

**PRELIMINARY STRUCTURAL
ENGINEERING ASSESSMENT
FOR NEW BASEMENT
AT**

4b Hampstead Hill Gardens

REF: 218136 - SEPTEMBER 2018

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1. INTRODUCTION

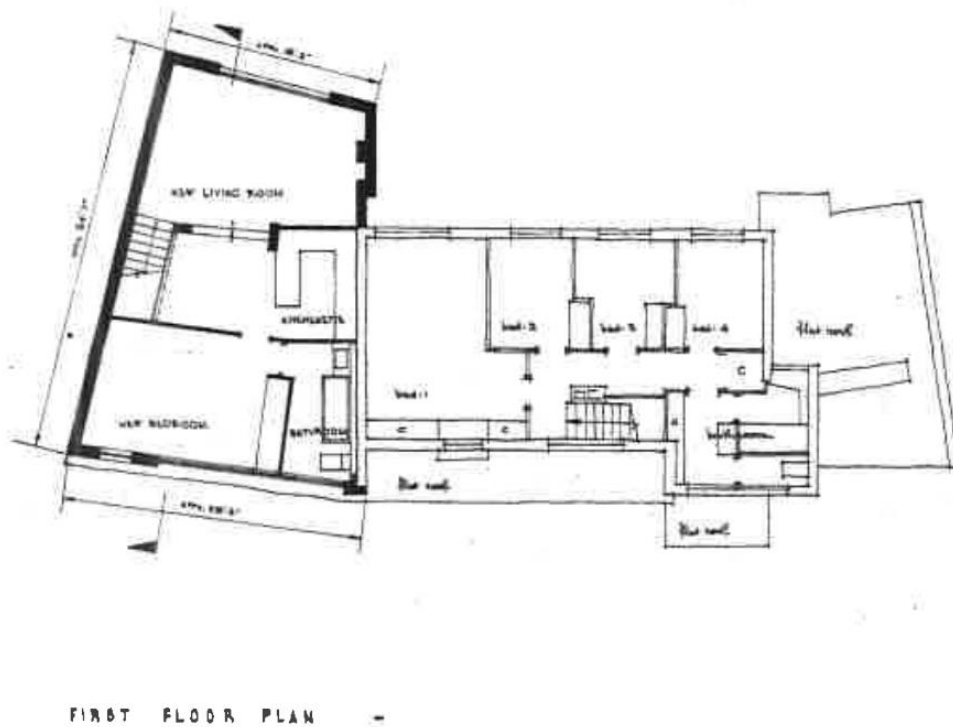
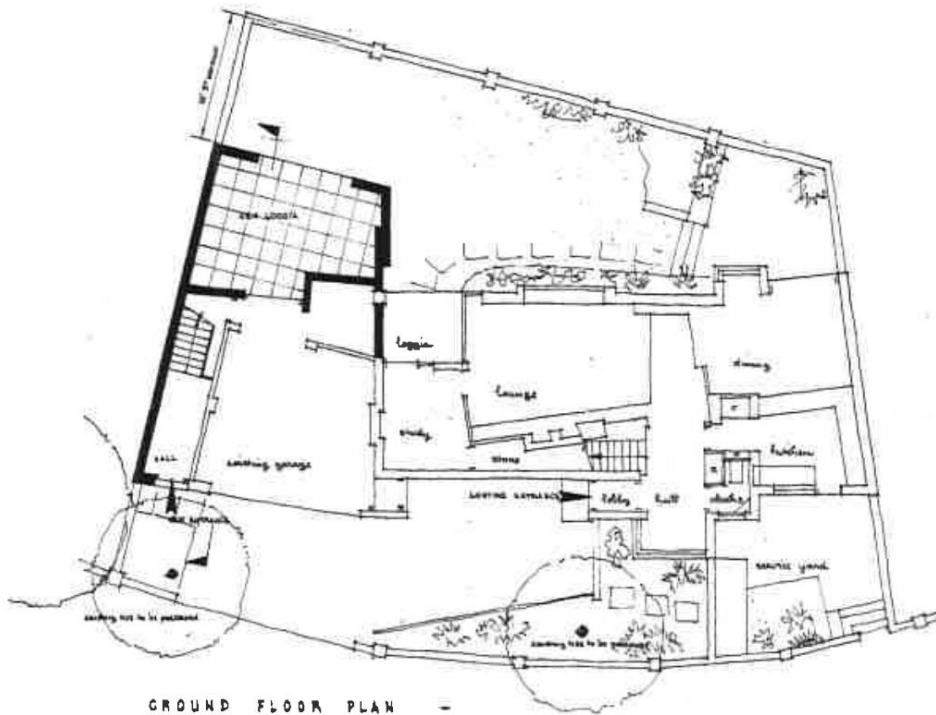
- 1.1 Mason Navarro Pledge Ltd have been appointed by the owners of 4b Hampstead Hill Gardens to prepare a Basement Impact Assessment, Construction Method Statement and Damage Assessment in support of their Planning Application for a rebuilt dwelling which includes a new basement. This report provides initial advice in order to support pre-application conversations with the local authority.
- 1.2 The proposed works comprise the formation of a new dwelling set on basement, ground and 2 upper floors. The proposals are illustrated on the Architects drawings.
- 1.3 The existing house was constructed in 1955 and is set on ground and first floors. The existing foundations are formed using piled trenches with piles noted as '*hand augered short bored piles extending 5 feet below trench bottoms and connected to strip footings with 3 foot dowel rods at corners. Strip footings generally of 2'9" x 9" with bottom of trenches average 2'10" below ground*'. This suggests that the piles extend to approximately 2.35m below ground.
- 1.4 The ground conditions have been established by soil testing undertaken as part of an insurance claim for subsidence related issues.
- 1.5 We are satisfied that through proper Structural Design and adopting carefully executed temporary and permanent works that the basement can be constructed without risk to the building or neighbouring properties.

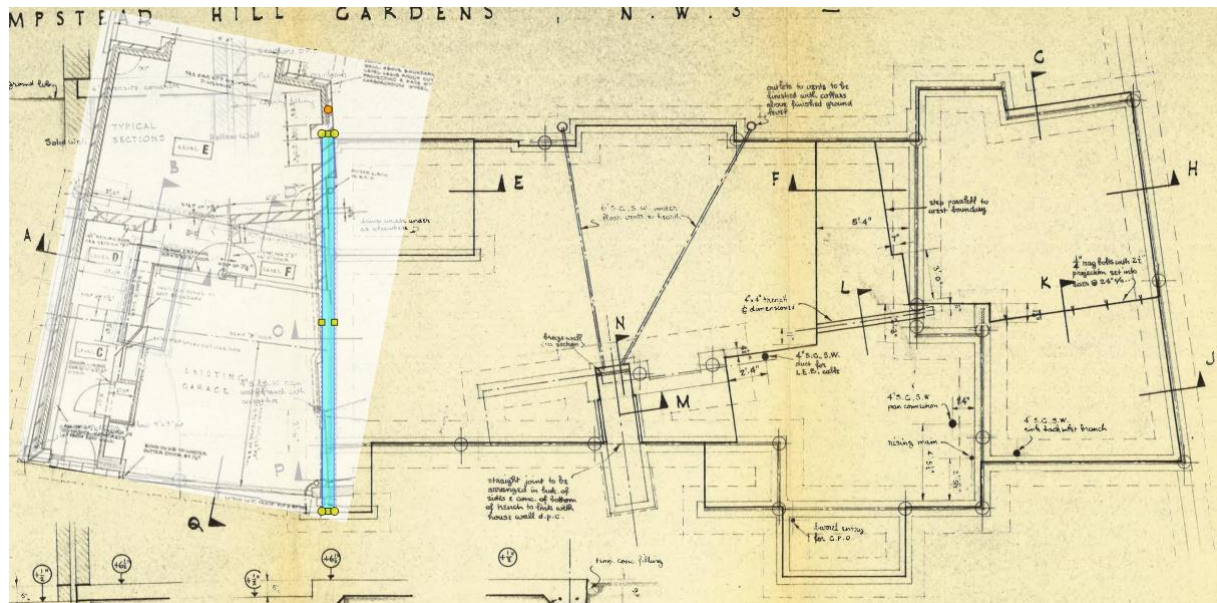


- 1.6 This report has been prepared by Stuart Pledge B(Eng) MIStructE CEng.

2. EXISTING BUILDING AND SITE CONDITIONS

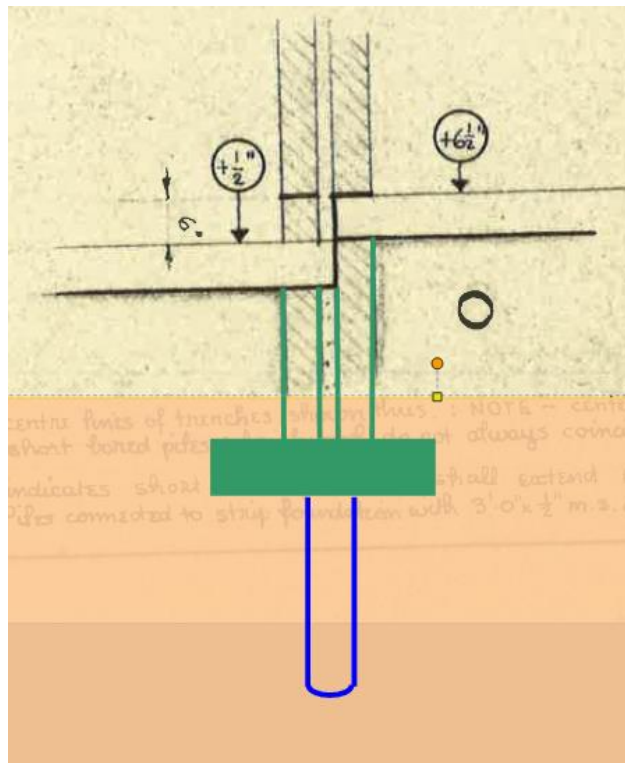
- 2.1 This is a semi detached property with 4b forming the left hand end of the dwelling noted in black hatching below. 4a is the neighbouring property and is to the right of the hatched 4b section.





Compiled plan of original dwelling and extended garage to the left hand end. Blue hatch denotes party wall.

- 2.2 The building is formed using cavity masonry walls and timber floors and roof. There is a shared party wall between 4a and 4b.
- 2.3 Foundation details to the party walls have been retrieved from the record drawings. They show floor slabs built in to a cavity masonry wall. The drawings then note a piled trench set down 850mm BGL which is approximately 825mm wide x 225mm deep with short bored piles below extending to 2.35m BGL.



Section through party wall

3. GEOLOGY AND GROUNDWATER

3.1 The report prepared by Crawford and Co as part of the insurance claim confirmed the following:-

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
BH1	Firm to Very Stiff, silty CLAY	22 - 50	Medium High
BH2	Firm to Stiff, silty CLAY	47 - 49	High

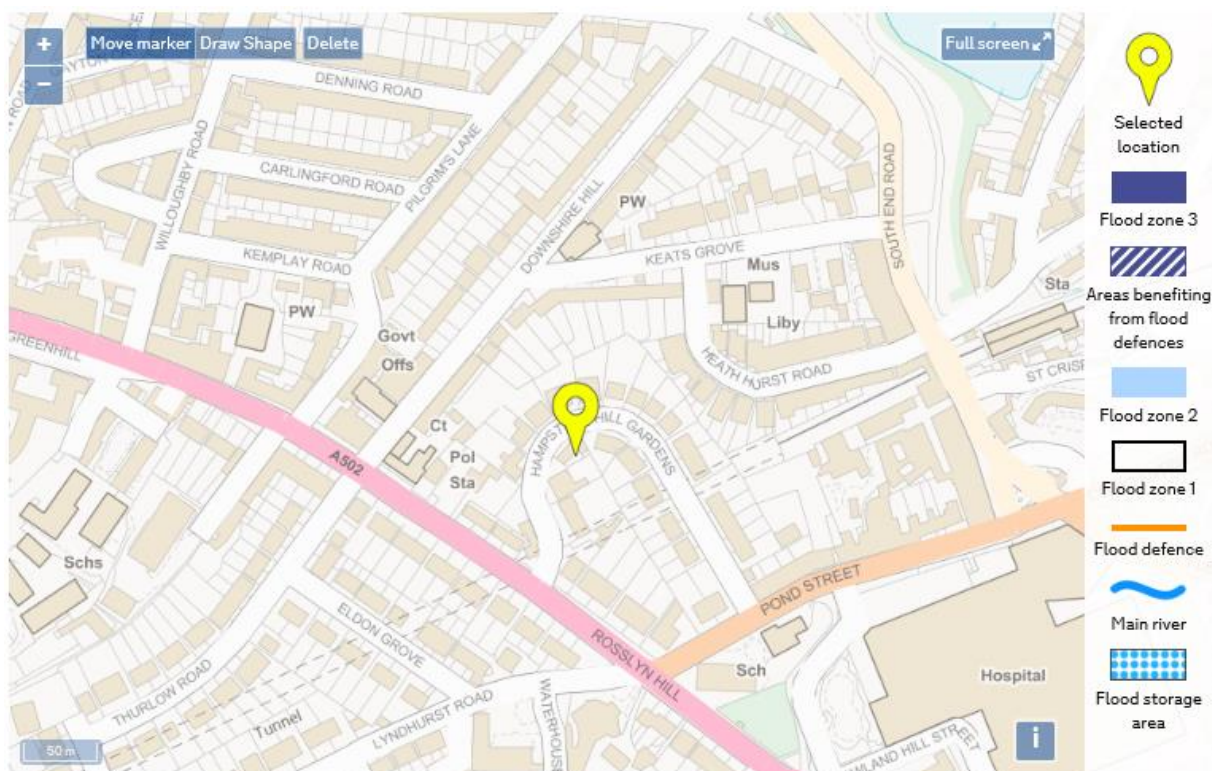
Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
BH1	2000	Carpinus spp.	Present
BH2	2600	Carpinus spp. Leguminosae spp.	Present

- 3.2 No water was noted in the report.
- 3.3 Desiccation levels were noted as high and the plasticity index was very high at 47+. With tree roots to 2.6m this confirms the upper soil layers are susceptible to volume change.
- 3.4 Trees were subsequently removed and the movement ceased suggesting that foundations bearing at 850mm below ground with stabilising piles to 2.35m below ground are sufficient in this location.
- 3.5 It is proposed to underpin the existing trenches using reinforced pins bearing at circa 3.2m below ground level thus the founding system will be at sufficient depth to avoid movements related to subsidence.
- 3.6 Removal of the clay soils below the site will result in a release of overburden causing the stiff clay below to heave. The affect on the party wall foundation as a result of this unload will need to be considered to prevent upward movement and subsequent cracking.
- 3.7 Groundwater was not encountered in the borehole at the site. Locally available BGS records indicate water to be at significant depth with low to zero mobility through the stiff clay from shallow ground waters.
- 3.8 In advance of a site specific borehole being undertaken a net allowable bearing pressure of 100 kN/m² should be assumed at this stage.

4. HYDROLOGY, FLOOD RISK AND SUDS

- 4.1 Since the new construction has a small footprint and will not penetrate water bearing strata it would not create a 'cut off' obstruction to ground water flow beneath the site. It would therefore have no effect on the hydrological flows below this and the adjacent properties.
- 4.2 A flood risk assessment will be prepared to support the application. However at this stage the published environment agency data confirms the site lies within flood zone 1 and is low risk.



5. PLANNED REDEVELOPMENT OF THE PROPERTY

The proposed structural alterations and refurbishment principally involve:

- 5.1 Removal of the independent vertical walls and floors above ground level initially retaining the ground floor slab. The neighbouring building is structurally independent in that it has sufficient front, rear and cross walls and is low rise. It was also designed as stable when the proposed development site was a single storey garage structure. Therefore no temporary props are envisaged.
- 5.2 The existing ground floor slab will be removed to allow reinforced underpins to be constructed to form perimeter and party wall foundations. These will be constructed in 1m headings and on a traditional hit and miss basis to prevent any settlement to the neighbouring property.
- 5.3 The reinforced retaining wall pins will be connected to a reinforced concrete basement raft construction thus reinstating the full bearing width at a geology below which is affected by soil volume fluctuations.
- 5.4 The ground floor will be constructed in either concrete or a ply sheathed timber floor to provide an adequate prop at ground level.
- 5.5 The upper storeys will be formed using cavity masonry walls and timber floors.

6. MINIMISING NOISE AND VIBRATION

- 6.1 The quietest available equipment and methods must be used in conjunction with noise barriers and mitigation measures, and the use of percussive breaking equipment must be avoided wherever possible. Dust suppression and screening must be used.
- 6.2 Permitted hours of noisy work (audible at boundary and estimated subject to planning)
- 8am to 6pm Monday to Friday
 - At no time Saturdays, Sundays and Public Holidays
- 6.3 Restricted hours for high impact activities (e.g. all demolition and concrete-breaking works)
- 9am to noon and 2pm to 5:30pm Monday to Friday
 - At no time Saturdays, Sundays and Public Holidays

Based upon the investigations carried out, the geological records and our experience of basement developments, we confirm that:

- 7.1 The development will maintain the structural stability of the proposed and neighbouring buildings. The engineering for basements of this kind is well understood and there are no difficult or peculiar issues that arise in this case.
- 7.2 The development will not adversely affect drainage and run-off and should not cause other damage to the water environment. We do not consider that this site raises any unusual or adverse groundwater or drainage issues.
- 7.3 The ground movements arising from the underpinning and excavation phases have been categorised as ‘Category 0’ (negligible). At this stage for the purposes of pre-app discussions the damage category will be limited to 1 (slight) on the party wall.

Category of Damage	Normal Degree of Severity	Description of Typical Damage (Ease of repair is printed <i>italic</i>)
1	Very slight	<i>Fine cracks which are easily treated during normal decoration.</i> Damage generally restricted to internal wall finishes. Close inspection may reveal some cracks in external brickworks or masonry. Typical crack widths up to 1mm.

- 7.4 Provided that the basement walls are installed by a reputable and experienced contractor in accordance with the guidelines published by the Association of Specialist Underpinning Contractors these figures should not be exceeded and that the predicted movements represent a conservative assessment of the likely movements.
- 7.5 In light of the information discussed above, the proposed development of this site will not give rise to any adverse stability, groundwater or drainage issues.

8. EXAMPLE PROJECTS UNDERTAKEN BY MNP (In LB Camden)

9 Downshire Hill, Hampstead - the re-construction of a dwelling including a double basement and 3 upper floors.



16 Lyndhurst Gardens, Belsize Park - the re-construction of a dwelling including a double basement and 1 upper floor.

