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11A Primrose Hill Road
London NW3 3DG

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12066-09

June 2015

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1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden (LBC) to carry out an independent review of the Basement Impact Assessment submitted as part of the Planning Submission documentation for 11A Primrose Hill Road, Camden Reference 2014/4514/P following its refusal and the lodging of an appeal, Camden Reference APP/X5210/W/15/3005758.

1.2. The review assessed 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 provided with relevant information and it was reviewed against an agreed audit check list.

1.4. The BIA Reports submitted do not contain an overview on construction methodology and programme.

1.5. There is a lack of information regarding temporary works and/or basement retaining wall construction and no clear indication of the location of the listed Network Rail tunnel which lies below the development site. It is not possible to determine whether the proposed basement lies within the exclusion zone of the tunnel.

1.6. No soil investigation works have been undertaken and instead the BIA relies on historical data from nearby sites. The depth of made ground overlying London Clay differs significantly between locations and a site specific investigation is recommended.

1.7. A critical phase of construction which will affect adjoining properties, the tunnel and the adjacent highway, is during basement excavation when ground heave of the London Clay is likely to occur. Additionally the structural loads associated with the proposed new building will impact the surrounding structures and infrastructure. With information from a site specific soil investigation, a line and level survey commissioned from Network Rail, and foundation inspection pits, a Ground Movement Assessment could be completed to allow horizontal and vertical movements to be estimated. Their impact on surrounding structures and infrastructure and the Burland category of damage could then be assessed.

1.8. No indication is provided of the intended method of constructing the basement retaining walls and floor slab other than standard underpinning details for the flank wall to no. 11A. There has been no trial pit investigation to determine the depth of the existing flank wall foundations.

1.9. Primrose Hill Road was subjected to surface water flooding in 2002 and its surrounding streets in 1975 and the development site is adjacent to a Critical Drainage Area. A topographical survey of the general area would be beneficial to assist on the likely impact of the development on surface water flow.

2.0 INTRODUCTION

CampbellReith was instructed by London Borough of Camden (LBC) on 20 May 2015 to carry out an independent review of the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 11A Primrose Hill Road, Camden Reference 2014/4514/P for which an appeal had been lodged, following refusal of the Planning Application, under APP/X5210/W/15/3005758. CampbellReith was provided with a series of attachments by email on 20 May 2015 as follows for audit purposes:

- BIA – Surface Water and Groundwater
- BIA – Screening and Scoping Report: Land Quality
- Aboricultural Impact Appraisal and Method Statement

The LBC Planning Portal was inspected but contained no additional relevant information.

2.1. One of the reasons for refusal was based on the BIA failing to demonstrate that it would not cause harm to the built and natural environment or local amenity, as well as flooding or ground stability.

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

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

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

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 the "*Erection of a 3 storey dwelling plus a basement under the footprint of the new building."*

and confirmed that the basement proposals did not involve a listed building nor did the site neighbour any listed buildings.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
Is data required by Cl.233 of the GSD presented?	Yes	Little information on construction methodology and programme.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	No information regarding temporary works and/or retaining wall construction.
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	Network Rail tunnel locations not determined.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	No site investigation undertaken.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Adjacent to a critical drainage area.
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA had identified that flooding has occurred in the past.
Is factual ground investigation data provided?	Yes	Historical BGS borehole information.
Is monitoring data presented?	No	
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	No	
Is the presence/absence of adjacent or nearby basements confirmed?	No	No information provided regarding presence of basements.
Is a geotechnical interpretation presented?	Yes	Based upon BGS borehole information.
Does the geotechnical interpretation include information on retaining wall design?	No	No information provided.
Are reports on other investigations required by screening and scoping presented?	Yes	Surface Water and Groundwater Land Quality
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	No	Other than unsubstantiated comment.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Inadequate basic information.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	
Has the need for monitoring during construction been considered?	No	
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure been maintained?	No	
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 2?	No	No estimate undertaken.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. Although Basement Impact Assessments for Land Stability and Surface Water, and Groundwater, have been produced by persons having suitable qualifications, they do not contain an overview of construction methodology and programme as usually provided by a firm of consulting civil and/or structural engineers.

4.2. This has led to a lack of information regarding temporary works and/or retaining wall construction during the excavation and construction of the basement. This is particularly important considering the adjacency of a Network Rail listed Grade 2* tunnel which appears to be located immediately below the development site and the proximity of the excavation to King Henry's Road highway and pavement.

4.3. Until surveys are commissioned from Network Rail for line and level and, in due course, structural condition of the tunnel, the proximity of the crown of the tunnel to the underside of basement construction is unknown. It is, therefore, in doubt as to whether the basement excavation is possible without encroaching upon the exclusion zone of the tunnel.

4.4. No soil investigation works have been undertaken in the form of boreholes or trial pits to investigate the existing foundations to the flank wall of no. 11. Instead reference has been made to historical borehole information within the Surface Water and Groundwater Report by ESI Environmental Specialists. These boreholes are taken from development sites at Adelaide Road in 1962 and Elsworthy Road in 1990. Unfortunately their locations have been transposed on the ESI Borehole Location Plan.

The borehole closest to 11A Primrose Hill Road shows approximately 1.4 metres (4' 6") of made ground above the London Clay strata whereas the Elsworthy Road borehole indicates 3.3 metres of made ground above London Clay. It also indicates a water strike at 3.3 metres, ie. at the top of the London Clay.

This variation indicates the necessity of a specific soil investigation for this site.

4.5. Although diagrams are provided of a typical underpinning solution to the flank wall of no. 11, no indication is provided as to how the remainder of the basement walls are to be constructed, nor the basement floor, given the construction constraints of the tunnel below and the highway in King Henry's Road.

4.6. A critical design consideration for the excavation and construction of the basement will be in the temporary condition, when heave of the underlying London Clay stratum is likely to occur. Which would affect the underlying tunnel and adjacent property. Dependent on the foundation and retaining wall solution, the tunnel and adjoining property will also be impacted by the

structural loads imposed by the new building. A Ground Movement Analysis, based upon the results of the soil investigation, the Network Rail survey, and foundation inspection pits, should be carried out in order to evaluate the effects on the adjoining property, the adjacent highway and the tunnel below. The category of damage as defined on the Burland scale could then be estimated.

4.7. Standpipes installed in, say, two boreholes would provide an indication of perched water for the excavation and design of the basement and give an indication of direction of any groundwater flow.

4.8. The conclusions within the Surface Water and Groundwater Report state *"There is a moderate overall risk of surface water flooding at the Site when considering the high risk in the adjacent Primrose Hill Road and historical flooding in this area ….. due to past sewer flooding events."* Primrose Hill Road was subject to surface water flooding in 2002 and some of the streets surrounding the development site were subject to flooding in 1975. While it is accepted that the impact of the development to surface water flows and related flooding will be low, LBC's Surface Water Management Plan indicates the site to be adjacent to a Critical Drainage Area. A topographical survey of the development site and adjacent areas of the Critical Drainage Area would assist an assessment of likely impact of a further incidence of flooding on the development.

5.0 CONCLUSIONS

5.1. The BIA Reports submitted do not contain an overview on construction methodology and programme.

5.2. There is a lack of information regarding temporary works and/or basement retaining wall construction and no clear indication of the location of the listed Network Rail tunnel which lies below the development site. It is not possible to determine whether the proposed basement lies within the exclusion zone of the tunnel.

5.3. No soil investigation works have been undertaken and instead the BIA relies on historical data from nearby sites. The depth of made ground overlying London Clay differs significantly between locations and there is potentially a shallow groundwater table. A site specific investigation is recommended.

5.4. A critical condition phase of construction which will affect adjoining properties, the tunnel and the adjacent highway, will be during basement excavation when ground heave of the underlying London Clay is likely to occur. The structural loads associated with the new building will also have an impact on the surrounding structures and infrastructure. With information from a site specific soil investigation, together with a line and level survey commissioned from Network Rail and information on the foundations to the adjoining property, a Ground Movement Analysis could be completed which would allow an assessment of the impact horizontal and vertical movements to be made. The Burland category of damage to affected properties could then be estimated.

5.5. No indication is provided to review the intended method of constructing the basement retaining walls and floor slab other than standard underpinning details for the flank wall to no. 11A. There has been no trial pit investigation to determine the depth of the existing flank wall foundations.

5.6. Primrose Hill Road was subjected to surface water flooding in 2002 and its surrounding streets in 1975 and the development site is adjacent to a Critical Drainage Area. A topographical survey of the general area would be beneficial to assist on the likely impact of the development.

Appendix 1: Residents' Consultation Comments

None reviewed

Appendix 2: Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability and water environment	No site specific data	Intrusive ground investigation and ground water monitoring required	
2	Stability	No information on proposed method of construction	Construction method statement required	
3	Stability	No information of adjoining foundations	Foundation inspection pits to affected properties required	
4	Stability	Depth and location of tunnel unknown	Details to be obtained and assessed	
5	Stability	No assessment of category of damage	Ground movement assessment required	
6	Surface water	Site levels not determined	Topographic survey required	

Appendix 3: Supplementary Supporting Documents

None

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