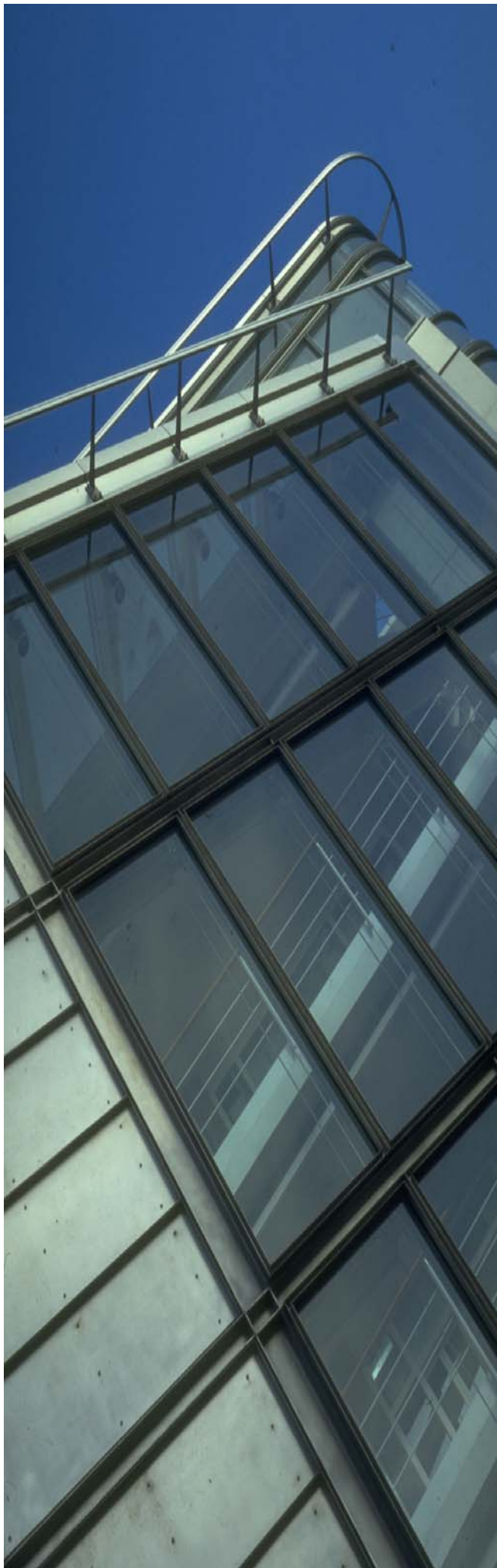




Structural Assessment

PRE-PLANNING STAGE

Project:

Proposed Alterations at:

47 South Hill Park, London, NW3 2SS

Client:

Kewdale Property Investment

Job No. 10-157

Date: May 2012

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1.0 Introduction:

This brief structural report has been prepared on behalf of the applicant in support of a proposed application for planning permission at 47 South Hill Park, London, NW3 2SS. This structural assessment has been prepared as supplementary support documentation for a "Basement Impact Assessment" (BIA) prepared by specialist geotechnical engineers and reference should be made when reading this report to the BIA prepared by Soils Ltd. Numbered "REPORT 12998/BIA"

In accordance with the requirements of *Camden Development policy 2010-Policy DP27*, this consideration seeks to demonstrate that the proposed works to the subject property (with particular reference to the works associated with the extension at the lower ground floor level) will not cause harm to the built environment and will maintain the structural stability of the building and the neighboring properties at all times during the various construction stages and in the permanent condition following the completion of the works.

2.0 Description of proposal

The property under consideration is located at 47 South Hill Park, London, NW3 2SS. The subject property is a substantial five storey building which forms one part of a semi-detached block constructed it is thought during the late 1800's or early 1900's using traditional building techniques with loadbearing masonry walls and timber floors.

This consideration relates to proposed alterations to the ground and lower ground floor levels of the property.

At ground floor level the principle proposed alteration relates to the formation of an opening within the main rear wall to the property. The formation of the aforementioned opening together with a small rear extension will facilitate a new open plan kitchen/ dining room to the rear of the property.

At present the lower ground floor level extends to the line of the central spine wall to the property with the rear footprint of the building from the central spine wall to the rear wall in effect being founded at a higher ground level. The present lower ground floor level appears to have been constructed with a nominal difference in level of approximately 600 mm below the pavement level to front of the property.

At lower ground floor level the proposals include further lowering of the floor by a nominal amount of less than 1m to increase headroom. In addition it is proposed that the lower ground floor level be extended to the rear to encompass the full footprint of the building and beyond beneath the small glazed rear extension at ground floor level.

3.0 Structural Design Philosophy:

3.1 Alterations at Ground Floor Level.

It is anticipated that the formation of the opening in the main rear wall of the property will be undertaken using a 'steel box' frame comprising steel beam and column elements to support the wall above first floor level. The design of the steelwork work will be undertaken in accordance with the recommendations of BS 5950. The formation of the opening and the installation of the steel frame will be undertaken once the works to the lower ground floor have been completed.

3.1 Alterations at Lower Ground Floor Level.

The increased storey height to the existing lower ground floor level as well as the extension of the lower ground floor under the full footprint of the building will be undertaken using traditional underpinning techniques. This construction method is a well tried and tested method for basement construction in London. It is anticipated that works will be undertaken by a specialist subcontractor with proven experience of undertaking such underpinning works. The specialist contractor will be required to be fully responsible for the preparation of a detailed method statement which will be agreed with the Contract Administrator prior to undertaking the works in order to ensure the method of working will not cause harm to the built environment and will maintain the structural stability of the building and the neighboring properties.

The underpinning will be undertaken utilising the generic method as outlined in the "Guidance for Subterranean Development" prepared by Ove Arup & Partners Ltd and partly reproduced below:

METHOD STATEMENT - Underpinning Works.

Underpinning will be executed in a series of gradual steps. It relies on the integrity of the surface wall to share load whilst small sections are progressively undermined.

- The first step is the exposure of the top of the existing foundation, by breaking out the existing lower ground/ground floor construction along the edge of the foundation to the wall that is to be underpinned.*
- The next step is to excavate along the existing foundation in a series of small sections [each typically of length 1m to 1.5m], in a "hit and miss" pattern that alternates an excavated section with one where the soil under the foundation is left in place. Within the existing lower ground floor, each pit would be approximately 1.2m deep and to the area to the rear the excavation would be approximately 3.2m deep.*

- The excavation is anticipated to be undertaken by hand. If groundwater encountered, this will be locally pumped to enable the works to progress.
- When a series of spaced gaps under a particular run of wall have been excavated, concrete will be cast under the existing foundation, thus filling the excavated holes to form underpins.
- The cast concrete will be stopped approximately 75 mm short of the soffit to the existing foundation to the wall being underpinned and this space will be packed with dry packing rammed into place to ensure full load transfer from the wall to the underpinning.
- After the concrete in the first set of underpins has cured, the remaining intermediate sections of soil (which have been left in place between the first underpins) will be gradually excavated piecemeal. Concrete underpins will then be cast into these holes. Together, the series of underpins form a continuous concrete strip footing.
- When the full perimeter of the basement area has been underpinned in this manner, extending down to the necessary depth, the full excavation of the basement space will proceed, followed by casting the basement floor slab of the basement and fitting out the basement.

DESIGN CRITERIA - Underpinning Works.

Soil Parameters – To be confirmed by Site Investigation

London Clay: $\phi = 30^\circ$, hence $K_a = 0.333$

$\delta = 18 \text{ kN/m}^3$ and basic bearing stress = 100 kN/m^2

Hence allowable bearing stress = $100 + (\text{weight of soil removed})$, say 125 kN/m^2

Existing Brickwork

Assuming 7N bricks in lime mortar, from CP.111, basic compressive strength = 0.49 N/mm^2

Hence under a concentrated load, bearing strength = 1.5×0.49 , say 0.7 N/mm^2

Typical Underpinning Sequence

6	1	4	7	2	5	8	3	6	1	4	7
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General

Concrete is grade C40 N/mm^2 and Class 1 to BRE Digest 363.

Reinforcement is grade 460 N/mm^2 ; Mortar is Class (iii).

4.0 REAR EXTENSION – Lower Ground Floor Level

Following the completion of the proposed works associated with the lower basement generally under the foot print of the building it is anticipated that excavation to allow the formation of the small rear extension at this level will be undertaken.

It is anticipated that the perimeter retaining walls and associated foundations to the rear and sides of the extension will be formed using reinforced concrete construction designed in accordance with the recommendations of BS 8110.

The method of construction envisaged for the formation of the rear extension is a “bottom-up” construction approach; as follows:

- Excavate top down installing trench sheeting extended as the depth of the excavation is increased. Retention of the soil behind the required excavation is to be provided by a suitably designed temporary support system comprising trench sheeting with horizontal ‘wales’ at the top, bottom and intermediate vertical intervals together with corresponding horizontal strutting across the full width of the excavation.
- Temporary works to be extended down vertically as excavation proceeds to final formation level.
- Once temporary works system to support the excavation is complete, the permanent reinforced concrete retaining walls and base foundations and slab will be constructed. The temporary works are to be maintained intact and in place until the permanent works are complete to ensure the stability of the excavation and surrounding and adjacent building structures.

All temporary works solutions are to be designed by the main contractor with input from specialist temporary works subcontractors and agreed with the project structural engineer.

5.0 Waterproofing:

Whilst not a structural consideration; It is anticipated that the architectural specification relating to the waterproofing at the lower ground floor level will use a cavity drained system internal to the perimeter walls and base slab at this level.

A cavity drainage system comprises the provision of a continuous pre-formed cavity, which intercepts and drains away incoming water in accordance with BS8102:2009 (Type C - Drained protection).

There is a permanent reliance on this cavity to collect groundwater seepage through the structure and channel it to drains or a sump for removal by drainage or pumping. It is expected that this system will be designed and specified by a proprietary specialist company to the satisfaction of the project architect.

6.0 Noise and Vibration:

The contractor will be required to be sensitive in the planning of his works and where appropriate to use such plant and machinery that will ensure compliance with the noise and vibration thresholds laid down by Camden Council.

It is anticipated that hand dig labour will be used in the undertaking of the underpinning works to minimize any vibrational disturbance to the exiting walls.

7.0 Pre-Contract Procedures:

It is anticipated that the following procedures will be undertaken at Pre-Contract stage prior to works commencing on site:

- Undertake a detailed site investigation to determine all design parameters sufficient to allow the final structural design.
- Undertake pre-condition surveys of adjacent and neighboring properties. It is expected that these surveys will be undertaken by suitably qualified party wall surveyors as part of the party wall award agreements with the neighboring property owners/occupiers.
- To undertake a detailed structural design relating to the proposals together with the preparation of detail design structural drawings sufficient in detail for building regulation approval and construction purposes.

8.0 Conclusion:

The design and construction methods to be used to achieve the proposed alterations are conventional well tried and tested methods.

The detailed structural assessment of the proposals has demonstrated, in our view, that the design and construction methods to be used are such as to ensure that the construction either during the course of works or upon the completion of works will not cause harm to the built environment and will at all times maintain the structural integrity of the subject property as well as neighboring properties.

Preliminary scheme drawings have been prepared showing structural proposals which should be read in conjunction with this assessment are numbered as follows:-

10-157-001	Existing Lower Ground & Ground Floor Plans
10-157-002	Proposed Lower Ground Floor Plan
10-157-003	Proposed Ground Floor Plan
10-157-010	Sectional Details – Sheet 1
10-157-011	Sectional Details – Sheet 2

SIGNED FOR AND ON BEHALF OF CSE CONSULTING:

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