

Basement Screening Assessment

Jan 2023

Job number: JH1751

Project: 73 Castelnau - Pool House

Prepared by: Alex Hunt C.Eng M.IStruct.E
Checked by: Matt Turner C.Eng M.IStruct.E

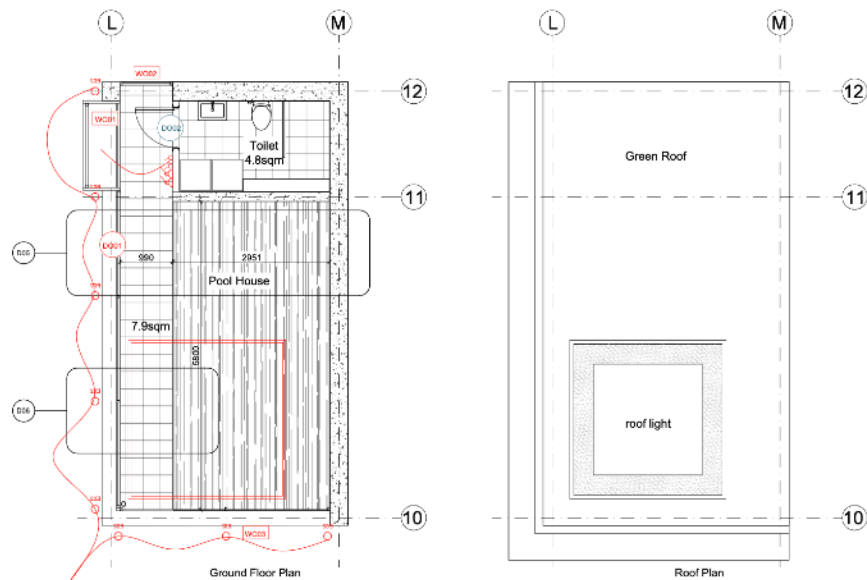
BASEMENT SCREENING ASSESSMENT - NEW POOL HOUSE AT 73 CASTELNAU SW13 9RT

The proposed pool house falls within an area with 75% or more susceptibility to groundwater flooding. Therefore, in accordance with the London Borough of Richmond Upon Thames *Basement Assessment User Guide*, a basement screening assessment must be completed. The purpose of this screening assessment is to identify areas of potential concern associated with the proposed below-ground works, particularly in the case of groundwater influenced flood risks. The proposed development will be screened against its subterranean characteristics, land and slope stability and flood risks and drainage.

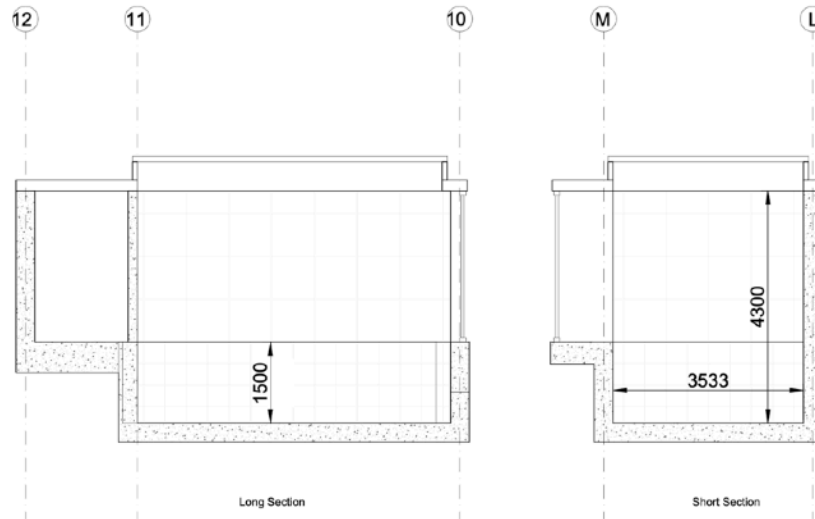
This report is to be used in conjunction with the planning application submitted by Locksley Architects.

1. Proposed Works

In addition to the proposed works to the main house, a new-build pool house is to be constructed in the back garden of the existing detached property. The pool itself is 1.5m deep, requiring approximately 2.0m excavation below ground level. The pool house is 8.0 x 4.6m on plan and 3.0m in height.



Proposed plans for ground floor (left) and roof (right) of pool house. Source: Locksley Architects



Proposed short (left) and long (right) sections of pool house. Source: Locksley Architects

2. Site Location

73 Castelnau is a detached, brick-built property located within the London Borough of Richmond Upon Thames. The property is thought to be built c. 1860 and bound by 71A and 73B Castelnau, both detached on either side. The rear elevation faces a large garden area within the property while the front elevation faces Castelnau street.



Street view (left) and aerial view (right) of 73 Castelnau. Source: Google Maps

3. Subterranean Characteristics

a. Does the recorded water table extend above the base of the proposed subsurface structure?

Unknown, yet. However, hydrological maps (discussed in Question 1.f.) suggest that the water table lies within the superficial Kempton Park Gravel Member and most likely at a moderate depth close to the interface of the granular superficial stratum and the cohesive London Clay bedrock stratum.

b. Is the proposed subsurface development structure within 100m of a watercourse or spring line?

No. The site is northbound by the Thames river at an approximate 1.0km radius from the site. The London lost rivers maps indication that the Beverley Brook river runs approximately 0.8km south of the site. This river is now culverted and not expected to be at risk of flooding.

c. Are infiltration methods proposed as part of the site’s drainage strategy?

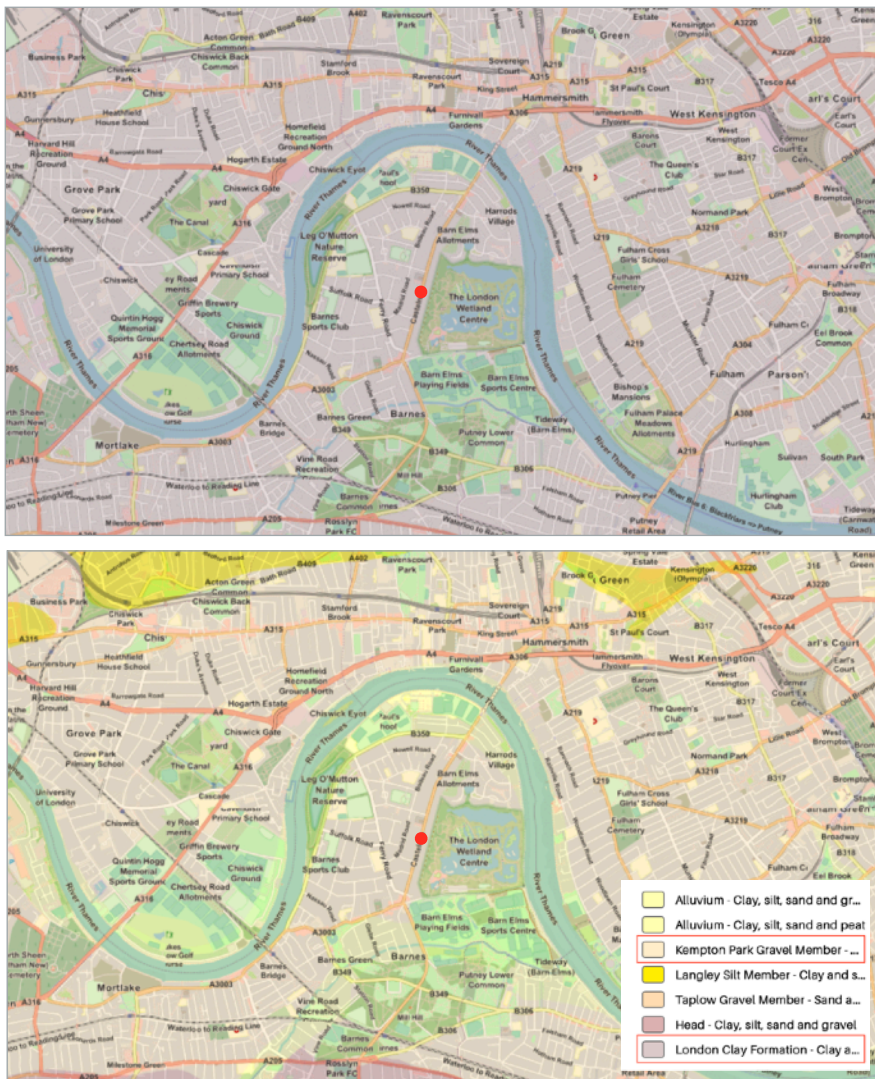
Unknown at this stage.

d. Does the proposed excavation during the construction phase extend below the local water table level or spring line?

Unknown, yet. However, hydrological maps (discussed in Question 1.f.) suggest that the water table lies within the superficial Kempton Park Gravel Member and most likely at a moderate depth close to the interface of the granular superficial stratum and the cohesive London Clay bedrock stratum.

e. Is the most shallow geological strata at the site London Clay?

No. Maps extracted from British Geological Survey (BGS) showed superficial deposits comprising Kempton Park Gravel Member. The bedrock was found to be London Clay formation. No variation in the superficial or bedrock deposits were found within at least a 250m radius of the site.

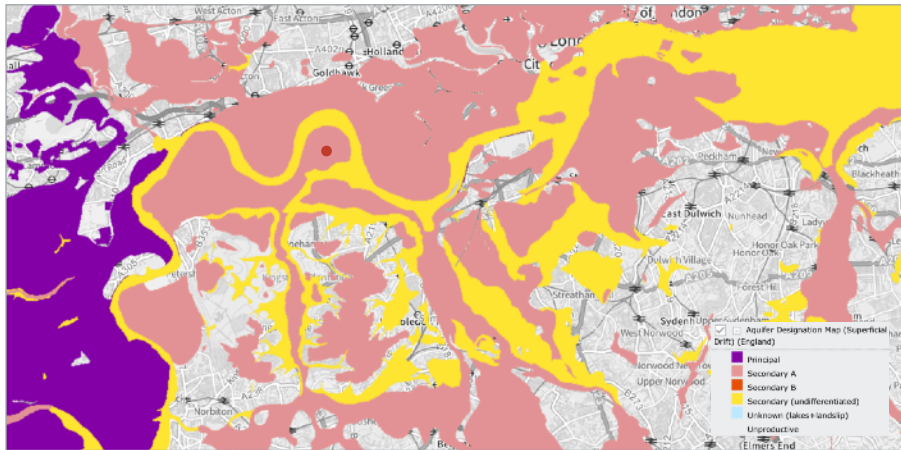


Colour map showing bedrock geology (top) and superficial deposits (bottom) within the area of 73 Castelnau. Source: BGS Online

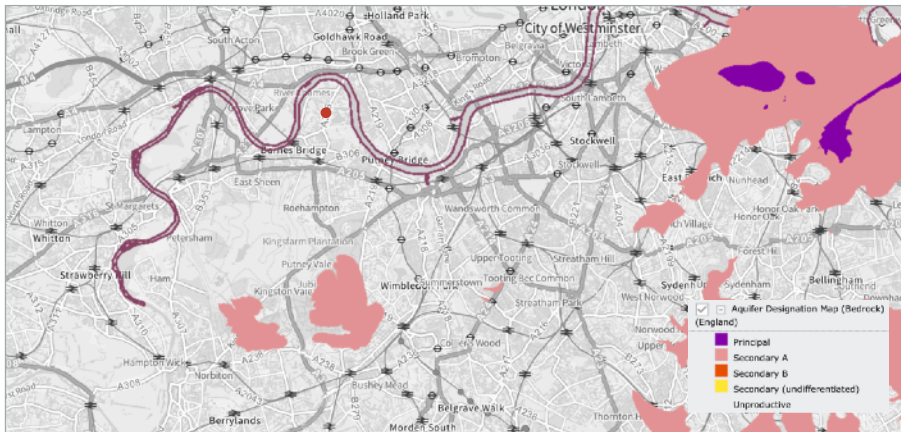
f. Is the site underlain by an aquifer and/or permeable geology?

Yes. Maps from the Department for Environment Food and Rural Affairs (DEFRA) revealed that the site was underlain by a Secondary A aquifer comprising the superficial Kempton Park Gravel stratum and an unproductive stratum comprising of the London Clay bedrock. Secondary A aquifers are made up of

permeable layers capable of holding small-scale water supplies. Meanwhile, unproductive aquifers are characterised by low-permeability rock strata that contribute negligibly to water supply.



Aquifer Designation Map (Superficial) within the area of 73 Castelnau. Source: DEFRA



Aquifer Designation Map (Bedrock) within the area of 73 Castelnau. Source: DEFRA

4. Land and Slope Stability

a. Does the site, or neighbouring area, topography include slopes that are greater than 7 degrees?

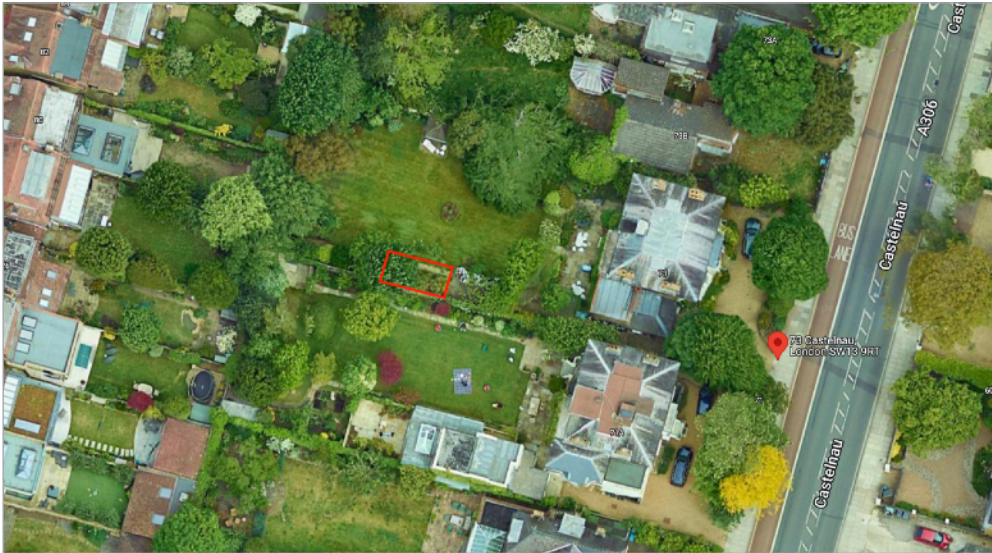
No.

b. Will changes to the site’s topography result in slopes that are greater than 7 degrees?

No.

c. Will the proposed subsurface structure extend significantly deeper underground compared to the foundations of the neighbouring properties?

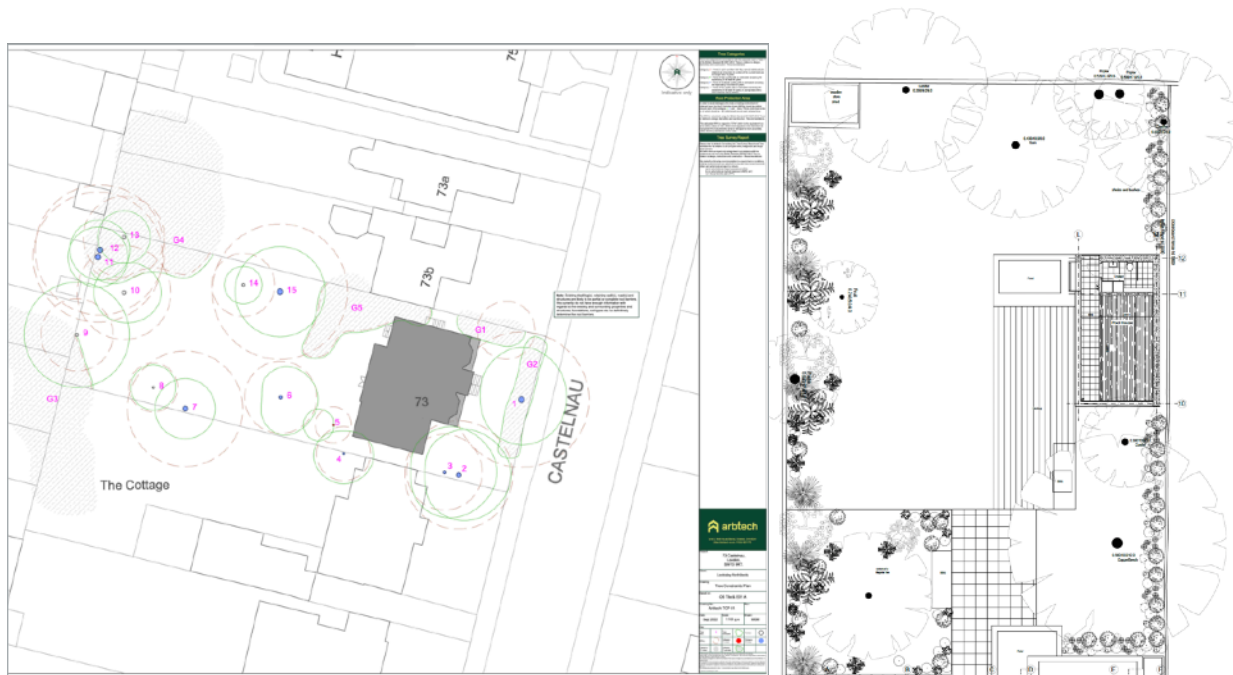
Yes, likely. The pool house is positioned in close proximity (approx. 0.5m) to the boundary of the neighbouring property (No. 73B Castelnau). This boundary is likely to be marked by either a wooden fence or a solid masonry wall. The proposed substructure of the pool house is very likely to extend below the footings of the wall. Depending on the wall construction, a party wall agreement and underpinning works may be required.



Aerial view of the site showing the approximate location of the proposed pool house. Source: Google Maps

d. Will the implementation of the proposed substructure require any trees to be felled or uprooted?

Yes. According to the existing and proposed landscape plans shown below, no trees are proposed to be removed to allow for the proposed pool house works.



Tree constraints plan showing existing trees (left) and proposed landscape plan showing pool house location (right). Source: Arbtech Consulting & Locksley Architects.

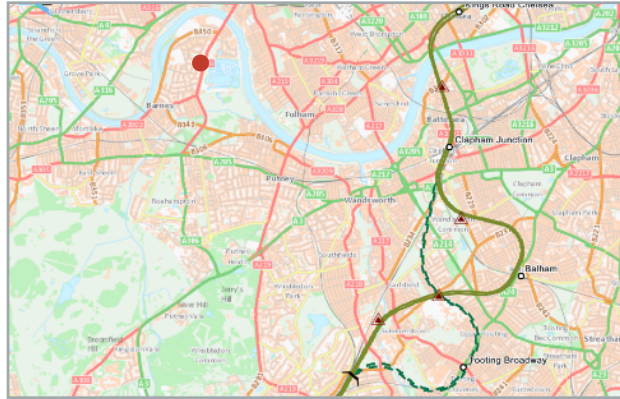
e. Has the ground at the site been previously worked on?

Yes, but not extensively. Several planning applications have been submitted within the period of 1999-2018 for the reduction/removal of trees at 73 Castelnau. This includes trees located in the vicinity of the proposed pool house location. An additional planning application was submitted and granted for the erection of a single storey extension at the side of the main property in 1998.

f. Is the site within the vicinity of any tunnels or railway lines?

The underground infrastructure has been reviewed and is not of concern.

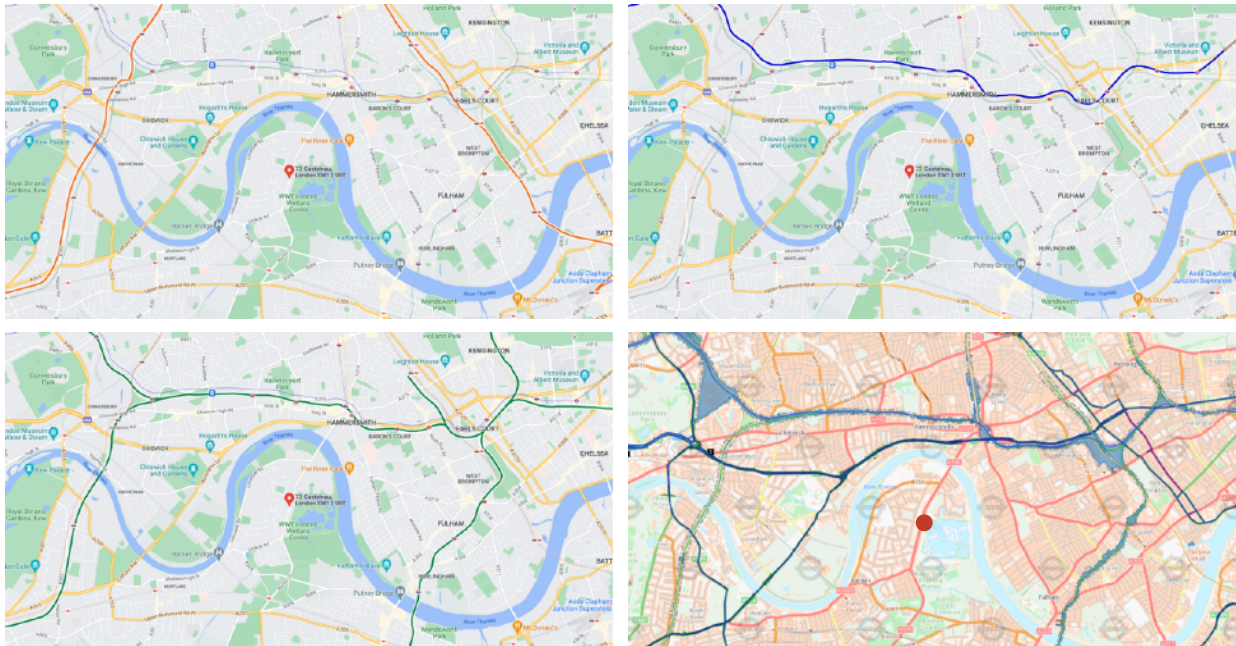
The proposed Crossrail 2 route is located to the east of the borough. The proposed tunnelled route is approximately 5km east of the site, falling outside the safeguard limits for Crossrail I and II.



Map showing proposed Crossrail 2 route located east of the site. Source: CR2 Maps

The London Overground rail route bounds the site on the east and west side at approx. 3km distance.

Additionally, the site is northbound by the London Underground Limited (LUL) Piccadilly line at a distance of approx. 1.8km from the site. Similarly, the District line travels around the north region of the site at an approx. 2.5km radius. The site does not fall within the zone of influence for these train routes.



Maps showing existing Transport for London Overground (top left), Piccadilly (top right) and District (bottom left) lines. Bottom right shows LUL Zone of Influence for these lines. Source: Google Maps & TfL Maps

5. Flood Risk and Drainage

a. Will the proposed subsurface development result in a change in impermeable area coverage on the site?

Yes. The pool house is to be built on an existing soft landscaped area in the rear garden of 73 Castelnau. Therefore, an increase in the impermeable area is to be expected with the new construction of the pool

house. However, considering the relatively small plan area of the proposed pool house, this increase in impermeable area is not expected to be significant.

b. Will the proposed subsurface development impact the flow profile of through flow, surface water or groundwater to downstream areas?

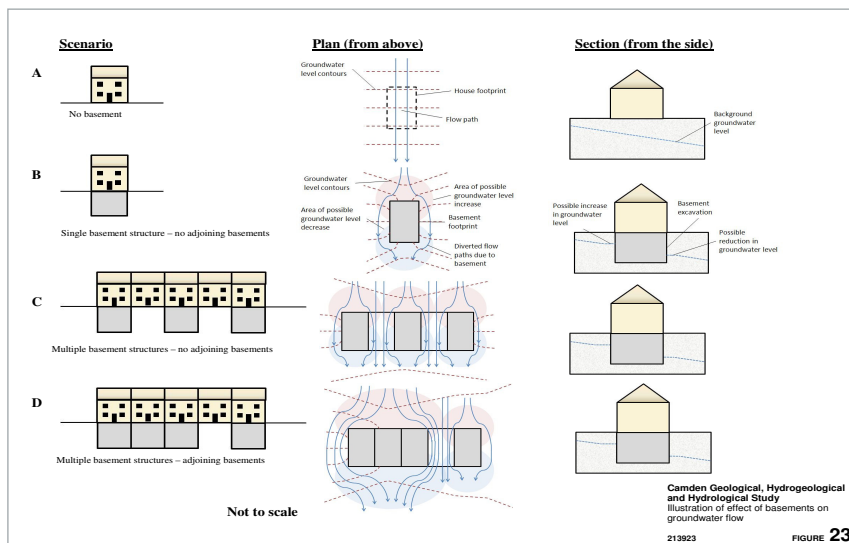
Not to a significant degree. The flow profile of surface water will be affected by the new presence of the pool house. However, this is only a minimal effect due to the small plan area of the pool house and the fact that the the risk of surface water flooding of the site is very low.



Map showing surface water flooding risk for 73 Castelnau. Source: gov.uk

Should a ground investigation identify the presence of a water table, it is anticipated that the groundwater will be able to follow a pathway beneath and around the new pool house substructure (Scenario B in figure below). Any potential effects of damming or restriction of ground water flow are considered minimal. Therefore, the proposed construction is unlikely to significantly impact the hydrology of the area. Any impact that should arise is likely to be localised in the vicinity of the new pool house due to its small building volume.

If ground water is encountered during the basement excavation, there may be a requirement to use sump pumps during construction but we do not expect this to affect the local hydrology.

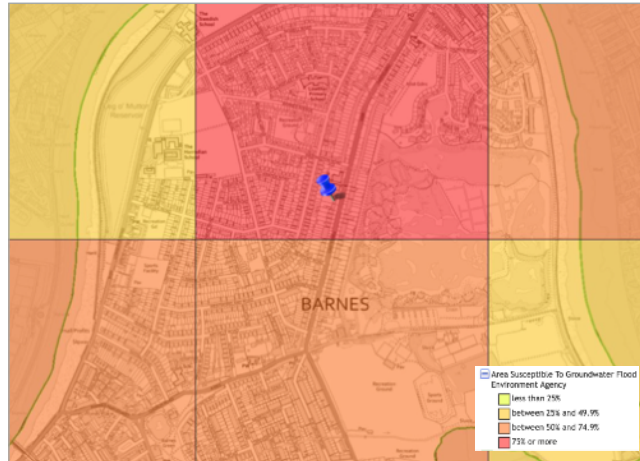


Camden Geological, Hydrogeological and Hydrological Study
Illustration of effect of basements on groundwater flow
213923 FIGURE 23

Illustration of the effect of basements on groundwater flow- Extract from 'Camden Geological, Hydrogeological and Hydrological Study / November 2010 - Arup'

c. Will the proposed subsurface development increase through flow or groundwater flood risk to neighbouring properties?

The existing site is of a very high risk (=> 75%) for groundwater flooding. Until a ground investigation has been conducted and the depth of the water table is identified, it is difficult to determine the influence of the proposed substructure on the groundwater behaviour. However, the figure above suggests that the presence of the new pool house substructure induces a reduction in the groundwater level and, in turn, reduces the risk of groundwater flooding.



Strategic Flood Risk Assessment (SFRA) map showing very high risk of groundwater flooding at the site location. Source: London Borough of Richmond Upon Thames.

6. Conclusion

The outcomes of this basement screening assessment have identified the need for a basement impact assessment. This assessment will focus on the following areas:

- fluvial/tidal flooding
- surface water flooding
- groundwater flooding
- reservoir flooding
- proposed drainage strategy
- impacts on neighbouring properties
- trees

Topography (land stability), underground infrastructure and impacts on watercourses will not be explored further in the Basement Impact Assessment as they were found to not be of any concern.