

BASEMENT IMPACT ASSESSMENT

FOR

PROPOSED RESIDENTIAL DEVELOPMENT

AT

**17, 25, 27 Ferdinand Street
Camden
London NW1**

Date: Jan 2015

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1.0 Introduction

Pringuer-James Consulting Engineers (PJCE) were appointed by Warmhaze Ltd. as the structural engineers for the proposed development at No.17 - 25 Ferdinand Street, Camden.

As part of the project brief PJCE are required to provide assistance on the structural engineering aspects of the proposed project. This includes the preparation of a Basement Impact Assessment (BIA) to be submitted with the planning submission package.

The BIA has been prepared in accordance with current format set-out by London Borough of Camden Planning Department (LB Camden) in the document, Camden Planning Guidance CPG4 - Basements and Lightwells (CPG4). The guidance document is based on the specially commissioned study prepared by Ove Arup & Partners Ltd, Camden Geological, Hydrogeological and Hydrological Study (CGH&H). This document is a detailed study of the geotechnical, hydrogeological and hydrological characteristics of soil strata found in the the borough of Camden.

There are three critical criteria identified in the CGH&H study which must be considered and dealt with in each assessment carried out for a proposed basement development. The defining criteria are as follows:-

- I) Subterannean Flow
- II) Land Stability
- III) Surface Flow & Flooding

This BIA document is set out with four stages indicated. Firstly, the initial screening process which leads to stage two, the scoping process, whereby relevant issues are identified for the site and their subsequent potential impacts. The third stage of the process involves gathering of site specific data by various means of a desk study and site investigation. From this the relevant information is obtained to enable an accurate assessment of the potential impacts of any issues identified in the first two stages.

Following the site investigation the fourth stage of the BIA involves an analysis of the information gathered and a site specific assessment is made on the potential impact of the proposed development. If the potential impacts identified are found to have an adverse risk to the existing site, the surrounding properties and/or the extended area, then a series of measures to mitigate against any negative impact are outlined for the project.

The assessment is then submitted as part of the planning package for the project to enable LB Camden make an informed decision on the overall planning submission.



2.0 Screening

2.1 Location of the Project

The site is located in Camden at number 17, 25 and 27 Ferdinand Street. The property faces East onto Ferdinand Street and is bounded by Chalk Farm Road to the South, Belmont Street to the West and Mead Close to the North.

Beyond the immediate boundaries outlined above, the site is also bounded by a number of railway lines. To the north and east by a north-south running line which is approximately 270m from the nearest boundary. To the south by a second national railway line, approximately 95m from the site outline. The railway line to the south runs in an east-west direction, and the train line to the north runs from an intersection 310m due east in a north-westerly direction. Euston Railway Station is located approximately 1.75km to the south-east of the site.

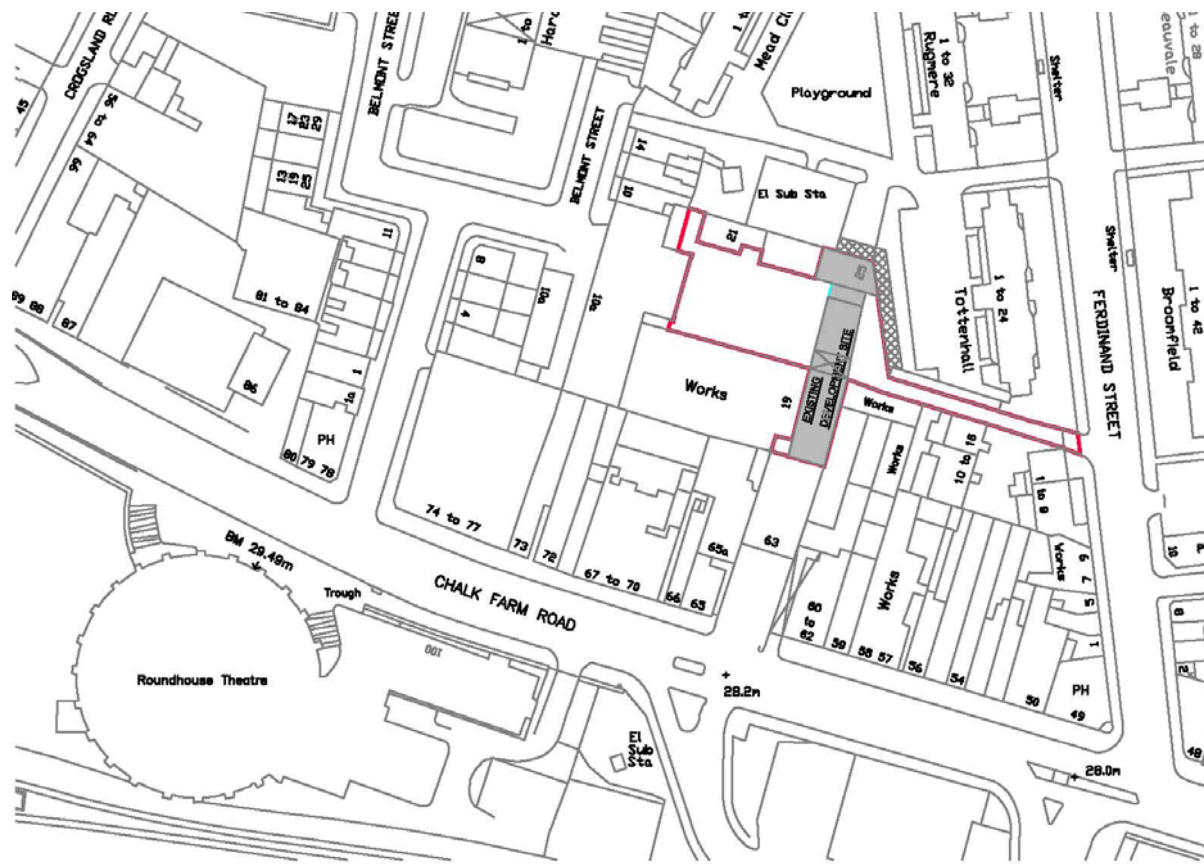
The Northern tube line is also found in the area. Chalk Farm Tube Station is 300m to the West of the site, while Camden Town tube station is found 1.3km to the south-east of the site. The underground line between the two stations is found approximately 100m to the south of the site.

2.2 Characteristics of the Project

The site in question was previously used for general office/workshop purposes. Within the site the existing buildings of No.s 17, 25 and 27 (as shaded in Fig 1) are to be redeveloped. The existing building is three storeys high and consists of brickwork walls with timber floor plates generally. The footings for the building have been determined by means of trial pit excavation and have found a corbelled brickwork footing bearing on to a mass concrete footings to a depth of approximately 1.45m below existing ground level.

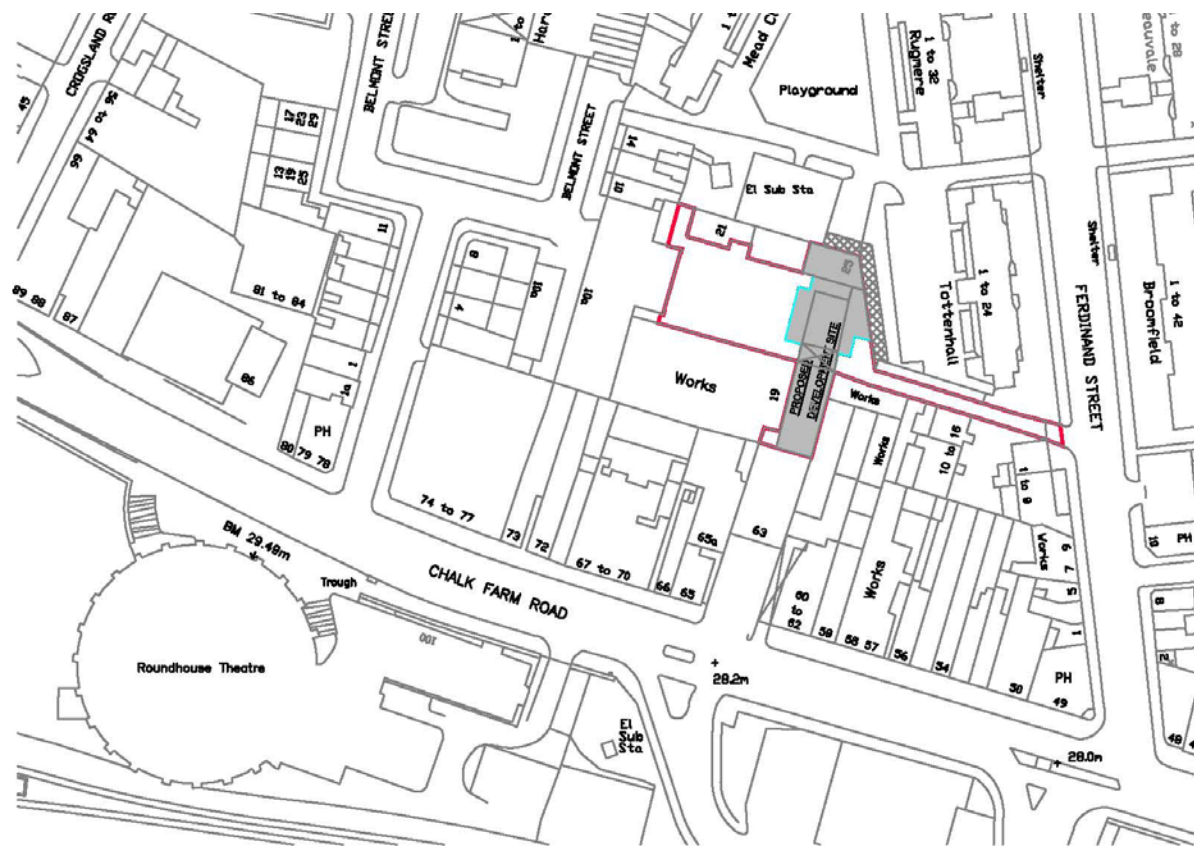
The proposed development of the three properties (17, 25 & 27) involves stripping out of the internal walls and floors of the existing buildings as required. The structural elements are then to be re-instated to suit the architectural floor plans submitted for planning. As part of the redevelopment a small portion of floor area at No 25 Ferdinand Street is to be dropped to accommodate the construction of a mezzanine floor above which requires an increased floor to floor height locally (see Fig 3). The existing ground level is 50.550m and the proposed reduced floor level will be 815mm below this at a level of 49.735m. This will thus require an excavation of approximately 1.0m to construct the lower ground floor area.

Preliminary structural details are attached as part of the appendices which outline the various foundations present on site and the proposed methods to facilitate a dropped slab level of 815mm.



EXISTING SITE LOCATION MAP

Fig 1



PROPOSED SITE LOCATION MAP

Fig 2



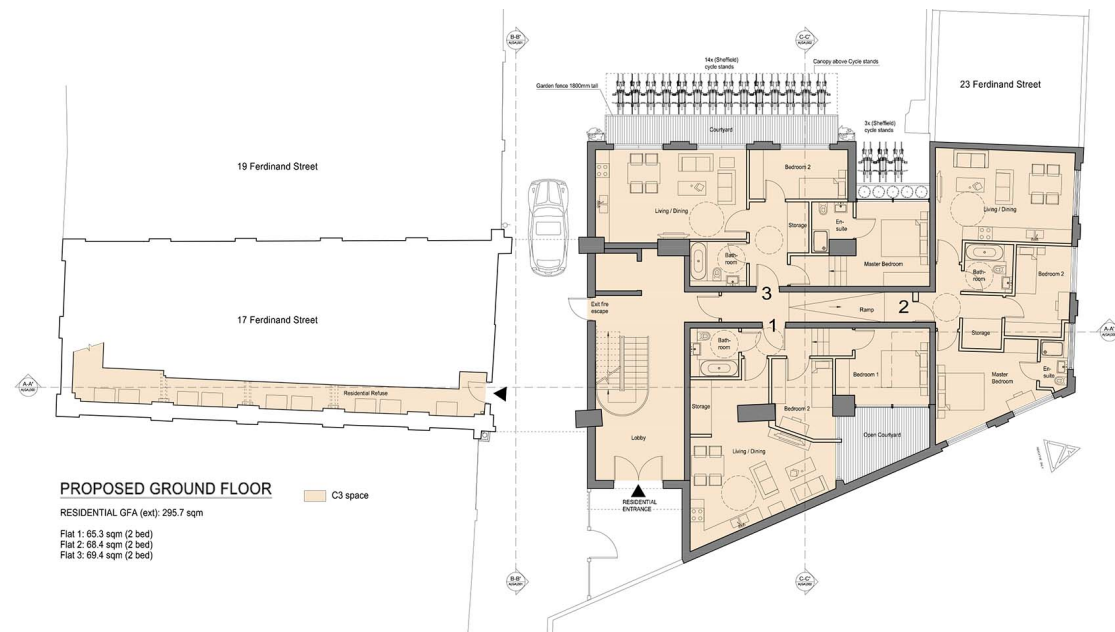


Fig 3

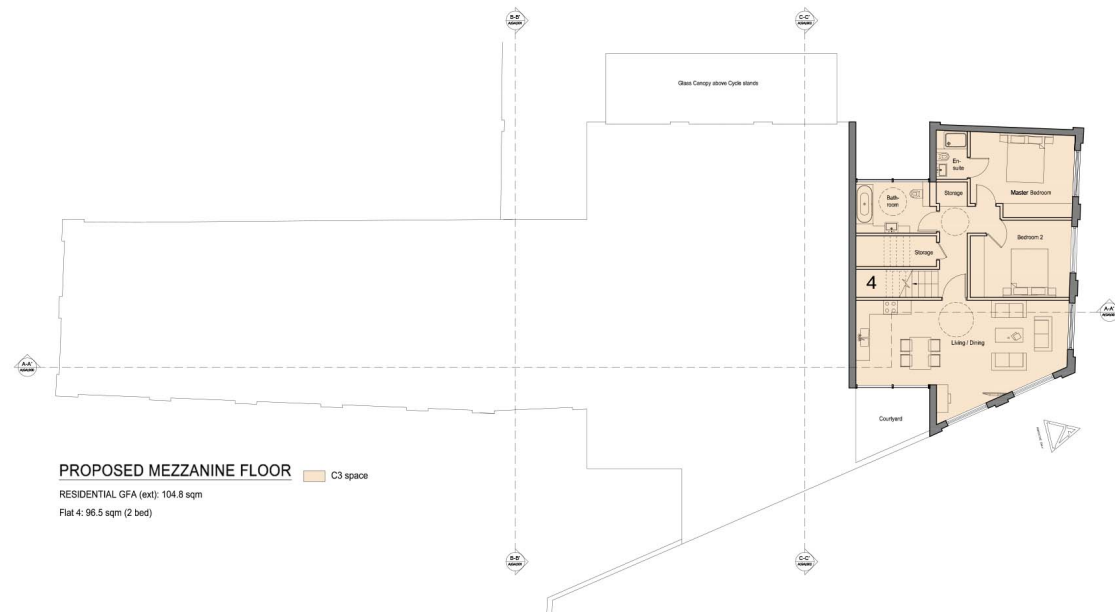


Fig 4

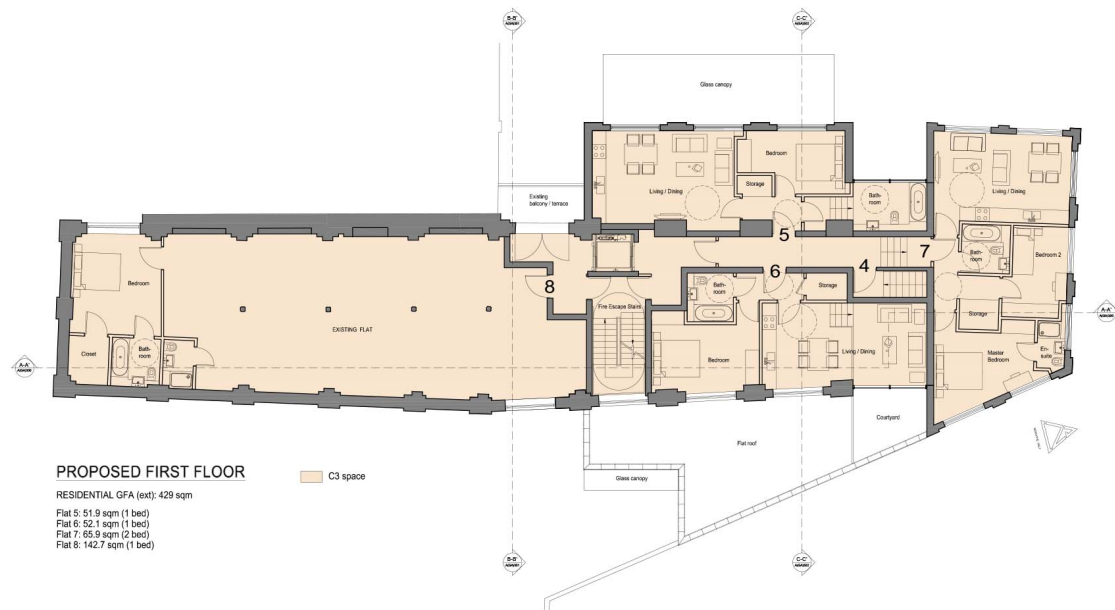


Fig 5

2.3 Physical Form of the Development

The lower ground floor level will be approximately 0.815m below existing ground floor level over an area 105m². It is proposed to form the lower ground floor using RC walls and slabs to the perimeter boundaries. Initial inspection of the site boundaries and available information suggests this is feasible along the full extent of the excavation.

Along the northern boundary with No.25 Ferdinand Street the adjacent building to the proposed excavation is in the ownership of the development company Warmhaze Ltd. The existing building is similar in construction and form to the existing building being redeveloped and the brickwork stepped corbel foundation on concrete deepening is anticipated.

It is thus proposed to form the northern boundary in a series of concrete underpins combination of graded excavation and reinforced concrete retaining walls formed in sequence.

To the east, the No.25 Ferdinand street is found and the trial pit carried out along the existing wall have identified a brickwork stepped corbel with mass concrete deepening below to a depth of 1.45m.

As regards the development at No.17, 25, 27 Ferdinand Street, the existing building line will represent the extent of the excavation to the lower ground floor.

The lower ground floor will be constructed in reinforced concrete with suitably designed slab deepening where required to support any possible concentrated loads taken from the floors above. The basement perimeter will consist of reinforced concrete retaining walls to the perimeter.

It is anticipated that the mezzanine floor and floors above will be formed using a series of steel beams with timber infill floor plates.

The existing building to the left of the excavation will be similar in construction to that found on site currently and does not directly affect the construction of the lower ground floor.

2.4 Mitigation Measures Being Considered

As with any development involving the construction of a basement, the proposed construction methods and programme of works must be chosen once appropriate levels of consideration are given to the inherent risks associated with excavation, and more specifically in this case, excavation in close proximity to existing buildings and their foundations.

Given the close proximity of the adjacent buildings along two of the four boundaries, the proposed development has been designed to limit the risk of adverse impact to the adjacent properties. This has been done by proposing the use of reinforced concrete underpinning in a staggered construction sequence. The underpinning walls will be designed to act as cantilevered retaining walls to retain the the boundaries. The method proposed, whereby the concrete underpins are built adopting a sequenced construction is widely accepted as best practice for the construction of basement walls where site conditions are restricted.



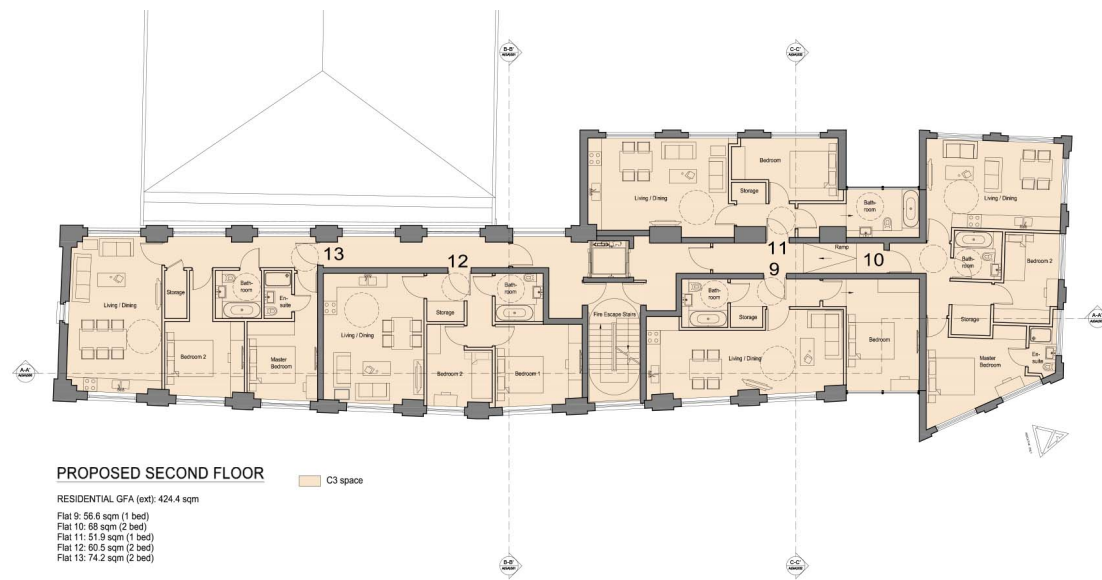


Fig 7



Fig 9



Fig 8

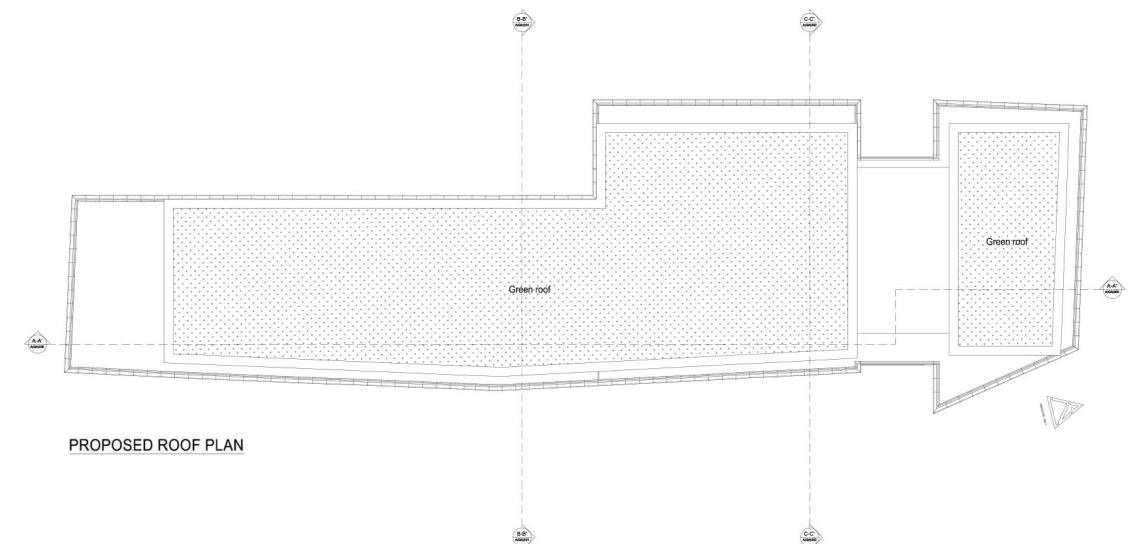


Fig 10



2.5 Characteristics of Potential Impacts

2.5.1 Subterranean (Groundwater Flow)

The prevalent geological characteristics of the Camden area consist of a stiff London Clay with a depth varying from 80m to 120m overlying a Chalk bedrock formation.

Over the extended Camden Borough region the upper levels of the clay layer contain relatively small regions of River Terrace Deposits defined by outcrops of Claygate Formation and Bagshot Sands. In these areas of permeable material it is not uncommon to come across a raised groundwater table due to the presence of a perched aquifer or historic river channel. The attributes of the groundwater in these areas varies, sometimes found to be static if not connected to additional groundwater features.

Where a high groundwater table is found the possible effects of excavating for a basement include altering the water table levels and/or diverting the existing flowpaths. The effect of these changes needs to be taken into consideration in the early planning stages of a development to ensure that adverse effects are accounted for.

These may include:-

- Forming alternative flowpaths for the groundwater which may conflict with existing basements that have not been adequately protected against moisture.
- Altering existing groundwater levels locally and as a result possibly altering the soil properties of the local area. The altered soil properties may influence among other things, the existing slope stability and the soil bearing capacity.

2.5.2 Slope Stability

Generally:

Slope instability is affected by a number of contributory factors ranging from soil properties, land use, topography, landscape and human activities (eg: mining or drainage etc.)The excavation and construction of a basement can affect the slope stability of a site and the adjoining land or properties in a number of ways including :-

- Altering the soil properties such as the moisture content, pore water pressure, consolidation and compaction levels, shear strength and bearing capacity of the soil.
- Requiring an element of pumping or dewatering of the site which can in some instances lead to the removal of "fines" in the existing soil, thus affecting the soil properties and interaction of the particles.
- Requiring the removal of existing vegetation, plants and/or trees from the site which are part of the system of groundwater extraction. This in turn may alter the groundwater levels which can affect the soil properties.
- Altering the natural state of the landscape or possibly involving works to previously disturbed or "worked" soil which could have an historic element of instability.

Beyond the Confines of the Site:

Possible effects of any basement construction must take into account the adjoining structures and their existing foundations, and any infrastructure in the area. The scale of proposed works will dictate the potential zone of influence of any works to be undertaken below ground.

During the construction stage of a project the local bearing capacity of the soil in the zone of influence for the works can be temporarily reduced. This is due to the removal of existing overburden pressures. Any project must allow for this reduction in pressure and undertake proper planning, design and execution of the excavation and any temporary works which would be required.

Additional effects which must be considered in the planning and design of a project are the inevitable ground movements which will be experienced. With any excavation there is a degree of ground movement which must be allowed for and this is generally done by specifying agreed design parameters for any piling element of the works and incorporating in the construction sequence a suitable scheme for temporary works.

Once the construction stage of a project is complete possible effects which should be considered include the increased stiffness of the new foundations and also the possible increase in the loads transmitted to the bearing strata.

As part of the project any existing foundations within a site or adjoining the site may require upgrading to support the new building. Upgrading foundations along party wall lines can give rise to a variation in stiffness between old and new foundations which should be considered as part of the planning and design process.

In addition to the variation in stiffness of the foundations, a new or redeveloped building can lead to increased or redirected pressures on soil bearing strata. The effects of this should be catered for in any design with particular attention paid in areas where the primary soil is a clay-based material. This is due to the susceptibility of clay to experience swelling and contraction as moisture content varies. The issue of swelling and contraction can be minimized by excavating below the upper layers of soil which would be more sensitive to weather and moisture conditions.

2.5.3 Surface Flow & Flooding

Potential impacts on the surface flow and flooding characteristics in an area as a result of excavation for a basement can vary dependent on a site location and the existing drainage infrastructure which is required to cater for any runoff from a site.

Excavating for a basement directly affects the volume of soil below ground and depending on the type of material can affect the natural groundwater storage capacity of the soil. If this is reduced significantly it can cause an increase in the proportion of surface water runoff which needs to be catered for by the local drainage network.

Following on from the point above, with an increase in the volume of surface water runoff, there is an increased risk of overwhelming the local drainage network which may not have sufficient capacity to deal with the increased volumes. This in turn may raise the possibility of flooding properties down-gradient. As part of the planning and design of a project careful consideration should be given to the need to cater for any runoff generated by the development and if possible deal with it within the confines of the development site before finally letting any excess which cannot be catered for flow into the drainage network.

If a project causes an increase in the levels of runoff produced, and the increased volumes are not catered for, the possibility and frequency of flooding is increased. In areas which are already prone to flooding the effects of this must be examined and further analysis may need to be undertaken.



2.6 Screening Process

2.6.1 Subterranean Flow

Q1a: Is the site located directly above an aquifer?

→NO

Referring to Figure 8 of the CGH&HS indicates that the underlying soil has been classified as "Unproductive Strata" and thus would not be expected to contain any groundwater.

The site investigation carried out in the adjacent site shows that the predominant soil condition is found to be a stiff London Clay to a minimum depth of 25m underlying a 1.5m depth of made ground. There are no indications of a high water table or outcrops of permeable material in the immediate area.

Q1b: Will the proposed basement extend beneath the water table surface?

→NO

The proposed basement depth is expected to be a maximum of 1.0m. Borehole results and trial pits carried out for the site do not indicate the presence of a high groundwater table and thus it is expected that the proposed basement excavation will not extend beneath the water table.

Q2: Is the site within 100m of a watercourse, well (used/disused), or potential spring line?

→NO

The latest available information relating to watercourses in the area would suggest that the site is not within 100m of any existing natural water feature. Initial inspection of available mapping in the area (see Appendix A.13) shows a watercourse approximately 200m to the east of the site.

Historic records from the Lost Rivers of London (see Appendix A.12) suggest that the upper course of the River Fleet may have previously run its course approximately 500m to the north. Preliminary site investigation carried out on the site has not come across any form of dried water channel. On this basis it is assumed that the site will not contain any river channel material.

From available information on the British Geological Survey (BGS) website, the nearest water borehole has been identified approximately 700metres to the east of the site. Available BGS information shows that this well is approximately 195m deep. (Reg No: TQ28SE1491/BJ). Additional wells in the area are found approximately 500m to the north, 750m to the west, and 800m to the south.

The site is located over an extensive area of London Clay material (see Appendix A.8) with no evidence of an outcrop of claygate formation or bagshot sands in the nearby area. This would suggest that the potential for a spring is minimal.

Q3: Is the site within the catchment of the pond chains on Hampstead Heath?

→NO

Referring to the Fig 14 of the CHG&HS (see Appendix A.14, the catchment areas for the Hampstead Heath pond chains do not coincide with the site location and are approximately 2km to the Hampstead Chain catchment.

Q4: Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?

→NO

At present the existing site is fully covered by existing buildings and hard-standing areas. It is envisaged that this situation will be maintained once the site is redeveloped, with a larger proportion of the site being used for the building and the remainder maintaining the current vehicular and pedestrian access and exit routes.

Q5: 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)?

→NO

The existing site is completely covered by impermeable material and this situation is not anticipated to change.

The existing drainage system for the site is assumed to drain freely into the local authority drainage network. The proposed development has adopted some SUDS techniques where suitable and it is not anticipated that this will increase the levels discharged to the ground.

Q6: 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 (not the pond chains on Hampstead Heath) or spring line?

→NO

The lowest point of the proposed excavation will be approximately 1.0metres below ground level assuming a 0.815m drop to lower ground floor level. The site is not in close proximity to any local ponds, the nearest pond being 1.5 kilometres to the south in Regents Park.



2.6.2 Slope Stability

Q1: Does the existing site include slopes, natural or manmade, greater than 7 degrees (approximately 1 in 8)?

→NO

The existing site has no significant gradient or falls. Topographical data available from existing site surveys suggests the site is relatively flat across the plan area. Over the extended region the site is located in an area which is not noted as vulnerable to landslides or significant soil movements. The elevation of the extended area is found to be approximately 28m AOD

Q2: Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees (approximately 1 in 8)?

→NO

The site is not anticipated to require any re-profiling to landscaping and is intended to be built upon over its entire plan area.

Q3: Does the development neighbour land including railway cuttings and the like, with a slope greater than 7 degrees (approximately 1 in 8)?

→NO

While the site is located approximately 100m to an existing railway line, initial site inspection and geotechnical investigations do not suggest the presence of any railway cuttings or indeed a slope in excess of 1 in 8.

Q4: Is the site within a wider hillside setting in which the general slope is greater than 7 degrees (approximately 1 in 8)?

→NO

The site is set in a region with a relatively flat slope. Approximate site levels are in the region of 28.5m with variance at a maximum of +/-0.3m.

Q5: Is the London clay the shallowest strata at the site?

→NO

The London Clay is the only definable strata at the site and is expected to go as far down as the underlying bedrock. Elements of the surrounding site have previously been used as parking areas and were found to have approximately 1.5-3.0m of made ground.

Q6: Will any tree/s be felled as part of the proposed development and/or any works proposed within any tree protection zones where trees are to be retained?

→NO

There are no trees found within the curtilage of the site. It can be expected that the works will not encroach into the potential root protection zones.

Q7: Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?

→MAYBE

With the limited information available (no pre condition survey has been carried out to date on the existing buildings either within or adjacent to the site) the effects of seasonal shrink-swell subsidence cannot be accurately established.

Q8: Is the site within 100m of a watercourse or a potential spring line?

→NO

Refer to Q2 of section 2.6.1 Subterranean Flow.

Q9: Is the site within an area of previously worked ground?

→NO

The site is not considered to be within an area of previously worked ground. Referring to the historic geological mapping available for the 1920's there is no indication that the area contains any worked ground.

Q10: 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?

→NO

The site is located in an area designated as unproductive strata. Thus it is not expected to be within an aquifer. (see Appendix A.1; A.2; A.11)

Site investigation also shows no signs of a perched water table or any evidence of moisture ingress into the boreholes and trial pits. It is anticipated that there will be no requirement for any dewatering during the construction of the proposed basement.

Q11: Is the site within 50m of the Hampstead Heath ponds?

→NO

The site is located approximately 1.5kilometres away from the nearest pond in the Hampstead Heath Ponds. (see Appendix A.14)

Q12: Is the site within 5m of a highway or pedestrian right of way?

→NO

The site is not within 5m of a highway however it is bounded to the south by the secondary road, Chalk Farm Road and to the east by the tertiary road.

The site is also not within 5m of a pedestrian right of way.

Q13: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?

→Yes

To the north along the boundary with the adjacent property it is anticipated that the differential depth of foundations will not be more than 1.0m.

To the East and South the site is bounded by a brickwork boundary wall and it is anticipated that the excavation will again result in a differential depth of foundations less than 1.0m.

To the Western extent of the excavation, the existing building will be redeveloped as part of the works and the relevant retaining structure and slab elements constructed as required. The depth of foundations will thus not be reduced from current levels to any noticeable level.

Q14: Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?

→NO

The site is located a minimum of 80m from the surrounding railway lines, and 100m from the neighbouring Northern tube line along the south elevation. Thus it is not expected that that the site is over or within any exclusion zones for rail or underground infrastructure.



2.6.3 Surface Flow & Flooding

Q1: Is the site within the catchment of the pond chains on Hampstead Heath?

→NO

The site is approximately 1.5kilometers from the Hampstead Pond Chain and is not within the catchment of any of the pond chains on Hampstead Heath.

Q2: 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?

→NO

The site is completely covered by impermeable elements and the proposed development will be similar in proportion to the extent of site covered. The use of any existing local authority drainage systems will be maintained and so the proposed development will not materially change the surface water flows.

Q3: Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?

→NO

It is not anticipated that the proposed basement will result in a change in surface water generated since the existing site is completely covered in hard-standing surfaces.

Q4: 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?

→NO

The existing site is serviced by a series of drainage sewers and channels which restrict the flow of surface water from the site to adjacent properties. This also ensures that all surface water generated is directed into the gravity fed drainage systems locally. The proposed basement is not expected to generate any additional surface water and so is not expected to change the profile of inflows of surface water to adjacent properties or downstream watercourses.

Q5: Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?

→NO

As per Q4, the proposed basement will not have any effect on the surface water which will be generated and so will have no subsequent effect on the quality of the surface water received by adjacent properties or downstream watercourses.

Q6: Is the site in an area known to be at risk from surface water flooding, such as South Hampstead, West Hampstead, Gospel Oak and King's Cross, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?

→NO

The site is located along Ferdinand Street. Examination of the available flooding data suggests that the site is not at risk of flooding of any nature.(see Appendix A.16)

2.7 Summary

2.7.1 Subterranean (Groundwater) Flow

The screening process has not identified any issues of concern to be investigated further as part of this BIA.

2.7.2 Slope Stability

The screening process has identified two issues which are of initial concern as part of the planning process and should be examined further as part of the scoping process

1. History of seasonal shrink-swell subsidence in the local area.
2. Possible differential depth between foundations of adjacent structures

2.7.3 Surface Flow & Flooding

The screening process has not identified any issues of concern to be investigated further as part of this BIA.



3.0 Scoping

3.1 Potential Impacts of the Proposed Scheme

3.1.1 Subterranean Flow

Not applicable

3.1.2 Slope Stability

3.1.2.1 Seasonal Shrink-Swell Subsidence

The history of the seasonal shrink-swell ground movements in the local area is not readily known, although the clay-based nature of the underlying soil does point to the need to consider the cause and effects of shrink-swell movement in the proposed structural design.

There are a number of methods for dealing with possible ground movements which occur in clay soils. For areas of deep basement excavation, these can include the use of tension piles to counteract the anticipated hydrostatic pressures and/or the use of compressible material (eg:cordek) to reduce the build up of hydrostatic pressure acting on the slab. In situations where a raft basement slab is used it is necessary to design the slab to resist the anticipated hydrostatic pressures.

In ground bearing RC strip foundation systems it is generally accepted that increasing the depth of a foundation below ground minimizes its susceptibility to the problems associated with the more frequent shrink-swell movement of clay soils due to freezing. A minimum depth of 1000mm is typically used for ground bearing foundations and is normally assumed to be below the level at which soil is susceptible to freezing and thawing.

The form of the foundations underlying the existing buildings adjacent to the excavation perimeter (typically stepped brickwork corbels on mass concrete footings to a depth of 1.45m below existing ground level) allows us to presume that the problems that are inherent with shrink/swell of clay soils in shallow foundations are not applicable to the existing buildings on the site and would lead to the assumption that shrink-swell movements in the local area are currently not causing any undue deterioration in the buildings or boundaries.

For the proposed development, the building foundations are expected to comprise a suitably designed RC raft slab, with an underlying layer of compressible material, and a suitable scheme of RC retaining walls to the perimeter of the excavation.

3.1.2.2 Differential Depth Between Foundations

The proposed excavation levels for the project will encounter two distinctive foundation configurations and levels between adjacent properties and boundary walls. A nominal differential level is expected between the proposed excavation and the existing building foundations. In this instance the risk of adverse effects is insignificant.

To the perimeter of the proposed excavation abutting existing boundary walls the anticipated foundation depth and the proposed foundation depth are expected to differ by no more than 1.0m. thus, the differential level of foundations is not expected to be deep enough to pose a significant risk to soil stability.

For an excavation of this depth the general slope stability and soil condition within neighbouring sites and adjacent areas are not considered overly onerous. The underlying soil may be subject to various potential impacts as a result of the proposed development. These can be categorised relative to their scale and an appropriate risk factor assigned to each case.

3.1.3 Surface Flow & Flooding

Not applicable

3.2 Summary

The proposed development is located in a region of London Clay throughout. The potential impacts of the basement excavation have been assessed in relation to the three screening flowcharts provided by LB Camden.

The scoping process has examined the particular areas which pose the highest risk for potential impact on the adjacent properties. Given the relatively shallow depth of the excavation it is not anticipated that the works will present significant risk to any of the boundaries affected provided the works are carried out in the appropriate manner.



4.0 Site Investigation & Study

A geotechnical site investigation has been carried out by Soil Consultants Ltd for the adjacent site at Belmont Street as part of the overall development and this has been used to interpret the soil conditions found in the proposed development site. The borehole log and trial pit details are attached in Appendix C of this document.

The findings of the borehole investigation confirm the assumptions made in relation to clay-based subsoil in the vicinity and serve to back up the points made as part of this BIA. Additional trial pits were excavated to determine the existing foundations for the existing building and they are included as part of the preliminary structural details proposed by PJCE and contained in Appendix B.

A brief summary of the findings from the site investigation reveals that the proposed excavation will be carried out in an area of soil containing predominantly stiff London Clay below a depth of fill of up to 3.0m depth. The subsoil has also been defined as unproductive in terms of groundwater and no evidence of water ingress was found during the site investigation.

5.0 Impact Assessment & Conclusion

5.1 Existing vs Proposed

The existing site is currently un-developed below ground level. To the north and west the adjacent properties have not made use of the potential provided by construction of a basement. The existing foundation and slab arrangements for both properties consist of a stepped brickwork corbel bearing on a mass of concrete to a depth of 1.50m.

The proposed development will lower a small proportion of the floor area by approximately 1.0m with a series of reinforced concrete retaining elements to the affected boundaries.

5.2 Site Attributes & Features Affected

5.2.1 Subterranean Flow

An analysis of preliminary site investigation results and an initial interpretation of the information obtained from various additional sources (British Geological Service, Environment Agency, Camden Geological Hydrogeological and Hydrological Study) would indicate that the presence of groundwater in the area is minimal and thus the potential impacts to the groundwater as a result of the development would safely be considered negligible.

5.2.2 Slope Stability

The scope of the proposed works and the extent of existing foundations in the area facilitate the reduction of the ground floor level over such a small area with a relatively low level of risk to the slope stability of the adjacent properties.

5.2.3 Surface Flow & Flooding

The existing site has been fully developed in terms of impermeable surfaces and thus the construction of a basement is anticipated to have negligible effects on the volume and quality of surface water generated by the redeveloped site.

Analysis of the available material in relation to flooding has indicated that the site is not historically prone to flooding and is not in an area which is required to consider flooding as part of the basement construction.

5.3 Conclusion

The basement impact assessment for No.17, 25, 27 Ferdinand Street has been carried out in accordance with current guidelines provided by London Borough of Camden Planning Department.

The three principle criteria identified by the department and which must be dealt with in each assessment include, subterranean (groundwater) flow, slope stability, and surface runoff and flooding.

At each stage of this assessment these three criteria have been considered and any requirements for each category have been incorporated into the projects proposed development scheme.

As a result of this assessment it is reasonable to conclude that the proposed basement will not be detrimental to the region in terms of groundwater, slope stability and surface flow and flooding.

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