46 Avenue Road, London NW8 6HS
Structural Method Statement for Proposed Redevelopment (Incorporating Construction Methodology)
Rev B

Project No. 1147

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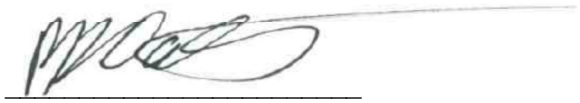
Revision History

Rev	Date	Purpose/Status	Document Ref.
draft	05/11/2010	For discussion	
Draft inc construction method	24/11/2010	For discussion	
A	25/11/2010	Pre-planning	
B	01/12/2011	Pre-planning	
C	03/04/2014	Revised for pool removal & re-submission	

Prepared by:



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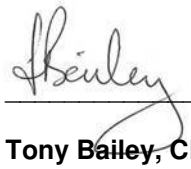

Tony Bailey, CEng MICE Director

1. Terms of Reference

We have been commissioned by Brightwood Ltd to prepare a report setting out the proposed construction methodology for the proposed alterations and extensions to this building. The report is intended to be submitted to the London Borough of Camden in support of a planning application. With reference to the criteria set out in Camden's Core Strategy Policy CS14 and policy DP27 – basements and light-wells, this documents provide factual information to demonstrate that the scheme maintains the structural stability of the building and neighbouring properties.

This report also addresses the issues of the access requirements for construction which might be employed in the development. The design has been developed to a level of detail whereby the key technical and methodological issues have been identified and addressed in principle. Structural designs and the methodology will be subject to a degree of further refinement.

This report is produced solely for the use of Brightwood Limited in connection with this planning application and not for any other purpose or for any other party. It shall not be used, in whole or in part, by any third parties without the express written permission of Edge Structures Ltd.

2. Description of Existing Building and Boundary Wall Conditions

46 Avenue Road is a four storey house comprising part basement, ground, first and second floors *(see fig 1)*. In front of the building is a hard standing area for vehicles with a basement car lift. The basement comprises staff accommodation, a gym, hydraulic lift room, water tank room, two electrical intake rooms and access to the car lift. There is an array of external air conditioning units and mechanical plant on the roof.

From British History online records: The southern part of Avenue Road existed by 1824 as far as Avenue Close and the northern part of Avenue Road was built by 1829. (*ref 1,2)*
From the London Borough of Camden Planning records: Full planning permission was granted for the following proposals to No 46 Avenue Road (dates of decisions given)

31-12-1934 Erect a garage addition to the premises.

25-11-1964 Erection of dwelling comprising basement, ground floor and two floors over.

16-12-2002 Alterations and extensions to a single family dwelling house comprising: a part single, part two storey rear extension, a wrought iron glazed awning, the infilling of an existing side external terrace, the extension and remodelling of a single storey side extension, including excavation to form a light-well and basement staff accommodation area, entrance portico, domed skylight, roof access hatch, a detached summer house and pool in the rear garden.

From the above we assume that an existing dwelling was demolished and the existing house built circa 1965 with the extensions and alterations including swimming pool and summer house built circa 2003. The pool was constructed but then demolished and removed in its entirety in 2013. Some records (including the survey and publicly available aerial photographs) still show the pool.

A site inspection has shown that the basement lift motor room walls and soffit to the basement to ground floor staircase is of in-situ concrete construction. The construction of the ground floor, upper floors and foundations is unknown. Whilst a full disclosure of records held by Camden Building will confirm the foundations, the age and type of the property suggest that the building is supported on ground bearing strip footings.

On the south side there is a narrow alley way between No 46 and No 44 *(see fig 2)*. A cross lattice wooden fence separates the properties.

The north wall to No 46 forms the boundary with No 48. Towards the rear of No 46 there is a light-well to the basement staff accommodation *(see fig 3)*.

3. Description of Adjacent Buildings

No 44 Avenue Road to the south of No 46 is arranged over three stories above ground with the upper level of mansard form. It is not known if there is a basement but this is highly probable.

No 48 Avenue Road to the north of No 46 is arranged over three stories above ground with the upper level of mansard form. It is not known if there is a basement but this is highly likely.

4. Description of Proposed Works

The completed proposed works are shown on drawings 1147/11 – 20 which are included in appendix B.

The works involve the new accommodation being provided at basement level.

The basement to the house is to be extended over the full footprint of the house with a new basement light-well at the front of the house. To the rear of the house a two storey basement to accommodate a swimming pool, changing room facilities, pool plant equipment with access to the existing house is to be constructed. The existing summer house is to be rebuilt.

The underside of the proposed lower basement floor is approximately 8.7m below ground level. Construction of 6m basements to domestic properties in London is now occurring on a regular basis.

A detailed site investigation and desk top study have been undertaken. The site investigation includes boreholes and trial pits for soil sampling and testing and provides the parameters used in preliminary geotechnical evaluation. This information will also inform the detailed geotechnical analysis that will be necessary for each stage of the basement construction.

Due to the depth of construction for the new basement areas, party wall notices etc involving adjoining owners will be required. Monitoring of surrounding ground and building movements will also be necessary and the requirements and limits on movement are likely to be incorporated into party wall awards. The works have been designed to minimise ground movements. The adjacent properties are considered to be sufficiently far away from these works for the damage resulting from any ground movements to be negligible or very slight.

It is anticipated that the wall to the two storey basement is likely to be formed with (approximately) 600mm diameter secant hard/soft bored piles and reinforced concrete floors to create an enclosed box. The walls will need to be propped at ground floor level. This could be achieved either with a large scale temporary propping arrangement or top-down construction with the permanent floors acting as props.

The basement will need to be designed to resist water pressures to CP102:1973. The lower basement slab will need to be held down with tension piles to resist water uplift and an under slab system provided to deal with clay heave pressures.

All of the aforementioned will need to be considered as part of a detailed geotechnical analysis to determine predicted ground movements and to provide design loads for the walls and floors.

The architect proposes the basement to be designed as Type C drained protection to BS8102:1990.

The volume of soil material to be excavated to the rear basement alone is of the order of 4000m3 (without bulking): about 6,800 to 8000 tonnes.

The types of underpinning to the existing house foundations depend on the nature of the existing foundations and the support required at various stages of the construction programme. Our current design includes a combination of traditional underpinning and mini-piling. The actual

underpinning system(s) implemented may vary from this as they would be influenced by the preferences of the specialist ground works contractor. These will however need to be reviewed by the Chartered Structural Engineer appointed for the project.

5. Access Requirements and Outline Construction Methodology

The sequencing of work to form the basements under the house, together with any temporary works to the house to provide access and the excavation of the rear basement requires special and detailed consideration. To this end we have considered the construction methodology in some detail. This is illustrated in drawings 1147/11 – 20 which are included in appendix B. These proposals would naturally be subject to some development through the involvement of a specialist groundworks contractor. The contractor's method statement will need to be agreed with the Chartered Structural Engineer appointed for the project and their geotechnical specialist.

The contractor to be employed for the works will need to have relevant experience for this type of project.

The proposed construction sequence can be summarised as follows.

1. Beams added at first floor to enable internal ground floor walls to be removed.
2. Mini piling undertaken inside, and to the front and south of the property. Columns and 1st floor level beams are to be supported on some of these to permit the further removal of ground floor walls. Ground beams are to be constructed under strip footings to permit excavation outlined in step 3.
3. The ground level inside the building (southern half) is to be reduced by 1m and ramps formed at either end to permit a piling rig to pass through into the rear garden. The headroom clearance that this will provide is adequate for a KlemmKR 709 drilling rig.
4. Construct secant piles for deep basement within the garden. Piles that will support the lower basement slab are to be blind bored at this stage. New piers are to be formed under the rear wall of the existing property and loads transferred to these.
5. The capping beams to the secant piles are to be installed and propped.
6. Local excavations under the ground beams are to be carried out, pile caps constructed over the cut down mini-piles and ground beam loads transferred to this arrangement through the installation of steel posts.
7. The first storey of basement is excavated leaving a ramp to permit arisings to be brought up to the surface at the front of the property.
8. The second storey of basement to the rear is excavated and the concrete base slab poured. The concrete base to intermediate level basement under the house may also be constructed at this point.
9. The concrete basement box is constructed from the bottom upwards.
10. The concrete ground slab is constructed over both the rear basement and the new area of basement under the house.

The volume of spoil to be removed is considerable however there is a sizable area to the front of the house and within the boundary of the site. To minimise disruption to road traffic this area may be used for vehicles carting away spoil. If this is to be the case then retaining walls along the front of the house can be designed for the resulting surcharge loading. To reduce traffic congestion it may be necessary to restrict the carting away of spoil to times after the morning rush hour and before the evening rush hour.

During all of the above construction period a monitoring system will need to be in place to check surrounding ground, existing house and adjacent building movements.

6. Conclusions and Recommendations

6.1 Whilst these works are considerable for a domestic property it is possible to carry them out in manner that complies with the policy DP27 criteria regarding structural stability of the building and neighbouring properties;

6.2 Access for construction equipment, delivery of materials and removal of excavated soil is a major challenge and will require considerable logistical planning by the appointed contractor.

6.3 Piling rig access and spoil removal may be undertaken through a corridor formed in the existing property.

6.4 Extensive temporary works will be required to ensure stability of the property throughout the works and to form the access corridor described above.

6.5 Construction of the basements has been demonstrated to be technically feasible and practicable however this will require expertise both in design and construction.

6.6 In excess of 4000m3 of soil will need to be removed from site and site management controls will need to be devised and implemented.

6.7 The works can be designed and constructed in such a way that ground movements and associated impacts on neighbouring buildings can be minimised. Detailed geotechnical analysis will be required to predict ground movements, and monitoring of surrounding ground and building movements will be required

7. References

1) 'Hampstead: St. John's Wood', A History of the County of Middlesex: Volume 9: Hampstead, Paddington (1989), pp. 60-63.
2) Greenwood's Map of London 1827
3) Going Underground Basement Project News, Ischebeck Titan

Appendix A Photographs

Fig 1 – Number 46 Front elevation

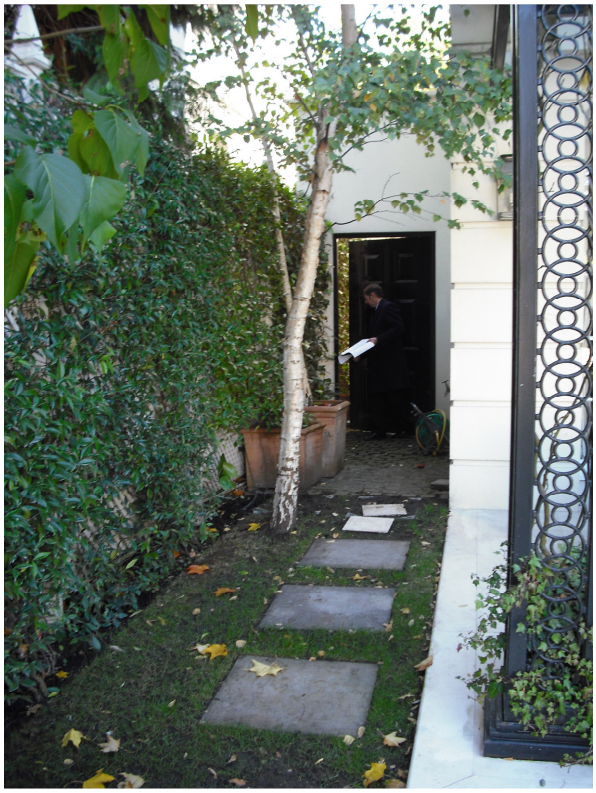

Fig 2 – Rear boundary wall to Number 44

Fig 3 – Rear boundary wall to Number 48

Fig 4 – Example of Temporary works for construction access to build a 6m basement where little access existed before– London (Ref 3 Ischebeck Titan)

Fig 5 – Example of Temporary works for construction access to build a 6m basement where little access existed before– London (Ref 3 Ischebeck Titan)

Appendix B Construction Methodology Drawings