

## **Surface Water Guidance note and pro-forma for Major Developments**

A surface water drainage strategy produced (possibly as part of an Flood Risk Assessment, if one is required) must be submitted for this size of development and attention must be paid to the management of surface water run-off. This advice should also be considered alongside the broader assessment of flood risk in Flood Zone(s) 3 and 2 where applicable, but often there will be an independent assessment of surface water drainage in Flood Zone 1. It can also be used as guidance for any other development where surface water drainage is of interest.

In drawing up schemes applicants should refer to the [SUSDRAINS website](#) and [CIRIA Guidance](#), as this includes a wealth of detailed information on sustainable drainage to assist the applicant in managing surface water drainage. Reference to the technical guidance in [Defra/EA Rainfall Runoff Management for new Developments](#) science report, Revision E will provide applicants with advice on the management of stormwater drainage and in particular to assist in sizing of storage elements for the control and treatment of stormwaters runoff. Applicants may also want to use the online tool from [www.UKSuds.com](http://www.UKSuds.com) to help derive preliminary calculations.

A surface water drainage strategy is vital so that a Local Planning Authority can make informed planning decisions and without this the flood risks resulting from the development are unknown.

### **Information Requirements – Outline Applications**

An outline planning application should include enough information to demonstrate a workable solution for managing surface water drainage. The assessment submitted should include a preliminary study outlining the existing surface water run-off rates from the site and an indication of post development run-off rates with associated storm water storage requirements. An indication should be given as to how sustainable drainage will be established with the preferred option of infiltration to ground where this is acceptable.

There needs to be a clear view of where the proposal is going as well as the underlying principles. At the outline planning stage it should be possible for an outline surface water drainage strategy to be produced which clearly identifies and quantifies the defining principles to be taken forward. This would allow a reasonably worded surface water drainage condition, that could be satisfied at the reserved matters detailed design stage, to be included as part of the outline planning permission.

### **Information Requirements – Full or Reserved Matters Applications**

A full planning application or reserved matters application should have progressed from an initial preliminary drainage study and include detailed information about the existing run-off rates and SuDS storage requirements. In addition to this, the drainage strategy should show that all opportunities to implement sustainable drainage techniques at the site have been maximised and that any obstacles to their use is clearly justified within the report. This should include, where appropriate, provision for the adoption of drainage infrastructure and a maintenance contribution to that party.

### **LPA Review of Surface Water Drainage Details**

Surface water drainage details should be reviewed in the following order:

Stage 1 – Assess the principles of sustainable drainage by identifying what methods are proposed to manage surface water drainage.

Stage 2 – Assess the technical detail of the application against the relevant standards

Stage 3 – Assess whether enough information is provided to ensure adoption and whether long term maintenance is viable.

Completion of the required pro-forma will present a summary of the key information from the surface water drainage strategy and will support a LPA/LLFA in making a decision as to the suitability of the proposal. When further detail of the proposed scheme is required the use of a planning condition to secure this information can be considered. We recommend that a competent person in drainage design completes this form on the applicant's behalf.

### **Stage 1 SuDS Principles**

Have the principles of sustainable drainage been understood and the destination of surface water drainage been clearly justified?  
(Section 3 of pro-forma)

**Paragraph 103 of the National Planning Policy Framework (NPPF) expects LPA's to give priority to the use of SuDS in determining planning applications. Additionally policy changes in April 2015 enhance the requirement for SuDS on Major developments. Please see [National Planning Practice Guidance](#) and the [Non-statutory technical standards for sustainable drainage systems](#).**

The discharge of surface water must be to one or more of the following in order of priority

- 1) discharge into the ground (infiltration); or where this is not reasonably practicable e.g. where the site is on impermeable ground or above protected groundwater zones\* (go to step 2)
- 2) discharge to a surface water body; or where not reasonably practicable (go to step 3)
- 3) discharge to a surface water sewer, highway drain, or another drainage system; or where not reasonably practicable (go to step 4)
- 4) discharge to a combined sewer.

\*In such locations the Environment Agency may still provide bespoke advice on groundwater protection

## **Stage 2 Technical Assessment**

**Paragraph 103 of the NPPF states that Local Planning Authorities should ensure that development does not increase flood risk elsewhere.**

In order for the surface water drainage strategy to show that flood risk is not made worse elsewhere, the applicant should confirm as a minimum the standards below:

1. The development considers capturing the first 5mm of rainfall through infiltration devices. This could be via permeable paving, swales, green roofs etc. This is to mimic natural drainage patterns.

### **Runoff rates** (Section 4 of Pro-forma)

2. For greenfield sites, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall\* events must not exceed the peak greenfield runoff rate from the site for the same event.

3. For previously developed sites, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall events\* must be as close as possible to the greenfield runoff rate from the site for the same rainfall event, but must not exceed the rate of discharge for the predevelopment scenario for that event.

\* *Climate Change* - An allowance for climate change needs to be incorporated into the post development calculations, which means adding an extra amount to peak rainfall (30% is the normal figure for the majority of development proposals unless they are temporary in nature).

### **Runoff Volumes** (Section 5 and 6 of Pro-forma)

4. For greenfield sites, the runoff volume from the developed site to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must not exceed the greenfield runoff volume for the same event. If the additional volume cannot be stored on site and infiltrated it must be released from site at a low trickle rate, typical 2/l/sec hectare.
5. For previously developed sites, the runoff volume from the developed site to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as possible to the greenfield runoff volume for the same event, but must not exceed the runoff volume for the predevelopment scenario for that event.

### **Residual Risk**

6. Ensure that the residual risk of flooding has been addressed should any drainage features fail or if they are subjected to an extreme flood event. Overland flow routes or above ground storage of water should not put people and property at unacceptable risk. This could include measures to manage residual risk such as raising ground or floor levels where appropriate.

### **Stage 3 Adoption and Maintenance** (Section 9 of proforma)

7. Clear details for the maintenance and/or adoption proposals of all elements of the proposed drainage system must be provided prior to the commencement of the development/granting of planning permission. Any constraints to this should be considered by the LPA prior to determination of the application. The Interim Code of Practice for Sustainable Drainage Systems (SuDS) provides advice on design, adoption and maintenance of SuDS. This can be obtained from the [SUSDRAINS website](#).

The applicant should confirm the above points by using the pro-forma which is contained below. This should be completed by or on behalf of the applicant and submitted as part of the planning application. The top part of the pro-forma includes a section where the applicant can clearly state what the difference in rates and volumes will be as a result of the development. The lower sections are provided to show that the applicant can explain how drainage rates and volumes are being dealt with on the site in order to not increase surface water rates and volumes. The pro-forma includes a column where the applicant should identify where the information is demonstrated.

### **Surface Water Pro-forma for new developments**

This pro-forma accompanies our surface water guidance note for developments classed as major. Applicants should complete this form and submit it to the Local Planning Authority, referencing from where in their submission documents this information is taken. The pro-forma is supported by the [Defra/EA guidance on Rainfall Runoff Management](#) and uses the storage calculator on [www.UKsuds.com](http://www.UKsuds.com)

#### **1. Site Details**

<b>Site</b>	
<b>Address &amp; post code or LPA reference</b>	
<b>Grid reference</b>	
<b>Is the existing site developed or Greenfield?</b>	
<b>Total Site Area served by drainage system (excluding open space) (Ha)*</b>	

\* The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

#### **2. Impermeable Area**

	<b>Existing</b>	<b>Proposed</b>	<b>Difference (Proposed-Existing)</b>	<b>Notes for developers &amp; Local Authorities</b>

<b>Impermeable area (ha)</b>				If proposed > existing, then runoff rates and volumes will be increasing. Section 6 must be filled in. If proposed ≤ existing, then section 6 can be skipped & section 7 filled in.
<b>Drainage Method</b> (infiltration/sewer/watercourse)			N/A	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

### 3. Proposing to Discharge Surface Water via

	Yes	No	Evidence that this is possible	Notes for developers & Local Authorities
<b>Infiltration</b>				e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed.
<b>To watercourse</b>				e.g. Is there a watercourse nearby?
<b>To surface water sewer</b>				Confirmation from sewer provider that sufficient capacity exists for this connection.
<b>Combination of above</b>				e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.

### 4. Peak Discharge Rates – This is the maximum flow rate at which storm water runoff leaves the site during a particular storm event.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Notes for developers & Local Authorities
<b>Greenfield QBAR</b>		N/A	N/A	QBAR is approx. 1 in 2 storm event. Provide this if Section 6 (QBAR) is proposed.
<b>1 in 1</b>				Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events.
<b>1 in 30</b>				
<b>1 in 100</b>				
<b>1 in 100 plus climate change</b>	N/A			To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change. 30% should be added to the peak rainfall intensity.

### 5. Calculate additional volumes for storage – The total volume of water leaving the development site. New hard surfaces potentially restrict the amount of stormwater that can go to the ground, so this needs to be controlled so not to make flood risk worse to properties downstream.

	Existing Volume (m <sup>3</sup> )	Proposed Volume (m <sup>3</sup> )	Difference (m <sup>3</sup> ) (Proposed-Existing)	Notes for developers & Local Authorities
<b>1 in 1</b>				Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere.
<b>1 in 30</b>				

<b>1 in 100</b>				Where volumes are increased section 6 must be filled in.
<b>1 in 100 plus climate change</b>				To mitigate for climate change the volume discharge from site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

**6. Calculate attenuation storage** – Attenuation storage is provided to enable the rate of runoff from the site into the receiving watercourse to be limited to an acceptable rate to protect against erosion and flooding downstream. The attenuation storage volume is a function of the degree of development relative to the greenfield discharge rate.

		<b>Notes for developers &amp; Local Authorities</b>
<b>Storage Attenuation volume (Flow rate control) required to retain rates as existing (m<sup>3</sup>)</b>		Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing

**7. How is Storm Water stored on site?** – Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long term storage. The idea is that the additional volume does not get into the watercourses, or if it does it is at an exceptionally low rate. You can either infiltrate the stored water back to ground, or if this isn't possible hold it back with on-site storage. Firstly, can infiltration work on site?

			<b>Notes for developers &amp; Local Authorities</b>
<b>Infiltration</b>	<b>State the Site's Geology and known Source Protection Zones (SPZ)</b>		Avoid infiltrating in made ground. Infiltration rates are highly variable and refer to Environment Agency website to identify SPZs
	<b>Are infiltration rates suitable?</b>		Infiltration rates should be no lower than $1 \times 10^{-6}$ m/s.
	<b>State the distance between a proposed infiltration device base and the ground water (GW) level</b>		Need 1m (min) between the base of the infiltration device & the water table to protect GW quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible.
	<b>Were infiltration rates obtained by desk study or infiltration test?</b>		Infiltration rates can be estimated from desk studies at most stages of the planning system if a back up attenuation scheme is provided.
	<b>Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.</b>		Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.
<b>In light of the</b>			If infiltration is not feasible how will the additional volume be stored?.

above , is infiltration feasible?	Yes/No? If the answer is No, please identify how the storm water will be stored prior to release		The applicant should then consider the following options in the next section.
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## 8. Storage requirements

The applicant must confirm that either of the two methods for dealing with the amount of water that needs to be stored on site has been submitted

**Option 1 Simple** – Store both the additional volume and attenuation volume in order to make a final discharge from site at **QBAR** (Mean annual flow rate). This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.

**Option 2 Complex** – If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site could be possible.

Please confirm what option has been chosen and how much storage is required on site.		<b>Notes for developers &amp; Local Authorities</b> The developer at this stage should have an idea of the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.
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## 9. Please confirm

Which sustainable drainage (SuDS) measures have been used?		<b>Notes for developers &amp; Local Authorities</b> SuDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SuDS devices allows treatment but not infiltration. See CIRIA SuDS Manual C697.
Drainage system can contain in the 1 in 30 storm event without flooding		This a requirement for sewers for adoption & is good practice even where drainage system is not adopted.
Any flooding between the 1 in 30 & 1 in 100 plus climate change storm events will be safely contained on site.		<b>Safely:</b> not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths. Flood waters



		must drain away at section 6 rates. Existing rates can be used where runoff volumes are not increased.
<b>How are rates being restricted (hydrobrake etc)</b>		Hydrobrakes to be used where rates are between 2l/s to 5l/s. Orifices not be used below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage.
<b>Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.</b>		If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Proforma.
<b>How is the entire drainage system to be maintained?</b>		If the features are to be maintained directly by the owners as stated in answer to the above question please answer yes to this question and submit the relevant maintenance schedule for each feature. If it is to be maintained by others than above please give details of each feature and the maintenance schedule. Clear details of the maintenance proposals of all element of the proposed drainage system must be provided. Poorly maintained drainage can lead to increased flooding problems in the future.

**10. Evidence** Please identify where the details quoted in the sections above were taken from. i.e. Plans, reports etc. Please also provide relevant drawings that need to accompany your proforma, in particular exceedance routes and ownership and location of SuDS (maintenance access strips etc).

Pro-forma Section	Document reference where details quoted above are taken from	Page Number
Section 2		
Section 3		
Section 4		
Section 5		
Section 6		
Section 7		

The above form should be completed using evidence from the Flood Risk Assessment/surface water drainage strategy and site plans. It should serve

as a summary sheet of the drainage proposals and should clearly show that the proposed rate and volume as a result of the development will not be increase. If there is an increase in rate or volume, the rate or volume section should be completed to set out how the additional rate/volume will be dealt with.

This form is completed using factual information from the Flood Risk Assessment/surface water drainage strategy and Site Plans that can be used as a summary of the surface water drainage strategy on this site.

Form Completed By.....

Job Title .....

Company.....

On behalf of (Client's details) .....

Date:.....