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56 Dartmouth Park Road,

London NW5 1SN

Basement Impact Assessment :

- **Screening and scoping assessment**
- **Construction Sequencing Methodology**
- **Impact assessment**

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1.0 INTRODUCTION

1.1 This report has been prepared by Helen Hawker MSc BEng (Hons) MIStructE of Conisbee for Mr J Wald. It is intended for the use of the client and their agents for submission to the London Borough of Camden as part of supporting documents for a planning application.

1.2 It is proposed to extend the existing basement of 56 Dartmouth Park Road. This report covers aspects in relation to the proposed basement which extends the existing cellar area by approximately a quarter of the existing ground floor footprint: under the present south-west front reception room and to form a shallow light-well to the front of the property.

1.3 This Basement Impact Assessment is to be read alongside the Site Investigation prepared by Ground Engineering Ltd. ref. C14561 dated October2018. The S.I. incorporates the following information:

- A desk study and historical data of the site and surrounds;
- A soil investigation, including 2 boreholes and a number of trial pits carried out at the site during the week of 27th August 2018.
- Assessment of the geological and hydro-geological impacts of the proposals in accordance with the London Borough of Camden CPG requirements; and
- Geological characteristics for the subsoil for foundation design (which addresses the main criteria as set out by CPG Basements March 2018 for the BIA).
- Interpretive commentary on the proposals.
- Information and interpretative commentary on further proposed works to 56 Dartmouth Park which are not part of this planning application.

This report includes screening and scoping flowcharts, as provided in CPG Basements and the ARUP Camden geological, hydro-geological and hydrological study, based upon the information contained with the S.I. by Ground Engineering Ltd.

This report outlines the structural engineering aspects of the works, the existing and proposed construction, and includes permanent structural design and temporary works proposals. This report also incorporates the Structural Method Statement.

It is not proposed to reproduce the full detail of geotechnical and hydro-geological information provided by the SI within this report, except where necessary for structural engineering design criteria.

2.0 EXSITING CONSTRUCTION

2.1 56 Dartmouth Park Road was built circa. 1880, a 3 storey, plus cellar, detached 'villa' property. It can be seen on the 1894 Gospel Oak Old Ordnance Survey map. A more comprehensive site history is given within the Site investigation by Ground Engineering with associated maps appended.

2.2 The construction is typical Victorian; solid load bearing brickwork external walls, brick filled timber stud and stud partition walls with timber floors and roof.

2.3 The London Bomb Damage map highlights a V1 flying bomb hit on Dartmouth Park Hill, with some general blast damage to No. 58 Dartmouth Park Hill (up the hill / Eastern neighbour to No.56), however none to no. 56 Dartmouth Park Road.

2.4 Conisbee undertook work in 1991 to open up the upper loft for accommodation.

2.5 The property was altered and extended to the rear at ground level in 2007.

2.6 It became apparent during the Site Investigation that the property has been underpinned deeply to the front, and possibly elsewhere. This has been confirmed by the owners and previous owners and is discussed further in part 3.0.

2.7 Conisbee undertook a walk-around and visual survey in June 2018, taking details of the existing construction and informing the design of the proposed basement. The existing mark-ups are appended to this report, Appendix A.

3.0 EXISTING SITE ENVIRONMENT

3.1 The ground conditions comprise made ground to a depth of up to 1.1m, overlying solid geology London Clay formation, varying from firm at around -5.0m to stiff at the base of both borehole at -10m. Ground water strike was at -8.0m and -8.2m, with standpipes inserted for re-visits. On the first re-visit, approximately one week after the site works, the 4m deep standpipes were dry.

	BH 01 (Rear)	**BH 02 (Front)**
MADE GROUND	0.3m	1.1m
Soft to firm CLAY	1.2m	
Firm CLAY	7.0m	5.0m
Firm to stiff CLAY	10.0m	10.0m

3.2 The property lies over 200m North-North-West to the over ground line between Gospel Oak and Thamesmead, and some 300m East in plan from the underground Northern Line as it runs between Tufnell Park and Archway.

3.3 The trial pits have highlighted deep concrete foundations to the front south corner of the property, to some -2.5m below ground level. This appears to have been underpinning, presumably placed due to movement as the property lies on a hill and there are, or may have been, large mature trees nearby. The underpinning, found on both front and flank elevations (the trial pit being on the corner), presumably also joins the previously shallow foundations with the deeper cellar foundations, so alleviating differential stresses in the masonry over. It is understood from the property owners that the underpinning was carried out some 25 years ago, to the front and side of the properly (to the cellar). These underpins practically surround the proposed area of excavation.

3.4 To the rear, the trial pits have exposed typically concrete underpinned or new foundations to an average depth of -1m.

3.5 The site lies in Flood Zone 1, with reference to the Environment Agency Flood map for planning. This is attached in Appendix C.

3.6 Dartmouth Park Hill was not flooded in the high flood events of 1975 and 2002. (Ref. Report on Flooding in Camden).

3.7 The above two items, plus the modest size of the development, means a Flood Risk Assessment is not required.

3.8 The site lies some 80m from the eastern tributary to the Fleet River, which runs culverted below York Rise.

3.9 The site lies outside Ground Source Protection zones and is within area marked ‘unproductive strata’ on the Environment agents and Camden Aquifer Designation maps. Refer to Camden Geological, Hydrogeological and Hydrological Study maps mark-up, Appendix D.

4.0 PROPOSED

4.1 It is proposed to form the basement extension by carefully removing the present soil / fill below the south –west reception room, which is presently surrounded by existing underpinned foundations.

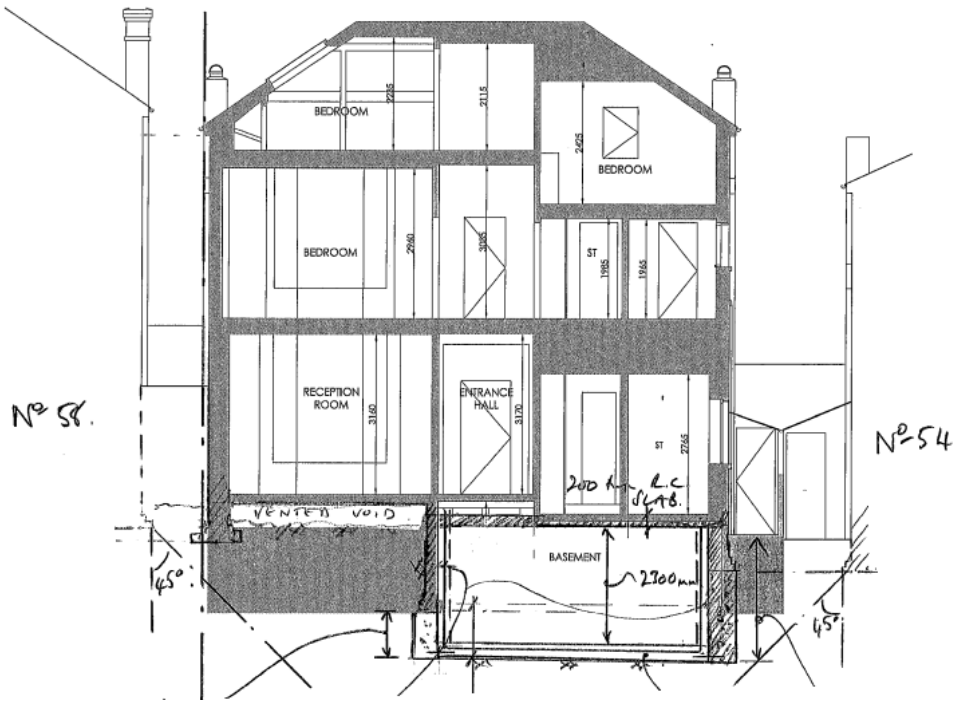
4.2 The present foundations will not have been designed to be a retaining structure therefore a new internal reinforced lining retaining structure is to be constructed. With a new ground floor and basement slab these form a 'box' structure, providing the necessary vertical and lateral integrity and the basement and existing structure above.

4.3 The enlarged basement will have a lower floor finish than existing to provide suitable headroom, such that some existing internal cellar walls will require underpinning.

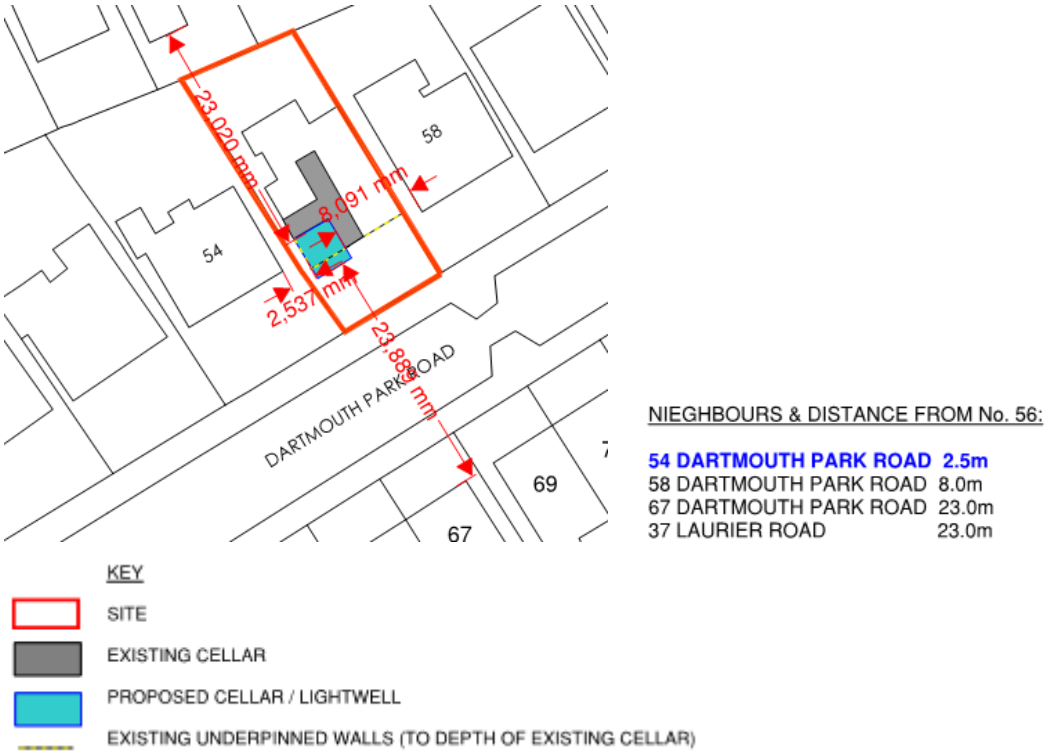
4.4 The shallow new light-well will be formed in masonry over a concrete slab, tied into the existing foundation structure. A new lintel will be inserted to support the existing front wall over the new window to the basement.

4.5 The ground investigation has proved the water table to be below the level of the proposed basement formation, however as best practice, a water head up to 1m below ground level is taken for design. Heave due to removing overburden of the clay will also be expected (although a good proportion of this is relieved in the short period after the dig), and is to be incorporated into detailed design, although this is typically resisted by the combined dead load of the existing and new structure with a reinforced concrete base slab.

4.6 Refer to proposed scheme drawings, construction sequence sketches and calculations appended, Appendices A, B and E.



Park SSK-003 : Cross section (full drawing appended)



Part mark-up to show neighbouring properties (Drawing SSK-000:Appendix C).

5.0 NEIGHBOURING PROPERTIES

5.1 The nearest properties to the proposed basement are adjacent neighbours, 54 and 58 Dartmouth Park Road. See part drawing SSK-100 above.

5.2 58 Dartmouth Park Road is some 8m from the proposed basement, with the existing cellar lying between them. Although slightly uphill, it is beyond a distance where the works may structurally impact the building.

5.3 54 Dartmouth Park Road is the nearest neighbour to the works, at 2.5m away. The flank wall closest to no. 54 has already been underpinned to 2.5m depth, which appears to have had negligible impact on no. 54. The new light-well will be a similar distance but much shallower, and in the 'shadow' of the existing foundations and therefore can be constructed with negligible impact on no 54.

5.4 The ground around the site and neighbouring areas is reasonably level therefore no particular surcharge or slope stability needs to be taken into account in the design of retaining walls.

6.0 BIA SCREENING FLOWCHARTS

From Appendix E : Camden geological, hydrological and hydrology study: Guidance for subterranean development.

6.1	**Surface Flow and Flooding Impact Identification**	
6.1.1	Is the site within the catchment of the pond chains on Hampstead Heath?	No, refer to CGHHS Figures 14 & 15 marked up, appended.
6.1.2	As part of the site drainage, will surface water flows (e.g. rainfall and run-off) be materially changed from the existing one?	No. No new hard landscaping is incorporated in the scheme. The area that is to become a light-well is presently a hard landscaped parking area.
6.1.3	Will the proposed basement development result in a change in the proportion of hard surface / paved external areas?	No. Refer to drawings / as above
6.1.4	Will the proposed basement development 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, as the amount of hard / soft landscaping is no different.
6.1.5	Will the proposed basement development result in a change to the quality of surface water being received by adjacent properties or downstream watercourses?	No.

6.2	**Subterranean (groundwater) Flow Impact Identification**	
6.2.1	Is the site located directly above an aquifer?	No. The site is over unproductive strata, refer to CGHHS Figure 8, Appended.
	○ Will the proposed basement extend beneath the water table surface?	No. Water strikes in the boreholes are min -7.0m below GL, so some 4.5m below the proposed basement / existing cellar. It my be noted the present cellar, whilst well

		ventilated, appears relatively dry with little/ no tanking.
6.2.2	Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	Yes – the eastern tributary to the Fleet (culverted) lies along York Rise 80m from the site. Owing to the distance and brick culvert, this will not be affected by, nor affect, the proposed development.
6.2.3	Is the site within the catchment of the pond chains on Hampstead Heath?	No, refer to Figures 14 & 15 appended
6.2.4	Will the proposed basement development result in a change in the proportion of hard surface / paved areas?	No. No new hard landscaping is incorporated in the scheme. The area that is to become a light-well is presently a hard landscaped parking area.
6.2.5	As part of the site drainage, will more surface water ((e.g. rainfall and run-off) than present be discharged to the ground? (e.g. via soak-aways and/or SUDS)	No.

6.3	**Slope Stability screening flowchart**	
6.3.1	Does the existing site include slopes, natural or manmade, greater than 7 degrees (approx. 1 in 8)?	No.
6.3.2	Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees (approx. 1 in 8)?	No.
6.3.3	Does the development neighbour land, including railway cutting and the like, with a slope greater than 7 degrees (approx. 1 in 8)?	No, refer to slope angle map Figure 16 appended.
6.3.4	Is the site within a wider hill setting in which the general slope is	No – although there are some relatively small areas of highly sloping ground, the

	greater than 7 degrees (approx. 1 in 8)?	general slope is lower than 7 degrees.
6.3.5	Is the London Clay the shallowest strata at the site?	Yes – although it is very thick. Refer to Fig 7.
6.3.6	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.
6.3.7	Is there a history of seasonal shrink-swell subsidence in the local area., and/or evidence of such effects on site?	London clay has high shrinkage potential, and there is potential to desiccation of subsoil, particularly if close to trees, this may well be the reason the original footings were underpinned.
6.3.8	Is the site within 100m of a watercourse or potential spring line?	Yes – the eastern tributary to the Fleet (culverted) lies along York Rise 80m from the site. Owing to the distance and brick culvert, this will not be affected by, nor affect, the proposed development.
6.3.9	Is the site within an area of previously worked ground.	No.
6.3.10	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 over unproductive strata.
6.3.11	Is the site within 50m of Hampstead Heath?	No, refer to Figure 11 and other maps appended.
6.3.12	Is the site within 5m of a Highway or pedestrian right of way?	The front of the lightwell is about 5m from the pedestrian pavement along Dartmouth Park Road.
6.3.13	Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties.	No, as the existing foundations have been the -2.5m below the ground level for some 25 years. Any new underpinning will be to match depths of existing foundations. Drawings 45 degree lines, the existing underpinned foundations still lie outside the line of influence to the neighbours. Refer to

		proposed sectional drawings.
6.3.14	Is the site over (or within the exclusion zone of) any tunnels, e.g. railways lines?	No.

7.0 CONSTRUCTION SEQUENCE METHODOLOGY

7.1 Refer to outline sequence drawings appended; Appendix B and supporting calculations; Appendix E.

7.2 The following is a procedure that the contractor could use to form the proposed basement construction. The final sequence will need to be by the contractor and will be agreed in advance with the structural engineer and principal designer. Note all elements will be required to be to the Structural Engineers and Architects specifications and details, and that the Contractor will need to provide specific method statements for each element, e.g. underpinning, needling and propping, forming reinforced concrete etc.

a) Prior to undertaking any works the conditions surveys and any agreed monitoring is to be undertaken. Refer to Section 9.0

b) Site set up including temporary or permanent relocation of services as necessary.

c) Insertion of underpins in staged manner to existing cellar walls whose foundations are shallow, and new pad footings (below proposed base slab level) to receive temporary props.

d) Needle and prop walls required to be supported by steels / r.c slab in the permanent condition, cast padstones in existing walls.

e) Insert new steels, wedge and pack up to take existing loads. Props to be removed once checked and signed off.

f) Remove present reception room floor and dig out to underside of reception room floor to level below beginning of existing underpinned.

g) Whaling beams and props fitted (masonry / concrete made good and non-shrink grout to rear of whaling beams to ensure flush connection).

h) Dig out soil below reception room further, at all times checking the integrity of the existing brickwork and underpinning concrete. Report to structural engineer any defects or concerns.

i) Make good defects and create approximately flush face to existing underpinning, filling voids in staged manner if necessary, tied into existing foundations.

j) Place blinding and tanking as necessary place plus protection.

k) Place reinforcement for base slab and starters for walls.

l) Cast new base slab.

m) At this time, works to form the light well may start, with digging out made ground as necessary, battened back and placing needling in front elevation, cast padstones.

n) Insert new lintel over proposed window. Cast concrete and make good brickwork about new opening.

o) Place reinforcement for walls and light well slab, with water stops and troughs for drainage as necessary.

p) Cast new retaining walls and base slab to light well (movement joint between these). Once necessary strength has been achieved, short masonry retaining walls maybe formed, tied into front elevation.

q) Form frame work on props and reinforcement for ground floor slab, including welding continuity bars to steels and dowels into existing walls.

r) Cast floor.

s) Once the concrete has been achieved adequate strength temporary props to be removed and concrete made good as necessary.

t) Waterproofing lining / cavity drainage and finishes formed to Architects details and specifications.

7.3 All of the above will be need to be checked and signed off at each stage by the contractor's agent and as agreed by the structural engineer and architect. Building Control will need to be notified with sufficient notice at all necessary stages to visit.

7.4 Refer to sequence sketches SSK-010 and SSK-011, Appendix B.

8.0 SERVICEABILITY & DRAINAGE.

8.1 In order to achieve a Grade 3 basement to BS 8102:2009 appropriate measures of waterproofing is to be incorporated into the detailed design. This will likely be a combination of tanking to the inside of existing retaining / cellar walls and a drained cavity (specified by the architect). Any water will be collected into its own dedicated sump and will be pumped to allow it to be discharged.

8.2 It is unlikely the development will impact existing services as none are known to pass through the under-floor area presently, however if the event any do, these will be diverted and / or encased as required.

8.3 Any drainage extending from the basement will require pumping to an appropriate level to allow it to feed into the existing Thames Water Sewer network. The basement will include a pump room and sump-pump as necessary. The final location is to be decided in detailed design.

9.0 MONITORING

9.1 A thorough condition survey of the existing building and neighbours flank wall will be carried out prior to commencement of works on site, which is to include clear photographs of all areas, with written description of any existing defects. This will be a requirement to be carried out by the contractor.

9.2 As the main load bearing walls have already been underpinned, and owing to the distance from the neighbouring properties, it is not expected that monitoring to the adjacent properties will be required, and that any defects that appear may be highlighted asap with the condition surveys as reference. This is to be agreed with the party wall surveyors.

9.3 If it is agreed that monitoring is required, these are to be agreed to and the first readings taken prior to commencement of works on site, and then periodically thereafter, typically weekly during construction of major works, monthly thereafter and a final reading taken six months after completion. This would largely be for the existing building, although points should also be fixed to neighbours walls as a matter of course, with the locations agreed with the party wall surveyors. A traffic light system would be in place with trigger levels to be agreed.

10.0 IMPACT ON SURROUNDING AND EXISTING STRUCTURES

10.1 From the site investigation by Ground Engineering Ltd. and the above screening and scoping checks, the following impacts in forming an extended basement has identified:

10.1.1 No impacts to the surface flow over the site and surrounding environment, as confirmed in the Site Investigation on page 32 under ‘ other issues’ as well as in the general content.

10.1.2 No impacts to flooding risk to the site and surrounding environment as confirmed by the Environment Agency search, historically flooded streets lists, and in the Site investigation under ‘other issues’ as well as in general content.

10.1.3 No impact to subterranean water flow, while the Fleet Brook / Holbourne is culverted 80m from the site, and the development is not anticipated to even affect the drainage of the site itself as confirmed by the Site Investigation under 'other issues' and well as within Ground water (page 23 of the SI) and Excavations / ground water (page 32 of the SI).

10.1.4 No significant slopes or ground identifying slope stability issues which would need further mitigation, as confirmed by the highlighted maps in appendix D.

10.2 Therefore the proposed development does not have the risks that require further detailed design or information to assess the impacts on the existing and surrounding structure and hydro-geology. All supporting structure, including new retaining walls and foundations as well as stability structures will be fully detailed and designed to the relevant British Standards and Regulations as well as along the guidance provided by the NHBC.

10.3 Due to the minimal works to the existing foundations adjacent to and the straightforward small scale construction of the light-well and distance from the nearest neighbour, no 54 Dartmouth Park, it is assessed that movement to the neighbours will be 0, negligible, on the Burland classification of damage (part table on next page). Damage to the existing building of no 56 Dartmouth Park Road, if at all, is expected to be a maximum of 1, very slight.

Damage category	Description of degree of damage	Description of typical damage and likely forms of repair for typical masonry buildings.	Approx. crack width (mm)	Max. tensile strain %
0	Negligible	Hairline cracks.		< 0.05
1	Very slight	Fine cracks easily treated during normal redecoration. Perhaps isolated slight fracture in building. Cracks in exterior visible upon close inspection.	0.1 to 1.0	0.05 to 0.075
2	Slight	Cracks easily filled. Redecoration probably required. Several slight fractures inside building. Exterior cracks visible; some repainting may be required for weather-tightness. Doors and windows may stick slightly.	1 to 5	0.075 to 0.15
3	Moderate	Cracks may require cutting out and patching. Recurrent cracks can be masked by suitable linings. Tuck pointing and possible replacement of a small amount of exterior brickwork may be required. Doors and windows sticking. Utility services may be interrupted. Weather tightness often impaired.	5 to 15 or a number of cracks > 3	0.15 to 0.3

Part table of Damage Classification proposed by ***Burland***

10.4 This is also discussed and confirmed in the SI under Excavations / ground water (page 29), anticipating a damage category of '0' to the existing building assuming that an experienced competent contractor is undertaking the works.

11.0 EXCECUTIVE & NON TECHINCAL SUMMARY

11.1 The design of the proposed basement extension and light-well to 56 Dartmouth Park Road will have negligible or no negative impacts on the existing building and neighbouring properties, structurally or in relation to geotechnical and hydro-geological aspects.

11.2 During construction it will be imperative on the construction company and specialist sub-consultants to adhere to method statements and designed elements to ensure this remains so during and after construction.

11.3 Conisbee have been appointed to act as the Structural Engineer for the project, and so will be continuing the detailed design; ensuring all supporting structure, including new retaining walls and foundations as well as stability structures will be fully detailed and designed to the relevant British Standards and Regulations as well as along the guidance provided by the NHBC. Conisbee will be over seeing the drawing and calculations undertaken by the contractors temporary work engineers, and attending site on a regular basis, particularly during the early construction phases.

Signed by author

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