

## Bronte Welham

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**From:** Amanda Scholes on behalf of Planning.Responses  
**Sent:** 30 January 2018 08:36  
**To:** Planning Scanning  
**Subject:** FW: R/215/17/PL  
**Attachments:** Drainage - Supplementary Guidance Notes.pdf

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**From:** David Easton  
**Sent:** 29 January 2018 13:20  
**To:** Planning.Responses  
**Subject:** FW: R/215/17/PL

Please upload as a consultation response from Engineers.

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**From:** Paul Cann  
**Sent:** 29 January 2018 13:15  
**To:** David Easton  
**Cc:** Planning.Responses  
**Subject:** RE: R/215/17/PL

Hi David

Just managed to have a look at it before I go out.

*Engineers comments in respect to surface water drainage:*

Please apply standard condition ENGD2A.

The proposal to discharge to a crate soakaway is noted. Presumably this includes the areas parking/vehicular access too.

Infiltration rates for soakage structures are to be based on percolation tests undertaken in the winter period and at the location and depth of the proposed structures. The percolation tests must be carried out in accordance with BRE 365, CIRIA R156 or a similar approved method and cater for the 1 in 10 year storm between the invert of the entry pipe to the soakaway, and the base of the structure. It must also have provision to ensure that there is capacity in the system to contain below ground level the 1 in 100 year event plus 40% on stored volumes, as an allowance for climate change. Adequate freeboard must be provided between the base of the soakaway structure and the highest recorded annual groundwater level identified in that location.

Any SuDS or soakaway design must include adequate groundwater monitoring data to determine the highest winter groundwater table in support of the design. The applicant is advised to discuss the extent of groundwater monitoring with the Council's Engineers. Supplementary guidance notes are also enclosed for information.

Regards

Paul Cann  
Senior Engineer (Drainage & Coastal)

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Paul Cann | Senior Engineer (Drainage & Coastal), Engineering Services, Arun District Council | Location: First Floor, Arun Civic Centre,

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**From:** David Easton  
**Sent:** 29 January 2018 08:58  
**To:** Paul Cann  
**Subject:** R/215/17/PL

Hi Paul,

Apologies for the short notice on this one, but I have an extension of time until today and have just noted that we had not consulted you. Would it be possible for you to take a quick look at R/215/17/PL and let me have your comments this morning?

I apologise for the short notice on this one... I have attached the 'Site Drainage Plan' for ease of reference.

Many thanks,  
David

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## Supplementary Requirements for Surface Water Drainage Proposals

Any proposed surface water scheme must consider sustainable drainage principles.

### **SuDS Selection**

The following destinations must be considered for surface runoff in order of preference:

1. Discharge into the ground (infiltration);
2. Controlled discharge to a surface water body;
3. Controlled discharge to a surface water sewer.

Surface water must not be discharged into the foul sewer system. Infiltration structures include soakaways, basins, swales and permeable paving. Discharge to surface water bodies and surface water sewers must be restricted to an agreed rate.

*SuDS selection hierarchy based on:*

*CIRIA C753 - The SuDS Manual*

*BS8582:2013 – Code of Practice for Surface Water Management for Development Sites*

*Approved Document H of the Building Regulations*

### **Infiltration Drainage Design**

Infiltration rates for soakage structures are to be based on percolation tests undertaken in the winter period at the location and depth of the proposed structures. The percolation tests must be carried out in accordance with BRE 365, CIRIA R156 or a similar approved method, and cater for the 1 in 10 year storm event between the invert of the lowest entry pipe into the infiltration structure and the base. For the purpose of design, the percolation rate must be applied to the sides of the infiltration structure only and the rate for the base must be zero. This does not apply to infiltration basins or permeable pavements, whereby the percolation rate is applied to the base only. There must be provision to ensure that there is capacity in the system to contain the 1 in 100 year storm event plus 40% on stored volumes, as an allowance for climate change. The infiltration structure should also drain 50% of its total volume in 24 hours or less for both the 1 in 10 and 1 in 100 year (plus 40%) storm events, in order to provide spare capacity for subsequent storms.

Any infiltration drainage design must include adequate winter groundwater monitoring data to determine the highest winter groundwater table. Residential developments in excess of five properties will require ground water monitoring to be carried out between October and March inclusive. The extent of monitoring required for smaller developments will be subject to agreement with the Council's Engineers.

Adequate freeboard must be provided between the base of the soakaway structure and the highest recorded groundwater level identified in that location.

## **Restricted Discharge**

Discharge to a watercourse or surface water sewer must be restricted to the estimated mean greenfield runoff rate ( $Q_{bar}$ ) by means of a controlled outflow (or restricted to existing runoff rates for brownfield sites). This can be derived from IH124 or a similar approved method. Any storage design must be submitted with groundwater monitoring data where applicable to ensure there will be no detrimental effect on the structure or storage. Storage areas are preferred to be in an 'open' form such as ponds, rather than underground tanks.

## **Flow Exceedance Routes**

The drainage design should show flow routes through the proposed development, demonstrating where surface water will be conveyed for three types of flow:

### 1. Low flow routes

Regular flow from source control features such as permeable pavements should travel in low flow channels through the development in a controlled way contributing to landscape quality.

### 2. Overflows

In the event of local blockages or surcharge a simple overflow arrangement should allow water to bypass the obstruction and return to the management train sequence until conditions return to normal.

### 3. Exceedance routes

When SuDS are overwhelmed by exceptional rainfall, then exceedance routes are required to protect people and property. These provide unobstructed overland flow routes from the development and should be considered for all drainage schemes. Exceedance routes should also be protected from future changes in land use.

## **Culverting a Watercourse**

Culverting (piping) a watercourse is not advised unless there is no alternative. The resulting reduction in storage volume, flow capacity and habitat potential would be unacceptable. Culverted watercourses are also more difficult to maintain due to the limited accessibility.

Land Drainage Consent must be sought from the Lead Local Flood Authority (West Sussex County Council), or its agent (Arun District Council – [land.drainage@arun.gov.uk](mailto:land.drainage@arun.gov.uk)), prior to starting any works (temporary or permanent) that affect the flow of water in the watercourse. Such works may include culverting, channel diversion and the installation of trash screens.

The development layout must take account of any existing watercourses (open or culverted) to ensure that future access for maintenance is not restricted.

*See also:*

*Land Drainage Act 1991 (amended 1994)*

## **Maintenance and Management**

Ditches and watercourses (including culverts) should retain a three metre easement with access that allows for its future maintenance.

Details of the maintenance and management of the SuDS system are to be set out in writing in a site specific maintenance manual. This manual shall include details of the financial management and arrangements for the replacement of components at the end of the manufacturers recommended design life. This document is then to be submitted as part of the planning process.

## **References**

The Building Regulations 2000  
Drainage and waste disposal  
Approved document H  
ISBN: 1-859462-08-1

Building Research Establishment,  
Soakaway Design – Digest 365 (BRE 365)  
ISBN: 1 86081 604 5, 1991

Centre for Ecology and Hydrology  
Flood Estimation for Small Catchments - IH Report 124  
Marshall, D.C.W. & Bayliss, A.C.  
ISBN: 0948540621, 1994

CIRIA  
C697 The SUDs Manual  
Woods-Ballard, B.; Kellagher, R. et al  
ISBN: 978-0-86017-697-8, 2007

CIRIA  
R156 Infiltration Drainage – Manual of Good Practice  
Bettess, R.  
ISBN: 0 86017 457 3

British Standards Institution  
BS8582:2013 – Code of Practice for Surface Water Management for Development Sites  
ISBN: 978 0 580 76700 5