

Murphy's Yard
London, NW5 1TN

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 13693-35
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March 2022

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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 Murphy Yard (planning reference 2021/3225/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 (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. It is proposed to demolish the existing buildings and structures and carry out the redevelopment in phases comprising 18 development plots. Five basements excavations will be carried out at Plots C, K, L, S and Q.
- 1.5. It's noted that the BIA has been submitted in relation to an outline planning application. Therefore, whilst this audit considers the BIA in accordance with LBC's policies and technical procedure, additional audits may be required when the detailed planning applications for plots with proposed basements are submitted.
- 1.6. The qualifications of the individuals involved in the production of the BIA are not stated and should be demonstrated to be in accordance with LBC guidance.
- 1.7. Screening and scoping assessments are presented, supported by desk study information.
- 1.8. A site investigation has been undertaken indicating the basements will be constructed within the London Clay Formation. Deep Made Ground is present across parts of the site.
- 1.9. The site investigation report includes interpretative geotechnical parameters. The BIA should discuss and confirm the geotechnical parameters to be adopted for design and assessment purposes, in accordance with LBC guidance.
- 1.10. The structural proposals and construction sequencing assumed in the BIA for outline assessment should be confirmed in future submissions to support detailed planning applications.
- 1.11. A drainage strategy is proposed to demonstrate that there will no adverse impacts to the hydrological environment.

- 1.12. There will be no impact to the hydrogeological environment. Further site investigation will be required to inform detailed design with respect to potential dewatering of the Made Ground.
- 1.13. As trees are proposed to be removed, a qualitative assessment should be presented in the BIA to confirm that neighbouring foundations will not be impacted by tree removal.
- 1.14. Based on the assumptions presented, the ground movement assessment (GMA) is generally accepted. Input and output data for the GMA models' analyses should be presented.
- 1.15. Queries and requests for information are discussed in Section 4 and summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on the 27th of January 2022 to carry out a Category C audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Murphy's Yard, Kentish Town, London, NW5 1TN, planning reference 2021/3225/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 (CPG): Basements. January 2021.
- 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. LBC's Audit Instruction described the planning proposal as *"Outline planning permission with all matters reserved for the demolition of existing buildings and structures and redevelopment to be carried out in phases (with each phase being an independent act of development) comprising 18 development plots (for the purposes of consultation: including buildings with a maximum height of 113.45m AOD) for the following mix of uses: [750-825] residential units (Use Class C3), [up to 8,000sqm GEA] residential institution floorspace (Use Class C2), [a minimum of 40,461sqm GEA] industrial floorspace within Use Classes E(g)(iii), B2 and B8 and [up to 8,150sqm] general industrial and/or storage floorspace [Use Class B2 and/or B8], commercial floorspace (Class E) including [up to 36,043sqm GEA] light industrial floorspace*

(Class E(g)(iii)), [up to 34,500sqm GEA] office floorspace, [up to 36,000sqm GEA] research and development floorspace (Class E(g)(ii)), and [up to 16,000sqm] healthcare floorspace (Class E(e)), [1,300-3,650sqm GEA] flexible commercial and sui generis floorspace (Use Class E and/or Sui Generis Use), [300-1,300sqm GEA] community floorspace (F1 and/or F2), [up to 1,500sqm] flexible mixed-use space (Class Sui Generis), and cycle and vehicle parking, refuse and recycling storage, plant, highway and access improvements, amenity space, landscape and public realm improvements including new pedestrian and cycle routes, and all associated works [for the purposes of consultation].”.

2.6. CampbellReith accessed LBC's Planning Portal on the 31st of January 2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Ove Arup & Partners Ltd, ref: MUR-ARP-ZZ-XX-RP-CX-0002 Issue 01, dated 24 June 2021.
- Flood Risk Assessment and Drainage Strategy Report by Ove Arup & Partners Ltd ,ref: MUR-ARP-ZZ-XX-RP-CX-0001 Issue 03, dated 18 June 2021.
- Report on ground Investigation by Ian Farmer Associates Limited, ref: 52816A Issue E, dated July 2019.
- Design and Access Statement by Studio Egret West, ref: 0360-SEW-ZZ-ZZ-RP-A-PL001, dated 18 June 2021.
- Arboricultural Impact Assessment by The Ecology Consultancy, ref: 8366.2 Version V3.0, dated 28 May 2021.
- Built Heritage Statement by RPS Group, ref: JCH00837, dated June 2021.
- Construction and Environmental Management Plan by Stace LLP, ref: H4.1.3.4-12.20, dated June 2021.
- Construction/Demolition Management Plan pro forma by Stace LLP, version 1, dated 25 May 2021 and additional sheet version 2, 9 June 2021.
- Architectural Drawings by Studio Egret West.
 - Set of Parameters Plan Consolidated (01 to 14), dated 18 June 2021.
 - Set of Proposed Site Sections with Context, dated 27 September 2021.
 - Site Sections, dated 27 September 2021.
 - Outline Heights Schedule, dated 25 October 2021.
 - Existing and Demolition drawings, dated 20 August 2021.
 - Site Location Plan, dated 18 June 2021.
 - Proposed Site Context Sections, dated 27 September 2021 and 15 November 2021.
 - Proposed Site Sections, dated 27 September 2021.
- Planning Consultation Responses as detailed in Appendix 1.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	Qualifications of the authors of the BIA are not provided.
Is data required by Cl.233 of the GSD presented?	Yes	To be further detailed in future planning applications for each plot.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	To be further detailed in future planning applications for each plot.
Are suitable plan/maps included?	Yes	All maps to support screening are included in the BIA.
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	Section 4.1 of the BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3 of the BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.2 of the BIA.
Is a conceptual model presented?	Yes	Section 5.2 of the BIA. To be further detailed in future planning applications for each plot.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.1 of the BIA.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.3 of the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.2 of the BIA.
Is factual ground investigation data provided?	Yes	Section 5 of the BIA & Report on Ground Investigation.
Is monitoring data presented?	Yes	Appendix 2 of the Report on Ground Investigation.
Is the ground investigation informed by a desk study?	Yes	Section 2.0 of the BIA.
Has a site walkover been undertaken?	Unknown	Not explicitly stated.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 3.1 of the BIA.
Is a geotechnical interpretation presented?	No	Section 7 of the Report on Ground Investigation. The BIA should confirm parameters to be adopted as ARUP GSD Appendix G3.
Does the geotechnical interpretation include information on retaining wall design?	No	Section 7.0 of the Ground Investigation Report. The BIA should confirm parameters to be adopted as ARUP GSD Appendix G3.
Are reports on other investigations required by screening and scoping presented?	Yes	GMA, Report on Ground Investigation, Arboricultural Impact Assessment and Survey, Flood Risk Assessment (FRA) and Drainage Strategy are provided.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Section 3.1 of the BIA.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	Section 4 of the BIA.
Are estimates of ground movement and structural impact presented?	Yes	Section 6.1 of the BIA. GMA provided, clarifications requested.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Section 6 of the BIA.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Section 6 of the BIA. To be further detailed in future planning applications for each plot.
Has the need for monitoring during construction been considered?	Yes	Section 6.4 of the BIA. Monitoring to neighbouring is not proposed, due to low impact. To be further detailed in future planning applications for each plot, if required.
Have the residual (after mitigation) impacts been clearly identified?	Yes	To be further detailed in future planning applications for each plot.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Sections 6.1, 6.2 & 6.3 of the BIA. GMA provided, however, clarifications requested.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Section 6.5 of the BIA.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Sections 6.2 & 6.3 of the BIA. However clarification on the BIA is required.

Item	Yes/No/NA	Comment
Are non-technical summaries provided	Yes	Executive Summary of the BIA.

4.0 DISCUSSION

- 4.1. It's noted that the Basement Impact Assessment (BIA) has been submitted in relation to an outline planning application. Assumptions made in the BIA for outline planning purposes will be required to be confirmed in any detailed planning applications, with any changes assessed to confirm impacts are in accordance with relevant LBC policies' criteria. Therefore, whilst this audit considers the BIA in accordance with LBC's policies and technical procedure, it's noted that additional audits may be required when the detailed planning applications for plots with proposed basements are submitted.
- 4.2. The BIA has been carried out by Ove Arup & Partners Limited ("Arup"). The qualifications of the individuals involved in the production of the BIA are not stated and are required. The qualifications should meet the requirements of CPG Basements.
- 4.3. The LBC Instruction to proceed with the audit identified that the development proposal is adjacent to 'The Forum' building on Kentish Town, a Grade II listed building. A number of designated heritage assets lie within a 500m search radius of the Site, including the Grade II listed Forum, a former cinema, 1-7 Highgate Road and the Christ Apostolic Church located along Highgate Road.
- 4.4. The site is located on a 6.23 hectare plot between Gospel Oak and Kentish Town stations. It consists of 18 plots for a proposed mixed use development. The site is currently occupied by a number of industrial buildings and offices used by J Murphy and Sons. Domestic and commercial properties are located along the eastern boundary; in particular, in the vicinity of a proposed single storey basement in the south of the site, are the Greenwood Centre and the Christ Apostolic Church.
- 4.5. The proposals include demolition of the existing buildings and structures and carrying out the redevelopment in phases. For assessment purposes Plots C, K and L have been assumed in the BIA to have a 4.00m deep single storey basement. Plot S & Q are both situated on slopes so have ground floor access on one side of the plot but require retention on other sides.
- 4.6. Screening and scoping assessments are presented and informed by desk study information. Most relevant figures/maps from the ARUP GSD and other guidance documents are referenced within the BIA to support responses to screening questions.
- 4.7. In the ground stability screening, it is stated that the site is not over or within any exclusion zones of tunnels. The BIA states that the Fleet Sewer runs below Plot F and alongside Plot I and the impact assessment indicates that an exclusion zone is present and that a detailed assessment will be carried out as part of Thames Water approvals. It's accepted that plots with proposed basements do not impact the exclusion zone.

- 4.8. The site has a low risk of surface water flooding. The BIA states that the proposed development is not increasing the amount of impermeable land and will retain the existing sewage connections. The Flood Risk Assessment indicates that the development can be constructed and operated safely without increasing the flood risk elsewhere.
- 4.9. The outline proposed drainage strategy includes a range of sustainable drainage systems following an appraisal of appropriate drainage techniques considered viable in line with the development proposals.
- 4.10. A site investigation was undertaken by Ian Farmer Associates. Site works comprised exploratory boreholes to a maximum depth of 20.45m below ground level (bgl). In the southern part of the site, Made Ground of thickness 0.80m to 1.30m was encountered above the London Clay Formation (with a thickness proven >19.65m). In the north western part of the site Made Ground was encountered to a depth of between 3.50m to 9.00m bgl and Superficial Deposits to a depth of between 4.60m and 8.00m bgl above the London Clay Formation.
- 4.11. Groundwater associated with Made Ground was observed at depths between 0.50m and 3.00m bgl during the investigation. On return monitoring visits, groundwater was confirmed within the Made Ground in the north western part of the site at depth between 0.89m and 2.19m bgl. The standpipe situated in the southern eastern part of the site was recorded as dry to a depth of 6.30m bgl. It has been identified that further site investigation will be required to inform detailed design with respect to potential dewatering of the Made Ground. It is accepted that the proposed basements are highly unlikely to cause wider significant changes to the local groundwater regime.
- 4.12. The geotechnical parameters to be adopted in the basement design are not presented within the BIA. Geotechnical parameters in accordance with the ARUP GSD Appendix G3 should be presented.
- 4.13. The site investigation report includes interpreted geotechnical parameters, although (as 4.12) these have not been discussed or confirmed within the BIA. An undrained shear strength c_u of $70+4.5z$ below the top of London Clay is adopted in the BIA, which is based on a factor f of 5.8, multiplying the N SPT to get the undrained shear strength. Based on the Plasticity Index values obtained for the London Clay this factor may not be reasonably conservative and clarification should be presented.
- 4.14. Structural proposals including descriptions of temporary and permanent works have not been provided for the outline scheme. However, the assumed construction sequence adopted in the ground movement assessment (GMA) is considered reasonable. Detailed planning applications should include either an updated BIA or Basement Construction Plan (BCP) detailing the

temporary and permanent construction measures to be adopted for the basement construction at each plot, with the GMA updated, if required.

- 4.15. A GMA and damage assessment are provided to demonstrate that ground movements and consequential damage to neighbouring properties will be within the LBC's policy requirements. The analyses were carried out using the Oasys programme XDisp.
- 4.16. The only neighbouring buildings which are considered to be within the zone of influence of any basements are the Greenwood Centre and the Christ Apostolic Church. Based on the current assumptions, no significant movement is predicted to occur to either the Greenwood Centre or the Christ Apostolic Church due to ground movements caused by wall installation and basement excavation. The result of the preliminary damage assessment confirms that damage is negligible (Category 0 of the Burland Scale) for both the Greenwood Centre and the Christ Apostolic Church. However, input and output from the XDisp analyses are not presented and are requested.
- 4.17. The site is bounded by Network Rail tracks to the east, north-west and south and by Highgate Road to the east. An additional Network Rail line bisects the site from north to south before running underground. Preliminary analysis of Network Railway infrastructure which are within the zone of influence of proposed basements has been presented in the BIA and the results indicate that those assets will not be significantly affected by the development. However, the BIA confirms that a full impact assessment will be produced and approvals will be sought from Network Rail in accordance with their formal process.
- 4.18. The western edge of the site overlays the Fleet Sewer. Movements at the centre of the line of the sewer have been analysed in PDisp with calculated movements varying from a settlement of 30mm to a heave of 26mm. The BIA considers that movements are likely to be acceptable. However, a detailed impact assessment will be carried out as part of asset protection criteria to be agreed with Thames Water.
- 4.19. The BIA indicates that a detailed monitoring strategy will be developed in conjunction with the third party asset protection approvals for both the Fleet Sewer and Rail Tunnel across the site. Due to the low level of impact, no monitoring is proposed to be undertaken for neighbouring properties. This should be confirmed in the BIAs or BCPs that accompany the detailed planning applications.
- 4.20. The Arboricultural Report indicates that trees close to neighbouring properties are going to be removed. The BIA should confirm whether these neighbouring properties will be impacted by the tree removal (i.e. due to potential for change in moisture contents of the soil to cause shrink / swell movements) and if so an assessment should be provided along with recommendation for mitigation measures, if required.

5.0 CONCLUSIONS

- 5.1. This audit considers the BIA in the context of an outline planning application. It's noted that additional audits may be required when the detailed planning applications for plots with proposed basements are submitted.
- 5.2. The qualifications of the individuals involved in the production of the BIA should be provided.
- 5.3. Screening and scoping assessments are presented, supported by desk study information.
- 5.4. A site investigation has been undertaken indicating the basement will be constructed within the London Clay Formation.
- 5.5. Interpreted geotechnical parameters should be presented.
- 5.6. The structural proposals and construction sequencing assumed should be confirmed in future submissions to support detailed planning applications.
- 5.7. A drainage strategy is proposed to demonstrate that there will no adverse impacts to the hydrological environment.
- 5.8. There will be no impact to the hydrogeological environment.
- 5.9. As trees are proposed to be removed, a qualitative assessment should be presented in the BIA to confirm that neighbouring foundations will not be impacted by tree removal.
- 5.10. Input and Output data for the Ground Movement Assessment is requested.
- 5.11. Queries and requests for information are summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

Appendix 1: Residents' Consultation Comment

Residents' Consultation Comments

Residents' consultation comments presented are related to issues outside the scope of this BIA.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The qualifications of the individuals involved in the production of the BIA are not stated and should be demonstrated to be in accordance with LBC guidance.	Open – See Section 4.1	
2	Land Stability / Hydrogeology	Assumptions made in regard to basement dimensions, construction sequences and methodology to be confirmed in future detailed applications.	Note only – 4.1, 4.5, 4.11, 4.14, 4.19	Note only
3	Land Stability	The geotechnical parameters to be adopted in the basement design are not presented within the BIA. Geotechnical parameters in accordance with the ARUP GSD Appendix G3 should be presented.	Open – See Section 4.12, 4.13	
4	Land Stability	GMA. Inputs and Outputs of XDisp analyses are requested.	Open – See Section 4.16	
5	Land Stability	Assessments of impact of tree removal on neighbouring properties is requested.	Open – See Section 4.20	

Appendix 3: Supplementary Supporting Documents

None

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