

T E C H N I K E R

34 Clarence Road, N22 8PL

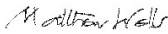
Basement Impact Assessment (BIA)

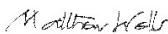
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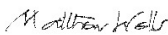
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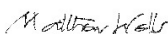
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1. Introduction

Techniker Ltd. has been appointed by Dr. Alex Amato, to carry out a Basement Impact Assessment (BIA) in support of a planning application for the proposed development at 34 Clarence Road, London, N22 8PL. Architectural design by Kin Yan Lau.

This report includes a screening exercise for the below-ground aspects of the proposed development in-line with the London Borough of Haringey (LBH) Development Management Development Plan Document Policy DM18 and Draft Basement Development Guidance Note (DBDGN) June 2012.

Based upon our findings of the screening segment, the impact of the proposed below ground construction is summarised. A ground investigation has been conducted to verify the proposed foundation strategy.

The DBDGN sets out a developer led methodology for assessing the impacts of basement construction which states:

“The Council will only permit basements and other underground development where you can demonstrate it will not cause harm to the built and natural environment and local amenity, including to the local water environment, ground conditions and biodiversity. Addressing these issues may require the submission of a variety of information to provide the Council with a basis for determining applications. The level of information required is commensurate with the scale, location and complexity of the scheme. The information required would normally need to cover the following:

1. Surface flooding
2. Groundwater flow
3. Land stability
4. Environmental affects and residential amenity”

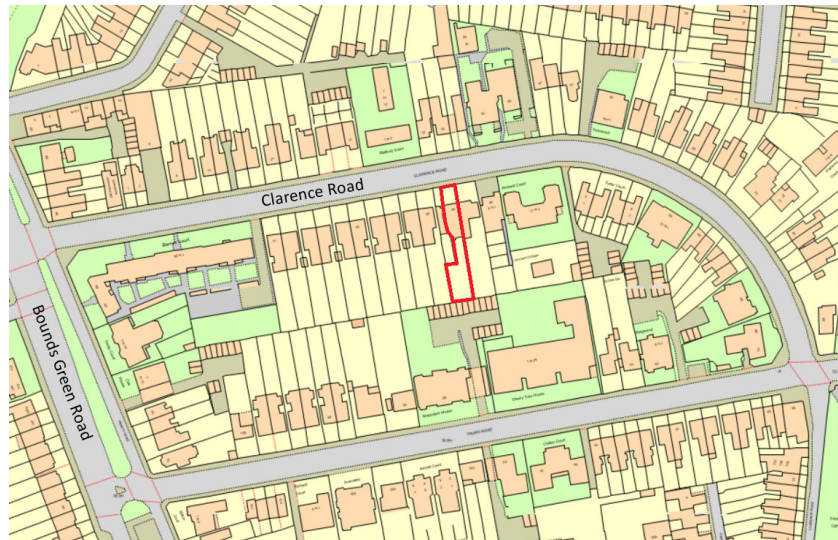
Additionally, London Borough of Haringey (LBH) Development Management Plan Document Policy DM18 states that the construction of basements to existing dwellings will only be permitted where it can be demonstrated that the proposal:

- a. “Will not adversely affect the structural stability of the application building, neighbouring buildings and other infrastructure, including the adjoining highway, having regard to local geological conditions;
- b. Does not increase flood risk to the property and nearby properties from any source (see Policy DM24);
- c. Avoids harm to the appearance or setting of the property or the established character of the surrounding area;
- d. Will not adversely impact the amenity of adjoining properties by reason of noise or increased levels of internal or external activity;
- e. Will not adversely impact the local natural and historic environment;”

Sections 2 and 3 of this report provide descriptions of the current site conditions and the proposed development respectively. Section 4 assesses the subterranean portion of the proposed development in accordance with the screening and scoping as outlined in the DBDGN. Any potential issues are then carried forward to Section 5 and 6. An interpretive ground investigation report is appended to this document. The structural engineering principles for the design and construction of the proposed subterranean elements, together with an assessment of the effects of the works on the existing and surrounding structures are presented in this report.

2. Site Location and Existing Conditions

The proposed development site is located at 34 Clarence Road, London N22 8PL situated within the Bowes Park area which borders Wood Green, Palmers Green and Bounds Green in North London.



The post code for the development site is N22 8PL. The approximate coordinates of the site are found to be at: 51.605267, 0.120654, and grid reference: TQ302912.

The site is bordered by neighbouring properties to the west, east and south. The entrance is directly off Clarence Road. The neighbouring house at 34½ is an unusual property having approximately half the footprint of number 34. The building is at present used as a dwelling. The other neighbouring property is a Victorian dwelling similar to number 34.

The property lies in The Bowes Park Conservation area extending from Green lanes to the East down to Trinity road to the South and the A406 to the North. The area was awarded this designation in November 1994. LBH definition of a conservation area is “A conservation area is an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance”. The surrounding area is primarily residential.

Clarence Road is a boulevard with a variety of buildings ranging from large traditional Edwardian semi-detached houses to low-rise blocks of 1950-60s flats. 34 Clarence road is a Victorian terraced house which has already been extended with a loft and rear extension.

Adjacent ground to the north is hard-standing, to the south, east and west gardens and will remain as such. There will be no change to surface water run-off from the current proposals.

The New River runs approximately 300m from the property running along the rear of the dwellings on Marlborough Road, at right angles to Clarence road. It is a man-made waterway which was provided in 1613 to supply London with fresh drinking water. It runs from Hertfordshire in the north to Islington in central London.

In addition to the new River the area has three main watercourses Bounds Green brook, Pymmes Brook and Moselle brook. They are all flowing towards The River Lea in the East. Pymmes Brook is the nearest to the property of the three, the brook lies approximately 1 km to the north of Clarence road. Alexandra Park ponds are situated in the park located approximately 1.2 miles to the North West of the site. Alexandra Park is approximately at an elevated level of 330ft above the level of our site.

Referring to the Environmental agency information concerning flood risk assessments 34 Clarence road is in zone 1 - assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

The area is served by a good rail transport system. The Great Northern line runs from Hertford in the north into Moorgate within central London. Bowes Park station is the nearest to the property located approximately 300 m, just off Whittington road running parallel to Clarence road. There are tube stations at Bounds Green and Wood Green, both on the Piccadilly line. The nearest is Bounds green which is approximately 200 m away.

Referring to the British Geological Society (BGS) the site is situated on London Clay. There are several boreholes on the vicinity which indicate similar soil profiles with the first 1.5 m being stiff brown silty clay and after this the soil is very stiff to hard brown silty clay.

The development on site is currently partly occupied by a three-storey residence with brick loadbearing walls timber floors and roof. The ground floor entrance is approximately 150 mm above external ground level on the forecourt. The existing development is shown in the drawings in Appendix A.

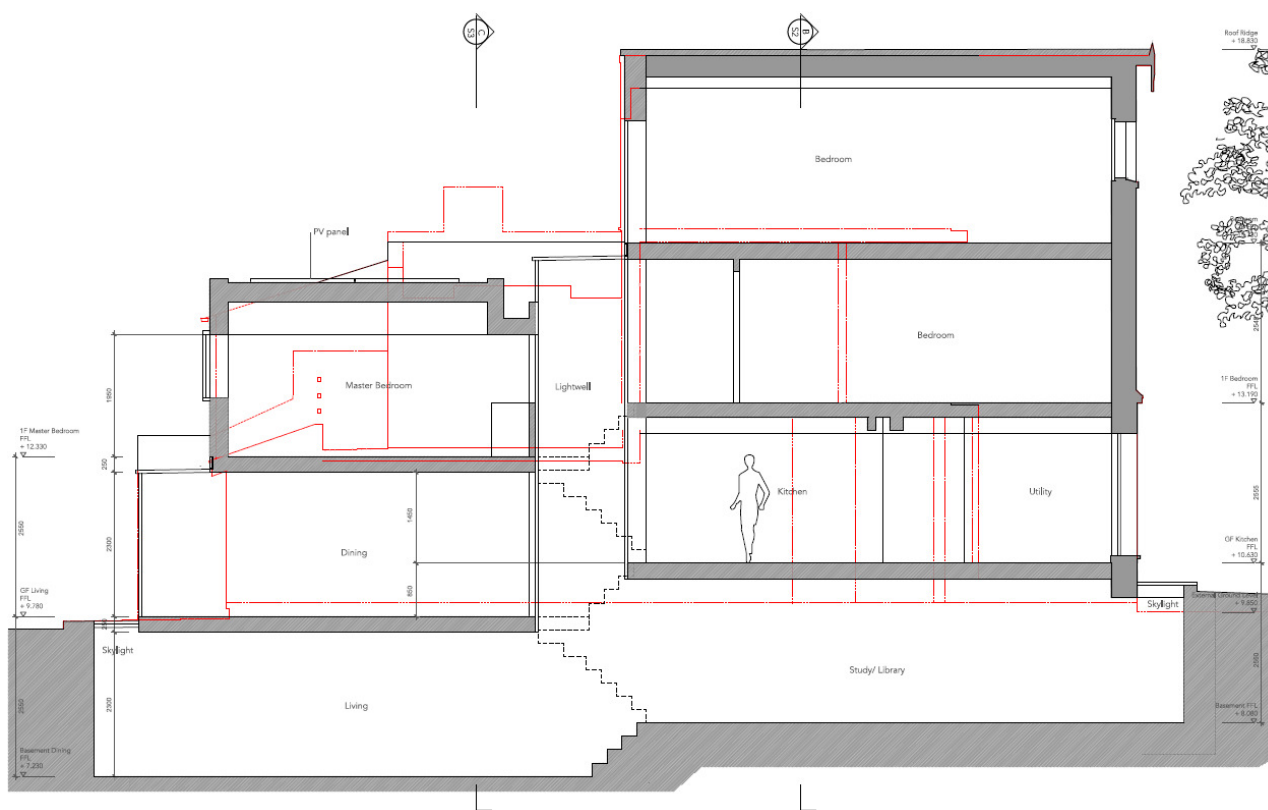
3. Proposed Development

It is proposed to replace and enhance the existing rear extension and provide the owner with a family home. As part of the new development it is proposed to create a new single-storey basement extending under the existing footprint including existing patio areas.

The new basement will be formed with an underpinning method using reinforced concrete pins containing a waterproofing admixture such as 'Caltite' for reassurance but no groundwater was encountered on-site. The underpinning will be propped as required in the temporary condition until the permanent structure is fully constructed. Refer to section 6 for an outline method statement.

This being the case it has been determined that the sub-surface geology is suitable for the extended subterranean construction and that the hydrogeology will remain unaffected. This is confirmed from the ground investigation report appended to this document.

The superstructure of the existing building is to be altered and extended to the rear and a new staircase is to be introduced. Drawings of the proposed development are appended.



Architectural Proposed Long Section by Kin Yan Lau

4. Stages 1 & 2 – Screening and Scoping

4.1. Surface Flooding

Question 1	Is the site on the direct route of the New River canal?
Response 1	No. Reference to the ordinance survey map shows it is not in the direct route of the New River Canal.
Question 2	As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?
Response 2	No and it is noted that site permeability is improved through the use of soft landscaping to the front garden.
Question 3	Will the proposed basement development result in a change in the proportion of hard surfaced/paved external areas?
Response 3	Proposed basement works has no effect. The works to replace front porch with soft landscaping will improve site permeability.
Question 4	Will the proposed basement result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?
Response 4	No.
Question 5	Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?
Response 5	No. There will be no material change to the condition of the site.
Question 6	Is the site in an area known to be at risk from surface water flooding or is it at risk of flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?
Response 6	From the Environmental agency website the property is in Zone 1 and is therefore outside the areas at risk of flooding. There are no nearby surface water features.

Based upon the above screening no matters need to be carried forward for scoping of further investigation. Notwithstanding this, all matters relating to the design of the surface water drainage will be carried out to the satisfaction of the London Borough of Haringey and Thames Water during the development of the design.

4.2. Groundwater Flow

Question 1a	Is the site located directly above an aquifer?
Response 1a	No. The site is underlain by London clay.
Question 1b	Will the proposed basement extend beneath the water table surface?
Response 1b	No, a Ground Investigation report has confirmed groundwater is not present at this site.
Question 2	Is the site within 100m of a watercourse, well (used/disused) or potential spring line?
Response 2	No, however the site is within 300m of the New River, a man-made watercourse.
Question 3	Is the site within pond catchment areas?
Response 3	No the site lies in the catchment of the Pymmes Brook.
Question 4	Will the proposed basement development result in a change in the proportion of hard surfaced/paved external areas?
Response 4	Proposed basement works has no effect. The works to replace front porch with soft landscaping will improve site permeability.
Question 5	As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?
Response 5	No. Surface water will be collected into a collection tank in the rear garden.
Question 6	Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than the mean water level in any local pond or spring line.
Response 6	No. There is no nearby pond or spring.

Based upon the above screening no matters need to be carried forward for scoping of further investigation. Notwithstanding this, all matters relating to the design of the surface water drainage will be carried out to the satisfaction of the London Borough of Haringey and Thames Water during the development of the design.

4.3. Land Stability

Question 1	Does the existing site include slopes, natural or manmade, greater than 7°?
Response 1	No
Question 2	Will the proposed re-profiling of the landscaping at site change slopes at the property boundary to more than 7°?
Response 2	No, there are no changes in slopes to landscaping. The front porch will be replaced with soft landscaping.
Question 3	Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?
Response 3	No.
Question 4	Is the site within a wider hillside setting in which the general slope is greater than 7°?
Response 4	No.
Question 5	Is the London Clay the shallowest strata at the site?
Response 5	Yes. From evidence from boreholes carried out within 200m of the site.
Question 6	Will any tree/s be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?
Response 6	No
Question 7	Is there a history of shrink-swell subsidence in the local area, and or evidence of such effects at the site?
Response 7	No.
Question 8	Is the site within 100m of a watercourse, well (used/disused) or potential spring line?
Response 8	No. Measurements from UK Map indicate the closest historical watercourse to be over 300m away. There are no wells (used or unused), abstraction boreholes or spring lines evident on OS maps, BGS data or EA data
Question 9	Is the site in an area of previously worked ground?
Response 9	No. There is no evidence to indicate that the ground has been worked.

Question 10	Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction?
Response 10	No. There is no information from the BGS to suggest the presence of an aquifer. A Ground Investigation report conducted August 2018h as confirmed ground to be dry. Additional monitoring will be undertaken prior to design and construction to re-confirm water levels in relation to the proposed scheme.
Question 11	Is the site within 50 m of ponds?
Response 11	No.
Question 12	Is the site within 5m of a highway or pedestrian right of way?
Response 12	Yes but the pedestrian right of way will not be affected during the works.
Question 13	Will the proposed basement significantly increase the differential depth of the foundations relative to neighbouring properties?
Response 13	Yes. Underpinning will be undertaken to suitably extend the foundation depth.
Question 14	Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?
Response 14	No.

4.4. Cumulative Development

The locations of nearby basements (existing and approved under Planning Permissions) has been researched. A basement was constructed recently when the existing Victorian property at No. 38 was demolished and the present building constructed.

The site slopes in the vicinity of the site are less than 7 degrees.

There is no evidence of sewer flooding in the vicinity. It is assumed that other developments will be restricted to existing flow rates into the surface water sewer.

There is a significant distance to the nearest substantial basement and therefore the cumulative effect on any groundwater flows is not considered to be a risk.

5. Stage 3 – Ground Investigation and Study

5.1. Ground Investigation

The proposed development comprises a new single-storey basement extension across the existing footprint of the building, extent shown on KYL architecture drawings appended. A ground investigation has been carried out by Soil Consultants Limited and their interpretive report is appended to this document; “Ground Investigation report” (Ref. No. 10284/MR dated 12th September 2018).

The ground investigation comprised the drilling of a 15 metre deep borehole, trial pits and monitoring of groundwater and gas levels including laboratory analysis. The investigation has established physical soil properties, groundwater levels and the depth, type of existing footings and relevant design parameters. It has been confirmed that the building is of conventional construction comprising brickwork walls supported on concrete strip footings. Further details can be found in the ground investigation report appended to this document.

The results of the ground investigation have revealed a ground profile comprising a thin covering of topsoil / made ground, overlying London Clay. Plasticity index testing shows the deposits to be of high to very high plasticity and medium to high volume change potential. Design parameters are given in the appended report.

The groundwater monitoring indicates that groundwater was not encountered. This was tested during summer and additional monitoring will be undertaken prior to design and construction to re-confirm water levels in relation to the proposed scheme.

Shallow foundations have been encountered to the neighbouring properties party walls and therefore conventional methods will be used to underpin the wall footings to suitable depth prior to commencement of excavation to incorporate the proposed basement. Refer to section 5 for the outline method statement.

Displacements will be limited to values not exceeding what is identified as Burland Category 1 damage.

5.2. Proposed Construction

Outline structural proposals for the proposed basement comprise a 300mm thick reinforced concrete basement slab and 250mm thick reinforced concrete walls. Ground floor structure to comprise composite slab on steel beams which prop the basement retaining walls or alternatively an in-situ concrete slab. Structural sizes are indicative and will be subject to detailed structural design in the next stage of design.

The basement will be specified as Grade 3 to BS8102 to provide watertight construction. This is likely to be achieved by using an internal drained cavity system. Full details will be established in the next stage of design.

The design and construction of the building structure will be in accordance with current Building Regulations, Eurocodes BS EN 1990-9, Health and Safety requirements and good building practice.

An outline method statement is provided in Section 6.4 of this report.

6. Stage 4 – Impact Assessment

6.1. Surface Flow, Flooding and Groundwater Flow

No groundwater has been encountered in the results of the standpipe monitoring. The proposed basement construction will not have a detrimental effect on groundwater.

The proposed basement was assessed by Soil Consultants Ltd by a chartered geologist and has been determined to not adversely affect the existing surface drainage and is expected to have minimal impact in terms of the geology and hydrogeology. Their conclusions are included in their appended report and subsequent letter.

The basement will be designed and constructed in a manner that will maintain the integrity, stability and safety of the surrounding public areas, buildings and services.

The proposed subterranean part of the development is a new single-storey basement extension covering the footprint of the existing property.

Monitoring of site conditions and surrounding features will form part of the construction method throughout the duration of the project. Method statements will be obtained from the appointed Contractor prior to the commencement of the works and acceptable movements will be agreed beforehand with adjoining owners.

6.2. Land Stability

The natural strata, encountered in the boreholes, was uniformly classified as the London Clay Formation. The soil tests demonstrated that the soil has medium to high volume change potential and will have limited susceptibility to heave and seasonal shrinking and swelling.

It is possible that following excavation for the basement that there could be heave of the London Clay formation, due to the weight of ground removed.

The majority of the heave is likely to occur during excavation, and an allowance will be made for future uplift forces on the completed basement. The uplift forces will be resisted by a combination of the self-weight of the structure, such that any upward movements of the completed structure will be minimal.

The predicted ground movements will be small, particularly in comparison to the ground movements, which will ordinarily be experienced in subsoils with clay content due to the seasonal shrinking and swelling.

Traditional 'hit and miss' underpinning is expected to be a viable option for the formation of the basement and a robust arrangement of temporary internal bracings/props, including support elements near the top of the basement wall, will be required to maintain wall stability and assist in controlling ground movements.

Tree protection measures shall be implemented prior to commencement of works. This will be in accordance with NHBC Chapter 4.2 trees and foundation depths.

6.3. Cumulative Development

There is adequate distance between the proposed basement and any nearby basements, either approved or existing. The impact of the cumulative development of basements is such that the proposed basement development will not adversely impact on groundwater flows or groundwater levels.

6.4. Construction Management

An outline Method Statement for the construction of the basement is given below. This will be developed and finalised in conjunction with the appointed Contractor and the Specialist Subcontractors, during the detailed design stage.

- a) The site boundary will be established and safety fencing and hoarding shall be installed around the site perimeter.
- b) Notices of the basement work will be served on the adjoining owners and schedules of condition will be carried out to the adjoining properties in accordance with the requirements of the Party Wall etc. Act 1996
- c) Tree protection zones will be installed in accordance with Landmark Trees advice and in accordance with BS 5837:2012 - Trees in Relation to Construction.
- d) Careful demolition of the existing buildings and structures ensuring that dust and vibration is controlled at all times.
- e) A key consideration in limiting movements of the surrounding ground will be the installation of effective temporary and permanent props, close to the existing ground level ('high level' as described in CIRIA C580); to achieve this, two principle methods of construction will be considered as follows:
 - o Open and propped excavation
 - o Top-down construction.
- f) For the open excavation method, the perimeter underpins will be installed and propped laterally. The props will be a combination of level props, spanning across the site and across corners, and raking props supported against thrust blocks. Following the installation of the props the ground will be excavated to formation level of the upper basement level, and subject to the detailed design of the underpinning, intermediate props will be installed where necessary.
- g) For the top-down method, the perimeter and internal underpins will be installed. The ground below the slab will then be excavated with the ground floor slab being supported on internal "temporary" piles. When excavation has reached formation level, the basement slab will be cast, followed by the construction of the vertical elements (RC walls, lining walls and columns). This method of construction avoids the need for temporary lateral props to the piled retaining walls, as the high level propping is provided by the permanent ground floor slab.
- h) The detailed design of the underpinning, propping and method of construction will be developed in conjunction with the specialist piling and groundworks contractor.
- i) All arising's will be disposed of in accordance with the Waste Acceptance Criteria (WAC) test results.
- j) It is confirmed that there will be no significant water inflows into the basement excavation during construction, however any groundwater which is trapped within the confines of structure will be collected in temporary sumps and pumped away.

6.5. Conclusions

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Haringey (LBH) in accordance with the Management Development Plan Document Policy DM18. Information from a Ground Investigation has been used to assess potential impacts identified by the screening process. It is concluded that the proposed development will not adversely affect the structural stability of the application building, neighbouring buildings and other infrastructure, including the adjoining highway. An outline construction method statement is included. The application building is not located in an area prone to flooding (Flood Zone 1) and does not increase flood risk to the property or nearby properties from any source. No groundwater was encountered during the monitoring and the proposed basement construction will not adversely affect the existing surface drainage and is expected to have negligible impact in terms of the geology and hydrogeology.

Appendices

Appendix A – Existing Site Drawings

Appendix B – Proposed Site Drawings

Appendix C – Ground Investigation Report