

**The Water House, Millfield Lane, N6  
Review of the Revised Planning  
Application**

**Prepared for  
The City of London  
Hampstead Heath  
Mr & Mrs A Beare  
Dormers, 49 Fitzroy Park  
&  
Mr & Mrs D Dale  
The Wallace House**

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## **The Water House, Fitzroy Park**

### **1.0 Background**

Alan Baxter Limited reviewed the previous revisions to the Planning Application and prepared a summary report dated June 2014 which addressed ongoing concerns in relation to the new basement adjacent to the site boundary with No. 49 Fitzroy Park, stormwater and groundwater issues. Camden Planning Department appointed Card Geotechnics Limited (CGL) to review the information submitted together with our comments. CGL appear to have appointed Horizon Consulting Engineers (HCE) to comment on the stormwater, drainage and groundwater issues.

Based on our comments and the CSL and HCE review, the following points were identified by CGL as needing further resolution. In summary, these were:

- The RSK damage assessment is not compatible and it is not clear how they derived lateral movements at the location of the neighbouring structures.
- Further details need to be provided on this boundary (with No. 49 Fitzroy Park) in particular in order to properly assess the potential damage and to revise the construction methodology if necessary.
- The gravel drain beneath the lane would have the potential to weaken the surface.

Note: HCE do not appear to have addressed the potential for the gravel trench to cause local flooding of groundwater on to the Heath or the Bird Sanctuary Pond.

### **2.0 Updated Information**

- The Greenhatch survey has now been updated to include the boundary with No. 49 Fitzroy Park and the features within approximately 10m of the site boundary.
- The Architects and Engineers drawings have been updated to reflect the survey including the retained height at the boundary.
- The centres of the King Posts have been reduced by 50% and a propping system provided between the King Post Walls and also the retaining boundary structure will be temporarily propped.
- RSK have carried out an updated Ground Movement Analysis to reflect the revised proposals.
- The surface water drainage design has been submitted, although it does not appear that any revisions have been made.

### **3.0 Brief**

Alan Baxter Limited have been asked to review the revised drawings and BIA and provide any further comments/recommendations.

## **4.0 Review**

### **4.1 Survey**

The survey information now appears to identify the key issues in relation to level difference, boundary conditions and adjacent structures with No. 49 Fitzroy Park.

It is obvious that the original survey did not correctly identify the ground levels and features beyond the immediate site boundary. As the boundary constraints are important, the survey should be extended to cover the Wallace House and No. 55 Fitzroy Park. If the levels are different from those shown, this may affect the conclusions of this report.

### **4.2 HRW drawings**

The engineering drawings have been updated to reflect the survey information. The drawings now indicate a reinforced concrete L shaped retaining structure supporting a concrete post boundary fence.

However, the retaining boundary structure appears to consist of a series of concrete posts at approximately 2m centres with either mass concrete or concrete panels in between. No investigations have been carried out to the foundations of the retaining boundary structure.

The retaining boundary structure has a notable lean in places, either due to the action of tree roots or because it has a low factor of safety against overturning. However it is reported that it has been in place for more than 35 years and has performed adequately.

It is likely that this retaining boundary structure will be very sensitive to any ground movements and there is a significant risk that the construction of the proposed basement could cause movements and damage.

The proposal to reduce the centres of the King Posts to 1.2m will help to reduce the ground movements. However it is not feasible to construct any basement without causing ground movements (ref CIRIA Report C580 Section 2).

### **4.3 RSK Revised Ground Movement Analysis**

RSK notes correctly that CIRIA Report C580 does refer to King Post Walls, but then goes on to use the predicted ground movement criteria in this report for contiguous piled walls, noting that this is a conservative estimate- this is not accepted as there will still be a 1m+ wide face of excavation left unsupported when the temporary King Post retaining structure is being constructed. There is no accepted data for ground movements resulting from the installation of a King Post Wall but it will be significantly higher than would occur with a contiguous bored pile wall.

CIRIA C580 notes for King Post Walls "This is a potentially very economical form of construction, but the movements associated with it can be relatively large".

The use of the ground movement prediction for a contiguous piled wall have been used for both underpinning and King Post Walls on some other projects because there is no accepted data for ground movement for these forms of construction. RSK note..." assuming that a high standard of workmanship is adopted during construction and that the temporary props are replaced as soon as possible by permanent props forming part of the permanent works". Regardless of this the ground movements are likely to be higher than for a contiguous piled wall, so RSK's statement that they have made a conservative estimate is not supported. There will be no opportunity to insist on "a high standard of workmanship" so this cannot be relied on.

As the retaining boundary structure is very sensitive to any movement, there remains a significant risk that it could move as a result of the King Post Wall construction. We are also aware of water pipes associated with the filtration of the swimming pool of No. 49 Fitzroy Park within the ground along the boundary. Such pipes are susceptible to ground movement and could fail if ground movements are not carefully controlled.

It should be noted that the ground movements as a result of a shallower excavation for a basement at No. 51 Fitzroy Park has resulted in movements of a similar retaining boundary structure on the boundary between No. 49 Fitzroy Park and No. 51 Fitzroy Park resulting in damage to the drive.

A detailed assessment of the stability of the retaining boundary structure should be carried out. This will require an investigation of the existing foundations. If the basement is to be retained in this position, then consideration should be given to either replacing the boundary structure or the installation of permanent props to the structure prior to any excavation taking place. The use of a contiguous bored pile wall in place of the King Post Wall would provide a greater degree of certainty in the predicted ground movements.

The use of a stiff propping system for the basement construction is noted and this should help reduce overall ground movements.

#### **4.4 Comments on surface water and groundwater proposals**

##### **4.4.1 *Surface water***

It appears that the Engineers advising Camden Planning Department have accepted the proposed run-off rates and that all the surface water can drain into the Thames Water sewer at a rate of 6 l/sec. This will still be subject to Thames Water approval.

##### **4.4.2 *Groundwater***

As previously noted, there are a series of fin drains to pick up the flow of groundwater which occurs at the interface of the impervious London Clay and the overlying fill or Head Deposits. These drain to a soakaway which is in the impervious London Clay and so will be ineffective. This means that the flow will discharge via a gravel filled trench passing under Mill Hill Lane onto the Heath. This would result in an overland flow towards the Bird Sanctuary Pond. This discharge needs to be agreed by the City of London as it is very unusual to discharge groundwater onto an adjoining owners land.

As there is up to a 3m level difference between the front and back of the site, there could be a significant flow of groundwater through this drain. This point has not been addressed in the design.

If there is a significant flow of water, it will result in overland flooding towards the Bird Sanctuary Pond with the accompanying risks that it could pollute the pond by washing fines towards the pond.

There are a number of important trees on or adjacent to the site. The proposed fin drains will affect the groundwater and can result in the reduction in moisture content which may affect the trees. An arboriculturalist should consider the impact to the trees.

- 4.4.3** As previously noted, there are concerns that the proposals may affect the pond in the garden of No. 55 Fitzroy Park. The source of water to this pond has not been identified. While a cut-off drain has been proposed during the construction period to culvert rainwater run-off, this will need very careful management and maintenance to stop it flowing towards the pond. However, as it is likely that the pond is fed by rainfall flowing towards the pond, there is a risk that the pond could dry up during the construction period. In the longer term, the basement could

partially block any groundwater which may have fed the pond. This has not been addressed. Also as noted above, the accuracy of the survey in this area needs to be checked.

#### 4.5 **Cumulative Effects**

There still does not appear to be any meaningful consideration of the cumulative effects of all the basements either constructed or proposed within the area. There is a strong possibility that these basements could divert and/or concentrate the lateral flow of groundwater towards this site.