The Water House

Executive Summary

i) The proposed run-off rate of 6l/sec is very significant (21.6m^3/hr) and in excess of what would be usually permitted for large new developments. The run-off should be limited to the current 1:2 year run off or 5l/sec whichever is the lesser.

ii) Given RSK's view that re-infiltration of the proposed soakaway is expected to be very low, all ground water picked up by the fin drain will be directed to the Heath via the gravel drain. This discharge could impact on the Bird Sanctuary Pond and any discharge needs to be agreed by the City of London.

iii) Survey drawings by Greenhatch Group of the boundary with 49 Fitzroy Park are inaccurate and incomplete. No survey has been undertaken of the boundary with The Wallace House or the boundary with 55 Fitzroy Park.

iv) The impact of the basement excavation on the boundary structure, pool plant room, pool services, spa and lap pool at 49 Fitzroy Park has not been adequately considered and the current design proposals will cause a level of damage significantly higher than estimated to the boundary structure and potentially to the pool plant room and spa pool. The impact on the *structural integrity of the* swimming pool has been under-estimated and a Category 2 damage with potential cracks up to 5mm is unacceptable. The estimate of damage should not exceed Category 1.

v) No consideration has been given to impact on the boundary structures with the Wallace House or with 55 Fitzroy Park.

vii) The installation of a king post retaining wall is not appropriate close to site boundaries and will cause significant ground movements and damage.

vi) No explanation of how the fin drain is to be installed or what effect the installation will have on the boundary structures with any of the neighbouring properties.

vii) No consideration has been given to contamination of land due to potential surcharging of combined sewer. The capacity of the existing sewer should be assessed together with the existing maximum flow rates to assess whether more attenuation is required.

viii) All these issues should be resolved prior to determination.

Comments on SWP Ltd's Surface Water Proposals 14/5/14

The criteria used for the design of the drainage is taken from PPS25. It is as follows:

1 in 2 years without surcharge in the surface water drainage system
1 in 30 years without flooding
1 in 100 years to be checked to determine what volume of flooding may occur

However this is only a small extract from PPS25 which relates to Development and Flood Risk. The criteria noted above relates to the design of the pipe sizes, but should not be taken as the allowable run off rates from the site.

If this were a new development then it is likely that the surface water drainage would be limited to "greenfield" run-off rates (ref: 23.9 Camden Development Policies).

Policy DP23 on water states:

b) limit the amount and rate of run-off and waste water entering the combined storm sewer…..to reduce the risk of flooding.

It appears that the drainage discharge rate assumed in the design is in the region of 6 l/sec. This equates to 21.6m^3 per hour which is a very significant volume. As this is a relatively high rate, the amount of rainwater attenuation proposed is 15m^3, which can all drain away in less than 45 minutes. This run-off rate is in excess of what would be permitted for many large new residential developments. The design run-off rates should be agreed in advance with both Camden and Thames Water, taking account of the capacity of the existing combined sewer. They should be limited so that they do not exceed the lesser of the existing run-off rate for a 1:2 year event or 5l/sec.

<u>Groundwater</u>

The system of fin drains is maintained and these drains to a soakaway in the vicinity of the existing pond. It has previously been advised by RSK that the rate of re-infiltration is expected to be very low. A high level overflow is proposed which will discharge into a gravel filled drain passing under Mill Hill Lane onto the opposite bank (and drain onto the Heath). This discharge could flow overland towards the Bird Sanctuary Pond and any discharge needs to be agreed with the City of London.

The ground levels adjacent to No. 49 Fitzroy Park and the north western corner of the site are noted to be in the region of 82.4m. The ground levels in the vicinity of the existing pond is approximately 79.8m. It is reasonable to assume that a high level outflow will be set ~0.4m below ground level, with an invert level of ~79.4m. Any groundwater which is picked up by the fin drain could have up to a 3m head, so once the soakaway is full, it will all drain via the overflow pipe and gravel drain on to the Heath. Therefore, as the view is that the soakaway will be ineffective, all the ground water picked up by the fin drain will be directed to the Heath.

Comments on RSK's response to the Independent Review of the BIA

Point 1.
The pool at No. 49 Fitzroy Park has been there many years and should have been considered in the design. It appears that the survey (drawing 14624-01-P prepared by Greenhatch Group on 6/3/14) is incomplete. There are no measurements of the ground levels within the garden of No. 49 Fitzroy Park and the survey does not pick up the spa pool or the pool plant room. It appears that the boundary structure between No. 49 and the Water House is, in places retaining 1.2-2.0m of ground approximately and it is not in good condition. No assessment has been made on the impact of the proposed basement on this boundary structure or the pool plant room which is approximately 1.0m from the boundary. The long sections through the site boundary do not reflect this and it does not appear that anyone has considered the situation across this boundary. This may also affect the assessment of heave due to the additional surcharge loading in this area.

The survey needs to be revised and access should be arranged with No. 49 Fitzroy Park and the Wallace House. Following this, RSK should again review the BIA and ensure that it takes account of the boundary conditions.

Point 2.
The principles of constructing a king post wall are fully understood, and it is an acceptable approach in areas away from existing buildings or sensitive structures. As noted above the concerns relate to the use of this type of construction close to the site boundary where there is a significant level difference, a pool plant room, a spa pool, pool drainage services and a boundary structure which is already out of plumb – see SKA-A for the typical assumed section. This needs to be fully surveyed so that the accurate sections can be drawn and considered.

It is noted that the concrete infill panels for the king post wall will be pushed into level. This means that:

a) There will be a 2-3m length of unsupported excavation before the concrete panel can be inserted. Also, in order to enable this to be pushed in, there will probably be a minimum of 25mm over excavation of soil on average.
b) Due to the proximity of the boundary structure and the change in level across the boundary, the boundary structure will move significantly.
c) Due to the gaps behind the precast concrete panels the ground movements will be much more than predicted by the analysis.

It should be noted that ground movements as a result of a shallower excavation to the boundary between No. 49 and No. 51 Fitzroy Park has resulted in significant cracks in both the driveway and annexe of No. 49 Fitzroy Park.

In addition to the points noted above, the proposed excavation to install the drainage will further destabilise the boundary structure.

CIRIA C580 is not appropriate for assessing ground movement for a king post wall, due to the temporary unsupported excavation and the gaps behind the wall to allow the panels to be inserted. It also does not make any allowance for the installation of the drain.

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”. This is why it is not generally used close to buildings.

In our opinion a king post wall and drain in this location will cause significant damage to the boundary structure and potentially the pool plant room and spa pool. It is likely the impact on the swimming pool has been under-estimated.

The RSK assessments of ground movements and damage category are therefore unlikely to be conservative and may even by very optimistic as they have assumed “a high standard of workmanship during the construction”. The damage assessment of the pool and the poolside extension is assumed as Category 2 which is for cracks up to 5mm. No consideration has been made for the spa pool, the pool plant room, pool services for the boundary structure, but it is likely that the level of damage would be higher, potentially causing structural damage.

Point 5.
The comments previously made in relation to instability primarily relate to the boundary conditions with No. 49, all as noted in the response to Point 2.

<u>Other Issues not addressed in the review of the BIA</u>

RSK have not addressed the concerns expressed on the potential for the fin drain to impact on the pond in No 55 Fitzroy Park, causing it to dry up.

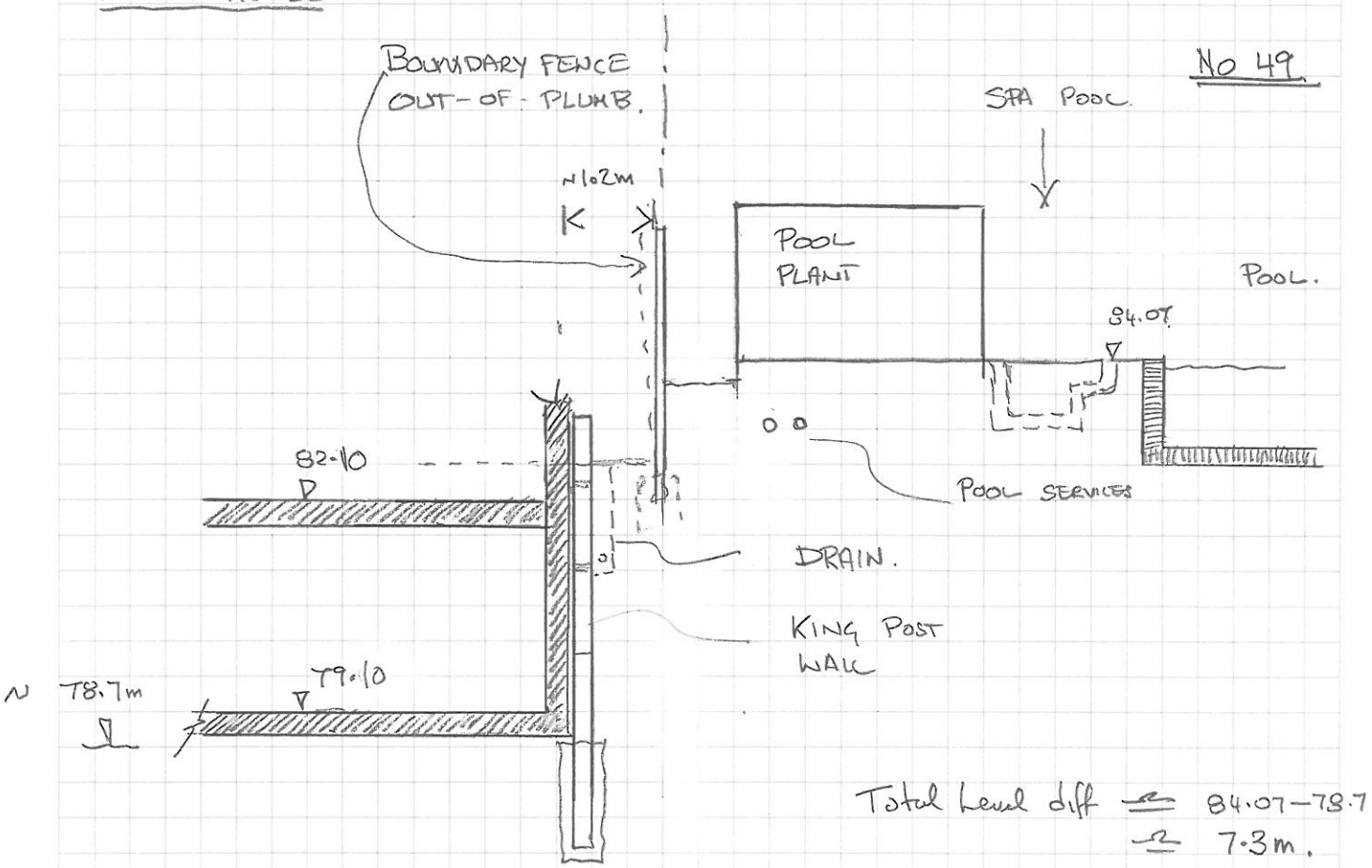
There has been no further consideration of the boundary with the Wallace House which may be undermined due to the proposed level adjustments. Also there is an important Mulberry tree in the grounds of the Wallace House and the potential impact on the level change and water regime change should be assessed by an Arboriculturalist?

Alan Baxter

75 Cowcross Street
London EC1M 6EL
tel 020 7250 1555
fax 020 7250 3022
email aba@alanbaxter.co.uk
www.alanbaxter.co.uk

Date	Job no.	Sheet
Engineer		
Checked by		
Project		

WATER HOUSE



Total level diff = 84.07 − 78.7
= 7.3m.

ASSUMED SECTION.

Comments on Haskins Robinson Waters response to CGL Assessment

4(a) Page 3
We note that some survey information has been provided but no access to No. 49 Fitzroy Park was obtained. The survey is not particularly accurate and does not pick up the pool surround, the pool plant room or the spa pool. Also the survey does not pick up the significant level differences at the boundary.

The boundary condition and retained structure in this area should be re-assessed – a contiguous bored pile wall solution may be more appropriate but even this may cause unacceptable movements at the boundary.

4(b) Page 3
It is noted that the fin drain has been moved to the outside of the temporary retaining structure, but there is no explanation of how the fin drain is to be installed or what the effect of the installation will be on the boundary structure.

Refer to the comments on SWP's drainage proposals re the surcharging of the soakaway due to the level differences across the site.