

43 Hollycroft Avenue

London NW3

Proposed Works to Lower Ground Floor

Construction of Pool and Fitness Room

Report prepared for

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Introduction

This report is prepared in response to a request from The London Borough of Camden Development Control and Planning Services following their checking of submitted Application No. 2006/3425. The Application was considered to be incomplete and was reported by the Planning Department to be invalid as advised 31 July 2006.

The Application proposal described this element of the works as 'excavation of extension to Lower Ground Floor under existing front garden'.

This report covers the request for a Structural Engineer's view on the methodology of the proposed works and provides an assessment of the historic impact in line with the requirements of PPG15.

Description of Building in the Context of the Proposed Works

The semi-detached red brick Grade II listed building was built during the turn of the century, and the Period, about 1905. The building displays all the Victorian characteristic signs of upper/middle class semi-detached 'villas' which proliferated at that time, displaying a riot of imaginative brickwork features, cornices, overhanging eaves, extravagant mouldings and projecting bay windows.

The building is on three storeys to the front, four storeys toward the rear and viewing from the front of the property the building is attached on the right hand side.

There is a narrow access the entire length of the left hand side.

The front of the property faces West and the garden extends some 8.5m forward of the front bay window.

In the context of the proposed works to the Lower Ground Floor the floor of the Ground Floor spans from side to side, is boarded with original timber floor boarding and on the detached side the floor takes support from the party wall.

It is presumed that the party wall is 13.5" (343mm) solid brick work, reducing to 9" (225mm) behind the chimney breast. Traditionally this wall thickness would corbel out to a dimension of twice the wall thickness, say 27" (686mm) and in turn this would be supported on an unreinforced concrete strip footing, usually 12"-15" (300-350mm) thick with projections 6" (150mm) either side. If following the pattern this would provide an overall footing width at formation of the order of 39" (990mm).

Advice is that the front room and hall of the building have a substantial void of approximately 1.0m beneath the floor, the under floor surface of oversite is concreted supporting sleeper walls and fender walls for the hearth.

In the absence of trial holes the house walls would expect to have foundations carried to a minimum depth of 4'-6" (1.37m) below natural ground level. Taking into account the void space beneath the Ground Floor it is suspected the depth to underside of foundations, beneath the Ground Floor at the front of the house, would likely be 6'-9" (2.00m).

As the building currently exists the lowest level (Lower Ground Floor) to the rear of the property is approximately 2.50m below that of the Ground Floor.

The Proposal

As indicated on the sketch drawings attached to this report the proposal is to construct beneath the existing property, on the West side frontage a pool and fitness area of dimensions 10.50m by 9.30m.

The proposed fitness area will maintain the level of the Lower Ground Floor while the proposed pool will have an increased depth of 1200mm below that level.

The building is of a substantial construction and structurally will accommodate the proposed changes.

The alterations have been sensitively considered and effort has been made to retain the characteristic features of the building's special interest.

All new work to the Lower Ground Floor will be fitted beneath the existing Ground Floor and garden and a proper understanding of the structure will ensure survival of the historic fabric of the building as far as practically possible.

The Method

Throughout the proposed works it is intended that there will be consultation with a specialist having experience in the field of underpinning and the creation of substructures.

At the outset, before any construction work is undertaken a monitoring strategy is required to be established to minimise damage as a result of structural movements.

Typically these might occur

- From adjacent ground movements resulting from subsoil responses to the new works, and
- Differential settlement movements occurring between the materials of the existing and those newly installed

The structural design of the proposed works to the Lower Ground Floor will comply in every respect to the current additions of the appropriate British Standards and Codes of Practice and the requirements of the Building Regulations.

The foundations of the existing building at Ground Floor will require underpinning where these project forward of the deeper construction of the existing lower floor. The underpinning, beneath the party wall and the garage/stair wall, will taper back from the proposed new depth described to the existing level of building foundation support (over an approximate length of 3.00m). Window openings in the façade will require to be cross braced

- Below the existing dpc., above the oversite and beneath the level of the Ground Floor of the existing premises, openings shall be made and 300mm deep in situ concrete underpinning stools shall be installed along the entire length of all walls to be supported, in 900mm lengths, in a typical underpinning sequence. The stools, dry packed to the underside of existing masonry will remain in place at least three days before any adjacent section is opened up and another stool installed. Joints and dowel bars, using to advantage reinforcement connectors, shall be incorporated to provide continuity of reinforcement in the underpinning stools to create a continuous beam.
- This process will continue until all walls to be supported have a beam installed within them at the level described.
- Designed mini-piles shall be flight augered down through the oversight concrete and cast in the positions indicated on the sketch attached to this report, at approximately 900mm centres with prepared caps and anchorages for support of steel beam needles. The piles will provide both compression and tension reaction forces to the applied load.
- Pockets shall be formed in the masonry supported walls at the same centres beneath the concrete underpinning beams to accommodate the needles providing temporary support to the supporting walls.
- Transverse preloaded steel UC section needles shall be installed and secured in place.
- The underside of the existing footings and walls shall be cut back and prepared and cleaned of all loose material.
- Reinforced concrete walls and thickenings for foundations beneath the external long walls on the North and South side of the property shall be constructed in a piece meal fashion and pinned up hard to the underside of the underpinning beams on those two sides.

- Reinforced concrete columns shall be constructed as shown on the plan on piled foundations, prepared and installed during the piling operation.
- Two lines of pre-loaded fabricated steel beams with diaphragms shall be erected and installed to support the front wall and bay window, bearing each end, in prepared pockets, on the constructed reinforced concrete long walls on the North and South sides.
- Transverse UC or PFC section fabricated beams, beneath the two internal walls either side of the hall beneath the under pinning beams, or alongside and through bolted, shall be installed and erected to take support from the two new concrete columns one end and the front façade supporting beams at the other.
- In the main the support of the Ground Floor will now be complete and when all dry packing is satisfactorily rammed in hard and solid contact is made between the new and existing elements of structure, and an agreed period of time has elapsed the temporary needles and supporting beams can be removed.
- During the excavation process the piles shall be cut down and removed and the Lower Ground Floor construction in reinforced concrete completed.
- The formation of the remaining three sides of the pool, within the dimensional constraints of the front garden, shall be carefully constructed using the same flight auger mini-pile system, minimising operational noise and vibration. The depths of piles will be decided upon by the Piling Contractor from a design taking into account the loads applied, the characteristic nature of soil and a factor of safety suggested as 3 to avoid the need for pile testing.
- A mature plane tree is positioned on the edge of the footpath in Hollycroft Avenue on an extended line of the party wall to No. 43.
- The location, nature and age of this tree will be taken into account in the detail of the proposals and the structural design of the piling and substructure.
- The completion of the pool and fitness room with the construction of reinforced concrete liner walls to the piled walls, of the order of 200mm thickness and waterproof system and construction of roof, utilising to advantage precast concrete units, with all appropriate protective treatments and coatings to exposed steelwork, screeds and internal finishes will satisfactorily complete the structural elements of the work.

Impact and Conclusion

Reference is made to the Guidance on alterations to Listed Buildings Section C1 of PPG 15 and it is recognised that there should be a proper balance between the special interest of a Listed Building and the proposals for alteration/extension.

In this case the proposed alterations are sensitive since there will be no apparent perception of the changes which will have taken place beneath the building.

The main chimney piece shall be retained and elements of masonry toward the front of the house considered to contribute toward the structural stability of the building shall also remain and continue to be effective; except that their foundations shall be set at a much lower level.

On completion there should be no impact on the historical nature of the building and no major structural defects should arise as a consequence of the undertaking of the work.