CampbellReith
consulting engineers

300 West End Lane
London NW6 1LN

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12066-58
Revision: F1

January 2016

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Project Number	12066-58
Project Name	300 West End Lane, London NW6 1LN
Planning Reference	2015/3690/P

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Appendix

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith has been instructed by the London Borough of Camden (LBC) to carry out an audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 300 West End Lane, London NW6 1LN - Planning Reference 2015/3690/P.

1.2. The Audit has been carried out in accordance with the Terms of Reference set by the LBC. The Audit has reviewed the BIA for potential impacts on land stability and on local ground and surface water conditions arising from the proposed basement development.

1.3. CampbellReith has accessed LBC's Planning Portal and reviewed the latest revisions of submitted documentation against an agreed audit check list.

1.4. The BIA has not been taken beyond the screening stage as defined in the LBC Planning Guidance document 'Basements and Lightwells' (CPG4), dated July 2015. It is noted that there are two potential impacts from basement construction: flooding and an increase in the differential foundation depth.

1.5. Supplementary information has confirmed that the qualifications and experience of the author are generally in accordance with CPG4.

1.6. It is accepted that the ground investigation to date is sufficient for planning purposes. It is recommended that the bearing stratum is validated during construction.

1.7. The BIA notes there to be no evidence or history of shrink-swell subsidence in the local area. It is accepted that the new basement is at a depth unlikely to be affected and the removal of a tree should not impact the neighbouring foundations.

1.8. No groundwater monitoring has been undertaken at the site although trial pits sunk at the site were noted to be dry. It is acknowledged in the supplementary information that some perched water may be encountered and this has been considered in the design.

1.9. The BIA states that the site and general area do not slope more than 7^{o} and that the proposed works will not alter this situation. Comments received from local residents note that West End Lane is sited on a hill with a steep gradient. It is accepted that there is not a significant change in ground level between 300 West End Lane and the neighbouring properties. For this reason it is agreed that the proposed basement will not significantly increase the differential depth of foundations relative to neighbouring properties with the exception of the lightwell.

1.10. The BIA states that Thames Water has undertaken works to alleviate the risk of flooding in the area and that West End Lane is (now) not at risk of surface flooding. However, reference to the

SFRA suggests that a risk remains during extreme rainfall events. Additionally, comments from local residents have suggested flooding to the basement to 300 West End Lane and other properties further down the hill. This has been assessed in more detail, including enquiries to Thames Water, and it is confirmed the risk is low.

1.11. The BIA states that the basement will not extend beneath the water table although the supplementary information acknowledges the likely presence of perched water. Proposals for basement water proofing and dewatering during construction have been provided.

1.12. Indicative calculations for retaining wall/underpinning design and floor slabs have been provided which will require to be developed in detailed design. Proposals for propping the basement walls/underpinning to resist ground pressures in the permanent case should be indicated. It is considered that these matters should be closed out as part of the party wall award.

1.13. It is accepted that due to the small scale nature of the works, ground movements should be limited. It is agreed, assuming good control of workmanship and that affected structures are in sound condition, damage should not exceed Burland Category 1.

1.14. Queries and requests for clarification/further information raised by the audit are summarised in Appendix 2. It is accepted that, subject to the agreement of the party wall award, the BIA and supporting documents provide adequate mitigation.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by the London Borough of Camden (LBC) on 28 September 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 300 West End Lane, London NW6 1LN - Planning Reference 2015/3690/P.

2.2. The above Audit has been carried out in accordance with the Terms of Reference set by the LBC. The Audit has reviewed the above BIA for potential impacts on land stability and on local ground and surface water conditions arising from the proposed basement development.

2.3. A BIA is required for all planning applications with basements in the LBC in general accordance with policies and technical procedures contained within the following documents:

a) Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

b) Camden Planning Guidance (CPG) 4: Basements and Lightwells.

c) Camden Development Policy (DP) 27: Basements and Lightwells.

d) 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.

The BIA should evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described within the GSD and should make recommendations for detailed design.

2.5. The LBC Audit Instruction described the planning proposal as '*Enlargement of existing basement to create habitable space associated with the ground floor flat, including light wells and access steps at the rear and balustrading around the existing decking.*'

The Audit Instruction noted the following:

a) The basement proposals do not involve a listed building nor does the site neighbour any listed buildings.

b) The site is not in an area subject to slope stability constraints but is in an area subject to surface water flow and flooding or subterranean (groundwater) flow constraints.

c) It is unknown whether the application requires determination by the Development Control Committee (DCC).

d) The scope of the submitted BIA does not extend beyond the screening stage.

2.6. CampbellReith accessed the LBC Planning Portal on 19 October 2015 and has examined the following reports and drawings relevant to the audit:

a) An 'Aboricultural Assessment & Protection Method Statement, prepared by ACS Consulting, dated 17 June 2015.

b) The application for 'Planning Permission', dated 29 June 2015.

c) A 'Planning, Design, Access and Heritage Statement' prepared by Salisbury Jones Planning, dated 29 June 2015.

d) The BIA prepared by Taylor Whalley Spyra (TWS), consulting civil and structural engineers, including the results of a trial pit investigation to confirm existing foundation conditions, dated 30 June 2015.

e) The following planning application drawings:

Site location plan.

Existing basement plan.

Existing ground floor plan.

Existing sections.

Proposed basement and ground floor plan.

Proposed sections.

Block plan.

f) Comments received from the public on the planning application.

2.7. Subsequent to the issue of the initial audit report and the later D2 audit report, additional information was provided by TWS responding to the queries raised. A copy is presented in Appendix 3 and its contents are considered in this final audit report.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are the BIA author(s) credentials satisfactory?	Yes	The BIA has been prepared by a Chartered Engineer without the input of a Chartered Geologist. However, the hydrogeological screening has been carried out correctly.
Is data required by Cl.233 of the GSD presented?	No	No works programme has been provided, although the BIA states that the main contractor for the works will be required to provide programmes and method statements.
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	
Slope and Ground Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrogeology (Groundwater Flow) Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual ground model presented?	Yes	Ground conditions have been assessed based on an examination of BGS mapping for the area and limited trial pitting.

Item	Yes/No/NA	Comment
Slope and Ground Stability Scoping Provided? Is scoping consistent with screening outcome?	No	The BIA does not extend beyond the screening stage.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	NA	The BIA does not extend beyond the screening stage.
Hydrogeology (Groundwater Flow) Scoping Provided? Is scoping consistent with screening outcome?	NA	The BIA does not extend beyond the screening stage.
Is factual ground investigation data provided?	No	However, a commentary is given on the ground conditions encountered during trial pit excavations to reveal foundation depths.
Is monitoring data presented?	No	No groundwater monitoring has been undertaken at the site although trial pits excavated at existing building foundation locations were noted to be dry.
Is the ground investigation informed by a desk study?	No	No formal GI has been undertaken.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	There is no discussion on nearby basements.
Is a geotechnical interpretation presented?	No	No formal GI has been undertaken and hence no interpretation made.
Does the geotechnical interpretation include information on retaining wall design?	No	No interpretation has been undertaken. No calculations have been provided for retaining or underpinning wall design.
Are reports on other investigations required by screening and scoping presented?	No	No such reports were identified as being required.
Are baseline conditions described, based on the 'Guidance for Subterranean Development (GSD)'?	No	No formal GI has been undertaken.

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	No	The BIA does not extend beyond the screening stage.
Are estimates of ground movement and structural impact presented?	Yes	A qualitative assessment is presented which is accepted in light of the limited depth of underpinning and excavation.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	The BIA does not extend beyond the screening stage.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	The BIA and supplementary information refer to temporary propping, condition surveys of potentially affected properties and the need for sound design and good workmanship.
Has the need for monitoring during construction been considered?	No	Precondition surveys of adjacent properties, highways, footpaths and associated infrastructure are to be undertaken but no construction monitoring or post-construction monitoring of ground movements etc. have been discussed in the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	It is stated that damage to affected properties will not exceed Burland Category 1.
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	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does the BIA report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	

Item	Yes/No/NA	Comment
Are non-technical summaries provided?	No	But presented documents are clearly written.

4.0 DISCUSSION

4.1. The BIA has not been taken beyond the screening stage as defined in the LBC Planning Guidance document 'Basements and Light wells' (CPG4), dated July 2015. It is accepted that there are no impacts arising from the screening with the exception of potential sewer flooding and an increased differential in foundation depth.

4.2. The BIA has been carried out by a registered company of consulting civil and structural engineers. The qualifications of the author were subsequently provided and comply with the requirements of CPG4. Although a Geologist was not involved in the preparation of the BIA, the hydrogeology screening has been correctly carried out.

4.3. The property lies on the southern side of West End Lane, West Hampstead near its junction with Finchley Road (A41) to the north-east. The property lies on the opposite side of the road to a 5-storey property, Buckingham Mansions and although not listed, lies within the West End Green conservation area. The property has a rear garden laid largely to lawn with a couple of small fruit trees and a line of Leyland Cypress trees along its southern border.

4.4. The property comprises a three-storey brick-built semi-detached dwelling house with a small stepped undercroft/basement. The undercroft/basement is of variable depth and extent. Trial pit information indicates the undercroft/basement depth to vary from 1.62m at the rear of the property to 0.7m or so beneath the middle part of the building. The undercroft/basement is provided with a 200mm thick concrete base slab at the rear of the property. However, no base slab was encountered in the middle area.

4.5. Building footings generally comprise corbelled brickwork on 200mm thick concrete strip foundations. However, no concrete strip foundations were encountered at the front of the house. The depth of the building footings (base of brickwork) below underside of existing ground floor slab level increases from 1.1m at the front of the property to 1.8m at the rear of the property where ground level is lower.

4.6. The proposed development comprises the deepening and lateral extension of the current restricted height basement to form a single-storey residential basement covering some 75% of the building footprint. The front 25% or so of the building is not to be developed. The depth of basement will involve variable amounts of excavation up to 2.75m or so below underside of existing ground floor slab level to create a constant floor to ceiling height of 2.4m. Existing external and internal load-bearing walls will be underpinned in a hit and miss sequence with reinforced concrete underpins. Light wells will be provided at the rear of the property.

4.7. The BIA records ground conditions (based on an examination of BGS mapping for the area only) to comprise Made Ground over London Clay. A brief comment only is given on the ground

conditions encountered during trial pit excavations to reveal existing building foundation depths. There is no quantitative information to substantiate the descriptions of soil consistency/strength provided. The author of the BIA has stated that the extent of the ground investigation is adequate. It is recommended that the bearing stratum is validated by inspection during construction.

4.8. The BIA says that there is no evidence of there being worked ground in the area of the site.

4.9. The BIA notes there to be no evidence or history of shrink-swell subsidence in the local area. Supplementary information provided by TWS confirms there is no evidence of movement or underpinning to the existing building. The BIA states that no trees will be felled. This is not strictly correct as an apple tree in poor condition is to be removed. However, the effect of this will be insignificant and can be discounted.

4.10. No groundwater monitoring has been undertaken at the site although the above trial pits were noted to be dry.

4.11. The BIA states that the site and general area do not slope more than 7^{o} and that the proposed works will not alter this situation. Comments received from local residents note that West End Lane is sited on a hill with a steep gradient. It is accepted that there is not a significant differential in ground levels between 300 West End Lane and its neighbouring properties.

4.12. The site is not in the vicinity of railway cuttings and the like, nor does it lie within the exclusion zones of any tunnels.

4.13. The BIA states that in the context of slope stability (and also structural stability), the proposed basement will not significantly increase the differential depth of foundations relative to neighbouring properties. Although this will be the case where existing foundations will be underpinning, there will be an increased differential where the rear lightwell is constructed.

4.14. The BIA notes that the property is not within the catchment area of the ponds on Hampstead Heath. Although not mentioned in the BIA, nor is it located within an area considered at risk of flooding due to the breach of a reservoir containment system e.g. the pond chains on Hampstead Heath. Additionally, although again not mentioned in the BIA, because of its high elevation, the site is also not within a fluvial or tidal flood plain.

4.15. There have been two major surface water flood events in Camden, that in 1975 and again in 2002. The report 'Floods in Camden, Report of the Floods Scrutiny Panel, London Borough of Camden 2003', indicates West End Lane to have been flooded in 2002. The BIA refers to the Camden Flood Risk Management Strategy which notes that Thames Water has undertaken works to alleviate the risk of flooding in the area and that West End Lane is (now) not at risk of surface flooding. Comments from local residents state that the basement to 300 West End Lane

and also properties further down the hill are prone to flooding – see Appendix 1. Additionally the 2014 SFRA prepared on behalf of Camden by URS notes that despite the alleviation works, there is potentially still a flood risk during an extreme rainfall event. Further consideration of flood risk, including enquiries to Thames Water, were provided in January 2016 and confirmed that the risk of flooding is low.

4.16. Although not covered in the BIA, there will be no change in the quality of surface water received by adjacent properties or downstream water courses.

4.17. The BIA notes again that the property is not within the catchment area of the ponds on Hampstead Heath, nor is it located within 100m of a watercourse, well (used or disused) or potential spring line. The property is also not within an area considered at risk of flooding due to the basement being lower than mean water level in any local pond or spring line.

4.18. Although not discussed in the BIA, two southward-flowing headwater streams of a former river (the Westbourne) pass several tens of metres to either side of the site but these were culverted when the Hampstead area was originally developed. The closest potential spring line is that along the outcrop of the Claygate Beds (which is designated by the Environment Agency (EA) as a Secondary Aquifer) and the London Clay. However, this strata boundary lies some distance to the north-west of the site.

4.19. It is stated that the foundations to the property and also to adjacent properties extend to the London Clay and that given that any groundwater flow at the site will be within the overlying Made Ground, further excavation into the London Clay for the basement will not alter the current situation and hence will not be adverse.

4.20. The BIA states that the basement will not extend beneath the water table. This latter comment is presumably based on the above noted trial pit data wherein no groundwater was detected. The supplementary information confirms that the existing foundations already intercept perched groundwater. Information provided in January 2016 provides details of the proposed waterproofing of the basement and methods to exclude perched water during construction.

4.21. The BIA notes that the site is not located directly above an aquifer. The London Clay formation is of low permeability and thus the site is not considered to be at risk of flooding due to rising groundwater.

4.22. The BIA states that the proportion of hard surfaced/paved areas will remain much as at present so that infiltration volumes and flows will remain unchanged following basement construction. It is also confirmed that no more surface water than present will be discharged into the ground e.g. via soakaways and/or SUDS. The London Clay below the site is not suitable for soakaways due to its low permeability.

4.23. Retaining walls/underpinning to the new basements and the basement floor are to be of reinforced concrete. Retaining walls will be up to approximately 2m in the area of the rear lightwell. Indicative calculations were provided in January 2016 for retaining wall/underpinning design. The calculations allow for a nominal surcharge and for a groundwater level at 1m below ground level. The calculations adopt a higher value for the internal angle of friction than is suggested by the BIA, however, it is considered that this can be addressed in the final design. Proposals for addressing heave and hydrostatic pressures remain to be clarified.

4.24. The issue of propping to the basement walls/underpinning to resist ground pressures in the temporary case is addressed in the BIA. Details of propping in the permanent case should be provided.

4.25. The BIA includes a reference to the design being undertaken with a view to minimising any structural disturbance to adjoining properties or infrastructure. However, no ground movement predictions were provided or an assessment of the likely impact of basement construction on adjacent properties and the likely category of damage. Supplementary information has provided a qualitative assessment and predicts that damage will not exceed Burland Category 1 (very slight). It is accepted that, for the scale of the proposed underpinning and excavation, ground movements should be small and, assuming good control of workmanship, damage should not exceed Category 1 provided the affected properties are in sound condition. It is recommended that condition surveys and a monitoring regime are agreed with the party wall surveyor(s).

4.26. No works programme has been provided in the BIA, although it is stated that the main contractor for the works will be required to provide programmes and method statements. It is also stated that the project will be supervised by a competent professional and that construction sequencing and underpinning methodology will be tightly controlled. It is essential that the designer's requirements regarding construction sequencing, ground movement monitoring etc. are fully specified in the contract documents for the Works so that the contractor is fully aware of the levels of compliance required.

5.0 CONCLUSIONS

5.1. The BIA has not been taken beyond the screening stage as defined in the LBC Planning Guidance document 'Basements and Lightwells' (CPG4), dated July 2015. It is noted that there are two potential impacts from basement construction: flooding and an increase in the differential foundation depth.

5.2. Supplementary information has confirmed that the qualifications and experience of the author are generally in accordance with CPG4.

5.3. It is accepted that the ground investigation to date is sufficient for planning purposes. It is recommended that the bearing stratum is validated during construction.

5.4. The BIA notes there to be no evidence or history of shrink-swell subsidence in the local area. It is accepted that the new basement is at a depth unlikely to be affected and the removal of a tree should not impact the neighbouring foundations.

5.5. No groundwater monitoring has been undertaken at the site although trial pits sunk at the site were noted to be dry. It is acknowledged in the supplementary information that some perched water may be encountered and proposals for dewatering and excluding water in the permanent condition were provided in further information submitted in January 2016.

5.6. The BIA states that the site and general area do not slope more than 7^{o} and that the proposed works will not alter this situation. Comments received from local residents note that West End Lane is sited on a hill with a steep gradient. It is accepted that there is not a significant change in ground level between 300 West End Lane and the neighbouring properties. For this reason it is agreed that the proposed basement will not significantly increase the differential depth of foundations relative to neighbouring properties with the exception of the lightwell.

5.7. The BIA states that Thames Water has undertaken works to alleviate the risk of flooding in the area and that West End Lane is (now) not at risk of surface flooding. However, reference to the SFRA suggests that a risk remains during extreme rainfall events. Additionally, comments from local residents have suggested flooding to the basement to 300 West End Lane and other properties further down the hill. This was considered in more detail in information provided in January 2016 and confirms the risk of flooding is low.

5.8. The BIA states that the basement will not extend beneath the water table although the supplementary information acknowledges the likely presence of perched water. Proposals for basement water proofing and dewatering during construction should be provided.

5.9. Indicative calculations for retaining wall/underpinning design and floor slabs have been provided which are generally acceptable. Proposals for propping the basement

walls/underpinning and designing the slab to resist ground pressures in the permanent case remain to be provided. Detailed design should be agreed with the party wall surveyor.

5.10. It is accepted that due to the small scale nature of the works, ground movements should be limited. It is agreed, assuming good control of workmanship and that affected structures are in sound condition, damage should not exceed Burland Category 1.

5.11. No works programme has been provided. It is essential that the programme and designer's requirements regarding construction sequencing, ground movement monitoring etc. are fully specified in the contract documents for the Works so that the contractor is fully aware of the levels of compliance required.

5.12. Queries and requests for clarification/further information raised by the audit are summarised in Appendix 2. It is accepted that, subject to the agreement of the party wall award, the BIA and supporting documents provide adequate mitigation.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Botkai (Robert)	66 Pattisson Road, London NW2 2HJ	01/08/15	Concerned as to the impact of the basement works on the structural integrity of the building and adjacent properties.	See 5.10.
Botkai (Gustav)	14 Buckingham Mansions, 353 West End Lane, London NW6 1LR	02/08/15	As above.	See 5.10.
Heritier	1st Floor Flat, 298 West End Lane	06/08/15	The excavation of a large basement under one half of a semi-detached house on sloping ground will cause substantial stability issues and result in subsidence and rapid deterioration. Specialist reports stating that stability will be ensured are not available.	See 5.10.
Puszet	302 West End lane, London NW6 1LN	11/08/15	No detailed calculations have been provided on structural stability. The basement of 300 West End Lane and other properties further down the hill are prone to flooding. No formal GI has been undertaken for the Works. No method statement has been provided, nor mitigation measures included with respect to stability, hydrology, drainage etc. No survey has been undertaken of 302	See 5.3, 5.7-5.11.

Surname	Address	Date	Issue raised	Response
			West End Lane (next door but not adjoining 300 West End Lane). The drains to 300 West End Lane will have to be moved as part of the Works. The proposed excavations at the side of 102 West End Lane could impact on the integrity of the pathway which is the sole access to 302 West End Lane. The greater elevation of 302 West End Lane relative to 300 West End Lane (uphill) means that the proposed new basement will be excavated to below the depth of the foundations to 302 West End Lane and also at close proximity. This is of concern. Require that Party Wall procedures are a condition of the work progressing.	
Patel	86 Woodland Drive, Watford WD17 3BZ	Undated	There is no guarantee that the building will remain safe for occupants. The report fails to present any qualified/calculated assessment of the likely impact of the works on the structural stability of the property during and after construction. West End Lane has been identified as being within an area at risk from flooding. There is currently an issue with water in the cellar to the property, thus contradicting the statements in the BIA	See 5.3, 5.7-5.11.

Surname	Address	Date	Issue raised	Response
			that the cellar is dry. Appended e-mail conversations indicate that the basement has been subject to regular flooding although water is prevented from ponding by pumping during rainfall events plus the use of a fan, dehumidifier etc. to control damp.	

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Evidence or otherwise of history of shrink-swell subsidence in the local area to be substantiated.	Accepted that no significant trees removed and new foundations likely to be below depth of influence.	14/12/15
2	Hydrology	The nature and scope of Thames Water's work to alleviate the risk of flooding in the area to be explained.	Flood risk further evaluated and confirmed to be low.	28/01/16
3	Stability	Calculations for wall and underpinning design should be provided – see Sections 5.7-5.8.	Indicative calculations provided. Detailed design to be agreed with party wall surveyor.	28/01/16
4	Stability	Ground movement predictions to assess the likely structural impact of basement construction on adjacent properties and the likely category of damage to be undertaken.	Accepted that with good condition of workmanship, ground movements should be small.	14/12/15
5	Stability	Programme of works to be provided.	To be provided at detailed design stage.	14/12/15
6	Stability	The designer's requirements regarding construction sequencing, propping, ground movement monitoring etc. to be fully specified in the contract documents for the Works so that the contractor is made fully aware of the levels of compliance required.	Open.	Party wall agreement.
7	Stability, hydrology and hydrogeology	An intrusive GI with associated insitu and laboratory testing should be undertaken to inform design of the basement walls/underpinning. This should also include the installation of standpipes to confirm the groundwater regime and groundwater flow directions.	Accepted that the current level of GI is acceptable provided that the bearing stratum is validated during construction and that measures are put in place to exclude perched water from the basement excavation.	14/12/15

Appendix 3: Supplementary Supporting Documents

Our ref: SCL/PC/8887

Your ref:

Date: 27th January 2016

Mr P C Daniels
Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
London SE1 8NZ

Dear Sir,

re: **300 West End Lane, NW6 1LN**
Ref: 12066-58 Rev D2
Planning Ref: 2015/3690/P

We are in receipt of your further audit report reference D2 and would respond to the outstanding points itemised as follows:

1.10 Please refer to additional report attached.

1.11 Refer to the detailed section drawings within the report. It is proposed to use a good quality structural concrete with normal under-slab damp protection. An internal delta membrane is proposed to control any damp/minor seepage that may occur. With regard dewatering, a simple sump pump will be employed if necessary but from trial holes to date ingress is expected to be minimal. If volume is sufficient and discharge to the sewer is necessary normal licences will be obtained from Thames Water. If fines are present appropriate filters will be employed. The final methodology will be agreed with the proposed contractor and form part of the Party Wall Agreement.

1.12 Indicative calculations are attached.

The basement is of modest depth and a combination of normal sequenced underpinning and temporary earthworks and pin support will be employed until the structural box is complete and integrity provided.

The sequence will be agreed with the chosen contractor who will prepare full method statements and calculations as may be required for agreement and incorporation into the Party Wall Agreement.

We trust that this additional information will enable you to complete your audit with a positive conclusion.

For and on behalf of
TAYLOR WHALLEY SPYRA

SIMON LANE
BSc(Eng), CEng, FICE, FIStructE

Encs: Flood Risk Appraisal / Structural Calculations

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FLOOD RISK APPRAISAL

IN RESPONSE TO CAMPBELL REITH AUDIT REPORT REF 12066-58 REV D2 – ITEM 1.10

HR/8887

JANUARY 2016

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The following is a response to the report completed by Campbell Reith, auditing the basement impact assessment for 300 West End Lane; specifically addressing point 1.10 of their report.

> *"The BIA states that Thames Water has undertaken works to alleviate the risk of flooding in the area and that West End Lane is (now) not at risk of surface flooding. However, reference to the SFRA suggests that a risk remains during extreme rainfall events. Additionally, comments from local residents have suggested flooding to the basement to 300 West End Lane and other properties further down the hill. It is recommended this is assessed in more detail or mitigation measures introduced."*

The site sits in an area of low flood risk (zone 1). Zone 1 sites have an annual chance of tidal flooding from the river Thames <0.1%, thus negligible to our overall drainage strategy. Further information was obtained regarding surface water flooding in the area from the Arup study. This data indicated that the street in question is not susceptible to surface water flooding.

Figure 15 from the Camden geological, hydrogeological and hydrological study by Arup, November 2010, indicates that the street in question was not flooded during the rainfall events of 2002 or 1975. Figure 11 in the same report indicates locations of watercourses around the Camden area, from which we can see that our site is more than 20m away from the nearest watercourse. Figure 10 gives an indication of the topography of the area. It is noted that the site in question is within a wider set of hills sloping down towards the Thames, thus any surface water around the area will fall southwards away from the site.

A Thames Water sewer flood enquiry was carried out to investigate the history of sewer flooding in the area. It was found that Thames Water do not hold any records of flooding due to sewer blockage or surcharges on the system – refer to attached.

Construction for all extreme weather events is not possible as many factors come into play and not all can be addressed. There is however a range of systems which can be incorporated to minimise the damage caused by such scenarios:

- Waterproof sealed doors and airbrick covers can ensure that the building itself remains watertight up to around 600mm above surrounding ground level.
- Sump pumps can be installed below ground level to prevent the water level rising drastically.
- Non-return valves installed on any surface or foul water outlets, preventing any surcharge on the property should the mains system back up.
- Doing away with soft finishes to vulnerable floor areas such as carpet and replacing them with waterproof systems.
- The first line of defence for the property is the surrounding external landscaping. Thus this should be designed to divert water away from the building itself by way of gradients and falls. Similarly permeable materials should be used where possible instead of solid concrete paving.

In summary, the historical data and geology of the site indicates that the property sits in an area of low risk in terms of flooding; having considered local watercourses, historical flood mapping and geology. Although it is impossible to design for every eventuality certain measures can be implemented to alleviate the damage caused from extreme events.

It is clear that the scale of the proposed lower ground floor extension is sufficiently small to have no impact on the local ground water regime, or any detrimental effect to flooding risk.

The existing damp area to the undercroft will be greatly improved by construction of modern robust construction and internal delta membrane.

Further resilience can be built in if desired by incorporation of robust details as described within the foregoing.

A useful reference document in that respect is "Homeowners Guide to Flood Resilience".

Sewer Flooding
History Enquiry

Taylor Whalley Spyra Limited

Dufferin Avenue

Search address supplied

300
West End Lane
Hampstead,
London
NW3 1LN

Your reference N/A

Our reference SFH/SFH Standard/2015_3221160

Received date **21 December 2015**

Search date **21 December 2015**

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

Search address supplied: 300,West End Lane,Hampstead,London,NW3 1LN

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

Thames Water Utilities Ltd

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Reading RG1 8DB

Sewer Flooding

History Enquiry

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk

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Reading RG1 8DB

300 WEST END LANE
LONDON
NW6 1LN

STRUCTURAL CALCULATIONS

IN RESPONSE TO CAMPBELL REITH AUDIT REPORT REF 12066-58 REV D2 – ITEM 1.12

NB/8887

JANUARY 2016

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Barbican, London, EC1Y 8PQ
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Job No	Description	Page:	1
8887	300 West End Lane, London NW6 1LN	Date:	22.01.16
		By:	S.Asadi
		Checked:	N.Buzhala

DESIGN ON RETAINING WALL

Loadings:

Floor Dead Load: 1.0kN/m^2 X 2.5m (load span) = 2.5kN/m (multiply by 2 for Ground & First floor = 5.0kN/m)
Floor Live Load: 1.5kN/m^2 X 2.5m (load span) = 3.8kN/m (multiply by 2 for Ground & First floor = 7.6kN/m)

Pitched Roof Dead Load: 1.0kN/m^2 X 2.5m (load span) = 2.5kN/m
Pitched Roof Live Load: 0.65kN/m^2 X 2.5m (load span) = 1.6kN/m

Brick wall Dead Load: 6.7kN/m^2 X 6.2m (height) = 41.5kN/m

RETAINING WALL ANALYSIS

In accordance with EN1997-1:2004 incorporating Corrigendum dated February 2009 and the UK National Annex incorporating Corrigendum No.1

Tedds calculation version 2.6.05

Retaining wall details

Stem type	Cantilever		
Stem height	h_{stem} = **1850** mm		
Stem thickness	t_{stem} = **350** mm		
Angle to rear face of stem	α = **90** deg		
Stem density	γ_{stem} = **25** kN/m^3		
Toe length	l_{toe} = **850** mm		
Base thickness	t_{base} = **350** mm		
Base density	γ_{base} = **25** kN/m^3		
Height of retained soil	h_{ret} = **1850** mm	Angle of soil surface	β = **0** deg
Depth of cover	d_{cover} = **0** mm		
Height of water	h_{water} = **850** mm		
Water density	γ_w = **10** kN/m^3		

Retained soil properties

Moist density	γ_{mr} = **22** kN/m^3
Saturated density	γ_{sr} = **32** kN/m^3

Base soil properties

Soil density	γ_b = **22** kN/m^3

Loading details

Permanent surcharge load	$Surcharge_G$ = **5** kN/m^2
Variable surcharge load	$Surcharge_Q$ = **5** kN/m^2
Vertical line load at 1025 mm	P_{G1} = **49** kN/m
	P_{Q1} = **9.2** kN/m

Calculate retaining wall geometry

Base length	l_{base} = **1200** mm		
Saturated soil height	h_{sat} = **850** mm		
Moist soil height	h_{moist} = **1000** mm		
Length of surcharge load	l_{sur} = **0** mm		
Vertical distance	x_{sur_v} = **1200** mm		
Effective height of wall	h_{eff} = **2200** mm		
Horizontal distance	x_{sur_h} = **1100** mm		
Area of wall stem	A_{stem} = **0.648** m^2	Vertical distance	x_{stem} = **1025** mm
Area of wall base	A_{base} = **0.42** m^2	Vertical distance	x_{base} = **600** mm

Partial factors on actions - Table A.3 - Combination 1

Permanent unfavourable action γ_G = **1.35** Permanent favourable action γ_{Gf} = **1.00**

Variable unfavourable action γ_Q = **1.50** Variable favourable action γ_{Qf} = **0.00**

Partial factors for soil parameters – Table A.4 - Combination 1

Angle of shearing resistance $\gamma_{\phi'}$ = **1.00** Effective cohesion $\gamma_{c'}$ = **1.00**

Weight density γ_γ = **1.00**

Soil coefficients

Coeff.friction to back of wall K_{fr} = **0.325**

Coeff.friction to front of wall K_{fb} = **0.325** Coeff.friction beneath base K_{fbb} = **0.325**

Active pressure coefficient K_A = **0.300** Passive pressure coefficient K_P = **3.700**

Overturning check

Vertical forces on wall

Total $F_{total\_v} = F_{stem} + F_{base} + F_{water\_v} + F_{P\_v}$ = **75.7** kN/m

Horizontal forces on wall

Total $F_{total\_h} = F_{sat\_h} + F_{moist\_h} + F_{exc\_h} + F_{water\_h} + F_{sur\_h}$ = **33.2** kN/m

Overturning moments on wall

Total $M_{total\_OT} = M_{sat\_OT} + M_{moist\_OT} + M_{water\_OT} + M_{sur\_OT}$ = **28.3** kNm/m

Restoring moments on wall

Total $M_{total\_R} = M_{stem\_R} + M_{base\_R} + M_{P\_R}$ = **73.1** kNm/m

Check stability against overturning

Factor of safety FoS_{ot} = **2.58**

PASS - Maximum restoring moment is greater than overturning moment

Bearing pressure check

Vertical forces on wall

Total $F_{total\_v} = F_{stem} + F_{base} + F_{water\_v} + F_{P\_v}$ = **116** kN/m

Horizontal forces on wall

Total $F_{total\_h} = F_{sat\_h} + F_{moist\_h} + F_{pass\_h} + F_{water\_h} + F_{sur\_h}$ = **33.2** kN/m

Moments on wall

Total $M_{total} = M_{stem} + M_{base} + M_{sat} + M_{moist} + M_{water} + M_{sur} + M_P$ = **84.5** kNm/m

Check bearing pressure

Propping force F_{prop_base} = **33.2** kN/m

Bearing pressure at toe q_{toe} = **96.6** kN/m^2 Bearing pressure at heel q_{heel} = **96.6** kN/m^2

Factor of safety FoS_{bp} = **1.552**

PASS - Allowable bearing pressure exceeds maximum applied bearing pressure

Partial factors on actions - Table A.3 - Combination 2

Permanent unfavourable action γ_G = **1.00** Permanent favourable action γ_{Gf} = **1.00**

Variable unfavourable action γ_Q = **1.30** Variable favourable action γ_{Qf} = **0.00**

Partial factors for soil parameters – Table A.4 - Combination 2

Angle of shearing resistance $\gamma_{\phi'}$ = **1.25** Effective cohesion $\gamma_{c'}$ = **1.25**

Weight density γ_γ = **1.00**

Soil coefficients

Coeff.friction to back of wall K_{fr} = **0.325**

Coeff.friction to front of wall K_{fb} = **0.325** Coeff.friction beneath base K_{fbb} = **0.325**

Active pressure coefficient K_A = **0.300** Passive pressure coefficient K_P = **3.700**

Overturning check

Vertical forces on wall

Total $F_{total\_v} = F_{stem} + F_{base} + F_{water\_v} + F_{P\_v} =$ **75.7** kN/m

Horizontal forces on wall

Total $F_{total\_h} = F_{sat\_h} + F_{moist\_h} + F_{exc\_h} + F_{water\_h} + F_{sur\_h} =$ **24.1** kN/m

Overturning moments on wall

Total $M_{total\_OT} = M_{sat\_OT} + M_{moist\_OT} + M_{water\_OT} + M_{sur\_OT} =$ **21.7** kNm/m

Restoring moments on wall

Total $M_{total\_R} = M_{stem\_R} + M_{base\_R} + M_{P\_R} =$ **73.1** kNm/m

Check stability against overturning

Factor of safety $FoS_{ot} =$ **3.373**

PASS - Maximum restoring moment is greater than overturning moment

Bearing pressure check

Vertical forces on wall

Total $F_{total\_v} = F_{stem} + F_{base} + F_{water\_v} + F_{P\_v} =$ **87.6** kN/m

Horizontal forces on wall

Total $F_{total\_h} = F_{sat\_h} + F_{moist\_h} + F_{pass\_h} + F_{water\_h} + F_{sur\_h} =$ **24.1** kN/m

Moments on wall

Total $M_{total} = M_{stem} + M_{base} + M_{sat} + M_{moist} + M_{water} + M_{sur} + M_P =$ **63.7** kNm/m

Check bearing pressure

Propping force $F_{prop\_base} =$ **24.1** kN/m

Bearing pressure at toe $q_{toe} =$ **73** kN/m^2 Bearing pressure at heel $q_{heel} =$ **73** kN/m^2

Factor of safety $FoS_{bp} =$ **2.054**

PASS - Allowable bearing pressure exceeds maximum applied bearing pressure

RETAINING WALL DESIGN

In accordance with EN1992-1-1:2004 incorporating Corrigendum dated January 2008 and the UK National Annex incorporating National Amendment No.1

Tedds calculation version 2.6.05

Concrete details - Table 3.1 - Strength and deformation characteristics for concrete

Concrete strength class C30/37

Char.comp.cylinder strength $f_{ck} =$ **30** N/mm^2 Mean axial tensile strength $f_{ctm} =$ **2.9** N/mm^2

Secant modulus of elasticity $E_{cm} =$ **32837** N/mm^2 Maximum aggregate size $h_{agg} =$ **20** mm

Design comp.concrete strength $f_{cd} =$ **17.0** N/mm^2 Partial factor $\gamma_C =$ **1.50**

Reinforcement details

Characteristic yield strength $f_{yk} =$ **500** N/mm^2 Modulus of elasticity $E_s =$ **200000** N/mm^2

Design yield strength $f_{yd} =$ **435** N/mm^2 Partial factor $\gamma_S =$ **1.15**

Cover to reinforcement

Front face of stem $c_{sf} =$ **40** mm Rear face of stem $c_{sr} =$ **50** mm

Top face of base $c_{bt} =$ **50** mm Bottom face of base $c_{bb} =$ **75** mm

Check stem design at base of stem

Depth of section h = **350** mm

Rectangular section in flexure - Section 6.1

Design bending moment M = **17.3** kNm/m K = **0.007** K' = **0.207**

K' > K - No compression reinforcement is required

Tens.reinforcement required	$A_{sr.req}$ = **142** mm^2/m		
Tens.reinforcement provided	10 dia.bars @ 150 c/c	Tens.reinforcement provided	$A_{sr.prov}$ = **524** mm^2/m
Min.area of reinforcement	$A_{sr.min}$ = **444** mm^2/m	Max.area of reinforcement	$A_{sr.max}$ = **14000** mm^2/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Deflection control - Section 7.4

Limiting span to depth ratio	413.6	Actual span to depth ratio	6.3

PASS - Span to depth ratio is less than deflection control limit

Crack control - Section 7.3

Limiting crack width	w_{max} = **0.3** mm	Maximum crack width	w_k = **0.12** mm

PASS - Maximum crack width is less than limiting crack width**Rectangular section in shear - Section 6.2**

Design shear force	V = **26.1** kN/m	Design shear resistance	$V_{Rd.c}$ = **139.2** kN/m

PASS - Design shear resistance exceeds design shear force

Horizontal reinforcement parallel to face of stem - Section 9.6

Min.area of reinforcement	$A_{sx.req}$ = **350** mm^2/m	Max.spacing of reinforcement	s_{sx_max} = **400** mm
Trans.reinforcement provided	10 dia.bars @ 200 c/c	Trans.reinforcement provided	$A_{sx.prov}$ = **393** mm^2/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Check base design at toe

Depth of section h = **350** mm

Rectangular section in flexure - Section 6.1

Design bending moment	M = **30.6** kNm/m	K = **0.014**	K' = **0.207**

K' > K - No compression reinforcement is required

Tens.reinforcement required	$A_{bb.req}$ = **275** mm^2/m		
Tens.reinforcement provided	10 dia.bars @ 150 c/c	Tens.reinforcement provided	$A_{bb.prov}$ = **524** mm^2/m
Min.area of reinforcement	$A_{bb.min}$ = **407** mm^2/m	Max.area of reinforcement	$A_{bb.max}$ = **14000** mm^2/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Crack control - Section 7.3

Limiting crack width	w_{max} = **0.3** mm	Maximum crack width	w_k = **0.299** mm

PASS - Maximum crack width is less than limiting crack width**Rectangular section in shear - Section 6.2**

Design shear force	V = **72.1** kN/m	Design shear resistance	$V_{Rd.c}$ = **131.4** kN/m

PASS - Design shear resistance exceeds design shear force

Secondary transverse reinforcement to base - Section 9.3

Min.area of reinforcement	$A_{bx.req}$ = **105** mm^2/m	Max.spacing of reinforcement	s_{bx_max} = **450** mm
Trans.reinforcement provided	10 dia.bars @ 200 c/c	Trans.reinforcement provided	$A_{bx.prov}$ = **393** mm^2/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Our ref: SCL/PC/8887

Your ref:

Date: 27th November 2015

Mr P C Daniels
Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ

Dear Sir,

re: **300 West End Lane, NW6 1LN**
Ref: 12066-58 Rev D1
Planning Ref: 2015/3690/P

We are in receipt, with thanks, of your Audit report as referenced above and would respond as follows:

Our report is as you know a screening exercise which we believe demonstrates that due to the small scale and known risk of the proposals a full BIA is not required. This is the process clearly defined within DP27 and CPG4, in particular CPG4 page 15, 3.7 refers.

DP27 defines this type of basement as 'small', being not more than 3m in depth and entirely within the footprint of the existing building and founded on the London Clay formation with its well known properties.

In essence what is proposed is of a simple nature and a scale undertaken many times in London without detrimental effect.

We entirely agree that the work needs to be undertaken by a competent contractor and adequately supervised but it is our opinion that further testing and calculation, whilst being time consuming and disproportionately expensive, will not improve the outcome.

Works of this scale as you know are almost entirely experience based and we have undertaken many on a similar and greater scale.

In answer to your more specific points as per your Non-Technical Summary points 1.1 - 1.19 inclusive:

1.1 CampbellReith has been instructed by the London Borough of Camden (LBC) to carry out an audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 300 West End Lane, London NW6 1LN - Planning Reference 2015/3690/P.

The TWS report is not a full BIA but a screening exercise only, as above, which in our opinion adequately demonstrates that due to its small scale and known quantum a full BIA is not required and indeed would not serve any useful purpose.

1.2 The Audit has been carried out in accordance with the Terms of Reference set by the LBC. The Audit has reviewed the BIA for potential impacts on land stability and on local ground and surface water conditions arising from the proposed basement development.

No comment.

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Barbican, London, EC1Y 8PQ
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1.3 CampbellReith has accessed LBC's Planning Portal and reviewed the latest revisions of submitted documentation against an agreed audit check list.

No comment.

1.4 The BIA has not been taken beyond the screening stage as defined in the LBC Planning Guidance document 'Basements and Lightwells' (CPG4), dated July 2015.

No comment.

1.5 The authorship of the BIA and the qualifications of the author(s) are not recorded within the document. This matter should be rectified with full details being supplied.

Please find attached my CV and brief examples relating to our basement experience. During the last 10 years in particular we have undertaken many successful basement installations in London a number of which have been multi-storey in nature. As my point within the initial part of this letter and as you know, ground engineering is largely based on precedent and experience and the scale of development concerned here has been undertaken on numerous occasions in similar conditions without detrimental effect.

1.6 There is no quantitative information given to substantiate the descriptions of soil consistency/strength provided for the ground beneath the basement - see comments below on the need for further GI.

Based on the information gathered to date it is our opinion that no further investigations are required. Within the screening document the results of trial holes to expose the existing foundations are included. The deepest was excavated 2m to the rear of the property and clearly shows weathered London Clay with localised lenses of silt as are typical for the upper London Clay lithology. There was no infiltration from ground water or any evidence of free water. This is confirmed by the geological map extract which is included within the report.

1.7 The BIA notes there to be no evidence or history of shrink-swell subsidence in the local area. However, given the shrink/swell potential of the London Clay (upon which the property is founded), the above comments should be substantiated.

The existing building has no signs of subsidence or movement or any evidence of past underpinning. It is well known that London Clay is a shrinkable medium but this fact is not practically of significance with regard the proposed works.

1.8 No groundwater monitoring has been undertaken at the site although trial pits sunk at the site were noted to be dry - see comments below on the need for further GI.

Due to the presence of London Clay any perched ground water table is very slow moving and will not be significantly affected by the works. Monitoring ground water to a deeper level really will not add anything to existing knowledge.

1.9 The BIA states that the site and general area do not slope more than 7° and that the proposed works will not alter this situation. However, based on comments received from local residents, noting that West End Lane is sited on a hill with a steep gradient – see Appendix 1, this matter needs to be clarified.

The area generally slopes but locally this is insignificant with the front level at OD 50.046m and the rear 49.46m. The London Clay extends as you know for significant depth and the proposed basement formation clearly does not increase the prospect of land instability.

1.10 The BIA states that the proposed basement will not significantly increase the differential depth of foundations relative to neighbouring properties. Again, given the apparently sloping nature of West End Lane, this comment requires substantiation.

The proposed basement level is OD 47.87m with the existing foundations at 48.17m. It can be seen that this is very minor underpinning work and will not pose any risk to adjacent properties.

1.11 The BIA states that Thames Water has undertaken works to alleviate the risk of flooding in the area and that West End Lane is (now) not at risk of surface flooding. However, given the apparently sloping nature of West End Lane and the comments from local residents concerning flooding to the basement to 300 West End Lane and other properties further down the hill – see Appendix 1, this matter needs to be clarified. The nature and scope of Thames Water's work to alleviate the risk of flooding in the area also requires further examination and clarification.

The EA flood plan confirms the property is in an area of low to medium risk with no specific local issues highlighted. The advice within Camden's advisory documents and highlighted within our screening document is that the extension of the basement will not increase flood risk.

1.12 The BIA states that the basement will not extend beneath the water table. This requires to be demonstrated following a period of heavy rainfall for example – see the local residents' comments in Appendix 1 and below regarding the need for further GI.

The existing property walls and below ground void are already intercepting any slow moving perched ground water. It is our opinion that the proposed basement installation will not adversely affect the current situation.

1.13 Calculations for retaining wall/underpinning design should be provided and should cover stability i.e. sliding, overturning and bearing capacity in addition to the structural design of the walls/underpinning.

This is not required for the screening process but is part of the final detailed design which will be undertaken if the project proceeds and will be required for any party wall agreements and building regulation approval. It is clear however that the load onto the existing foundations is not being increased.

1.14 The issue of propping to the basement walls/underpinning to resist ground pressures in the temporary and permanent cases should be addressed.

This is not required by the screening process and will be addressed within the specification with detailed contractor's design and sequencing required which will be checked by the appointed engineer. This will also be required as part of the party wall agreements.

1.15 No ground movement predictions have been made to assess the likely impact of basement construction on adjacent properties and the likely category of damage. This is required to be done before the BIA can be approved. There should also be contingency provisions in place should on-going movements indicate the likely exceedance of predicted values

As already stated this work is best assessed by precedent and experience. Similar scale of works have been successfully implemented on numerous occasions without detrimental effect. The most important factor is sound design and implementation by those with the relevant experience. On this basis predicted ground movements will be confined within the property and its party wall. Some horizontal strain will develop and we predict that maximum settlements are likely to be in the order of 2mm with distortions of less than 1mm and horizontal strains of around 0.03%. Any potential damage caused would be aesthetic in nature resulting, in the worst case, in fine cracks which may easily be treated by normal decoration (Category 1 damage as defined within the attached guide. We consider the level of predicted movements normal and acceptable in terms of risk and that further mitigation measures are not possible or necessary.

1.16 No works programme has been provided. This should be rectified. It is essential that the designer's requirements regarding construction sequencing, ground movement monitoring etc. are fully specified in the contract documents for the Works so that the contractor is fully aware of the levels of compliance required.

Refer to our screening report 7.0.

1.17 Given the current lack of any qualitative information on the soil strength/depth profile at the site, some form of intrusive GI with associated insitu and laboratory testing should be undertaken to inform design of the basement walls/underpinning.

1.6 above refers.

1.18 This should also include the installation of standpipes to confirm the groundwater regime and groundwater flow directions.

As mentioned earlier ground water monitoring is not considered necessary given the scale of the works proposed.

1.19 Queries and requests for clarification/further information are summarised in Appendix 2.

Dealt with within the above.

In conclusion, and as stated, it is our opinion that the thorough screening process as undertaken is fully in compliance with LBC guidelines and that based upon experience, and presuming detailed design and implementation as would normally be expected from those suitably qualified and experienced in undertaking works of a similar scale and magnitude, the proposed basement extension will be capable of construction without detriment to the adjacent properties or local area.

For and on behalf of
TAYLOR WHALLEY SPYRA

SIMON LANE
BSc(Eng), CEng, FICE, FIStructE

Encs: CV / Examples of basement projects / Ciria table

Curriculum Vitae

SIMON LANE
Director

Qualifications:

- BSc Civil Engineering
- Chartered Engineer
- Fellow of The Institution of Structural Engineers
- Fellow of The Institution of Civil Engineers

Simon has been an equity director since 1996. Prior to that he had extensive experience with developers, contractors, and Local Authorities. He has been a Fellow of the Institution of Civil Engineers and a Fellow of the Institution of Structural Engineers since 1993.

He has extensive experience of designing in all structural forms and with all the common materials. He has worked in project teams throughout the UK and in particular in London and the surrounding counties. He has worked on most building types both new build and complex refurbishments in city centres, multiple occupancy and greenfield locations.

Core strengths are: technical excellence, managerial ability, practical approach, good people skills, calm nature, commercial acumen and problem solving ability.

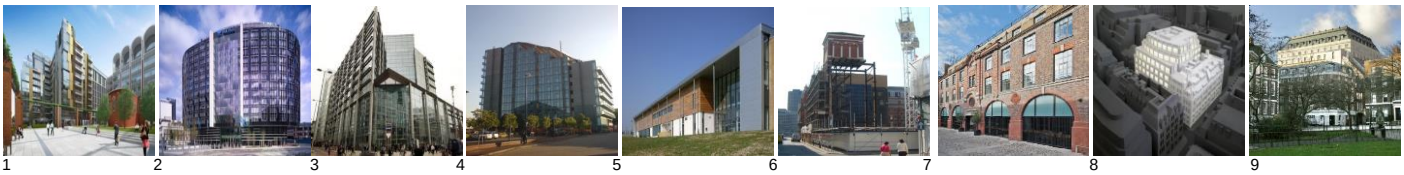
Simon has worked for and is retained by a wide cross section of clients including the education and research sector, institutions and pension funds, banks and financial institutions, the church, local authorities, commercial organisations, developers, private investors and building contractors.

He is a supervising engineer for graduates working towards chartered status and an examiner for the Institution of Civil Engineers.

He is a reviewer for the Institution of Structural Engineers commenting on the content of technical papers prior to publication in engineering journals and proceedings.

Project examples include:

- *Fitzroy Place, W1 – mixed use development consisting of circa 71,000m^2 offices, residential units, retail/restaurant, educational and primary care facilities including Grade 2 Listed chapel facade retention and below-ground car parking[1]*
- *Westminster Park Plaza – 1200 bed hotel with 5 basements[2]*
- *RBS Central London – major power & UPS upgrade in support of the principal Central London trading, IT infrastructure and training facilities[3]*
- *Abito Apartments, Salford Quays - 280 apartments with office & leisure facilities[4]*
- *Downham Lifestyles, Lewisham – leisure centre, medical consulting rooms, library[5]*
- *Whitefriars – facade & water tower retention[6]*
- *The Brassworks, Frederick Close, Hyde Park – conversion of listed building into luxury flats[7]*
- *Lonsdale Chambers, WC2 – major office development[8]*
- *Africa House, WC2 – remodelling of existing office building[9]*


1 2 3 4 5 6 7 8 9

AWARDS: Civic Trust Awards 1972 – George Hotel, Edinburgh; Civic Trust Awards 1989 – Richmond House, Whitehall; Structural Steel Design Award 1973 – London Ambulance Services Transmitter Stations and Masts; Structural Steel Design Award 1987 – Volvo House, Marlow; Burnley Borough Council Mayor's Award of Excellence 1995/96 – Towneley House; London Borough of Camden Building Quality Award 2007 – Ambassadors Hotel London; Civic Trust Awards 2008 – Abito Apartments, Manchester; Civic Trust Awards 2009 – Downham Health & Leisure Centre, Lewisham; RIBA East – Spirit of Ingenuity Education & Healthcare Award 2010 – Kimbolton School; European Hotel Design Awards 2011 – Westminster Park Plaza; Commendation for British Homes Awards 2013 and Winner of the Interior Design of the Year at the 2014 Blue Ribbon Awards – The Brassworks, London; Nominated for BCO Central London Office Award 2014 - Africa House, London; NHBC Pride in the Job Award 2015 – The Grove, Highgate.

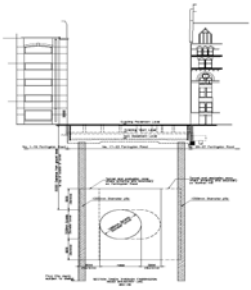
TYPICAL EXAMPLES OF DIFFICULT SUPERSTRUCTURE RETENTION AND SUBSTANTIAL BASEMENT CONSTRUCTION IN LONDON




16 Boltons Place, London
Formation of significant residential basements adjacent to and beneath existing

37 Loudon Road, London


67 West Heath Road, London
New construction adjacent to existing buildings

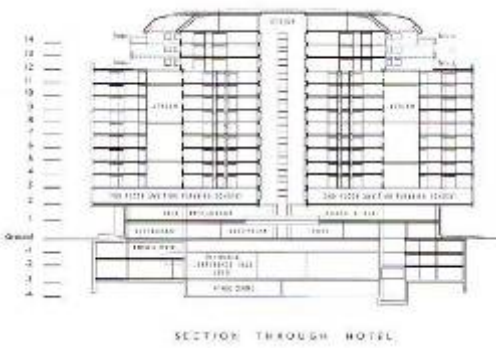
17-23 Farringdon Road, London
Construction of new retail, commercial and residential building over the proposed Crossrail link

60 Addison Road W14
Facade retention over new basement

1 St Kildas Road N16
New single basement office facility

5 Cannon Lane, NW3
New residential double basement

Whitefriars, London
Façade & water tower retention prior to basement construction

Westminster Park Plaza, London
Construction of new luxury hotel by top-down method incorporating 4 basement levels

Clifton Ford Hotel London
Façade retention & new double basement leisure facility

Assessment of damage category
(Table 2.5 from CIRIA Report C580 2003)

Table 2.5 *Classification of visible damage to walls (after Burland* et al, *1977, Boscardin and Cording, 1989; and Burland, 2001)*

Category of damage	Description of typical damage (ease of repair is underlined)	Approximate crack width (mm)	Limiting tensile strain ε_{lim} (per cent)
0 Negligible	Hairline cracks of less than about 0.1 mm are classed as negligible.	< 0.1	0.0–0.05
1 Very slight	Fine cracks that can easily be treated during normal decoration. Perhaps isolated slight fracture in building. Cracks in external brickwork visible on inspection.	< 1	0.05–0.075
2 Slight	Cracks easily filled. Redecoration probably required. Several slight fractures showing inside of building. Cracks are visible externally and some repointing may be required externally to ensure weathertightness. Doors and windows may stick slightly.	< 5	0.075–0.15
3 Moderate	The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable linings. Repointing of external brickwork and possibly a small amount of brickwork to be replaced. Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired.	5–15 or a number of cracks > 3	0.15–0.3
4 Severe	Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Windows and frames distorted, floor sloping noticeably. Walls leaning or bulging noticeably, some loss of bearing in beams. Service pipes disrupted.	15–25 but also depends on number of cracks	> 0.3
5 Very severe	This requires a major repair involving partial or complete rebuilding. Beams lose bearings, walls lean badly and require shoring. Windows broken with distortion. Danger of instability.	usually > 25 but depends on number of cracks.	

Notes

1. In assessing the degree of damage, account must be taken of its location in the building or structure.
2. Crack width is only one aspect of damage and should not be used on its own as a direct measure of it.

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