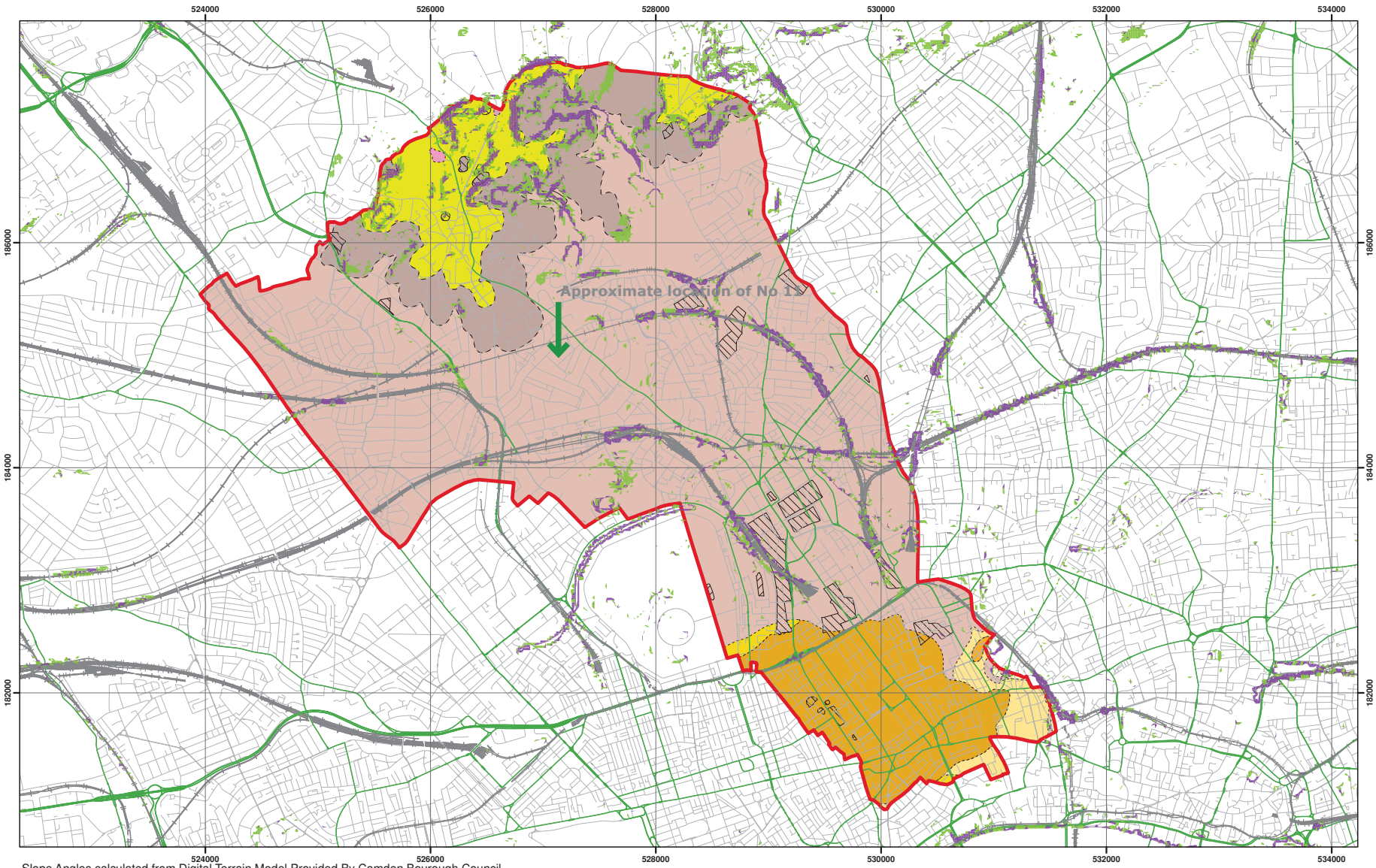

Slope Angles calculated from Digital Terrain Model Provided By Camden Bourough Council

N

Scale at A3: 1:30,000

1:10,000 BGS Mapping
Coordinate System:
British National Grid
GCS_OSGB_1936

0 0.5 1 2 3
Kilometers

Legend

Slope
0° - 7°
7° - 10°
> 10°

London Borough of Camden
Railway Lines
A Roads

BGS 1:10K Artificial Ground
MADE GROUND
WORKED GROUND

BGS 1:10K Drift Geology
ALLUVIUM
HACKNEY GRAVEL FORMATION
LANGLEY SILT FORMATION
LYNCH HILL GRAVEL FORMATION
STANMORE GRAVEL FORMATION

BGS 1:10K Solid Geology
BAGSHOT FORMATION
CLAYGATE MEMBER
LAMBETH GROUP
LONDON CLAY FORMATION

NB. Geological boundaries are largely indicative based on available geological mapping data

Camden Geological, Hydrogeological and Hydrological Study

Slope Angle Map

213923 FIGURE **16**

Fig14. Slope Angle Map - Camden. Source *Camden Geological, Hydrogeological and Hydrological Study* as carried by ARUP dated 18/11/2010 Figure 16.

6. SCREENING TEST

The first stage of the Basement Impact Assessment is the identification of any matters of concern due to the proposed basement intervention; which will be investigated in accordance to the guidance as set out in London Borough of Camden's CPG 4.

The guidance states that all basement proposals should be subjected to the screening stage of a Basement Impact Assessment to identify the matters relevant to assessment of local flooding and/or neighbour amenity and structural risks. This Screening is a process of determining whether or not a full Basement Impact Assessment is required for a specific planning application.

In accordance with the guidance we have answered the series of flow chart questions that cover the three main issues:
- A. Groundwater flow
- B. Land stability
- C. Surface flow and flooding

Please read in conjunction with the study carried out in the section above.

6-A. SUBTERRANEAN (GROUNDWATER) FLOW SCREENING

Question 1a: Is the site located directly above an aquifer?
No, see Fig.10 above.

Question 1b: Will the proposed basement extend beneath the water table surface?
No, see section above and separate soil investigation report.

Question 2: Is the site within 100m of a watercourse, well (used/disused) or potential spring line?
No, see Fig.11&12 above.

Question 3: Is the site within the catchment of the pond chains on Hampstead Heath?
No

Question 4: Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?
No, existing hard standing/paving to rear garden will be removed and replaced with a lawn/permeable landscaping.

Question 5: As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?
No, this will be reduced see point above. All run-off water or less will discharge to the nearby public sewer as per current use.

Question 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

6-B. SLOPE STABILITY SCREENING

Question 1: Does the existing site include slopes, natural or manmade, greater than 7°?
No, See Fig.14

Question 2: Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7°?
No

Question 3: Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?
No

Question 4: Is the site within a wider hillside setting in which the general slope is greater than 7°?
No

Question 5: Is the London Clay the shallowest strata at the site?
No

Question 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? (Note that consent is required from LB Camden to undertake work to any tree/s protected by a Tree Protection Order or to tree/s in a Conservation Area if the tree is over certain dimensions).
No

Question 7: Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?
No

Question 8: Is the site within 100m of a watercourse or a potential spring line?
No

Question 9: Is the site within an area of previously worked ground?
No

Question 10: Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that de-watering may be required during construction?
No

Question 11: Is the site within 50m of the Hampstead Heath ponds?
No

Question 12: Is the site within 5m of a highway or pedestrian right of way?
Yes, although given the small size of the frontage this is not seen as a concern. This point is addressed in the structural design section below.

Question 13: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?
Yes, note that all the existing properties along Glenilla Road already have partial basement excavations dating back to when originally constructed. This differential depth of foundations is addressed within the structural design of the proposed basement.

Question 14: Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?
No

6-C. SURFACE FLOW AND FLOODING SCREENING

Question 1: Is the site within the catchment of the pond chains on Hampstead Heath?

No

Question 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

Question 3: Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?

No

Question 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 down-stream watercourses?

No

Question 5: Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?

No

Question 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 flood-ing, for example because the proposed basement is below the static water level of a nearby surface water feature?

No

Statement:

From the above screening, it can be seen that the questions giving a positive answer are the two within the slope stability section relating to the adjacent Highway and adjacent foundations. The screening shows that in relation to surface flow and flooding and groundwater flow the proposed basement poses no potential risks. The location of the basement is such that it is not within an area of geological, hydrogeolocical or hydrological concern and that the water table is below that of the basement excavation. The proposed development also reduces the overall impermeable area on the site and hence no change in the surface water runoff or flood risk from this cause.

7. SCOPING

Within this stage the potential impact of the scheme are identified as set out in chapter 5 of the Camden Geological, Hydrogeological and Hydological Study. The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment.

7.1 SUBTERRANEAN (GROUNDWATER) FLOW

As highlighted before there is no requirement to carry the scoping stage further regarding this point.

7.2 SLOPE STABILITY

General:

The basement construction will be above the ground water table. Thus there will be no change or increase of pore water pressures within the soils from the construction. De-watering will not be a requirement, and there is no loss of vegetation.

Structural Damage beyond the boundary:

An examination of the existing structure and the adjacent properties will take place before the works commence as part of the party wall inspections. This will provide a record of the current state of the structures.

As the basement is close to the public highway a design loading surcharge pressure of 10kN/m2 will be incorporated into the retaining wall design. All temporary works will be designed to limit any local movements that may impact on the existing highway. All works will be monitored for movement accordingly with all temporary works agreed prior to construction in accordance with Building Control requirements and approval.

The proposed construction method for the basement takes full account of the structural transfer of loads and load bearing capacity of both the existing and proposed foundations. The use of underpinning procedures is to be utilised which as stated in the Camden study is a technique widely and successfully used. Careful construction planning will address the issue of temporary localised reduction in bearing pressure, although this will not be a significant issue in this case due to the nature of the clay soils already identified as being present.

The proposed construction method utilises temporary propping so as to minimise and control any potential for ground movement during the course of the works.

The design and construction method of the basement are such that any potential changes in foundation behaviour are minimised as is any potential disturbance to the adjacent structures.

These issues are all covered in more detail in the remainder of this report.

7.3 SURFACE FLOW AND FLOODING

As highlighted before there is no requirement to carry the scoping stage further regarding this point.

8. SITE INVESTIGATION

A detailed site investigation was carried out by Fastrack in June 2016 at the front garden area; see their Geotechnical Survey Report with reference 9984

Generally the investigations con-firmed the presence of firm to very stiff London Clay to a 5m depth with no significant standing water.

The ground conditions found during the site investigations are consistent with published geological records and known history of the area. Typically with a thin layer of made up ground sitting on the London Clay strata as noted above.

The borehole was dry on completion and so the formation level of the proposed basement is above the ground water table. As construction of the proposed basement is above the ground water level, construction will not be affected by ground water and the finished basement will not affect the level of the ground water in the future. The new basement will be designed for the ground conditions encountered and be formed in the clay. The new basement will be designed to limit ground – bearing pressure to 100 kN/m2, which is considered to be conservative. Thus the existing geology at the depth of the proposed basement will be capable of supporting the new imposed loads.

Trial pit investigations

Prior to commencement of construction; adequate trial pits will be carried out along the perimeter of the existing property to confirm the depth and extent of existing foundations.

Existing corbelled foundations are expected at a depth between 500-1000mm below existing ground floor level in general except along the part basement where it could be less.

9. STRUCTURAL DESIGN

The following Engineering design principles will be adhered to with the proposed basement development where necessary:
- the prediction of likely ground movements;
- assessing permissible movements (based on the vulnerability of nearby structures);
- designing the basement and selecting the construction method to limit the induced ground movements;
- pre-condition surveys of adjacent buildings;
- monitoring of movements and other effects during construction including crack monitoring;
- establishing contingencies to deal with adverse performance.

Preliminary calculations have been carried out for the design of the new basement retaining walls underpinning the existing masonry party walls. These new reinforced retaining concrete walls are designed as free standing in the temporary and permanent conditions to avoid the need for temporary propping of the party walls. In the permanent condition the new perimeter retaining walls will have additional lateral support from the new reinforced floor slab to the basement and ground floor slab construction.

Structural stability: Temporary works to permanent condition.

At all stages of the temporary works; a system of both vertical and lateral propping shall be installed to maintain stability in the interim period. The type of props and the loading requirements will be identified and monitored by the Contractor throughout the construction period. Details of transferring the loading in the props to the new permanent works shall also be assessed.

The front garden will be reduced in level with construction of the light well to provide the route for access of workmen and the passage of excavated material, plant and storage of new construction materials. A series of steel beams will be installed to provide support to the bay window, internal spine wall, rear wall and read addition flank wall prior to the commencement of the underpinning.

The new reinforced concrete walls will provide permanent support to the existing superstructure and adjacent properties.

Construction method and sequences

The proposed basement under the existing property will be formed using an underpinning method. This method of constructing the basement is achieved through the use of a series of sequenced 900-1000mm wide underpinning sections of the main structural elements. No adjacent underpins shall be constructed within a 48 hour period. The traditional 1, 3, 5, 2 & 4 sequence shall be adopted to ensure that no more than 20% of the existing building's walls are unsupported at any time. The sequence is controlled to ensure adequate support of the gravity loads from the building above and to provide adequate lateral restraint to the below ground lateral loads arising from earth, water pressure and surcharge.

As part of the above mentioned sequence this series of 900-1000mm wide underpins are structurally linked together as progress is made. The minimum thickness of the reinforced concrete stem wall would be 250mm and would also be tied to the basement and ground floor slab. The new vertical support stems are linked up together to form a reinforced concrete retaining wall or ultimately a closed reinforced concrete box at completion.

This method of construction reduces the amount of potential ground movement and minimises the effects of settlement of adjacent structures.

10. POTENTIAL IMPACT ON 11 GLENILLA ROAD AND ADJACENT PROPERTIES

Local sewers
This development will not impose any new surcharge loads on the local sewers below the host or adjacent properties. Sewers beneath the host property are to be re-routed and will be accessible for rodding and routine maintenance of the pump and ancillary items.

Ground Water
Due to the presence of London Clay, which limits the presence of ground water, and the distances to the nearest open water course the risk of contamination of ground water or surface watercourses is considered to be 'low'.

No signs of perched water levels for the site are evident but the Basement Construction will be designed accordingly based on the results of any further investigations.

The introduction of a permeable landscape to the rear garden will assist the current condition.

Existing Trees
Due to the presence of large tree adjacent to the boundary of the property, the basement design, construction methods and site management will take account of the presence of these trees accordingly.

Foundation and Basement Design
The investigation has indicated that formation level for the basement will be within the stiff London Clay. With reference to the Soil investigation report, significant groundwater inflows are not anticipated during basement excavation, although some groundwater inflows may be encountered from perched water from within the made ground. It is considered likely that the rate of any inflows will be relatively slow and localised and should be adequately dealt with through sump pumping, although it will be necessary to carry out trial excavations to confirm this view. The design of basement support in the temporary and permanent conditions will take account of the need to maintain the stability of surrounding structures and to protect against perched groundwater inflows.

Basement Heave
The proposed construction of the 3.0/3.3m deep basement will result in an unloading of the London Clay at formation level. The excavations will result in approximate unloading of the soil, which will result in an elastic heave and long term swelling of the London Clay. These movements will be mitigated to some extent by the applied structural loads but the basement floor slab will need to be designed to accommodate heave movements orccordingly.

Structural settlement or damage
The underpinning process involves transferring the foundation loads to a lower level and inevitably this leads to some settlement. Some movement will also be caused by the sequential transfer of load between different parts of the structure but the careful control of the underpinning process and sequence will keep such movements to a practicable minimum. Particular care will be taken in the vicinity of the more vulnerable parts of the existing fabric.

The depth to the London Clay and the modest dimensions of the site are such that the heave of the Clay is unlikely to exceed a few millimetres or to have any discernible effect outside the site boundaries. Any movement that does occur will be further mitigated by the necessarily slow rate of the excavation and construction.

As explained above, by installing adequate temporary propping and new permanent works the anticipated movements caused by the development are to be limited to not exceed 5mm at any location within the host or adjacent properties.

Movement not exceeding 5mm will keep the movements within the Slight category as defined by BRE Digest 251, Category 2 of damage defined as Slight – up to 5mm and described as:

- -Cracks easily filled.
- -Redecoration probably required.
- -Recurrent cracks can be masked by suitable linings.
- -Cracks not necessarily visible externally, some external re-pointing may be required to ensure weathertightness.
- -Doors and windows may stick slightly.

Waterproofing Systems
It is most likely that a cavity drainage system will be proposed which will be connected to sump chamber and pump system. The waterproofing system will be installed in accordance with a specialist contrac-tor's details in conjunction with a manufacturer's technical specifications once the basement slab is complete.

11. SUMMARY

The above assessment finds that the proposed basement development is within the expected norm for a small scale residential basement excavation and that the proposed development has no triggering factor which initiates an instability problem in an area which otherwise would have remained stable for the foreseeable future.

We therefore can conclude that the proposed development is unlikely to result in any specific issues relating to land or slope stability, the hydrogeology and hydrology of the site. Suitable construction methods will ensure slope stability at the site and there should not be any negative impact on the groundwater.

We are of the opinion that the proposed basement construction has no long term detrimental impact to either the water environment or the neighbouring properties.