicing, hard and soft landscaping, public realm, and other ancillary*

works, alongside amendments to Plot C within planning permission 2017/5497/P, namely increase of affordable housing provision."

2.6. The proposal is located within the Regent's Canal Conservation Area; however, the proposal does not involve a listed building nor is it a neighbour to a listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 10 July 2021 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (Version F) for Plot B dated May 2021 by GD Partnership including:
    - Geoenvironmental and Geotechnical Site Investigation Report (Ref 371654-01 (01)) dated August 2019 by RSK Environment Ltd.
    - Ground Movement and Building Damage Assessment Report (Ref 371654-02 (01)) dated August 2020 by RSK Environment Ltd.
    - Thames Water Asset Assessment Report (Ref 371654-03(03)) dated December 2020 by RSK Environment Ltd.
    - Flood Risk Assessment and SuDS Strategy (Rev C) dated March 2018.
    - The Structural Engineer, Volume 63A/No. 4, dated April 1985: The Granary Site: design and construction of a mechanised letter-sorting office (referred to as IStructE papers).
- Application Drawings - Proposed plans of elevations, floor plans and sections dated May 2021 by Bennetts Associates Architects.
- Transformation of the Ugly Brown Building (Ref 1603_RP_005) dated May 2021 by Bennetts Associates Architects.
- Letter from RSK Environment Ltd to GD Partnership Ltd on Retaining Wall Assessment (ref 371654-L01 (00)) dated 19th May 2020.
- Arboricultural Impact Assessment (ref 9298_AIA.001 Rev E) dated March 2018 by Aspect Arboriculture.
- Planning Statement for Plot B and C (ref DP4133) dated May 2021 by DP9 Limited.
- Outline Construction Management Plan (ref WIE11701-100-R-6-7-1-OCMP) dated May 2021 by Waterman Infrastructure & Environment Ltd.

- Historic Environment Desk Based Assessment (ref WIE1170) dated August 2017 by Waterman Infrastructure & Environment Ltd.
- Preliminary Risk Assessment (Contamination) (ref E12897/1) dated June 2017 by DTS Raeburn.
- Comments on the proposed development from Historic England, Canal and River Trust, Transport for London and Thames Water.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	Whilst the preliminary hydrogeological assessment is accepted, a Chartered Geologist should review the final assessment within the required Basement Construction Plan (BCP).
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 plans/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	BIA Report, Section 3, Table 3.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Report, Section 3, Table 2.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Report, Section 3, Table 1.
Is a conceptual model presented?	Yes	Figure 10 of Geoenvironmental and Geotechnical Site Investigation Report (BIA Report, Appendix 3).

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 4.3.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 4.2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 4.1. Flood Risk Assessment / SUDS assessment provided.
Is factual ground investigation data provided?	Yes	BIA Report, Appendix 3, Geoenvironmental and Geotechnical Site Investigation Report. Also published IStructE papers from construction of current development.
Is monitoring data presented?	Yes	Groundwater monitoring results in Section 9.2.2 and Appendices J and K of Geoenvironmental and Geotechnical Site Investigation Report (BIA Report, Appendix 3).
Is the ground investigation informed by a desk study?	Yes	Preliminary Risk Assessment report by DTS Raeburn Ltd.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA Report, Section 6, Table 4a.
Is a geotechnical interpretation presented?	Yes	BIA Report, Appendix 3, Section 13 of Geoenvironmental and Geotechnical Site Investigation Report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Letter from RSK Environment Ltd to GD Partnership Ltd on Retaining Wall Assessment (ref 371654-L01 (00)) dated 19th May 2020.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Movement and Building Damage Assessment Report, Thames Water Asset Assessment Report, Flood Risk Assessment including SUDS Strategy and Arboricultural Impact Assessment provided.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	As above.
Is an Impact Assessment provided?	Yes	BIA Report, Section 6.
Are estimates of ground movement and structural impact presented?	Yes	Ground Movement and Building Damage Assessment Report and Thames Water Asset Assessment Report by RSK Environment Ltd.
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	
Has the need for monitoring during construction been considered?	Yes	BIA, Report, Section 7.
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	SUDS assessment.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Ground Movement and Building Damage Assessment Report
Are non-technical summaries provided?	Yes	BIA Report.

4.0 DISCUSSION

4.1. CampbellReith previously audited a basement scheme at the site (ref 12727-14, March 2018) in relation to planning application reference 2017/5497/P. This permission granted consent for the use of Plot B as a nine-storey building with a single basement which would be used as a hotel at lower levels with office use above. A new proposal for Plot B and Plot C4 has been submitted which will remove the hotel and create a building comprising commercial space only with an upper and lower basement.

4.2. The previous audit recommended that a Basement Construction Plan (BCP) was implemented, due to the scale and complexity of the proposed development, to ensure a robust monitoring methodology was employed to control the works, and to confirm the hydrogeological assessment. The requirement for a BCP is similarly recommended.

4.3. The BIA has been prepared by GD Partnership Ltd with supporting documents prepared by RSK Environment Ltd, Waterman Infrastructure & Environment Ltd and Bennetts Associates Architects. The authors' qualifications for stability and hydrological assessments have been demonstrated, in accordance with LBC guidance. Whilst the preliminary hydrogeological assessment is accepted, a Chartered Geologist should review the final assessment within the recommended BCP.

4.4. The site is currently occupied by a 4 to 5 storey concrete structure known as the 'Ugly Brown Building'. The proposed redevelopment will involve the demolition of the existing building and erection of 6 new buildings ranging in height from 2 storeys to 12 storeys in height above ground and two basement levels comprising a mixed-use business floorspace, residential, gym, flexible retail and storage space development with associated landscaping works.

4.5. The development has been split into Plots A, B, C1, C2 and C3. Plot A will be built in place of the existing administration building, Plot B which is currently the existing Ted Baker Building will be re-built as offices and Plot C will occupy the existing Verizon digital building. The BIA submitted as part of the current application (dated May 2021) relates to plot B only as it is understood that a separate application for amendments to Plot A was submitted in March 2021 and the changes to Plot C will have no impact on the basement.

4.6. The proposed basement level at the site varies from 13.40m to 18.00m AOD. The adjacent canal water level is at 23.13m AOD and canal bed is at 21.15m AOD. Plot A will have a single basement level (at the north of the site), and plots B and C will have two basements with lower basement level proposed to be at 13.40m AOD (at the south of the site).

4.7. The BIA includes the majority of the information required from a desk study in line with the GSD Appendix G1. A conceptual model is provided within the Geoenvironmental and Geotechnical Site Investigation.

4.8. The Screening and Scoping assessments are generally accepted.

4.9. A site investigation was undertaken by RSK Environment Ltd in January 2019. The investigation comprised 8 no. machine excavated trial pits dug to a maximum depth of 2.40m bgl, 13 no. cable percussive boreholes drilled to a maximum depth of 40.00m bgl and 6 no. shallow boreholes were drilled by windowless dynamic sampler techniques to a maximum depth of 5.45m bgl. The site is underlain by a variable thickness of Made Ground over London Clay Formation with the Lower Mottled Beds of the Lambeth Group encountered at depth.

4.10. In addition, reference to published IStructE papers indicates that the former Granary building that occupied the site was founded upon a concrete raft foundation that was placed directly upon London Clay, approximately 6.00m below the canal water level.

4.11. Geotechnical data is presented in an interpretative report in accordance with GSD Appendix G3. Geotechnical parameters for retaining wall and foundation design have been provided.

4.12. Groundwater encountered during the investigation manifested as seepages within the London Clay Formation and as perched water within the Made Ground. Groundwater monitoring was undertaken on a monthly basis from March through until August 2019, typically within 5.00m bgl. The site investigation report recommends that on-going monitoring would be required to establish both the full range of conditions and any trends in groundwater levels. This should be reported and assessed within the BCP.

4.13. The formation levels of the new basements are anticipated to lie within the firm/stiff London Clay Formation. The BIA states that “waterproofing protection measures should be designed on the basis of water to the full height of the retained ground, unless effective drainage measures can be ensured.”

4.14. RSK Environment have undertaken an assessment of the likely ground movements and associated potential impacts to local Thames Water (TW) sewer assets that will result from the redevelopment of the site. Thames Water assets are known to run below the site: an existing ~2100 mm diameter (ID) Thames Water (TW) brick sewer, formerly part of London historic sewer system, which bisects the site beneath the northern part of the site; an existing ~1200 mm diameter becoming 1100 mm (ID) Thames Water brick sewer (Culverted River Fleet), which is located beneath St Pancras Way; an existing 4” cast iron clean water asset located beneath St Pancras Way and an existing ~400mm ductile iron foul water connection from the site (located between Plot A and B), joining into the ~1200mm Thames Water brick sewer in St Pancras Way.

4.15. The impact assessment should be presented to TW and asset protection criteria agreed. It is recommended that as part of the development and construction programme a robust monitoring scheme is adopted to check for impacts on the utility assets from the development.

4.16. Similarly, prior to construction, appropriate survey to confirm the location of all other utilities / underground infrastructure within the zone of influence should be undertaken, with potential impacts to those assets assessed and asset protection agreements entered into, where required.

4.17. The ground movement assessment (GMA) also considered neighbouring buildings within the zone of influence of the proposed works. The GMA was carried using industry standard software (PDisp and XDisp). Movements caused by demolition were calculated using PDisp assuming loads applied to an equivalent raft foundation. These movements were then imported into XDisp to calculate movements due to the piled wall installation and basement excavation. From the GMA, the adjacent buildings were all assessed as sustaining a maximum of Category 1 damage (Very Slight) in accordance with the Burland Scale.

4.18. An outline structural monitoring strategy is proposed in the BIA. This should be reviewed and confirmed within the BCP, sufficient to demonstrate that construction will be controlled and damage to neighbours will be a maximum of Category 1.

4.19. The site is within a Critical Drainage Area (Group 3-003) and on the boundary of Kings Cross Flood Risk Zone. The Flood Risk Assessment confirms the site is predominantly at a low risk of flooding from all sources. The current medium risk areas along the canal are due to the existing walkway along that side of the building, currently set 2m below the top of the canal bank. This walkway will no longer exist in the proposed development. Standard flood risk mitigation measures should be implemented within the final design.

4.20. The development will not increase the impermeable area across the site. A SUDS assessment is presented. Off-site drainage flows will be attenuated in accordance with LBC guidance, which will provide a benefit to the wider hydrological environment. However, current proposals include some drainage discharge to the Regent Canal, subject to the consent of the Canal & River Trust. It is noted that the Trust has raised concerns regarding specific discharge arrangements, including ensuring water quality. Final drainage design should be agreed with Thames Water, LBC and the Canal & River Trust.

4.21. It is also noted that the Canal & River Trust have asked for a condition to be attached to the application to ensure that the structural integrity of the Regent's Canal is retained. The condition is: "Prior to the commencement of the development hereby approved, a survey of the condition of the waterway wall, and a method statement and schedule of works identified shall be submitted to and approved in writing by the Local Planning Authority. Any heritage features and materials identified by the survey shall be made available for inspection by the Canal & River Trust. The repair works identified shall be carried out in accordance with the agreed method statement and repairs schedule by a date to be confirmed in the repairs schedule."

4.22. An outline construction programme is provided within section 2.3 of the BIA Report in addition to the Outline Construction Management Plan prepared by Waterman Infrastructure & Environment Ltd.

5.0 CONCLUSIONS

5.1. The author's qualifications and experience have been accepted for the preliminary assessment. Within the recommended BCP, a Chartered Geologist should confirm the hydrogeological assessment.

5.2. The BIA includes the majority of the information required from a desk study in line with LBC guidance.

5.3. The Screening and Scoping assessments are generally accepted.

5.4. Site investigation and geotechnical parameters have been presented. Further groundwater monitoring has been recommended, and this should be reported and assessed within the BCP.

5.5. It is accepted that the site is not in a Flood Risk Zone and is at low risk of flooding from all sources.

5.6. The site is within a Critical Drainage Area (Group 3-003). A SUDS assessment is presented. Off-site drainage flows will be attenuated in accordance with LBC guidance, which will provide a benefit to the wider hydrological environment.

5.7. In the BIA, contiguous piled retaining walls with stiff popping are confirmed as the proposed construction method. The design should be confirmed within the BCP.

5.8. A preliminary GMA is presented by RSK that concludes that damage to neighbours should be feasibly maintained within Category 1 (Very Slight), in accordance with the Burland Scale.

5.9. An outline structural monitoring strategy is proposed in the updated BIA. This should be reviewed and confirmed within the BCP.

5.10. The requirements of CPG Basements have been met, subject to submission of the recommended BCP to confirm assessments and design prior to construction.

Appendix 1: Consultation Comments

Consultation Comments

Surname	Address	Date	Issue raised	Response
Canal & River Trust	Fradley Junction, Alrewas, Burton-Upon-Trent, Staffordshire, DE13 7DN	21/06/21	The Canal & River Trust have asked for a condition to be attached to the application to ensure that the structural integrity of the Regent's Canal is retained. The condition is: "Prior to the commencement of the development hereby approved, a survey of the condition of the waterway wall, and a method statement and schedule of works identified shall be submitted to and approved in writing by the Local Planning Authority. Any heritage features and materials identified by the survey shall be made available for inspection by the Canal & River Trust. The repair works identified shall be carried out in accordance with the agreed method statement and repairs schedule by a date to be confirmed in the repairs schedule."	Section 4
Thames Water	Via email	02/07/21	Various conditions requested relating to foul water drainage, surface water drainage, sewage flooding, trade effluent consent, existing water network infrastructure and underground assets.	Section 4

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Author's qualifications	The authors' qualifications should be demonstrated in accordance with CPG Basements for the hydrogeological assessment.	Open – See Section 4.3.	N/A - Hydrgeological review by CGeol to be demonstrated in BCP.
2	Hydrogeology	Further groundwater monitoring to be undertaken as per the recommendations of the site investigation report.	Open – See section 4.12.	N/A – BCP recommended
3	Land stability	Temporary works strategy and design with associated monitoring strategy for control of construction should be confirmed.	Open – See Section 4.18.	N/A – BCP recommended
4	Land stability	The impact assessment undertaken to determine damages to nearby sewers should be presented to Thames Water and asset protection criteria agreed. It is recommended that as part of the development and construction programme a robust monitoring scheme is adopted to check for impacts on the utility assets from the development.	Note only – See Section 4.15.	N/A

Appendix 3: Supplementary Supporting Documents

None

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