

Technical design note

Project name	Spring Park P6 Data Centre		
Design note title	Response to Drainage and Flood Risk Concerns of the Community		
Document reference	24639		
Author	J. Charlesworth		
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1. Introduction

This technical note has been prepared by Hydrock, now Stantec at the request of Ark Data Centres Limited to provide further rationale behind the proposed drainage strategy and respond to concerns from the local community.

This note has been written by Mr John Charlesworth BEng (Hons) (myself) who holds 10+ years professionally as a Civil Engineer with the position of Principal Engineer within Hydrock.

I have an extensive portfolio of civil engineering design experience on development projects across the UK and includes international project. I act as the lead civil engineer for numerous projects of varying sizes including SuDS master planning and detailed SuDS and drainage design.

This has included designing measures to mitigate the effects of high groundwater table. Furthermore, I am the technical lead within Hydrock, dealing with water quality and the implementation of SuDS within sensitive areas.

To this effect I am a specialist in SuDS and Engineering in Adverse Ground Conditions, and therefore suitably qualified to comment.

2. Groundwater and Geology

As noted, not only in Hydrock's reports but also past applications for the locations, groundwater and geology vary considerable within the area. This variation has led to some concern in regards to the proposed drainage strategy and the utilisations of soakaways for the development.

However, specific ground investigation and soakaway testing has been conducted within the location of the proposed soakaways limiting the risk of this variation. Furthermore, in accordance with guidelines and building regulations, testing will be required at the specific infiltration locations at the depth of formation. Testing of this magnitude is not undertaken prior to planning approval due to its intrusive nature, cost and changes that may occur within the planning process. As a result, language used to describe the hydrogeology and soils can appear vague and uncertain. This is certainly not the case and rather respectful of the complexities.

Analysis has been undertaken of the local mine, military structures and drainage to ensure this is achieved safely. Whilst some of this information has been provided to the public through the planning portal, some information can not be shared due to its sensitive and secure nature. These items have been discussed in length not just for this development but also development within the surrounding area with the MOD.

With the varying strata formed of topsoil, made ground, Forest Marble Formation, Bath Oolite Member and Corsham Limestone Formation with a complex intertwined nature, resulting in banding of layers that support infiltration and others with perched (elevated pockets) of ground water. This leads to an abundance of local pockets of near surface groundwater which would appear concerning to local residence. However, the testing undertaken to date has established that in the specific location proposed for the soakaway structures, no such event occurs.

Whilst initial testing has already proven the absence of such groundwater within the proposed area of soakage, the aforementioned further testing will hone this data and as stated will be a requirement of building regulation approval.

The capture and controlled release into sub-soils will aid the highlighted concerns made by local residence caused by surface water flooding. The cause of surface water flooding is much to the inability of the surface to allow waters to permeate in a timely manner, typical of development increasing hard standing (i.e. roads, footways, buildings, etc). As such, the proposed development will offer alleviation by promoting infiltration and reducing overland surface water flows.

3. Historic Works & Planning

A brief planning history of the proposed drainage discharge methodology has been included within the table below for ease of reference.

Development Summary	Planning Ref.	Date	Method of Surface Water Drainage
Mixed use of B1, B2, B8 and 23 units of affordable housing	N/11/01613/OUT	28/04/2011	Infiltration
Re-submission of N/11/01613/OUT	N/12/01289/OUT	19/10/2013	Infiltration
95 residential units	18/09884/OUT	18/10/2018	Sewer
Data Centre	PL/2024/05527	25/06/2024	Infiltration

As demonstrated by the historic proposals for the site, infiltration has predominantly been identified as the most practicable means of surface water discharge.

It is noted that whilst concern has been raised through comments of the public as to the differences between the Hydrock drainage strategy in support of application PL/2024/05527 and that of the previous application 18/09884/OUT produced by RSK.

Said application (PL/2024/05527) was refused with grounds including drainage matters. On review of the information available and the decision notice it is clear that the Lead Local Flood Authority (LLFA) have been diligent and concluded that appropriate details had not been provided to ensure that the proposal conformed to Local Policy CP67, the NPPF and NPPG. This is likely due to the sustainability of the aforementioned development proposing discharged to what is already a stressed surface water network with complicated ownership and stakeholder considerations where it is evident an infiltration solution was viable.

Furthermore, the Lead Local Flood Authority are in support of the application subject to the relevant conditions as stated below.

1. 1. The applicant must provide the following information on the surface water drainage strategy:
 - a. The applicant must provide detailed cross and long section drawings, in addition to detailed calculation for each drainage feature, including the ground attenuation tank and detention basins.
 - b. The applicant must provide the raw infiltration test data for review by the LLFA and justify why the value 2 is an appropriate factor of safety for this application. The applicant is referred to the informatives for further guidance. The LLFA notes that the drainage strategy is largely reliant on infiltration, we require an explanation as to why a FoS of 2 is adequate when considering the size of the site & potential flood risk in the event of infiltration failure/issues.
 - c. The applicant shall submit a plan showing overland exceedance routes for flows in excess of the 1 in 100 year plus climate change (40%) rainfall event, that minimise the risk to people and property.
 - d. We note the applicant has provided a table outlining an approximate maintenance plan. At this stage of an application, the applicant is required to outline who will be responsible for undertaking maintenance, and a time frame to represent the frequency of maintenance (e.g. every 3 months) for each feature of the draining system, (including SuDS features)
2. The applicant must undertake geotechnical factual and interpretive reports, including infiltration tests in accordance with British Research Establishment (BRE) Digest 365 – Soakaway Design. The applicant must use these results to develop the detailed drainage plan, and agree this with the LLFA prior to commencing construction.
3. The applicant must provide a construction management plan which demonstrates how flood risk to people and property will be mitigated, and how pollution to groundwater and existing watercourse will be prevented.

Condition 1 as listed above demonstrates the Lead Local Flood Authorities diligence in auditing of the proposed design. To satisfy this condition the developer will need to provide detailed construction ready drawings, far advanced than those deemed suitable by policy for support of a planning application. In addition, the condition provides surety as to the required maintenance and ensures that there is an accounting party to take responsibility with clear outlines of what that responsibility shall be and a mechanism of enforcement.

Condition 2 relates to the aforementioned testing that will be undertaken and again provides a mechanism to ensure such testing is conducted and to a suitable and recognised standard.

Condition 3 ensures the safety of local residences not during operation but the construction where systems are in a partial state of completion.

The granting of the permission will enable the works necessary to further develop the design. In turn this will provide the additional details requested by the Lead Local Flood Authority which are otherwise unobtainable at this point in time.

These conditions offer full security to the local residence and will prohibit the construction of structures that may affect the flood risk.

This demonstrates that a fully robust system will be implement, with all variables considered though an enforced, robust system that holds the developer accountable.