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369-377 Kentish Own Road
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Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12985-43
Revision: F1

June 2019

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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 369-377 Kentish Town Road, London, NW5 2TJ (planning reference 2019/0910/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 (BIA) 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 carried out by individuals with suitable qualifications.

1.5. The basement proposal does not involve nor is adjacent to a listed building.

1.6. The proposed development comprises the demolition of the existing structures and construction of a new building covering the majority of the site of 7 storeys plus single storey basement. The site footprint is triangular in shape and is limited by a railway cutting to the south, Kentish Town Road to the north and 379 Kentish Town Road to the west. Two London Underground lines are located approximately 6m to the north of the northern site boundary.

1.7. A site specific desk study and ground investigation has been carried out and a ground model presented. The ground conditions comprise a variable thickness of Made Ground overlying London Clay. Groundwater was discovered during the investigations.

1.8. The BIA indicated that the only neighbouring property, number 379, does not have a basement.

1.9. A ground movement assessment (GMA) has been carried out and the potential damage to the neighbouring structure assessed. The BIA states that the category of damage will not exceed Burland Category 1 (Very Slight).

1.10. The GMA concludes that the proposal does not pose a significant risk to the pavements, nor the services within the pavements. A utilities search was undertaken and two Thames Water sewers were identified in the vicinity of the proposed development. Although these appear to be outside the influence zone, asset owners should be consulted.

1.11. A preliminary assessment of potential impacts to the Network Rail retaining wall and tracks was undertaken. Network Rail should be consulted and an asset protection agreement entered into, as required.

1.12. To the north, the LUL tunnels are located deeper than the proposed structures and 6m to the north of the northern boundary. LUL should be consulted and an asset protection agreement entered into, as required.

1.13. Although the screening stage did not identify it, the site is located in the vicinity of an historic "lost river". As no alluvial soils were identified in the site investigation boreholes, it is accepted that the proposed works will not impact the wider hydrogeological environment.

1.14. There will be no change to impermeable site area. Attenuation SUDS is proposed. The proposed works will not impact the wider hydrological environment.

1.15. A flood risk assessment was completed confirming that the risk of flooding is low.

1.16. An outline construction programme should be presented.

1.17. It can be confirmed that the BIA complies with the requirements of CPG Basements, with discussion presented in section 4

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 28/02/2019 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 369-377 Kentish Town Road, London, NW5 2TJ, reference 2019/0910/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 Basements. March 2018.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- Local Plan 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;

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

d) 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 "*Redevelopment including change of use from car wash (Sui Generis) and erection of part six and part seven storey building plus basement to provide 14 flats (10 x 2-bed units and 4 x 1-bed) (Class C3) at 1st floor and above (with terraces at 5th floor rear and 6th floor level (north elevation); and retail (Class A1) or restaurant (Class A3) use at ground and basement level incorporating widened pavement to Kentish Town Road.*"

2.6. CampbellReith accessed LBC's Planning Portal on 13/03/2019 and gained access to the following relevant documents for audit purposes:

- Design Study & Basement Impact Assessment Report (BIA) parts 1, 2 and 3, by CGL document reference CG/28407, Feb. 2019 including:

  Appendix A: Proposed development plans (Price&Myers pages 090, 100, 110, 120-150, 160, 170 and 200)

  Appendix B: Topographical Survey, Greenhatch Group, 28520_01_PS

  Appendix C: Historical Network Rail drawings

  Appendix D: LUL asset report

  Appendix E: Construction Sequence, Price&Myers, CM01, Dec. 2018

  Appendix F: OS historical Maps

  Appendix G: BGS Boreholes record

  Appendix H: Flood risk assessment, Price&Myers, Jan. 2019, version 01

  Appendix I: CGL boreholes records

  Appendix J: Geotech. Test results

  Appendix K: proposed building pile loads

  Appendix L: WALLAP ret. wall analysis results

  Appendix M: Masonry gravity ret. wall surcharge model

- Planning Application Drawings consisting of:

  Location Plan (dMFK drawing A05)

  Proposed Plans (dMFK drawings A90, A100, A101, A105, A106 and A107)

- Design & Access Statement parts 2 and 3 (dMFK)

- Planning Comments and Responses

2.7. CampbellReith were issued the following relevant documents for audit purposes in June 2019:

- Basement Impact Assessment (BIA) – Revision 1, by CGL, doc. ref. CG/28407, June 2019Technical Note by CGL, June 2019

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA, page 1 and BIA, Appendix H, page 1
Is data required by Cl.233 of the GSD presented?	No	A construction programme is not presented;
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Information indicated in section 2
Are suitable plan/maps included?	Yes	Arup maps are not included; EA maps are included in appendix H
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	App. A, B, D and E
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3. Question 8: The site in the vicinity of an historic river (refer to Arup, figure 11).
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.4 Question 2: The site in the vicinity of an historic river (refer to Arup, figure 11).
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.2
Is a conceptual model presented?	Yes	Sections 7.1 and 7.4
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Sections 9 and 10

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	N/A	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	
Is factual ground investigation data provided?	Yes	Yes. Section 7 and appendix I
Is monitoring data presented?	Yes	Further monitoring is recommended, before final design is completed
Is the ground investigation informed by a desk study?	Yes	Section 3.
Has a site walkover been undertaken?	Yes	Section 2.1
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	It was confirmed that neighbouring property number 379 did not have a basement.
Is a geotechnical interpretation presented?	Yes	Section 7.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 7.5, Table 5
Are reports on other investigations required by screening and scoping presented?	Yes	Flood risk assessment presented appendix H.
Are the baseline conditions described, based on the GSD?	Yes	It was confirmed that neighbouring property number 379 did not have a basement and foundation depth has been assumed.
Do the base line conditions consider adjacent or nearby basements?	N/A	

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	Sections 9 and 10 (BIA Revision 1)
Are estimates of ground movement and structural impact presented?	Yes	GMA provided in section 9
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	Construction methodology, sequencing and propping
Has the need for monitoring during construction been considered?	Yes	High level monitoring strategy indicated in section 11.
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	No increase in hard surfaced area; SUDS (blue-roof) proposed
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	Section 10;
Are non-technical summaries provided?	Yes	Sections 1 and 12

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of engineering consultants, Card Geotechnics Limited (CGL) and the individuals concerned in its production have suitable qualifications.

4.2. The structural strategy has similarly been prepared by a well-known firm of engineering consultants, Price&Myers.

4.3. The basement proposal does not involve nor is adjacent to a listed building.

4.4. The proposed development comprises the demolition of the existing single storey structures and construction of a new building covering the majority of the site. The proposed building is a 7 storey reinforced concrete frame plus single storey basement (approximately 4.0m in depth). The site footprint is triangular in shape and is limited by a railway cutting to the south, Kentish Town Road (including a footpath) to the north and a four storey building (number 379) to the west. Two LUL lines tunnels are located approximately 6m to the north of the northern site boundary.

4.5. The proposal includes the installation of a contiguous piled wall along the site boundaries followed by a "top-down" construction methodology. The retaining walls will be propped by the ground floor and basement RC slabs.

4.6. A site specific desk study and ground investigations has been carried out. The site investigation confirmed that the ground conditions comprise Made Ground (to maximum 2.0m bgl), Weathered London Clay (to 7.3m bgl) and London Clay (to depth of investigation of 12.45m bgl). Ground water was recorded on a single visit (17th April 2019) at 0.97, 2.21 and 3.66mbgl. Although the London Clay is of low permeability and not an aquifer, it is recommended that groundwater monitoring is undertaken prior to final design and construction.

4.7. The BIA indicates that the only neighbouring property, number 379, does not have a basement. Its foundation depth was assumed to be at 1.5mbgl (from preliminary inspection pits) and although it is not clearly stated, it is understood that a strip foundation has been assumed.

4.8. To the north, the LUL tunnels are located deeper than the proposed structures and 6m to the north of the northern boundary. LUL should be consulted and an asset protection agreement entered into, as required.

4.9. An appropriate geotechnical interpretation has been provided, including parameters for retaining wall and foundation design.

4.10. A ground movement assessment (GMA) has been carried out broadly in accordance with CIRIA C760 and the potential damage to the neighbouring structures was assessed. Following clarification, the GMA methodology presented in the revised BIA is considered to be a reasonably conservative approach, with heave generally considered to be contained by an embedded piled wall.

4.11. The BIA states that damage to no. 379 will not exceed Burland Category 1 (Very Slight). The GMA methodology was clarified, as requested, by the applicant and results presented in the revised BIA.

4.12. The impact assessment concludes that the proposal does not pose a significant risk to the pavements, nor the services within the pavements. A utilities search is presented in the revised BIA document showing two Thames Water sewers beneath the Kentish Town Road. The first is a 1.219m diameter storm relief at 13.86mbgl and 5.5m from the proposed basement. The second is a 1.549mx0.991m sewer at 7.34mbgl and 11.5m from the wall. The assessment concludes that both sewers are outside the zone of influence of the proposed construction. Thames Water should be consulted to confirm if their asset protection requirements have been met.

4.13. A preliminary assessment of potential impacts to the Network Rail retaining wall and tracks was undertaken, and the risks to the existing structures is stated to be low. Network Rail should be consulted and an asset protection agreement entered into, as required.

4.14. A high level monitoring strategy is outlined in the BIA. A detailed strategy, including targets and trigger limits, should be agreed with Party Wall surveyors and asset owners prior to commencement of site works.

4.15. Although the screening stage did not identify that the site is located in the vicinity of an historic "lost river", no alluvial soils were identified in the site investigation boreholes. It is therefore accepted that the proposed works will not impact the wider hydrogeological environment.

4.16. There will be no change to impermeable site area as a result of the development. Attenuation SUDS in the form of a blue roof system is proposed. The proposed works will not impact the wider hydrological environment.

4.17. A flood risk assessment was completed confirming that the risk of flooding is low.

4.18. An outline construction programme should be presented.

4.19. It can be confirmed that the BIA complies with the requirements of CPG Basements, with comments listed in this section.

5.0 CONCLUSIONS

5.1. The BIA authors hold suitable qualifications.

5.2. The proposed development comprises the demolition of the existing structures and construction of a new 7 storey building plus single storey basement.

5.3. The ground conditions comprise Made Ground over London Clay. Groundwater was observed during the investigations and further monitoring is recommended.

5.4. A ground movement assessment (GMA) has been carried out.

5.5. A utilities search was undertaken and two sewers were identified in the vicinity of the site. Although the sewers are considered to be outside the influence zone of the proposed works, Thames Water should be consulted in regard to their asset protection requirements.

5.6. A preliminary assessment of potential impacts to the Network Rail retaining wall and tracks was undertaken. Network Rail should be consulted and an asset protection agreement entered into, as required.

5.7. LUL tunnels are located 6m to the north of the northern boundary. LUL should be consulted and an asset protection agreement entered into, as required.

5.8. It is accepted that the proposed works will not impact the wider hydrogeological environment.

5.9. The proposed works will not impact the wider hydrological environment.

5.10. A flood risk assessment confirms that the risk of flooding is low.

5.11. An outline construction programme should be presented.

5.12. It can be confirmed that the BIA complies with the requirements of CPG Basements.

Appendix 1: Residents' Consultation Comments

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Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Gregory	-	08.03.2019	Construction of basement in proximity of existing retaining wall	The applicant assessed the potential risks to the Network Rail tracks and retaining wall. Risks to existing structures is stated to be low. Network Rail should be consulted.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Land Stability	A utilities search should be undertaken to clarify if any assets are within the zone of influence of the works. Consultation with potentially impacted asset owners should be demonstrated.	Closed	03 June 2019
2	Land Stability	The GMA and consequential damage impacts should be clarified, as detailed in Section 4.	Closed	03 June 2019
3	BIA Format	An outline construction programme should be presented	Programme to be confirmed with LBC once contractor appointed	Note Only
4				
5				
6				

Appendix 3: Supplementary Supporting Documents

Technical Note by CGL

This technical note has been produced to address the initial audit undertaken by Campbell Reith on behalf of the London Borough of Camden.

CGL responses to Items 4.6, 4.10, 4.11 and 4.12 are provided below and have been incorporated into Revision 1 of the Basement Impact Assessment (dated June 2019).

4.6. A site specific desk study and ground investigations has been carried out. The site investigation confirmed that the ground conditions comprise Made Ground (to maximum 2.0m bgl), Weathered London Clay (to 7.3m bgl) and London Clay (to depth of investigation of 12.45m bgl). No groundwater was discovered during the investigation and further monitoring was not undertaken. It is recommended that groundwater monitoring is undertaken prior to final design and construction.

Groundwater levels were measured during the recent trial pitting (to expose the top of the Network Rail retaining wall); Water was recorded in borehole WS03 0.7mbgl, resting within the Made Ground and above the London Clay and is considered to be perched water. Water was recorded in BH1 at 1.31mbgl and is considered to be water from a claystone layer at 5.5mbgl to 6mbgl (response zone is between 1.5mbgl and 6mbgl). ***The monitoring is detailed in the Revision 1 of the BIA (dated June 2019) in Section 7.4.***

As the basement excavation is approximately 4m below ground level it is unlikely that the groundwater from the claystone will be encountered. Perched water, if encountered during construction, may be controlled using sump pumps.

It is noted that the London Clay is of very low permeability and is not an aquifer (unproductive stratum) and the water encountered is therefore not a continuous groundwater body across the site; no impacts to the wider hydrogeological environment have been identified due to the proposed basement and no mitigation measures are therefore required.

4.10. A ground movement assessment (GMA) has been carried out broadly in accordance with CIRIA C760 and the potential damage to the neighbouring structures was assessed. However, the GMA methodology appears to offset settlement outside of the piled wall by heave generated within the piled wall, which is not considered to be a reasonably conservative approach, with heave generally considered to be contained by an embedded piled wall. It is also unclear if the stage 3 settlements are generated at the pile wall, and if so, what impact they have on the damage assessment.

While we would agree that it would be more conservative to assume that the ground movements due to heave are limited to within the basement excavation and therefore not offset the movements outside the basement. However, the ground movement generated by heave are global and are not limited to the basement wall. CGL's own experience of this has found that the heave movements do generate some vertical movements of the piled wall. We have carried out an additional damage category assessment for 379 Kentish Town Road assuming no ground movements due to heave outside of the piled wall and the damage category remains Category 1. ***This assessment is included in Section 10.2 of the Revision 1 of the BIA (dated June 2019).***

We can confirm that the stage 3 settlements are generated by the vertical loads generated by the pile wall in PDISP and the guidance given in CIRIA C760.

4.11. The BIA states that damage to no. 379 will not exceed Burland Category 1 (Very Slight). This should be confirmed once the GMA methodology has been clarified. Calculations and/or model inputs / outputs should be provided.

We can confirm that the Burland Category does not exceed Category 1 (very slight). ***The PDISP model inputs/outputs in included in the Revision 1 of the BIA (dated June 2019) within Appendix N***.

4.12. The impact assessment concludes that the proposal does not pose a significant risk to the pavements, nor the services within the pavements. A utilities search should be undertaken to clarify if any assets are within the zone of influence of the works. Consultation with the asset owners should be demonstrated, if applicable, in regard to asset protection criteria. As 4.10 / 4.11, movements and impacts should be confirmed once the GMA methodology is clarified.

The Thames Water asset search shows two sewers beneath the Kentish Town Road. The first is a 1.219m diameter storm relief sewer some 13.86m below ground level and some 5.5m from the proposed pile wall. The sewer is outside load influence profile of the pile wall (assuming an influence profile of 1 in 4) and is at a significant depth that there would be negligible lateral movements from the deflection of the pile wall. The other sewer is a 1.549mx991m dimeter trunk sewer some 7.34m below ground level and some 11.5m from the pile wall. The sewer is outside the load influence profile of the pile wall and is at sufficient distance pile wall that the lateral movements from the deflection of the wall would be negligible. ***This assessment is included in Section 10.6 of the Revision 1 of the BIA (dated June 2019).***

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