

Technical Note

Project 60580436	Subject Review of Drainage Proposals for 55 Fitzroy Park (Planning application reference 2018/3672/P)	Written by Stephanie Wood	Checked by Bernadine Maguire	Approved by Emily Craven
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Date
10 March 2020

Introduction

AECOM were asked to review the drainage submission for a proposed development at 55 Fitzroy Park, Camden (Planning application reference 2018/3672/P) considering the issues raised by the objections received against the proposals. This Technical Note provides a summary of the design in respect of surface water, foul water and groundwater and provides comments on each aspect. In particular, these comments highlight where the existing detail is sufficient and where further information is required in order to clarify the proposals.

Surface water design summary

- The proposed (post development) impermeable area on the site will be less than the existing (pre-development) impermeable area.
- Surface water arising from hard standing that comes into contact with vehicles will have a separate drainage system that conveys flows via an interceptor to the public combined sewer in Fitzroy Park.
- Surface water arising from roof areas and access paths to be conveyed to geo-cellular attenuation, with an outfall to the Heath.
- Perforated land drains are proposed around plots.
- Swale proposed outside of the plot boundaries (but within the site ownership), with the intention of using percolation and infiltration to discharge surface water runoff from the site. Overflows proposed to discharge to the Heath.

Surface water comments

There is no demonstration in the MicroDrainage calculations or the drawings of how the discharge will be restricted. The concept of infiltration with overflow to the Heath is not supported by infiltration testing in accordance with BRE 365 or orifice sizing in the MicroDrainage calculations. Furthermore, evidence suggests groundwater levels are too high to allow the recommended 1m between base of infiltration measure and top of water table to ensure infiltration feature does not fill with groundwater and to assist with the removal of pollutants through the action of percolation.

The surface water pipe network model uses a 1 in 5 year event, and it is only this return period that is presented in the MicroDrainage calculation output. Results for a variety of return periods and evidence that the proposed attenuation volume is appropriate have not been provided. The proposed attenuation is sized to accommodate the 1 in 100 year + climate change event, with discharge restricted to Q_{bar} , but the MicroDrainage calculations do not demonstrate this, and the drawing does not show how discharge will be restricted to this rate. Volumes provided in pro-forma, report and drawing do not correspond with each other, so it is difficult to decipher what is being proposed.

In principal, the surface water runoff arising from the site should be less than the existing, as the total impermeable area is less than existing according to the pro-forma. However, surface water runoff arising from the existing dwelling appears to discharge to the combined sewer, and therefore surface water runoff arising from hard standing areas across the proposed development should discharge to the combined sewer, unless infiltration is proven to be feasible on this site.

The gully connecting to pipe S3.003 should connect into S2.000 due to this area being a designated parking space.

The angle between pipe S1.002 and S1.003 needs revising to ensure no acute connections.

It is stated that permission is not required to preserve the existing watercourse. However, in the Hydrological & Hydrogeological Impact Assessment report (Document reference LBH4480 V2.0) report it is stated that '*What is left of the valley feature does not appear to contain any permanent water course, but parts of it are evidently swampy and it is presumed to be liable to some intermittent flooding during storm events*'. Evidence would need to be provided to demonstrate the existence of a culvert or other drainage conduit carrying water towards the Heath that could be defined as a 'watercourse'.

The main source of pollution from this site are from vehicles, which will be managed through the installation of a separate drainage system, and during construction. There is also a risk of polluted runoff entering the Heath via overland flows as

there is a surface water flood flow pathway crossing the site. Any pollutants transported by this pathway would arise from this specific pathway's catchment, not just from the site.

The location of the land drain adjacent to plots 1-3 may need to be removed. This area is already served by positive drainage to ensure all pollutants are intercepted, introducing a land drain here potentially creates a pollution pathway.

Foul water design summary

- Foul drainage from each plot is conveyed to a pumping station in lower reaches of the site.
- The pumping station is located to intercept an existing foul sewer.
- The rising main discharges to the Thames Water combined sewer in Fitzroy Park.

Foul water comments

Foul sewer MicroDrainage network design shows pipe gradients need revising as self cleansing velocity is not being achieved outside of pipe full conditions. If gradients cannot be made steeper, 150mm diameter pipe should be tested in the MicroDrainage model to try and achieve the required velocity.

Existing foul sewer crossing the site will be intercepted and accommodated by the on site pumping station. What flows are expected? Have flows been monitored or have you estimated expected flows? What happens to the now redundant existing pipe? Do you know if there are further connections downstream? Can access for maintenance be guaranteed? Who will maintain it, as there is a risk that Thames Water won't adopt it and therefore sewerage from beyond the boundary of 55 Fitzroy Park will be the responsibility of a private owner. The foul drainage proposed for the site is reasonable, providing the new pumping station can be accessed. Being responsible for foul flows from beyond the site boundary is a risk and it would be strongly recommended to seek Thames Water adopt these assets.

Has pre-application advice been sought from Thames Water on the proposed flows discharging to the combined sewer?

Groundwater design summary

- Basements are proposed and mitigation is offered in the form of pervious material surrounding the basements and foundations.

Groundwater comments

The proposed basements will obstruct groundwater flows. The mitigation offered could be feasible and is adequate at an outline design stage. Designs will need to be progressed to understand how they will be maintained and what happens if they silt up/fail. Evidence needed to progress detailed design includes information of groundwater levels at each plot, how groundwater will be routed around foundations and basements, understanding of groundwater flow rates, sizing of stone filled mitigation trenches, freeboard needed to avoid flooding of habitable space and design measures to ensure stone isn't "washed away" by groundwater movement.

Groundwater flows routes will be impacted by the development of this site, but perforated land drains are proposed to mitigate this and keep the general route of groundwater flow similar to existing. As per previous comments, these land drains should be sized according to the measured groundwater flows.

Concerns have been raised about groundwater being removed through these works, but there is no evidence that abstraction is part of these proposals. Groundwater will be routed around buildings and will still flow through the superficial deposits following the natural valley into the Heath. Furthermore, the pond within the site boundary is fed via surface water and perched groundwater, and the proposed development is unlikely to prevent groundwater flows from reaching the pond.

Summary

Surface water drainage design on this site is lacking detail with regard to controlled overflows and proven infiltration rates. The MicroDrainage calculations do not provide enough information to assess the adequacy of the proposals. Therefore, until further information is made available, surface water from all hard-standing areas should be directed to the combined sewer unless infiltration can be proven as feasible.

A more complete set of MicroDrainage results should be issued. A meeting is suggested to go through the proposals.

Evidence should be provided to demonstrate the existence of a culvert or other drainage conduit carrying water towards the Heath that could be defined as a 'watercourse'.

Pollution prevention through routing surface water runoff arising from areas subject to vehicle movements through an interceptor are appropriate for this development. Polluted runoff arising during construction will need to be carefully managed.

Foul drainage designs need refining to ensure self cleansing velocity. There is a risk posed from taking third party foul flows, therefore adoption by Thames Water is recommended to be sought.

Groundwater flows will be managed around structures. The details provided are adequate for concept/outline design, but more detail and investigation will be necessary to ensure future residents are not at risk of groundwater flooding to properties. The proposed development is unlikely to reduce groundwater flows entering the Heath.