PUBLIC REALM DIVISION
Asset Management

Briefing Note 22: Camberwell Old Cemetery – Area Z Proposed Works – Drainage

By: John Kissi

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1. Purpose

1.1 The purpose of this briefing is to provide a summary of the study undertaken so far with regard to the drainage design for Camberwell Old Cemetery (Area Z). This includes a summary of the reports provided by BSP Consulting and WYG, and a summary of all other relevant associated information.

2. Background

2.1 The proposed works at Camberwell Old Cemetery "Area Z" is to provide additional burial capacity. The identified site has been subjected to illegal tipping and this stockpiled material is to be removed and / or recycled prior to re-landscaping to provide additional burial plots. The overall works will consist of ground remediation, importing of construction materials and capping, boundary treatment, planting, nature conservation measures and the construction of access paths, drainage and burial areas.

2.2 A planning application (15/AP/3185) was submitted in August 2015; the Flood and Drainage Team were consulted in September 2015, when comments regarding possible flow of surface water from the site to the road particularly Underhill was raised to the consultant. Based on the consultant's responses, the Flood and Drainage Team had no objection to the proposed application, as the level of detail was suitable for planning purposes. The team considered the proposal to be reasonable given the site constraint. The principle of the scheme is also in line with the principle of minimising flow of surface water from greenfields into sewers.

2.3 A number of objections were raised at the time of the application. These objections are ongoing, and as a result, a stakeholder meeting has been arranged for 17th January to further discuss the issues.

3. Drainage Strategy (developed by BSP Consulting)

3.1 The original drainage strategy was submitted as part of the planning application. The following is a summary of the information contained in the strategy.

3.2 The feasibility of three options for drainage was considered, i.e. infiltration, discharge to a watercourse and discharge to a sewer. As there are no watercourses in proximity to the site and as a connection to a sewer would involve laying a pipe through an existing burial area, infiltration was identified as the most suitable option for drainage of the proposed works. Based on infiltration tests undertaken, suitable locations for soakaways were identified. Based on an event which has a likelihood of occurring once in hundred years (1 in 100 year storm, plus an allowance for climate change), 2 No. soakways, with an overall volume of 90 m^3, were proposed. The soakaways would be constructed from cellular units.

4. Plot Z Drainage Strategy Review (developed by WYG)

4.1 Southwark Council commissioned WYG to undertake a review of the drainage strategy developed by BSP Consulting. A summary of the items highlighted by WYG is as follows:

a) The proposed soakaway has a half drain time of 131 hours; this is not in line with the design standard specified (C753 SuDS Manual), which requires a half drain time of 24 hours. It is worth noting that the SuDS manual alludes to the need for higher discharge time for higher return events such as the criteria for which the scheme is being designed for. However, the solution still represents a significant improvement on the existing site drainage (paragraph 4.1 of review report "*The incorporation of any surface water storage tanks and filter drains within the site will be a significant improvement on the existing scenario and prevent surface water run-off in the vast majority of storm events."*
b) The infiltration rates obtained from test results is on the limit of what is acceptable for the use of soakaways. However, soakaways are the only viable option for this scenario.
c) Providing there are no geological implications, the inclusion of below ground tanks and filter drains will significantly reduce the risk of flooding to the adjacent Ryedale properties in storms up to 1 in 100 year (plus climate change) events.
d) The BSP drainage strategy is appropriate in principle, subject to further ground investigation.

4.2 The report also recommends further testing and investigation to determine depths of groundwater in winter months, infiltration rates and soil characteristics. This is to ensure that high groundwater levels and low infiltration rates do not affect the operation of the soakaway and that the introduction of the tanks will not have a detrimental effect on the stability of adjacent embankments. The report also recommends that a maintenance schedule be developed for the drainage system.

4.3 The strategy review was provided to BSP for comment, who confirmed that all recommendations were sensible and should be implemented prior to detailed design and implementation. The flood and drainage team supports the need for detailed ground investigation prior to detailed design and construction.

5. SuDS in the Thames (British Geological Survey)

5.1 "SuDS in the Thames" is a document developed by the British Geological Survey (BGS) to provide guidance on the use of infiltration. The document has been referenced in queries raised to the council. In particular, the following sentence is referenced *"the foremost concern with regards to ground instability is the presence of swelling clays; these may expand and contract as a result of changes in moisture content causing ground instability."* Whilst this is generally valid, it is a generic statement; further geotechnical testing is required to determine if this is relevant for the proposed site.

5.2 This guidance note highlights the items to consider with regards to infiltration and provides information on a national dataset that is currently being developed. The note does however highlight that the dataset is not a replacement for infiltration testing or site investigation.

5.3 This document is no more valid than Southwark's Surface Water Management Plan (SWMP). The information provided in the SWMP is for general guidance only, to inform initial desktop study. The SWMP has also been referenced as a basis for objecting to the development. However, in section 3.5.14 (Table 5.2) the SWMP provides further details on elevated ground water susceptibility. In each case the requirement for site specific investigations is clearly stated. This requirement is valid even for areas that the SWMP identifies as suitable for infiltration. Furthermore, in section 4.2.4 (Table 4.2.2) soakaway is

listed as a possible SUDS option across all critical drainage areas subject to site specific infiltration testing.

6. Conclusion

6.1 Based on the information provided in the planning application, the subsequent review undertaken by WYG and all other information provided, the Flood and Drainage Team believe that the drainage strategy developed by BSP Consultants represents a suitable solution for the proposed works given the site constraints. The strategy has been developed based on actual site infiltration information, which was sufficient for the planning phase. However, further testing should be undertaken prior to and during the detailed design phase. The tests should confirm that the infiltration rates are suitable (including subsoil infiltration rates), the groundwater levels are suitable for infiltration, and that the proposed soakaway systems can be constructed safely without causing any ground instability.

6.2 We are aware that the local residents have concerns over the proposed development, i.e. those associated with the following.

a) Slope stability
b) Strength of the soil to provide a stable foundation for the soakaway
c) Ability of the underlying soil to drain the soakaway
d) The depth of the water table
e) Designing for exceedance
f) Operation and Maintenance

6.3 Whilst we believe that the concerns are justified, we also believe that it is normal for a scheme of this nature to approach ground investigation in a staged manner, reserving detailed investigation for the detailed design stage. We believe that the majority of the concerns can be dealt with via the aforementioned geotechnical investigation. It is also normal for a scheme of this nature to undertake a staged investigation process. The level of detail for planning was sufficient, but it is now the consultant's responsibility to specify the required level of ground investigation testing to demonstrate that a suitable detailed design is developed.