

# Cambridgeshire County Council Surface Water Guidance

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## 1. Sustainable Drainage Systems (SuDS)

Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.

SuDS are an approach to managing surface water run-off which seeks to mimic natural drainage systems and retain water on or near the site as opposed to traditional drainage approaches which involve piping water off site as quickly as possible. SuDS involve a range of techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands. SuDS offer significant advantages over conventional piped drainage systems in reducing flood risk by attenuating the rate and quantity of surface water run-off from a site, promoting groundwater recharge, and improving water quality and amenity.

The variety of SuDS techniques available means that virtually any development should be able to include a scheme based around these principles. This should not be a piecemeal use of a few techniques. A fully integrated system is essential.

Some SuDS options could require significant land take so it is essential that they are considered early on in the design process. SuDS solutions are also available for high density urban environments where space is at a minimum. It can be difficult to incorporate some options once the detailed development design is underway.

The [Ciria SuDS Manual](#) provides guidance covering the planning, design, construction and maintenance of SuDS to assist with their effective implementation within developments.

### **Further Information**

- CIRIA 523 (SuDS Best Practice Manual)
- CIRIA 609 (SuDS – hydraulic, structural and water quality advice)
- C687 (Planning for SuDS)
- CIRIA W12 (Sustainable Water management in Schools)
- CIRIA R156 (Infiltration Drainage – Manual of Good Practice)
- CIRIA C698 (SuDS Construction Guide)
- A future Flood & Water Supplementary Planning Document will be published, please keep an eye for updates within the Cambridgeshire County Council on this.

## 2. Planning Application Guidance

Any application for 'major development' with surface water drainage implications will need to be accompanied by a surface water drainage strategy (possibly as part of a Flood Risk Assessment if one is required) regardless of flood zone.

An application for Outline planning permission should include details of at least one workable solution for managing surface water (this may alter at the detailed application stage). Applications for Full permission should refer to Section 3 for what information will be required.

The following is a list of the information required by the Lead Local Flood Authority (LLFA) to assess a planning application. This is intended only as a starting point and it is strongly recommended that applicants contact the LLFA to discuss any site specific issues.

- Demonstration of how SuDS have been considered as part of the development proposals. Refer to the SuDS hierarchy and justify the chosen method(s) of surface water disposal.
- Areas of permeable and impermeable land for both the existing site and the proposed development to be used to assess the change in surface water runoff. The site characteristics including how surface water management is functioning on the site at present should be investigated.
- Consideration should be given to sub-catchments which may exist on the site. Calculations of greenfield runoff rates for individual watercourses should be based on the proposed area of impermeable land within its sub-catchment. It may be possible to divert water to a different sub-catchment only if the greenfield runoff rate for that watercourse is not exceeded.
- Establish the permitted discharge rate in accordance with the following information:

### **Undeveloped (Greenfield) Sites**

- For discharge into a main river or an ordinary watercourse outside of an Internal Drainage Board (IDB) District, the allowable discharge rate will be based on the calculated pre-development (greenfield) runoff rate for the site and for a simple control structure will be based on the QBAR rate. This should be agreed in discussions with the LLFA.

- If complex controls are to be used for control of discharge rates, calculations of the greenfield runoff rates should be provided for the 1 in 1, 1 in 30 and 1 in 100 annual probability (plus climate change) rainfall events. The methodology in the EA/Defra document "[Preliminary Rainfall Runoff Management for Development](#) (W5-074/A/TR1) should be used as the basis for calculations.
- Written confirmation of the discharge rate as agreed by the receiving drainage body (i.e. Water Company or the Internal Drainage Board) should be provided to the LLFA.

### Previously Developed (Brownfield) Sites

- For previously developed sites, the peak discharge rate must be as close as reasonably practicable to the equivalent greenfield runoff rate for the site. It should never exceed the rate of discharge from the site prior to redevelopment. The proposed discharge rate should be agreed with the receiving drainage body and confirmation should be provided to the LLFA.
- If discharging into an Ordinary Watercourse outside an IDB area, evidence to demonstrate the watercourse has sufficient capacity to convey the proposed discharge rate and volume should be provided. Any known history of flooding problems will also need to be provided to the LLFA.
- If proposing to discharge to soakaways then percolation tests should be submitted in accordance with BRE Digest 365 or CIRIA guidance 156.
- An assessment of the volume of attenuation storage that will be required on site must be provided. This should be based on the 1 in 100 annual probability critical storm duration with an appropriate allowance for climate change (see [Flood Risk Assessments: Climate Change Allowances](#) for further information). The 'central estimate' of 20% should be used for design purposes to assess the performance of the drainage system and ensure it can cope with the critical duration design rainfall event. The 'upper end' of 40% should be used in sensitivity analysis to assess the potential flood risk implications both on and off-site in the critical duration design rainfall event. When using the upper end figure it must be ensured that surface water is wholly contained on site and that flood hazard is within acceptable tolerances (see [Flood Risk Assessment Guidance for New Development](#) for further information on flood hazard). .Flood Studies Report (FSR)

rainfall data should be used for storm durations less than 1 hour and Flood Estimation Handbook (FEH) rainfall data should be used for storm durations greater than 1 hour when identifying the critical storm duration. The method of attenuation should be identified and located on a plan of the site.

- An assessment of the need for long term storage should be provided. This will address the additional volume of runoff generated by the development. See the EA/Defra document "[Preliminary Rainfall Runoff Management for Development](#)" (W5- 074/A/TR1) for further information. The need for this provision will vary between sites so contact the LLFA.

### Further Information

- Technical Guidance to the National Planning Policy Framework
- R&D Technical Report W5-074/A/TR/1 Revision D, Preliminary rainfall runoff management for developments.
- BRE Digest 365 (Soakaway Design)
- CIRIA 523 (SuDS Best Practice Manual)
- CIRIA 609 (SuDS – hydraulic, structural and water quality advice)
- CIRIA 753 (SuDS Manual)
- CIRIA R156 (Infiltration Drainage – Manual of Good Practice)
- A future Flood & Water Supplementary Planning Document will be published, please keep an eye on updates within the County Council on this.

### 3. Discharge of Surface Water Condition

The following list of information represents the likely minimum requirements of the LLFA in order to recommend that the LPA discharges a surface water drainage condition. This is not an exhaustive list and further information may be requested to support the application. Information to discharge a condition should be submitted as one package in a Drainage Strategy rather than in piecemeal submissions.

In addition to the information outlined in Section 2, the following information will also be required:

1. Fully labelled drainage network drawing showing details (pipe numbers, gradients, sizes, locations, manhole details etc.) of every element of the proposed drainage system (pipes, swales, storage areas, ponds, etc.).
2. Hydraulic calculations to support the design of the system:
  - FSR rainfall data should be used for storm durations less than 1 hour and FEH rainfall data should be used for storm durations greater than 1 hour.
  - Calculations for the 1 in 30 annual probability rainfall event identifying the critical storm duration for the network considering a range of summer and winter storm durations from 15 minutes up to the 10080 minute (7 day) duration. No above ground flooding should occur for this event.
  - Calculations for the 1 in 100 annual probability rainfall event including an appropriate allowance for climate change (see [Flood Risk Assessments: Climate Change Allowances](#) for further information). This should identify the critical storm duration for the network considering a range of summer and winter storm durations from 15 minutes up to the 10080 minute (7 day) duration. Some short term above ground flooding may be permitted for the 1 in 100 annual probability event with an appropriate allowance for climate change. Any above ground flooding should be managed to be safe and not enter any buildings or disrupt emergency access routes. The volumes, depths, velocity and extent should be mapped on a topographical plan of the site. If flooding is extensive the hazard should be considered in line with guidance from the EA/Defra document '[Flood Risk Assessment Guidance for New Development](#) (FD 2320/TR2) table 13.1.
3. Details of any online or offline flow control structures to be used such as complex controls or vortex flow controls or attenuation ponds.

4. Consideration of a surcharged outfall. The standard default setting of many surface water computer modelling programmes assumes a freely discharging outfall. Careful consideration is required and evidence provided to demonstrate that this assumption is correct. In many circumstances an outfall maybe surcharged affecting its hydraulic capacity and impacting on the surface water network. A surcharged outfall is likely to occur if discharging into a watercourse or surface water network near capacity. In these scenarios and with the absence of supporting information to the contrary it is expected the surface water calculations will assume a surcharged outfall.
5. If it is proposed to raise any land levels on site, the surface water strategy should consider the effect this could have on runoff leaving the site and affecting third parties. The most appropriate solution(s) to prevent this will need to be assessed.
6. Details of the party/parties responsible for the long term management and maintenance of every element of the proposed drainage system.
7. A Summary report to include:
  - The methodology applied in the calculations for the scheme. This should include the global variables and any assumptions used.
  - An explanation of how the system operates.
  - An assessment of whether the receiving watercourse or sewer network will be able to convey the proposed discharge.

### Further Information

- R&D Technical Report W5-074/A/TR/1, Preliminary rainfall runoff management for developments – refer to the most up to date Revision.
- R&D Technical Report FD 2320/TR2, Flood Risk Assessment Guidance for New Development.
- BRE Digest 365 (Soakaway Design)
- CIRIA 523 (SuDS Best Practice Manual)
- CIRIA 609 (SuDS – hydraulic, structural and water quality advice)
- A future Flood & Water Supplementary Planning Document will be published, please keep an eye on updates within the County on this.

### Contact Information

If you would like to contact Cambridgeshire County Council's Flood and Water team, please email [fr.planning@cambridgeshire.gov.uk](mailto:fr.planning@cambridgeshire.gov.uk)