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Proposed lightwell construction: undertaking the Screening and Scoping stages to assess whether a full Basement Impact Assessment (BIA) is required

53 Platts Lane, London, NW3 7NL

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1. Executive Summary & Report Recommendation

As laid out clearly in this report in a non-technical manner, having carried out the Screening, and where necessary Scoping stages via a Conceptual Site Model, as a well as a site walkover, our view is that for the proposed construction of this modest lightwell, a full Basement Impact Analysis (BIA) is neither required nor warranted.

As part of the Screening process that related to slope stability, although it was identified that London clay is the shallowest strata at the site, the lightwell's excavation would cause such a small amount of material to be removed, that the volume change potential is so small as to be insignificant.

The design of the lightwell's structure and the sequence of the excavations have taken the much more significant issue of stability and ground movement fully into account, which will have the effect of minimizing to make negligible the impact on the adjoining houses in the terrace and the pavement to the front.

It should be noted that the basement of number 51 is of the same depth as the basement of number 53 to the front of the property, and will be near to the location of the proposed lightwell. The lightwell will be at the same depth, so issues of ground stability are minimized to the point of being negligible. All of this has been taken into account in the engineering designs.

There is no underground infrastructure below the property within the zone of influence of the lightwell excavation.

In terms of subterranean (ground water) flow, the Screening process identified no significant risks associated with ground water. There is no ground water present on site.

Relating to surface flow and flooding, the Screening process identified that the quantity and quality of surface water flows will be unaffected by this scheme.

The Scoping stage has informed the Conceptual Site Model (CSM) and has concluded that no further site investigation is required.

Having undertaken the initial stages of the BIA as requested by Camden Planning, our view is that the proposed construction of this modest lightwell will cause no harm to the built and natural environment, or local amenity, and we recommend that no further stages of the BIA are required.

2. Introduction

It is proposed to create a modest, new lightwell in the front garden of the existing property, 53 Platts Lane, NW3 7NL, so as to allow natural daylight into the lower ground floor at the front of the house, which the applicant intends to use as a family room for the use of his family.

The new lightwell will be approximately 5 square metres in area, a maximum of three metres in depth, and approximately 15 cubic metres in volume. It will be formed from reinforced concrete retaining walls. The plans show the proposed lightwell in plan and section.

The applicant has been notified by Camden's Planning department that the Screening and possible Scoping stages of the Basement Impact Assessment (BIA) are required to ascertain whether a full BIA is necessary. This report supplements the planning application for the lightwell, which has previously been submitted.

EcosMaclean has been instructed to carry out the Screening and possible Scoping stages, and issue a detailed report of its findings. This report closely follows and meets the requirements of *Camden Planning Guidance: Basements and lightwells, CPG4, July 2015*.

3. Site Context

Summary

The site is to the west of Hampstead on level ground. The building is a Victorian terraced property with an existing basement and small front garden. The site and surrounding area is founded on weathered London Clay with no ground water present. The existing building and its curtilage are paved at the front. The site geology and ground conditions are well understood, based on the British Geological Society public record of boreholes in the area.

3.1. Site Location

The site is located at 53 Platts Lane, NW3 7NL. The site location is shown in figure 1.

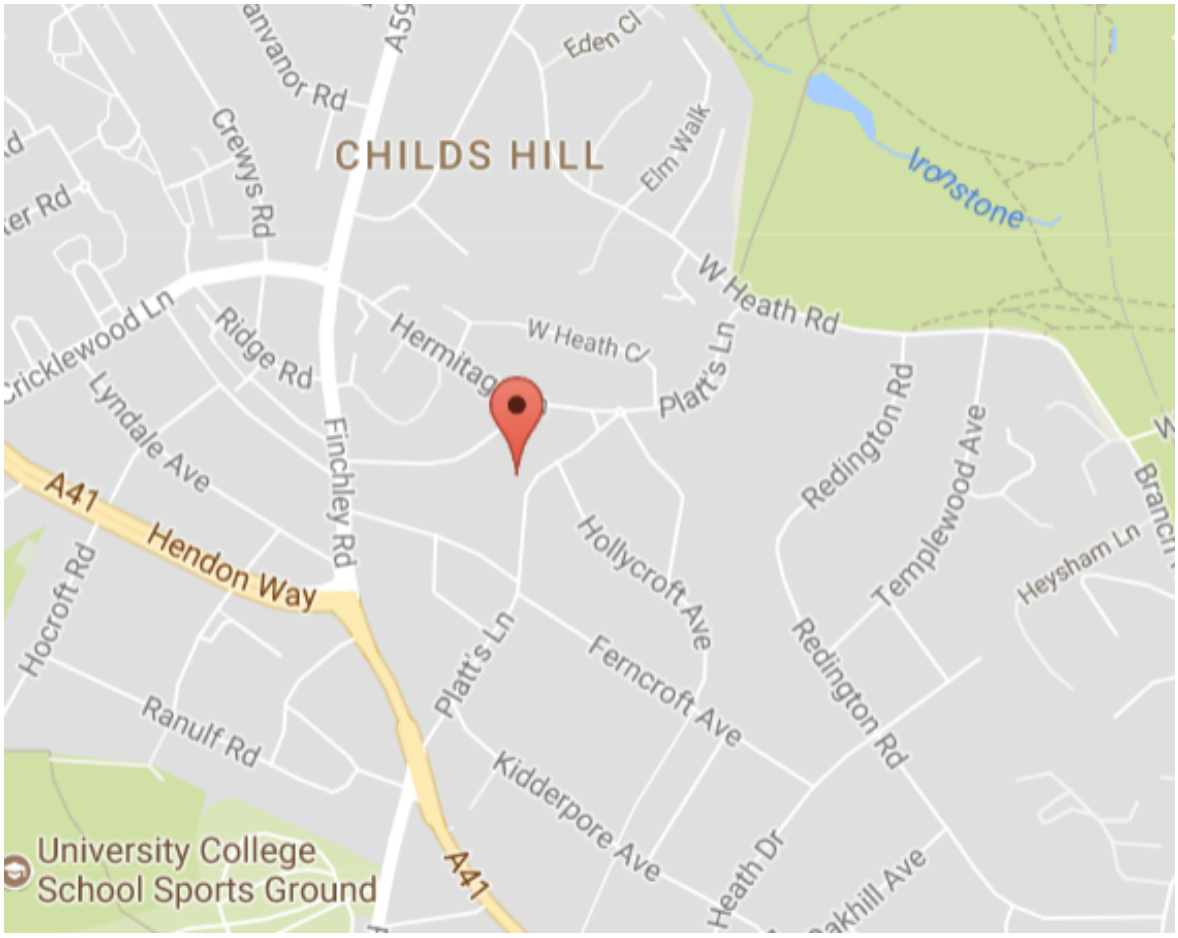

Figure 1: Site location plan

3.2. Site Layout

The property is a terraced dwelling on the west side of Platts Lane and the front garden is enclosed by a timber picket fence.

3.3. Proposed Development

There is an existing basement of 2.7 metres floor to ceiling height, which is 50 square metres in extent. The proposal is to add a new lightwell at the front of the property, so as to allow natural daylight into the lower ground floor at the front of the house, which the applicant intends to use as a family room for the use of his family.

The new lightwell will be approximately 5 square metres in area, a maximum of three metres in depth, and approximately 15 cubic metres in volume. It will be formed from reinforced concrete retaining walls. The plans show the proposed lightwell in plan and section.

3.4. Site History

Historic maps of the site have been reviewed and show the site has been part of a residential setting since the early 20th century and show Platts Lane in its present day alignment. The general arrangement of the residential dwellings along Platts Lane has not changed since the initial development.

3.5. Topography

The site lies at an elevation of approximately 90 metres above sea level. The street is level at this point and it is not until further east that it begins to slope upwards toward Hampstead Heath.

3.6. Published Geology

The British Geological Survey (BGS) of the area indicates the site to be near the boundary between London Clay Formation and Claygate Member and near to an area of worked ground beside the Finchley Road. See Figure 4 of ARUP CGHS

3.7. Site Walkover

The basement of number 51 is of the same depth as the basement of number 53 to the front of the property, and will be near to the location of the proposed lightwell. The lightwell will be at the same depth, so issues of ground stability are minimized to the point of being negligible. All of this has been taken into account in the engineering designs.

There is no underground infrastructure below the property within the zone of influence of the lightwell excavation.

The property is served by gas, electrical, and foul drainage infrastructure, all of which are connected to the property from the front pavement.

3.8. Hydrogeology

The Environment Agency (EA) Aquifer Designation shown in Fig 8 of CGHHS indicates that the site location is on the boundary of the Hampstead Heath secondary aquifer and the unproductive strata of the London Clay Formation. The site walkover revealed no perched water or groundwater, as would be expected for a site within London Clay.

3.9. Hydrology

There are no culverted rivers or other water bodies within 100 metres of the site as indicated in Fig 11 of CGHHS.

3.10. Flood risk

With reference to the Environment Agency website, Platts Lane is within Flood Risk Zone 1, and so is classified as an area at low risk from Rivers or Surface Water Flooding. All streets have a Flood Risk Zone rating – and Platts Lane is in the lowest possible Flood Risk Zone.

3.11. Drainage Assessment and SUDS

The lightwell extends into front garden, which is fully paved, so there is no increase in impermeable area as a result of the development and therefore no justification for, or scope for the introduction of, flood attenuation features.

4. SCREENING

4.1 Subterranean (ground water) flow screening chart - Fig 1

	Question	Response	Justification	Reference
1a	**Is the site located directly above an aquifer?**	No	The site is located in clay formation.	Fig. 8 CGHH Site walkover
1b	**Will the proposed development extend beneath the water table surface?**	No	The water table is below the impermeable clay, which is below the level of the basement excavations.	
2	**Is the site within 100m of a watercourse, well (used/disused) or potential spring line?**	No	Evidence from maps and reference to *The lost of Rivers of London* indicate that the site is distant from any culverted water bodies.	Fig. 11 CGHH
3	**Is this site within the catchment of the pond chains on Hampstead Heath**	No	Evidence from Map.	Fig. 14 CGHH
4	**Will the proposed development change the proportion of hard surfaced/paved areas?**	No	The lightwell is in a part of the front garden, which is already paved.	
5	**As part of the site drainage, will more surface water than at present be discharged to the ground (e.g. via soak ways and/or SUDS)?**	No	There is no increase in impermeable surfaces, therefore no change to drainage arrangements.	
6	**Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond (not just the pond chains on Hampstead Heath) or spring line.**	No	The site is one kilometer from ponds or any spring lines.	Fig. 11 and 12 CGHH

4.2 Slope stability screening chart - Fig 2

	Question	Response	Justification	Reference
1	**Does the existing site include slopes, natural or manmade, greater than 7°? (approximately 1 in 8)**	No	The slope is less than 7°.	Fig 16 CGHH
2	**Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7°?**	No	The slopes at the property boundary will be unaffected by the development.	
3	**Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?**	No	Evidence from site location plan.	
4	**Is the site within a wider hillside setting in which the general slope is greater than 7°?**	No	Evidence from site plan.	Fig 16 CGHH
5	**Is the London Clay the shallowest strata at the site?**	Yes	Evidence from BGS geology map.	Fig 4 CGHH
6	**Will any tree/s be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?**	No	Evidence from site plan and site walkover. No trees exist on the site.	
7	**Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?**	No	There is no evidence of shrink-swell subsidence.	Site walkover
8	**Is the site within 100m of a watercourse or a potential spring line?**	No	Evidence from maps and site walkover.	Fig. 11 and 12 CGHH
9	**Is the site within an area of previously worked ground?**	No	Evidence from Site walkover.	Site Walkover
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 situated in unproductive strata.	Site Walkover

11	**Is the site within 50m of the Hampstead Heath ponds?**	No	Evidence from map.	Fig 12 GCHH
12	**Is the site within 5m of a highway or pedestrian right of way?**	Yes	The front lightwell will be within 2metres of the pavement.	
13	**Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?**	No	The neighbouring properties have existing basements.	Site Walkover
14	**Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?**	No	Evidence from location map.	Fig 18 CGHH

4.3 Surface flow and flooding screening - Fig 3 [1]

	Question	Response	Justification	Reference
1	**Is the site within the catchment of the pond chains on Hampstead Heath?**	No	Evidence from location map	Fig. 14 CGHH
2	**As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?**	No	Site drainage will be channelled along the existing routes.	Proposed LGF plan
3	**Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?**	No	The lightwell is in an existing paved garden	Proposed LGF plan
4	**Will the proposed basement 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	Evidence from plan of existing and proposed	Proposed LGF plan
5	**Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?**	No	Existing surface water drainage arrangements will be maintained	Proposed LGF plan
6	**Is the site in an area known to be at risk from surface water flooding, such as South Hampstead, West Hampstead, Gospel Oak and King's Cross, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?**	No	The site is not in one of the risk locations and is not below the level of the water table.	

5. SCOPING

5.1. Summary

The Scoping stage has been undertaken to specifically investigate the potential impact of any areas of the proposed scheme on the ground water, slope stability and surface water flow that have been identified as risks in the Screening stage and therefore require further investigation.

Despite the fact that the proposed construction work is minimal – in that it is a modest lightwell - and will have a negligible impact on the adjoining properties, the applicant has nonetheless entered into pre-consultation with the residents of each of the adjoining properties, both via verbal discussion and written correspondence, which has included the sharing of the Design and Access Statement and architectural drawings. The residents have to date offered no concerns or objections.

The Scoping stage has informed the Conceptual Site Model (CSM) and concludes that no further site investigation is required.

5.2. Groundwater

The Screening stage identified no significant risks associated with ground water. There is no ground water present on site.

5.3. Slope Stability (i) - question 5 from Screening chart: Is the London Clay the shallowest strata at the site?

Although the Screening stage has identified that the shallowest strata at the site is London Clay, the site is not into the over-consolidated London Clay, merely the 'weathered' brown London Clay. This is an important distinction, since the over-consolidated London clay is known to be a consolidated clay formation, and therefore subject to some changes in volume when excavating.

The proposal is to excavate an area of 5 square metres, to a maximum of three metres in depth from the existing front garden. This represents such a small amount of material to be removed that the volume change potential is so small as to be insignificant.

The design of the lightwell structure and the sequence of the excavations have taken the much more significant issue of stability and ground movement fully into account, which will have the effect of minimizing to make negligible the impact on the adjoining houses in the terrace and the pavement to the front.

The GSD guidance says soil investigation testing is necessary only if 'Screening reveals concerns'. No concerns were identified. The site walkover has established the depth and structure of the adjoining properties' substantial foundations.

5.4. Slope Stability (ii) - question 12 from Screening chart: Is the site within 5m of a highway or pedestrian right of way?

Although the proposed lightwell is less than 5m from the pavement on Platts Lane, the depth and size of the lightwell are of such a scale that will cause negligible impact to the stability of the pavement. Together with the proposed construction, as well as the sequence of the excavations, this has taken the much more significant issue of stability and ground movement fully into account, which will have the effect of minimizing the impact on the adjoining houses in the terrace and the pavement to the front.

5.5. Surface Flow and Flooding

The quantity and quality of surface water flows will be unaffected by this scheme and risks of flooding of the property can be reduced by taking the opportunity of introducing a bund and step to protect the front garden, path and lightwell from surface water flooding.

5.6. Conceptual Site Model

Camden Planning Guidance: Basements and lightwells, CPG4 states that 'a Conceptual Site Model is often a useful way of carrying out the Scoping stage as it can include the known and suspected features on, below and adjacent to a proposed site.' We agree with this and have employed a Conceptual Site Model to undertake the Scoping stage.

A Conceptual Site Model before and after the proposed development has been formed based on a thorough site walkover of the property and the surrounding area, in accordance with the recommendations of the Camden Geological, Hydrogeological, and Hydrological study, and it is set out below.

The site is located in the London Borough of Camden to the west of Hampstead Heath on Platts Lane. The lightwell excavation will be in weathered brown London clay overlain by made ground. The London Clay formation is an unproductive strata in terms of ground water flow. Ground water is absent from the strata below and beside the building.

Hard surfacing is the predominant surface covering in the local area, including the garden at the front of the property. The majority of rainfall falling on the surrounding area will run-off into local guttering and drainage system surrounding the site.

The property and the neighboring properties are constructed on corbelled foundations to the north and the adjacent property has mass concrete underpinning. There are no sensitive or vulnerable buildings or infrastructure nearby the proposed lightwell. The property and adjacent property to the south have an existing basement formed with mass concrete underpinning.

The risks, impacts and mitigation measures associated with the lightwell are identified in the table below.

Risk	Impact	Mitigation
Inadequate restraint of front garden during construction	Leading to undermining of the front garden and pavement	Propping of face of excavation and face of excavation to be less than 1.5 M
Flooding of excavation during construction from surface water	Leading to swelling of clay below existing building	Covering all exposed excavation. De-water sump pump on site during excavation
Flooding of lightwell and property from surface water when complete	Leading to damage to property	Construction of bund to protect property from flooding

5.6.1 Existing

1. The London Clay Formation below Made Ground to at least 20 metres in depth.

2. Rainwater is channeled as surface run-off into the main drainage system.

3. Front garden paved impermeable surface.

4. No ground water flows below the existing building.

5. No sensitive infrastructure or structures within the vicinity.

6. Existing basement room below building.

7. Existing basement below adjacent building.

5.6.2 Proposed

1. The lightwell will be approx. 3 metres in depth at the front of the property.

2. Rainwater from the 5 sq. metre lightwell will be channeled as surface run-off into the main drainage system.

3. Lightwell constructed as reinforced concrete with floor and side walls acting as restraint of the adjacent soil and pavement.

6. References

1. *Camden Planning Guidance, CPG4, Basements and Lightwells*, July 2015. .

2. *Environment Agency, Risk of Flooding from Rivers and Sea*, February 2013.

3. *Ove Arup and Partners, Camden geological, hydrogeological, and hydrological study. Guidance for subterranean development*, November 2010.

4. *Environment Agency, Drinking Water Protected Areas*, February 2013.

5. *Ordinance Survey Map – London Borough of Camden 1:2500*

6. *Burland, J.B., and Wroth, C.P. (1974). Settlement of buildings and associated damage, State of the art review. Conf on Settlement of Structures, Cambridge, Pentech Press, London, pp. 611-654*

Appendix 1 - The authors

Roger Gulhane, MICE, has been a practicing civil and structural engineer for over forty years, including have worked as a chartered engineer in Ove Arup specialist structures division. His practice is based in Camden and he has designed and overseen a multitude of basement projects in North London over the last decade.

Nick Maclean is the Principal Engineer at EcosMaclean. He has over forty years' experience as a practicing civil and structural engineer, with extensive experience of basement construction in London both in new-build, and existing buildings. Nick was the Assistant Resident Engineer at the Barbican Arts Centre, explicitly dealing with the defects in the retaining structure to form the substantially underground building.

List of Appendices