53 Fitzroy Park, Highgate

Report to FPRA on the Basement Proposals

Prepared for

Fitzroy Park Residents Association

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Report to FPRA on the Basement Proposals at the site of 53 Fitzroy Park

1.0 Introduction and Brief

In 2012 Alan Baxter & Associates were appointed by the Fitzroy Park Residents Association (FPRA) to review a planning application for the redevelopment of No. 53 Fitzroy Park. The scheme eventually received Planning Consent. However the site was then sold. The new owners then submitted a new Planning Application in 2015 and Alan Baxter & Associates (ABA) were again commissioned by FPRA to review and comment on the engineering aspects and their compliance with London Borough of Camden's planning policy.

Although the application was for a larger building, many of the engineering aspects of the 2015 proposals were similar to those of the 2012 Planning Application. The structural engineering design for the 2015 planning application was carried out by Elliot Wood and the Basement Impact Assessment prepared by RSK who both were involved in the 2012 application.

The engineering issues were generally addressed but major concerns were raised about the volumes of material which were to be removed and delivered to site and the number of vehicle movements. The site access is very restricted and manoeuvring onto site, turning and exiting the site required extensive manoeuvres. These aspects were never properly addressed. However Planning Consent was granted.

In 2017, yet another application has been submitted. The 2017 application is essentially the same as the 2015 Planning Application except that the basement has been omitted. This report provides an overview of the latest application.

2.0 Information Received

The following reports have been considered as part of this review:

- RSK Geotechnical, Hydrogeological and Geoenvironmental Site Investigation Report dated December 2010.
- Elliot Wood Structural Engineering Design and Construction Method Statement dated February 2017.
- Wolf Architects drawings dated November 2015.
- RSK Basement Impact Assessment February 2017.
- Landmark Trees Aboriculturalist Assessment Report dated March 2017
- Knight Build Construction Management Plan dated January 2017.

3.0 2017 Proposals

The 2017 planning application is essentially the same as the scheme which was consented in 2015 except that the basement has been removed.

Therefore, while the overall bulk of the building is substantially the same, the impact of the basement construction is reduced and there will be a reduction in the amount of materials removed from and delivered to site.

4.0 Key Points

4.1 The following points have been identified from the previous report and/or a review of the current proposals.

- Potential contamination of the pond.
- The excavation and temporary works in relation to the groundwater proposals.
- Groundwater design proposals.
- Overall slope stability.
- Local slope stability, particularly at the boundary with No. 55 Fitzroy Park.
- Construction access.
- Impact on retained trees.
- Drainage.
- Ground movements.

Each of these points are discussed in more detail below:

4.2 **Potential Contamination of the Pond**

The proposals still cut into the natural ground slope in the area to form the lower ground floor and therefore need a retaining structure on two sides of the excavation. The excavation is very close to the pond in the garden of No. 55 Fitzroy Park. It appears that there was a historic tributary stream line running east-west either on or very close to the site. Tests carried out by the developer's team suggest that the pond, is mainly fed by surface water.

The proposals are to divert all the rainwater/surface water collected during the construction stage to a sump on site – it will then be pumped to a settlement tank and drained to a Thames Water sewer (subject to obtaining consent from Thames Water).

This is a fairly standard approach and is acceptable as a principle.

However this process will need to be very carefully managed on site by the Contractor – if not, due to the close proximity of the pond there is a risk that it could become contaminated.

4.3 **Excavation and Temporary Works Proposals – Groundwater**

There are two potential sources of groundwater on this site, one from the near surface flows in the made ground and one from the sandy lenses within the upper layers of the underlying London Clay. The permeability of the layer within the London Clay is low, so any potential flow of groundwater is also expected to be low.

In areas where there is a significant near surface groundwater flow, the normal approach to constructing a basement would be to attempt to keep groundwater out of the excavation.

The boreholes indicate that groundwater within the made ground was found in some but not all of the boreholes.

The temporary works design to facilitate the construction of the lower ground floor utilises a contiguous bored pile wall which will allow any near surface groundwater to drain into the excavation as well as any groundwater in the sandy layers within the London Clay. However as the flows of groundwater are expected to be low, this approach is generally acceptable on the basis that suitable measures are put in place to collect and drain this water as noted in 4.2. above.

4.4 **Groundwater – Permanent Design**

The design seeks to maintain the groundwater regime near the surface and any lower level flows by surrounding the new lower ground floor construction with a generous zone of free draining material on the sides and below the new basement slab. Water can drain through the gaps between the piles into the free draining material surrounding the basement structure and then out through the piles on the west side of the basement. This may alter the existing groundwater flow patterns but it should not block the flow.

The scheme does connect the near surface water flow with the water in the sandy lenses within the London Clay but it is unlikely that this should have any overall impact on the groundwater regime due to the low permeability of the lower layers.

The proposals could also cause a slight change in the hydraulic gradient across the site as the proposed free draining material around the lower ground floor will be more permeable than the existing made ground. However, it is likely that the hydraulic gradient will reach equilibrium at an early stage.

Finally the proposals indicate that free draining layer be protected by a geotextile fabric to prevent the system silting up. A back up land drain system around the lower ground floor has now been proposed to overcome this.

4.5 **Overall Slope Stability**

The proposals indicate a contiguous bored pile solution. The proposals do not note that the piles will be temporarily propped by horizontal props. While this may be appropriate generally, there are a few deeper areas of excavation, the lift pit for example, where some props should be provided, or there is a risk of deflection of the wall which could result in movement of the slope and cause damage to the road.

4.6 **Local Slope Stability**

Based on the information provided the key issues appear to be:

a) There is a relatively steep slope from the road down to the general site level. This slope is currently stabilised by the root systems of the large number of trees which are mostly to be retained. While the basement excavation is close to the base of the slope, the proposals should not destabilise it provided the excavation is continuously propped as noted in 4.5 above in areas where there are locally deep excavations. This should be considered.

b) The transport assessment indicates that up to 1600 HGV vehicle movements will be using the road during the construction period. It appears that the lorries will drive past the site before reversing in. This is a reduction from the previous figure of 3100 vehicle movements. The ground slope from the road down to the ground site level is in the region of 30 degrees in places and it is unlikely that this embankment was constructed using engineered fill. The local stability of the embankment should be assessed for the loading from the HGV's and details of any protection or strengthening to the road edge provided.

c) The ground levels to the west of the basement are to be modified slightly to provide a level area of paving and garden. The local stability of this area has not been assessed.

d) On the south of the new house the proposals suggest that the ground levels will be built up by approximately 1.0-2.0m to form a level area to the front entrance. The drawings now indicate that a retaining structure will be provided along the boundary with No. 55 Fitzroy Park. The effect of this on the boundary structure/fence or the adjacent house needs to be considered.

   While not a structural issue, the change in level here could create overlooking issues.

4.7 **Construction Access**

The Knight Build proposals indicate that the existing drive will be initially be used as a loading area and this will be further extended to the north. However this new loading area appears to extend into the root protection area of T22. The arboriculturalist report notes that this and all other trees need tree protection barriers which will further reduce the loading area. This report also notes that construction vehicles should operate outside the Root Protection Areas (RPA) or the underlying soil needs to be protected. No details of this have been provided and it appears as if the proposals do not follow the guidance of the report. The tracking diagrams show that even a small rigid vehicle requires up to 6 manoeuvres to turn around during which time the road will be blocked to passing traffic. These type of repeated manoeuvres are likely to damage the surfacing of the road.

Knight Build also provide tracking diagrams for a variety of typical construction vehicles. They are now showing a vehicle loading platform which is to be constructed to allow larger vehicles to reverse on to site, as we highlighted these manoeuvres did not appear to be feasible without some sort of large access area. The size and shape of the platform will be varied during construction to allow the new building to be constructed, but it will make manoeuvring on to and off site more straightforward.

The new platform will need to be a substantial structure and is shown to be supported on temporary piles.

This proposal addresses some of the previous concerns raised, although the requirement, to bring the platform to site and remove it at a later date will increase the number of vehicle movements.

Further details are required to demonstrate that the traffic management proposals are feasible.

4.8 **Impact on Retained Trees**

As noted above – it appears that the ground levels to the south of the house are to be raised. There are two retained trees T1 and T2, in the slope adjacent to the road. This means the ground level over the tree roots will be increased. This is not good practice and it is likely that the trees will be damaged as a result. They could die. The arboriculturalist should comment on the impact of this.

As noted in 4.7 there appears to be a similar issue for the tree in the loading area.

4.9 **Drainage**

The Structural Engineering Design and Construction Method Statement report states that, even though the proposed house is significantly larger than the existing, there will be no increase in drained area. This is because it is assumed that all the existing paved areas are fully drained and that permeable paving will be used for the new paved areas.

It is unlikely that all existing paved areas are positively drained so the statement that there is no increase in drained area is unlikely to be accurate.

Further justification should be provided as drainage issues are significant here.

4.10 **Ground Movements**

As the basement has been removed ground movements due to excavation should not be a significant concern.

However, the temporary retaining structures adjacent to the road appear to be un-propped. Locally there are areas of quite deep excavations which would cause deflections of the wall which could impact on the construction of the road.

This should be assessed or temporary props to the retaining wall should be provided.

There is also a risk that the road, particularly the edges could be damaged by the construction traffic.

The condition of the road should be recorded before construction commences and any damage should be made good.

4.11 **Vehicle Movements**

The removal of the basement will significantly reduce the volume of soil to be excavated and removal from site together with the volume of concrete and reinforcement to be delivered to site. We have made an initial assessment of the reduction in vehicle movements and our estimate broadly agrees with the reductions proposed by Knight Build. (See section 4.6).

At this stage, we have not carried out an independent assessment of the total number of vehicle movements to and from site.

5.0 Conclusions

The proposals adopted for the design and construction of the house and dealing with groundwater are based on the previous proposals and are, to a degree slightly more developed. The removal of the basement will reduce the impact. The overall proposals appear acceptable in principle but will need to be further developed during the detailed design and construction stages. Particular care should be taken to avoid any water run-off into the pond in the garden of No. 55 Fitzroy Park.

There are a variety of local stability issues which have been identified due to proposed level changes. Some trees which are indicated as being retained are affected by the proposals. While it is likely that these can be resolved, more details should be provided now particularly in relation to the effect on the trees.

The main issue remains the construction access. It appears that this has been considered in more detail than previously but it will still cause substantial disruption to the road users even with the reduction in the number of movements.