
St Ann's Hospital, Haringey

Surface Water Drainage Design – Phase 1B & 2 Planning Condition Report

Submitted to discharge planning condition 71

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Job Number:	28744

Date	Revision	Notes/Amendments/Issue Purpose
July, 2023	DRAFT	To discharge planning Condition 71
December, 2023	1	For planning

Introduction

This statement has been produced to support the submission of a Reserved Matters application for Phases 1b and 2 in relation to the proposed residential redevelopment at St Ann's Hospital, London (Ref: HGY/2022/1833). The report specifically address planning condition 71. The development has been granted full planning permission for Phase 1A and outline planning permission for Phases 1B, 2 and 3.

The EA's indicative floodplain map shows that the site is in Flood Zone 1, therefore is not at risk of flooding from a watercourse. This report will focus on the SuDS strategy and should be read in conjunction with the Flood Risk Assessment and Drainage Strategy Report (REF: N15301-PAM-ZZ-ZZ-RP-C-00001) dated October 2022 and approved as part of the hybrid consent. The drainage layout drawings have been appended to this document in Appendix B.

The development was submitted as a hybrid planning application, split into four phases (Phase 1A, 1B, 2 and 3). A detailed planning application was submitted for Phase 1A (239 residential dwellings) with the remaining phases submitted for outline planning (up to 756 residential dwellings). See below figure that shows the phasing boundaries.



Figure 1.1: Phasing boundaries

Development Proposals

Application for the approval of reserved matters respect of appearance, landscaping, layout and scale relating to Phases 1b and 2 associated with the outline component of planning permission HGY/2022/1833 for *“Outline planning permission (with all matters reserved except for access) for Phases 1B, 2 and 3, for: (a) the erection of new buildings for residential development (Use Class C3) and a flexible range of non-residential uses within Use Class E, F1/F2; (b) provision of associated pedestrian and cycle accesses; (c) landscaping including enhancements to the St Ann's Hospital Wood and Tottenham Railsides Site of Importance for Nature Conservation (SINC); and, (d) car and cycle parking spaces and servicing spaces.”*

The combined site area of Phase 1b and 2 is 2.39ha and includes 464 proposed new dwellings.

Planning Decision Notice

Planning condition 71 on the decision notice states the following:

'Surface Water Drainage Scheme (Outline)

Each reserved matters application shall be submitted with a Surface Water Drainage scheme with an appropriate level of detail for site that shall be approved in writing by the Local Planning Authority. The detailed drainage scheme should also accompany a detailed drainage plan appropriately cross-referenced to supporting calculations for the development and they should clearly indicate the location of all proposed drainage elements demonstrating that the surface water generated by this development (For all the rainfall durations starting from 15 min to 10080 min and intensities up to and including the climate change adjusted critical 100 yr storm) can be accommodated and disposed of without discharging onto the highway and without increasing flood risk on or off-site.

Reason: To ensure that the principles of Sustainable Drainage are incorporated into this proposal and maintained thereafter.'

SuDS Hierarchy

In accordance with the London Plan, Haringey SuDS Design Requirements, and CIRIA documents, surface water run-off should be managed as close to its source as possible. The London Plan states that all new developments should aim to reduce run-off to greenfield rates "utilising SuDS unless there are practical reasons for not doing so".

In accordance with the above statement and the London Plan SuDS hierarchy, it is proposed to incorporate the following SuDS features:

Store Rainwater for Later Use

Rainwater harvesting promotes the storage and re-use of rain water collected from roofs and hard surfaced areas. This type of system contributes to the reduction of run-off rates and volumes within a development.

The use of 'smart' or 'active' attenuation tanks that combine surface water attenuation and rainwater harvesting will be considered during the detailed design. These tanks work by continually monitoring short- and medium-term rainfall forecasts. Once rainfall is forecast the system automatically adjusts the water levels within the tank to ensure that there is sufficient free volume to attenuate the storm water runoff from the upcoming rainfall event. This means that one 'smart' tank can be used for both rainwater harvesting and storm water attenuation. The quality of the harvested runoff will need to be suitable for reuse within the scheme. Further details and design will be submitted during the detailed design stage when a specialist rainwater harvesting consultant can be engaged.

The capture of rainwater into tanks for other non-potable uses (for example toilet flushing) is not considered to be feasible or viable for the terraced properties.

Infiltration

The ground investigation report produced by RSK in 2017 revealed a ground profile comprising of Made Ground and London Clay. Infiltration testing to BRE365 was carried out in three site locations at 3m depth. The results of the testing failed to identify a rate of infiltration due to very low rates of infiltration. The Contaminated Land Assessment carried out by IDOM in 2022 determined that the groundwater level to the south of the Site is approximately 15.1 – 15.2m AOD. CIRIA C753 The SuDS Manual states that there should be a minimum of 1m between the base of infiltration systems and the seasonal high groundwater. Therefore, it is not viable to dispose of surface water via soakaways. The infiltration test results are contained in Appendix A.

Green Roofs

Green roofs are proposed throughout the site.

Above ground SuDS features

Three swales are proposed to the south of the Site; a large swale is located to the south of Plot J, a smaller swale to the south east of Plot G, and a north-south swale located between Plot F and Plot H. There are also a number of rain gardens proposed within the courtyards of the plots.

Permeable paving

Permeable paving is proposed within the car parking bays and other predominantly pedestrian areas. The permeable car parking bays will be underlain by cellular tree pits that provide space for the roots of the proposed trees and provide attenuation storage for surface water during storm events. The permeable car parking bays and bioretention tree pits will be used to intercept surface water run-off from the road.

Underground Modular Attenuation Tanks

Below ground geocellular attenuation tanks are required to provide the remaining attenuation storage. An attenuation tanks is required and is proposed to be located beneath the courtyard of Plot F.

SuDS Method	Area Used on site:	Comment:
Green Roofs	Blocks F, G, H & J	Provide interception and improves biodiversity.
Swales	Soft landscaping areas	Provides attenuation and interception, improves water quality and biodiversity.
Permeable Paving	Parking bays and pedestrian hardstanding areas	Provides interception and improves water quality.
Bioretention Tree Pits	Adjacent/beneath parking bays	Provides interception, improves water quality, biodiversity and amenity.
Raingardens	External courtyard areas	Provides interception, improves water quality, biodiversity and amenity.
Attenuation Tanks	Tank located in Block F courtyard	Provide attenuation.

Table 6.1: Summary of SuDS Methods Used on Site.

Drainage Strategy Overview

The surface water drainage strategy has been designed to work as one development site with a single connection point to the Thames Water 610mm diameter surface water sewer in St Ann's Road to the north. The peak discharge rate will be restricted to the Q_{BAR} Greenfield runoff rate of 29.2 l/s for all storm events up to and including the 100 year + 40% climate change storm using a vortex flow control. The below ground drainage from the Phase 1B and 2 development is proposed to connect to the drainage system that serves Phase 1A. The proposed drainage drawings are included within Appendix B.

Hydraulic Modelling

As discussed above, the site wide peak discharge rate will be restricted to the Q_{BAR} Greenfield runoff rate of 29.2 l/s for all storm events up to and including the 100 year + 40% climate change storm using a vortex flow control.

The hydraulic calculations are available within Appendix C. The calculations show that there will be no flooding for all storm events up to and including the 100 year plus 40% climate change event for storm durations of 15 to 10,080 minutes. The 15 and 30 minute storm durations have been analysed using FSR rainfall data and for the 60 – 10,080 minute durations have been analysed using the FEH rainfall data. This is in accordance with the CIRIA SuDS manual (C753) Section 24.2.3 which states that, *"although the FEH can be used for durations as short as 30 minutes, flood estimation guidance from the EA (2015) currently recommends that, for shorter durations, FSR rainfall statistics should be used to scale down the corresponding FEH 1-hour rainfall."*

The current EA guidance on climate change allowance states that new drainage systems must be designed to ensure that there is no increase in the rate of runoff discharged from the site for the "Upper End" allowance. The expected lifetime of this development is over 50 years, therefore a 40% allowance has been applied to the calculations.

Water Quality

CIRIA C753 The SuDS Manual, Chapter 26 sets out the 'simple index approach' to water quality risk management.

Step 1 of the simple index approach is to identify the pollution hazard indices for the proposed land use. The proposed residential development is considered to have a 'Very Low' and 'Low' pollution hazard level and Table 6.2 below shows the associated pollution hazard indices that are taken from Table 26.2 of The SuDS Manual:

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change	Low	0.5	0.4	0.4

Table 6.2: Pollution Hazard Indices

Step 2 of the simple index approach is to select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index. The indicative surface water pollution mitigation indices for the proposed SuDS features are shown in Table 6.3 below:

Type of SuDS Component	TSS	Metals	Hydrocarbons
Swale	0.5	0.6	0.6
Bioretention Tree Pit	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7

Table 6.3: Surface Water Pollution Mitigation Indices, taken from Table 26.3 of The SuDS Manual

Provided that the mitigation indices of the treatment techniques are greater than or equal to the hazard indices for the scheme then there should be no reduction in the overall water quality within the receiving watercourse or groundwater body. Therefore, the incorporation of swales, detention basins, tree pits and permeable paving will provide suitable prevention from pollution to surface water. Table 6.4 indicates that sufficient mitigation has been achieved for the hazard pollution indices associated with the development.

	TSS	Metals	Hydrocarbons
Total Pollution Hazard Indices	0.7	0.6	0.45
Total Pollution Mitigation Indices	2.0	2.0	2.1
Sufficiency of Pollution Mitigation Measures	Sufficient	Sufficient	Sufficient

Table 6.4: Evaluation of Pollution Indices

Appendix A

Infiltration Test Results



- LEGEND
- Site Boundary
 - CP Borehole Location
 - Window Sample Location
 - Machine Excavated Pit Location
 - Hand Pit Location

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



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Drawn	Date	Checked	Date	Approved	Date
ASC	02.11.17	MF	02.11.17	ST	02.11.17
Scale	1:1000	Orig Size	A1	Dimensions	m

Client	VINCI CONSTRUCTION UK		
Project Title	ST. ANN'S HOSPITAL		
Drawing Title	SITE LAYOUT & PROPOSED EXPLORATORY HOLE LOCATION PLAN		
Project No. 29356 - R03 (00)	Drawing File 29356 (R03-00) Fig 2.dwg		
Drawing No. FIGURE 2			Rev. P1